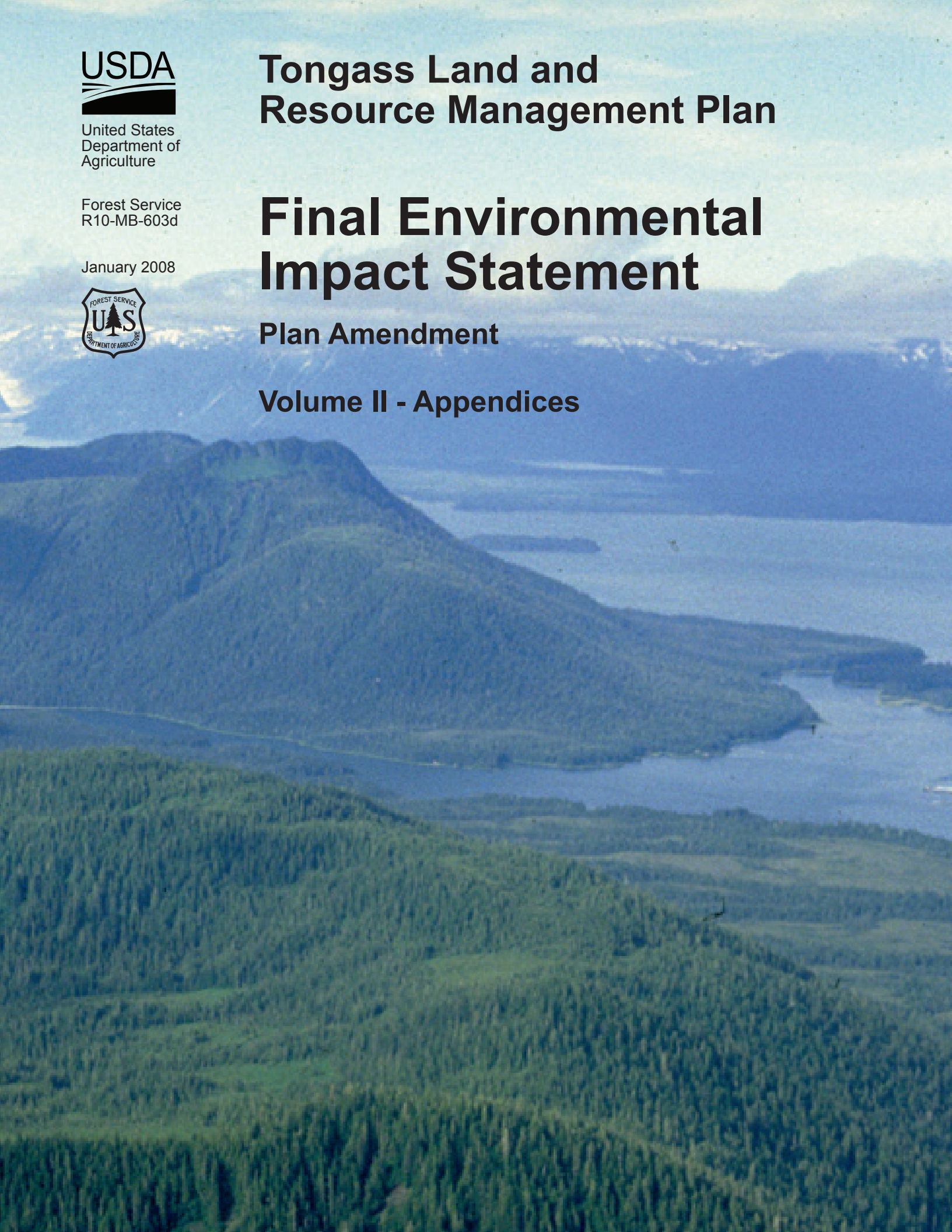

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Tongass Land and Resource Management Plan

Final Environmental Impact Statement

Plan Amendment

Volume II - Appendices

Tongass National Forest
Land and Resource Management Plan

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2008

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APPENDIX A
ISSUE IDENTIFICATION

Appendix A

Issue Identification

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Appendix A
Issue Identification

Introduction

This Environmental Impact Statement (EIS) responds to the August 2005 U.S. Ninth Circuit Court Decision that found inadequacies primarily relating to the National Environmental Policy Act (NEPA) process for the 1997 Land and Resource Management Plan (Forest Plan or Plan). The Court directed the Forest Service to prepare an EIS that evaluates and considers timber demand, the range of alternatives related to the timber demand, and the cumulative analysis related to activities on non-National Forest System (NFS) lands. This is discussed further in Chapter 1 of the EIS. This EIS responds to the Court and the 5-Year Review by analyzing six alternatives for amending the Plan in addition to the No-Action alternative. Appendix A of the 1997 Final EIS discusses the issue identification process used in the Tongass National Forest planning process.

Identification of issues helps define or predict what resources or uses could be most affected by the planning alternatives under consideration. These issues are then used as a basis to formulate alternatives or to measure differences between alternatives. The following sections describe the process used to identify the issues for this EIS and the key issues identified.

The scope of this EIS was initially determined by the Court in its 2005 ruling, and by the 5-Year Plan Review (completed in January 2005) that indicated the need to amend the current Tongass Forest Plan. Additional information was considered to help clearly define the issues and for use in the development and analysis of alternatives. For this EIS, comments and information from a wide variety of public inputs that were related to amending the Forest Plan were considered. This information included:

- Public comments generated during the 1997 Tongass Forest Plan Revision process;
- Tongass Forest Plan Revision appeals;
- Public input specific to the Tongass National Forest on the Forest Service's 2001 National Roadless Area Conservation Rule;
- Public comments generated relative to the 2003 Supplemental EIS, Roadless Area Evaluation for Wilderness Recommendations;
- Public input expressed during project-level NEPA analyses over approximately the past 10 years; and
- Public input received in response to the Notice of Intent and the Web site for this EIS.

This record of public input on the management of the Tongass covers a period of almost 2 decades.. Of special note are the extensive public meetings held in Southeast Alaska for the 1997 Forest Plan Revision, the 2001 National Roadless Area Conservation Rule, and the 2003 Supplemental EIS.

Past Planning Efforts

Tongass Forest Plan Revision

Appendix L of the 1997 Final EIS presents summaries of all substantive comments received during the three public comment periods for the Tongass Forest Plan Revision, as well as presents Forest Service responses to these comment summaries. All public comment periods held during the Tongass Forest Plan Revision were announced in the Federal Register, by news release, in local newspapers, and

through newsletters. Informational meetings and open houses, followed by hearings, were held in most Southeast Alaska communities during each comment period. More than 3,000 individuals, organizations, interest groups, and agencies provided written or oral input on the 1990 Draft EIS, and more than 7,000 and 21,000 responses were received on the 1991 Supplement and the 1996 Revised Supplement, respectively.

Comments summarized in Appendix L were identified by location and issue and entered into a database that had more than 850 entries. Information developed through this review was used to help identify public interest in specific roadless areas, as well as in the issue identification process.

Tongass Forest Plan Revision Appeals

A total of 23 appeals were received on the 1997 Tongass Land Management Plan Revision Record of Decision (ROD). These appeals were reviewed and comments were summarized by location and issue and entered into a database. Information developed through this review was used to help identify public interest in specific roadless areas, as well as in the issue identification process.

National Roadless Area Conservation Rule

More than 1.1 million separate pieces of public input were received on the National Roadless Area Conservation Rule Draft EIS. The results of the Forest Service's content analysis of these comments are presented in Volume 3 of the Roadless Area Conservation Final EIS along with the Forest Service's responses to the identified comment summaries (USDA Forest Service 2000). A portion of these comments specifically pertained to the Tongass. Some of these comments were in support of, and some were against, roadless area conservation on the Tongass. Some stated that roadless areas were important for wildlife and endangered and threatened species, some were concerned about effects on the regional economy, recreation, and subsistence (some indicated that limiting road construction would limit access for subsistence, while others stated that there are already sufficient roads on the Tongass to meet subsistence needs).

Project-Level EIS Analyses

Public input related to timber management, recreation, roadless areas, and other issues that has been expressed during project-level EIS analyses over approximately the past 10 years was considered. This included many recent project-level EISs and EAs completed since 1997, as well as several landscape-level plans. Many of the comments that addressed timber demand, economics, wildlife, subsistence, scenery, tourism, and roadless area issues were made in response to proposals to harvest timber and to build roads.

National Forest Transportation Rule and Policy

Public input on the National Forest Transportation Rule and Policy that pertained specifically to the Tongass was also reviewed as part of this issue identification process.

Supplemental EIS, Roadless Area Evaluation for Wilderness Recommendations

Public input on the Supplemental EIS, Roadless Area Evaluation for Wilderness Recommendations was also reviewed as part of this issue identification process. Approximately 177,000 separate pieces of input were received during the public comment period. Eighteen public hearings were held, 16 in Southeast Alaska, one in Anchorage, and one electronic public hearing (via the internet). Comments were received from all 50 states and at least 11 foreign countries. Comments generally focused on how much roadless area to retain and how this would effect recreation, tourism, timber, wildlife, subsistence, and the local economy. Comment summaries and Forest Service responses are presented in Volume IV of the Final Supplemental EIS, along with letters from agencies, elected officials, and tribal governments.

Public Issues

Identification of issues helps define or predict the resources or uses that could be most affected by the management of NFS lands. These issues are then used as a basis to formulate alternatives or to measure differences between alternatives.

Ten public issues were originally identified in 1988 for the Forest Plan Revision. These original issues included scenic quality, recreation, fish habitat, wildlife habitat, subsistence, timber harvest, roads, minerals, roadless areas, and local economy. The 1991 Forest Plan Revision Supplemental Draft EIS (SDEIS) added an additional concern, identifying and considering rivers for recommendation as Wild, Scenic, and Recreational rivers.

After the release of the 1991 SDEIS, considerable new information pertaining to the Tongass Forest Plan Revision became available. Out of this information emerged five additional issues, determined by the Regional Forester to need more study and evaluation before a final revised Forest Plan could be adopted. Some of these issues were aspects or extensions of the ten public issues previously considered; others were new as issues or had not been considered as issues in themselves. The five issues were wildlife viability, fish habitat, karst and caves, alternatives to clearcutting, and socioeconomic considerations. These issues were assessed in the 1996 Revised SDEIS and the 1997 Tongass Forest Plan Revision Final EIS.

The 2003 Supplemental EIS reviewed and evaluated roadless areas and analyzed alternative groupings of roadless areas for wilderness recommendations. Two broad issue categories, referred to as key issues, were identified as the major issues driving the alternatives and the analysis. They included 1) the long-term protection of roadless areas and associated values, and 2) the social and economic well-being of the communities of Southeast Alaska.

Public Input for this EIS

In addition to the above, extensive public involvement has occurred during the development of this EIS. All public input received has been reviewed and is maintained in the planning record. Comments and responses on the Draft EIS are also included in Appendix H. Public involvement activities have included the following items.

- The Notice of Intent was published in the Federal Register in March 2006.
- A Forest Plan Adjustment Web site was developed in January 2006 and has been maintained to inform and engage the public since then. It is updated as new information is developed or published and provides a mechanism for public input. Several hundred comments and questions were received through the Web site or via emails associated with the Web site in the first few months of operation.
- A Weblog regarding the Forest Plan adjustment effort was established in July 2006 and was continually maintained as another method of public communication.
- In response to the above items, a number of letters were received containing comments regarding the issues and alternatives. These included letters from environmental organizations, the timber industry, Southeast Alaska community organizations, and a number of individuals from Southeast Alaska and across the nation.
- Government-to-government consultation has been conducted throughout the process, and is ongoing, with federally recognized Tribes.
- A number of group-specific meetings have also occurred with various organizations (including Alaska Native groups).
- A variety of news releases were issued relative to the Forest Plan adjustment throughout the process.

- A series of ongoing meetings, hosted by the National Forest Foundation and The Nature Conservancy, known as the Tongass Futures Roundtable, have resulted in considerable discussion of Tongass management issues among a broad spectrum of individuals and groups interested in the future of Southeast Alaska since May 2006.
- The input received prior to issuance of the Draft EIS was reviewed and a summary of this synthesis is presented as Appendix A (Issue Identification) to the Final EIS.
- A Draft EIS and Proposed Forest Plan were released on January 12, 2007. This began a 90-day comment period, which was later extended to 108 days. The comment period closed on April 30, 2007.
- During the comment period, open houses and public hearings were held in 24 Alaska communities. In addition to comments on the Draft EIS, the hearings provided opportunity to hear concerns related to subsistence and Alaska Native issues.
- On March 22, 2007, an open house and public hearing was held on the internet, to solicit public comment in an open forum from individuals living anywhere in the world.
- Over 84,000 comment documents were received, including individual letters, form letters, emails, hearing testimony, and comments submitted directly via the Forest Plan Adjustment Web site. Slightly more than 2,000 of these were classified as individual comment documents and the others were classified as form letters and emails. The individual comment documents were subdivided into approximately 5,500 individual comments. Responses were received from all 50 states and 89 foreign countries. A summary of the substantive comments and Forest Service responses to those comments can be found in Appendix H.

Key Issues

Any alternative that proposes to change the Forest Plan could affect resources and/or outputs relative to the current Forest Plan. Therefore, Chapter 3 of the EIS shows the effects of the various alternatives on all relevant resources and evaluates their effects relative to all of the issues and concerns previously identified during the 1997 plan revision process. However, based on the purpose and need of this EIS and the public input received during the current EIS process, some issues are more likely to influence the comparison among alternatives and represent the major issues to be evaluated. These issues were grouped into three broad issue categories, referred to as the key issues. These key issues are the major issues driving the alternatives and analyses.

Key Issue 1 – Protection of high value roadless areas from road development and timber harvest activity on the Tongass National Forest is of local and national importance, particularly for wildlife and biodiversity, recreation, and tourism.

Many people believe roadless areas should be allowed to evolve naturally through their own dynamic processes and should be afforded protection that ensures this will occur. The Tongass includes very large undeveloped land areas with several portions of the Forest consisting of contiguous roadless areas that exceed 1 million acres and represent large, unfragmented blocks of wildlife habitat. This large scale of roadless lands does not exist on any other National Forest, except the Chugach National Forest in Southcentral Alaska.

Roadless areas are considered important because of their wildlife habitat and recreation values and their importance for tourism. They are also important because of the passive-use and ecosystem services values they provide.

Passive-use values represent values that individuals assign to a resource independent of their use of that resource. Typically this includes existence, option, and bequest values, and represents the value individuals obtain from knowing that expansive roadless areas exist, knowing that they are available to visit in the future should they choose to do so, and knowing that they are available for future generations to inherit. There is interest in preserving large portions of the Tongass because so much of it is in a

natural condition, unlike most other national forests, and because the Forest represents a significant portion of the world's remaining temperate rainforests.

Ecosystem services represent the services provided to society by healthy ecosystems. These services and benefits include what some consider to be long-term life support benefits to society as a whole. Examples of ecosystem services include watershed services, soil stabilization and erosion control, improved air quality, climate regulation and carbon sequestration, and biological diversity.

Indicators: Analysis relative to this issue compares the amount and proportion of land protected in non-development Land Use Designations (LUDs); the amount of inventoried roadless areas that would be protected under each alternative; and the amount of productive old-growth forest that would be protected under each alternative. Also, the values of the lands protected are considered. Non-use or passive-use values are discussed qualitatively and with examples provided from other studies.

Key Issue 2 – The Tongass National Forest needs to seek to provide a sufficient timber supply to meet the market demand and help maintain a vibrant economy in Southeast Alaska.

TTRA (Section 101) requires the Forest Service to seek to provide a supply of timber from the Tongass National Forest that meets the annual market demand and the market demand for each planning cycle, consistent with providing for the multiple-use and sustained yield of all renewable resources. With the cancellation of long-term timber contracts and the closure of two Southeast Alaska pulp mills in the 1990s (discussed in detail in Chapter 3 Environment and Effects), current demand for Alaska's National Forest timber depends on markets for sawn wood and the option of exporting manufacturing residues and lower grade logs. Future or planning cycle demand scenarios cover a wide range of issues and depend on rates of economic growth in key markets, conditions faced by competitors, and the rate of investment and innovation in Alaskan manufacturing.

Over the past half a century, the timber industry has been a major component of the economy of Southeast Alaska. However, with the closure of two Southeast Alaska pulp mills and the growth of tourism, timber has played a lesser role. Because the economy of Southeast Alaska is based on relatively few industries, maintaining an active timber industry is important for maintaining a well-diversified economy.

Indicators: Analysis relative to this issue compares the likely demand for timber based on capacity of the local industry and the amount of harvest made available to meet that demand. It also considers the type of wood (sawlogs and utility wood) made available and the usefulness of that wood type to the local industry, as well as the amount of timber that would be available from state and private sources. Finally, it considers the effects on the regional and national economies and the effects on the local communities.

Key Issue 3 – Protection of the wildlife habitat and biodiversity of the Tongass National Forest is of local and national significance and is affected by road development and timber harvest activities.

The Tongass National Forest supports a unique and important assemblage of wildlife including the largest population of brown bears and breeding bald eagles in the world, species of high importance for subsistence (e.g., Sitka black-tailed deer), an extensive array of endemic mammals and other species, and a large number of species that are at least partially dependent on old-growth habitats (e.g., marten and goshawk). Populations of many of these species and the biodiversity of Southeast Alaska are affected by timber harvest and the development of roads.

Although less than 10 percent of the productive old-growth habitat on the Tongass has been converted to young growth, the percentage is much higher for certain types of old growth, such as lowland and large-tree old growth. In addition, a high percentage of non-NFS lands have been harvested at a much higher rate. Therefore, the cumulative effects of harvest and road building on wildlife in Southeast Alaska are greater than the effects for the Tongass by itself.

Indicators: Analysis relative to this issue compares the amount of productive old- growth forest that would be protected under each alternative, as well as the percentages of biogeographic provinces that would be protected in reserves. It also considers the role of the managed lands (development LUDs) in providing

wildlife habitat. It rates the alternatives in terms of the expert panel ratings conducted for the 1997 Forest Plan Revision EIS. Habitat changes, as documented by habitat amounts, changes in road densities, and habitat models are also used as indicators. Finally, cumulative harvest and road development on non-NFS lands is quantified and evaluated in conjunction with harvest and road development on NFS lands.

APPENDIX B
MODELING AND ANALYSIS

Appendix B

Modeling and Analysis

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Appendix B
Modeling and Analysis

Planning Situation

The National Forest Management Act of 1976 (NFMA) directs each National Forest to prepare a comprehensive land and resource management plan. The Tongass National Forest produced its first comprehensive Plan in April 1979. The NFMA also directs that these management plans be revised at least every 15 years. The Tongass began the Revision process in 1987, published a Draft Environmental Impact Statement (DEIS) in June 1990, and prepared the Supplement to the DEIS (SDEIS) as a result of the November 1990 Tongass Timber Reform Act (TTRA). The SDEIS was published in August 1991 and the Revised SDEIS (RSDEIS) was published in April 1996. The Final EIS for the Forest Plan Revision was published in 1997 along with a comprehensive Appendix B that detailed the analytical process followed. In 2002 a Draft Supplemental EIS (SEIS) was published and in 2003 a Final SEIS was developed; an Appendix B for modeling and analysis also accompanied the Final SEIS. The purpose of the 2008 Tongass Appendix B is to present a discussion of the major analytical processes and models used in this 2008 Forest Plan Amendment EIS. Due to the magnitude (17 million acres) and complexity (19 land use designations) of the planning process, a number of analytical methods are used. This discussion includes basic assumptions, modeling components and inputs, rules, methods, and constraints. The information supplements the broader, less technical descriptions included in the body of Chapters 2 and 3 of the EIS. Additional information and documents used in the analysis process are contained in the planning record. The planning record in its entirety is incorporated here by reference.

Spectrum Modeling

Analysis-related Changes between the 1997 and 2008 Final EISs

As the assessment, development, and analysis of geographic information is a continuous process, aspects and attributes of existing databases are continually changing. These improvements and additions to the databases often have direct results on models, model results, and the assumptions used within the models themselves. The years between the 1997 FEIS and this EIS saw a number of changes to resource inventories, coefficient development, and model assumptions, all of which played a role in the recalculation of alternative outputs. These changes are:

Development of a Forest-wide Logging System and Transportation Analysis (LSTA)—A complete and consistent Forest-wide LSTA and Integrated Timber Operability analysis were developed. These products resulted in geographic information system (GIS) layers for all potential harvest units and the roads needed to access them under the current Forest Plan. The harvest units were identified within the mapped suitable land base, as defined by the latest GIS layers. The harvest units and roads were mapped by logging engineers and foresters with knowledge and training in the standards and guidelines. Mapping included identification of the most appropriate logging systems, so that the suitable land base could be apportioned into operability classes. Risk factors were also identified that will be used for refinements to the estimated suitable land base.

Recalculation of the Tentatively Suitable Land Base—More accurate information about the landscape has been captured in the Forest's GIS resource layers (e.g., streams, slopes, karst). This information was used to update the tentatively suitable and the suitable land bases. See Appendix A of the Forest Plan and Chapter 3 of this EIS for more detailed information on how more current information was included in the suitability analysis.

Geographic Zone Recognition—Due to recent analysis that showed significant volume differences between five physical geographic zones on the Forest, the decision was made to recognize cost, price, and volume differences according to these zones. The zones recognized were North Islands, South Islands, North Mainland, South Mainland, and Yakutat. This is distinct from past analyses in which three administrative area differences were recognized.

Commercial Thinning—The interdisciplinary team recognized the option of commercially thinning young-growth stands to achieve volume and/or wildlife goals. This prescription was included in the Spectrum model along with thinning volume estimates derived from the Forest Vegetation Simulator (FVS).

Goshawk and Marten and Legacy Standards and Guidelines—For modeling the current Plan, Goshawk and Marten standards and guidelines were included in the Spectrum analysis. In some of the other alternatives, legacy standards and guidelines were incorporated as a way to leave forest structure after harvests.

Changes to Visual Management System—The Forest completely changed over from the Visual Management System (VMS) to the Scenery Management System (SMS). At the same time, all of the scenery GIS layers were updated. This updating began with the mapping and development of a GIS layer for the Visual Priority Routes and Use Areas (see Appendix F in the Forest Plan). Next Seen Areas, based on these Visual Priority Routes and Use Areas, were modeled using digital elevation models (DEMs) and Distance Zones (foreground, middleground, and background) were mapped based on established criteria. Scenic Integrity Objectives were then mapped for each alternative, based on Seen Areas, Distance Zones, and Land Use Designations (LUDs). The Visual Absorption Capability was remodeled and mapped and based on all of these sources. Regulation Class layers (see below) were developed for use in Spectrum modeling.

Land Adjustments—Since 1997, a variety of land adjustments have occurred. These adjustments have been incorporated into the current analysis as they have affected the total National Forest System (NFS) land base as well as the tentatively suitable and suitable forest land bases.

Modeling Implementation Reduction Factors (MIRF)—These factors, used to adjust model results to account for missing and known data inaccuracies, have been recalculated for each alternative. The MIRF changes have occurred as a result of improved information derived from upgraded GIS layers, including streams, slopes, and karst, a reduction in the lands identified as encumbered, and other factors. This calculation is explained in detail later in this appendix.

Inventory and Data—The inventory step of the planning process consists of the collection, development, and documentation of data to address the public issues, management concerns and resource opportunities, and planning criteria. Two basic types of information are needed to facilitate the analysis and development of alternatives. The first consists of information related to the classification of land into categories with unique properties. This classification can be based on any attribute significant to planning issues. This type of information is tied directly to the map base. In the case of the Tongass National Forest, this map base is its GIS database. The second type of information is not directly tied to a map base, but has more to do with the estimation of how land will respond to certain management activities. This type of information comes from many sources: Regional procedural handbooks, research studies, available literature, etc. The most up-to-date and verifiable information available was used for the EIS. Several Forest-wide inventory data sources have been updated and improved for the 2008 EIS. The primary changes and updates to the inventory, data, and modeling include:

- The timber harvest map was updated to reflect timber harvested through 2006.
- A new coverage was created to better estimate timber volumes. The cover was based on the value and degree of operational difficulty of the timber across the forest. Five unique geographic zones were identified; Yakutat, North Island, North Mainland, South Island, and South Mainland. Additionally, a size-density model (SDM) cover was created based on several landscape features incorporating the Common Land Unit (CLU), National Wetlands Inventory, aspect, and existing vegetation map to stratify old growth into seven unique size density classifications for productive old growth (POG). For modeling and yield estimation purposes, the old-growth stratum was derived from a generalization of the SDM into three volume strata (High, Medium, and Low).

These attributes stratified the Forest Inventory and Analysis (FIA) plots on the forest used in old-growth volume estimates.

- Forest Vegetation Simulator (FVS) model runs were conducted to estimate young-growth yields, including commercial thins. These runs were based off of a combination of FIA and forest-level data collected on young-growth stands.
- Forest-wide LSTA and timber operability analysis were developed (noted above).
- Inventoried roadless area boundaries were changed to reflect new road construction and timber harvest that occurred through 2006.
- New roads were added to the roads data base.
- Changes in land ownership due to conveyances to the state and Native corporations and other adjustments have been addressed in the data base (noted above).
- Improvements and updates have been made to most other resource databases, including tentatively suitable lands, streams, slopes, karst, and other data.
- Development of a completely new set of Scenery Management System GIS layers (noted above).

Modeling Changes—Some of the newly derived and updated information required updates to the Spectrum model formulation (see below for more detailed information on Spectrum modeling). The major modeling changes were:

- Analysis Areas were refined and recalculated for alternatives. See “Land Base Analysis Areas” below for further discussion.
- Young-growth stands were classified into 10-year age categories and by whether they had been precommercially thinned.
- All timber values were recalculated to reflect current information.
- Cost information was updated to reflect current information.
- Management intensity regimes (Regulation Classes – see below) were recalculated for each alternative.
- Watershed constraints were recalculated based on the suitable lands in each alternative.
- Model implementation reduction factors (MIRFs – see below) were updated.
- Incorporation of Goshawk/marten standards and/or legacy standards and guidelines into the Spectrum model.
- Addition of new treatment options including commercial thinning and partial cutting.
- Cost, price, and yield differences recognized by geographic zone rather than by administration area.

The Forest Planning Model (Spectrum)

Spectrum is a vegetation management model developed by the Forest Service Ecosystem Management staff in cooperation with the Rocky Mountain Experiment Station to assist in Plan Revision alternative evaluation. It was designed to fulfill the requirements outlined in the 1982 National Forest System Land and Resource Management Planning Act (36 CFR), most importantly Section 219.12(f)(8): “Each alternative shall represent to the extent practicable the most cost efficient combination of management prescriptions examined that can meet the objectives established in each alternative.” Spectrum is the primary modeling tool used to ensure that land allocations and output schedules for alternatives are realistic and meet standards and guidelines in a cost-efficient manner. Spectrum enables planners to create a sufficiently detailed linear model with fairly simplistic data entries.

Spectrum is a derivative of the FORPLAN model used for analysis in the 1986 Forest Plan. Spectrum assumes that relationships between outputs and the land base are linear (e.g., twice the number of similar acres yields twice the timber volume). A management objective is specified (e.g., maximize net revenues from harvesting activity) as well as any constraints that may affect that objective (for example, produce a steady supply of timber over time).

The Spectrum solution process involves three steps: 1) create a linear programming (LP) model, 2) find the optimal solution to the LP model, and 3) put the model solution into a more readable form (i.e., interprets the linear programming results). Spectrum's matrix generator portion translates the management objective, constraints and assumptions about the land base into a matrix of numbers that can be solved with a linear programming (LP) solver software package. The Tongass used the C-WHIZ LP solver software package to solve the matrix generated by the Spectrum model. The solver software determines a system of management prescriptions that results in the highest possible management objective value (e.g., Present Net Value) within the constraint parameters (meeting desired conditions and appropriate standards and guidelines). Spectrum's report writer portion then translates the LP output into reports, such as costs, revenues, landscape condition, and long-term sustained yield capacity.

Results from the modeling process are only approximations of what to expect when any given alternative is implemented. The main purpose of modeling is to aid planners in estimating likely future consequences of management prescriptions. A choice between alternatives can be made even though the model may lack precision in describing specific attributes of a given alternative.

An in-depth technical discussion of linear programming and its use in forest management applications can be found in Davis et al. (2001).

The Tongass Spectrum Models

Large Linear Programming models can be difficult or impossible to solve. Initial size estimates of the Tongass model, given the desired level of detail, made it clear that for each alternative, three Spectrum models would be needed; one model for each of the three old Administrative Areas of the Tongass National Forest (Chatham, Ketchikan, Stikine). To further mitigate model size, Spectrum models for the Tongass only analyze land classified as suitable for timber harvest. Those lands considered "unsuitable" for timber harvest were omitted from the models. The process for determining suitability can be found in Appendix A, "Timber Suitability Classification," of the Forest Plan. Results of each of the Administrative Area models were then aggregated to determine Forest-level quantities and impacts presented in the chapters of this EIS.

Spectrum Model Components

A Spectrum model has five main components: 1) the objective function, 2) land base analysis areas, 3) management prescriptions, 4) activities and outputs, and 5) constraints. The objective function is the overall management strategy objective of the model. Examples of typical objective functions are "maximize present net value," "maximize timber volume," and "minimize cost." Only one objective function can be used for each model run; however, forests typically find it beneficial to use the results of one objective function learn about the specific nature of their management problem or to formulate desired conditions used with another objective function. Detailed information on objective functions used by the Tongass is found in the solution process section of this appendix. The last three components of the Spectrum model greatly influence how the second (the land base) will be defined. The Tongass models are designed to analyze the activities and outputs associated with timber harvest scheduling; therefore, the land base is defined by those characteristics significant to the timber resource. Other resources are dealt with through the LUD allocation process and model constraints. The management prescriptions applied to the Forest differ mostly by rotation age and dispersion amount (portion of the trees removed from the stand). The activities (costs) associated with timber harvesting are well documented as are the outputs (benefits) obtained from the wood fiber. The constraints differ by alternative but often refer to a particular timber classification, specific geographic area, activity or output volumes allowed, and management allocation. Constraints are used to ensure desired condition achievement, compliance with appropriate standards and guidelines, and that the resultant management strategy is feasible.

Land Base Analysis Areas

Analysis Areas represent unique combinations of the different Identifiers used to stratify the mapped suitable land base. The mapped suitable land base is different for each alternative and is derived in

Table 3.13-8 of this EIS. Analysis Areas represent between 378,000 and 1.5 million acres, depending on the alternative. It is important to note that they include the unmapped unsuitable lands accommodated for by the Model Implementation Reduction Factor (MIRF – see below for detailed discussion). If information was perfect, and all unsuitable lands could be mapped, the actual suitable would be somewhat less than the land base represented by the Analysis Areas (similar to figures found in line 13 of Table 3.13-8).

An analysis area is an operational aggregation of land resource polygons that have the same characteristics, are expected to have similar responses management prescriptions, and have similar costs and benefits associated with management prescriptions. By an extension of this logic, analysis areas differ from each other in management prescription response and the costs and benefits associated with those prescriptions. Analysis Areas are unique combinations of the Analysis Area Identifies described below.

Analysis Area Identifiers. The 1996 modeling process determined analysis area identifiers that provided a categorization of the timber base consistent with the timber management analysis nature of the harvest scheduling model used for plan revision. These identifiers were re-evaluated for the 2008 EIS and determined to still be relevant for classifying the land base into areas where the land within an area had similar logging costs and timber values. However, the identifiers were updated and expanded when appropriate to reflect new information or additional levels of detail that are relevant to the 2008 EIS process. Six identifiers were used for input into the Spectrum models: 1) Value Comparison Units, 2) logging operability, 3) productivity group, 4) roaded/unroaded classification, 5) timber strata/volume class, and 6) Regulation Class. A summary of each identifier and why it was selected follows. The identifiers are presented by name in Table B-1.

Value Comparison Unit (VCU). In the current Plan, there are 946 unique VCUs. Each of the VCUs provides Spectrum with a level of spatiality the other identifiers cannot. In previous FORPLAN models, the main spatial identifier was Management Area (MA). Moving to VCU as the spatial identifier increased the resolution of mapping by six times. VCUs can be used to recognize spatially-variable costs such as hauling costs to the appropriate mill, road construction costs, and construction of log transfer facilities. VCUs are also used to formulate management constraints such as old growth retention, goshawk/marten, and legacy constraints, watershed constraints, and dispersion constraints (see constraints section of this appendix for further explanation).

Timber Harvest Operability. Operability, or logging system, was a direct product from the LSTA developed for the Tongass National Forest. Suitable acres on the Tongass National Forest were classified into six operability classifications used in Spectrum; ground-based/shovel, short-span cable, long-span cable, short-distance helicopter, mid-distance helicopter, and long-distance helicopter. Slope was a factor in determining the logging system appropriate for each stand. Lands with a slope > 72% were eliminated from the suitable land base and, therefore, cannot be logged. Lands with slope > 67% are generally to be left unroaded (and are mostly harvested by helicopter) unless no practical alternatives exist. Lands between 35% and 67% slope generally cannot use the ground-based/shovel system, and must use the helicopter or cable system. Lands with < 35% slope can generally be harvested with the ground-based/shovel system. It is easy to see how slope has an indirect effect on the cost of removing the timber from the land; generally, ground-based/shovel systems are the least expensive, followed by cable, with helicopter harvests as the most expensive. Therefore, steeper-sloped areas incur a higher timber harvest cost. Operability also correlates quite strongly with elevation and general accessibility.

Productivity Groups. This land classification is based on the site productivity as categorized in the Soil Mapping Unit (SMU) data base. There are three basic groups that indicate the regeneration potential for future timber stands. Group 1 is the highest productivity class with a minimum site index (SI) of 75. Group 2 is lands with an SI less than 75 that are not Group 3. Group 3 is all lands in the following wetland soil types: Karheen, Kaikli, Maybeso, Kitkum, or lithic Cryosaprist. Group 3 ranges from an SI of 40 (Chatham) to 50 (Ketchikan).

Roaded Classification. This identifier specifies whether an area is presently roaded or unroaded. The road/roadless condition of an area influences the cost of harvesting the timber.

Unroaded areas require more costly road construction; roaded areas require less costly road maintenance and repair when harvesting activities are conducted.

Volume Class/Strata. This attribute was used as an identifier due to its relevance to many forest management considerations. Wildlife habitat and most recreational settings correlate with the vegetation types described by this feature. This attribute was relevant in then Spectrum model to distinguish the logging costs and timber benefits associated with the volumes generated from the different volume classes. There are 12 second-growth strata and three old-growth strata used as Spectrum identifiers. Young growth (or "second growth") stands are categorized into 10-year age classes between 0 to 80 years old and also by whether they have been precommercially thinned. Old-growth strata include low-volume, medium-volume, and high-volume stocking levels. The strata used for this identifier are obtained from a GIS dataset derived from the Tongass National Forest's recently derived size density model (SDM).

Regulation Class. This identifier distinguishes the three regulation classes recognized in the model. Regulation class is determined by the combination of Scenic Integrity Objective, LUD designation, Distance Zone and Visual Absorption Capacity. Regulation class affects the intensity of potential harvesting activities. See below in this Appendix for a detailed explanation the Regulation Class process.

Table B-1
Spectrum Level Identifiers

Identifier	Possible Attributes
Value Comparison Unit (VCU)	00 through 3950 (Chatham) 5270 through 8670 (Ketchikan) 3980 through 5260 (Stikine)
Logging Operability	Ground-based/Shovel Short-span cable Short-distance helicopter Long-span cable Mid-distance helicopter Long-distance helicopter
Roaded Condition	Roaded Unroaded
Volume Class/Strata	Young Growth Age 0-9 Young Growth Age 10-19 Young Growth Age 20-29 Young Growth Age 30-39 Young Growth Age 40-49 Young Growth Age 50-59 Young Growth Age 60-69 Young Growth Age 70+ Young Gr. w/ Precomm. Thin Age 20-29 Young Gr. w/ Precomm. Thin Age 30-39 Young Gr. w/ Precomm. Thin Age 40-49 Young Gr. w/ Precomm. Thin Age 50+ Low Volume Old growth Medium Volume Old growth High Volume Old growth
Regulation Class	Regulation Class 1 Regulation Class 2 Regulation Class 3

Modeled Analysis Areas. Once the Analysis Area Identifiers were determined, the next step was to estimate the number of possible analysis area combinations. The maximum number possible is the product of the number of unique elements in each identifier:

946 VCUs x 6 Operability Classes x 2 road/unroaded x 3 productivity groups x 12 volume strata x 3 regulation classes = 1,226,016 potential Analysis Areas

The Tongass GIS layers of Analysis Area Identifiers were intersected to result in a Forest-wide total of about 87,500 unique polygons (Alternative 6). However, more than 86,000 of these polygons were less than 100 acres in size. Due to size considerations of the Spectrum model and the fact that, on an operational level, very small areas of land would not be independently managed, it was necessary to generalize smaller polygons and lump them with similar larger ones. Through a process of trial-and-error, an 80-acre threshold was used to create a manageable model size, while still preserving model integrity at a strategic planning level. In other words, all polygons less than 80 acres and within certain guidelines were aggregated into a larger analysis area.

A four-step algorithm was used to take small polygons and lump them with larger ones to create a manageable number of analysis areas. Step 1 combined polygons regardless of size. Steps 2 through 4 generalized only polygons less than 80 acres in size (they could be lumped into an analysis area larger or smaller than 80 acres).

Step 1: Match on all attributes
Some polygons were geographically distinct but not distinct based upon analysis area identifiers. Therefore, the first generalization was that if all identifiers matched between two or more polygons (initial analysis areas), they were combined into one for analysis purposes.

Step 2: Ignore the roaded/unroaded classification
If two Analysis Areas were in the same VCU, had the same operability, regulation class, volume strata, and productivity class, the smaller one was lumped with the larger one.

Step 3: Ignore roaded/unroaded classification and operability classification
After step 2, if two Analysis Areas were in the same VCU, had the same regulation class, volume strata, and productivity class, the smaller one was lumped with the larger one.

Step 4: Ignore volume strata
After step 3, if two Analysis Areas were in the same VCU, had the same operability, roaded/unroaded classification, regulation class, and productivity class, but different volume strata classification, the smaller one was lumped with the larger one. The exception was that old growth was not lumped with young growth and young growth was not lumped with old growth.

Finally, if the analysis area could not be generalized and it was less than 5 acres in size, it was left out of the model. The final number of analysis areas for the Tongass was 5403 (Alternative 6).

A note on the effects of model generalization
As with any model, the Spectrum model is a landscape planning model that relies heavily on generalizations and assumptions. There are many generalizations used in the Spectrum model that affect exactness of the outcome. These factors include generalizations in the GIS maps used to create the analysis areas, aggregation and averaging of FIA stand inventories used to calculate per-acre yields, statistical inference used in calculating the value of harvested logs, statistical inference and generalizations in determining costs of logging, road construction, miles of roads to construct, etc., and simplifying assumptions about the uncertainty of future costs and commodity prices. Analysis Area aggregation is simply another generalization technique used to make the model a manageable size. It is simply not possible without further detailed study to isolate the effect of Analysis Area aggregation on the true value for any given land area/prescription or for the Forest as a whole. It is assumed that the level of detail maintained in the model is accurate enough to give managers enough information to make informed decisions about the alternatives evaluated in this Forest Plan.

Appendix B

Management Prescriptions

A prescription is a management practice or group of management practices applied to a specific land area. The planning process involves assignment of the land base to the available prescriptions. This is facilitated by the Spectrum model. The solution process of Spectrum assigns land to prescriptions based on forest constraints, the given management alternative, and the objective function.

Prescriptions were developed by the interdisciplinary team to represent the full range of possible management activities and outputs. Since the Tongass models are concerned primarily with timber harvest scheduling, only prescriptions related to timber harvest were modeled. The interdisciplinary team quantified the outputs, costs, and benefits that would occur when these timber prescriptions were applied to a given analysis area. This quantification process produced the output, cost, and benefit coefficients that are used in Spectrum yield and economic tables. The interdisciplinary team, during its development of standards and guidelines for all prescriptions, ensured that the specific management requirements set forth in 36 CFR 219.27 would be met in accomplishing the goals and objectives for the Tongass.

Spectrum prescriptions were developed to allow consideration of a full range of management activities in the analysis areas. A minimum level or no-harvest prescription was created for each analysis area as well as several different harvest options. The only criterion used to eliminate timber options from the models was technical feasibility. For example, ground-based/shovel logging was not considered on slopes greater than 35 percent. Consideration of timber prescriptions for any given Analysis Area was not directly limited by economic efficiency, in order to allow they may be chosen in efficient fulfillment of a forest-wide desired condition (CFR 219.14(f)(8)). Available timber options were not eliminated from consideration because they produced a negative Present Net Value (PNV) or even a lesser PNV than some other timber option. A full range of timber options with varying levels of economic efficiency was available to the model, and the Spectrum model was able to consider the economic efficiency of each prescription during the solution process. The Spectrum prescriptions analyzed are briefly described below.

Minimum Level/Maintenance. Applies minimum custodial direction for the timber resource. There is no commercial timber harvest and no production of outputs related to timber harvest. This is the prescription assigned to lands not scheduled for timber harvest

Clearcut. Removal of all merchantable commercial trees within a stand in one operation. The regenerated stand receives no thinning activities before the next clearcut.

Clearcut with precommercial thinning. Removal of all merchantable commercial trees within a stand in one operation. The regenerated stand receives a subsequent precommercial thin at 20 years of age.

Clearcut with commercial thinning. Commercial thin at age 70, 80, or 90. Clearcut at choice of rotation ages. Applies to Productivity Class 1 lands, Regulation Classes 1 and 2.

Clearcut with precommercial and commercial thinning: Precommercial thin at age 20. Commercial thin at age 60, 70, or 80. Clearcut at choice of rotation ages. Applies to Productivity Class 1 lands, Regulation Classes 1 and 2.

Small-group selection and uneven-aged harvesting. The objective of this prescription is to create uneven-aged stands with regeneration of desirable species. Trees are harvested individually or in small groups normally from 0.5 to 5 acres in size. Timber production is not the primary management emphasis in these areas (emphasis is recreation, scenery, fisheries, and/or wildlife). Applies to Regulation Class 3.

This prescription is modeled as a series of removals that occur every 50 years and remove 25% of the volume at every entry. For old-growth stands, accounting rows (reflecting standing volume) in these yield tables show the combination of remaining old growth plus assumed regrowth of the small patch. Green-up interval is implied by the regulated scheduled entries (50 years); rotation

age will be 200 years. Existing young-growth stands in Regulation Class 3 are modeled in a similar manner as the old growth; 25% of the volume is removed upon first entry (starting age 80) and 25% is removed at second entry, etc.

Old Growth Two-Aged Management (Partial Cut). This prescription was developed for areas where goshawk and marten standards apply. On first entry into old-growth stands, 75% of the land area is harvested (75% of the standing volume). The stand is then considered "regenerated" and second-growth activities are allowed on the cut portions of the stand starting at age 80. Standing volume is a function of remaining old growth plus assumed regeneration. Regeneration volume is approximately 10% less than full young-growth volume, due to the increased shading from reserve trees. This prescription is available to Regulation Class 1 and 2, Productivity Classes 1 and 2 Old-Growth High volume strata only. This prescription is applied to Alternative 5 VCUs with goshawk/marten standards when more than 33% of the POG within a VCU has been regenerated.

Activities and Outputs

Activities are the costs associated with Spectrum-assigned timber harvests. Outputs are the timber volumes and prices associated with the same harvests. Each Activity and Output used in the model is described below.

Activities (Costs). All costs and values used in the Spectrum analysis are based on collected values (2004). In order to reduce the number of numeric tables in this appendix, only average and summarized values are used in this section. The actual cost figures used in the analyses are available in the planning records.

Coefficient Development and Estimation of Effects. The GIS enables identification and stratification of land into logical groupings. The response of these groups to management activities was determined from a wide variety of existing data. All coefficients and assumptions made in the modeling process have been developed from the following information sources.

Sale Preparation and Administration
Information Sources: Tongass National Forest, historic actual expenditures and accomplishment data, declaration of Forrest Cole, July 2004.

Occurs With: Thousand board feet of net sawlogs removed from the stand.

Assumptions*:* This is the cost to the Forest Service of administering and laying out timber sale areas. A single coefficient was used to estimate timber sale preparation and administration costs: $32/MBF.

Log Transfer Facility (LTF)
Information Source: The forest GIS coverage of existing and proposed LTFs. Costs and construction levels are based on historic costs experienced in the past 5 years of construction contracts and adjusted with Region 10 construction cost guide information.

Occurs With or Varies By: Acres harvested.

Assumptions: Using the LTF map and database, each LTF, existing or proposed, was assigned to the appropriate VCU. Appropriate mathematical adjustments were made for VCUs that access more than one LTF, or LTFs that service more than one VCU. LTF costs used in Spectrum are an average of total cost of the LTF to be constructed divided by the number of suitable acres in that VCU. The cost is incurred at time of harvest. LTF Construction costs are classified by 4 different categories to reflect the total cost of constructing the LTF.

Category 1: Existing LTF constructed/used within last 10 years = $50,000
Category 2: Existing LTF constructed/used more than 10 years ago = $125,000

Category 3: New Construction (large) (>30 MMBF total volume) = $175,000
Category 4: New Construction (small) (<30 MMBF total volume) = $125,000

LTF Camp/Commute
Information Source: Based on most recent published collected costs, Region 10 Forest Management (2004).

Occurs With or Varies By: Acres harvested. Varies by VCU.

Assumptions: The cost is incurred at the time of harvest. Each LTF used by a VCU was identified as either needing to maintain a camp, pay for a significant commute, or be free of this cost. Average camp cost per MBF is $15. Average commute cost is $7 per MBF. Weighted averages assigned to all acres of a VCU were used when not all acres of a VCU require LTFs to incur camp or commute costs.

Road, Raft, and Barge Haul
Information Source: Road haul costs are an average for the forest based on most recent published collected costs (2004). Raft and barge haul distances are based on a GIS analysis of LTFs and existing and/or potential mill locations. Barge and raft haul costs are calculated by a formula based on regional published costs.

Occurs With or Varies By: Value Comparison Unit (VCU). Costs are based on the volume (thousand board feet) removed from the stand.

Assumptions: Hauling cost includes all anticipated modes of transport likely used to transport logs from the landing to the mill. This may include road, barge, and/or log raft. Road haul is the cost of transporting logs by truck to either the closest LTF or mill. Road haul costs represent the forest-wide average haul cost per MBF volume removed based on average haul time. The average Road Haul cost is $24 per MBF. Barge haul is the cost of barging logs from the site or the LTF to the appropriate mill. Raft haul is the cost of building rafts out of the logs and hauling them to the appropriate mill. Raft haul cost may only be used in higher-demand alternatives, assuming the construction of new Medium Density Fiberboard (MDF) plants. Appropriate mathematical adjustments were made for calculating the haul costs for alternatives that incurred haul costs for utility wood vs. those Alternatives that left the utility wood at the site.

The distance to the nearest sawmill was determined for each VCU as VCUs are geographically distinct. For alternatives that recognized the eventual existence of Medium Density Fiberboard (MDF) plants, there were potentially two distances calculated for each VCU – one from the VCU's LTF to the sawmill and one from the LTF to the MDF plant. This distance was then used in a formula to calculate the total cost per thousand board feet (MBF) of the timber sale.

Formula: ((((RTD/M)*C)/B) + F)/(1-SD)

Where:
RTD = Round trip distance (unique for each VCU – twice the distance from the LTF to the mill)
SD = Scaling Defect (unique based upon age of the stand, volume strata, and geographic zone).
C = Cost per hour of operation ($182.50)
B = Average MBF on the barge or raft (238)
M= Miles per Hour (6.9)
F = Fixed costs ($33.72)

By inspection, one can see that when all other factors are held constant, logs traveling a greater distance to the mill incur a higher per-MBF transportation cost. This relationship is not exact, however, in that different VCUs were determined to have different Scaling Defects (SD) which may mitigate or exacerbate the transportation costs due to proximity to the mills.

Road Construction, Maintenance, and Repair
Information Source: The extent of Road construction and maintenance and repair needs are based on total projected road miles and the total suitable land base. Costs required for different regulation class lands are derived from the linear grading road construction calculations within the Construction Cost Guide. Road construction and maintenance and repair costs are obtained from the Construction Cost Guide calculations, compared to the costs for construction of roads, over the past 5 years, for public works and timbersale contracts. Road maintenance that occurs during logging operations is included in logging costs.

Occurs With or Varies By: Cost varies by Regulation Class. Miles of Road Construction and/or Maintenance and Repair vary by Roaded status and Regulation Class within each VCU.

Assumptions: All harvest requires some road construction and maintenance and repair. If the area is classified as roaded, then the majority of the activity is road maintenance and repair. Otherwise, road construction is the primary activity. The amount of road construction or maintenance and repair required depends on the geographic location of the harvest area. Each VCU has a distinct roading requirement coefficient. This coefficient is in the terms of miles of roads required to access 1 acre of timber land. The average construction and maintenance and repair for the Tongass is approximately seven miles of road per 1,000 acres (this does not include temporary roads). Maintenance and repair is the only activity necessary once timber harvest is comprised solely of regenerated timber stands because the roads were assumed to be built to the stands for the first harvest.

The timing of construction and maintenance and repair activities and costs varied by management prescription:

- Even-aged prescriptions without commercial thinning incur road construction and maintenance and repair costs as necessary upon first harvest. Upon subsequent harvests, these prescriptions incur the sum of the initial construction and maintenance and repair costs as maintenance and repair costs.
- Even-aged prescriptions with commercial thinning incur road construction and maintenance and repair costs as necessary at the time of the thin. When the stand is regenerated, roads maintained and repaired at thin will be maintained and repaired and roads constructed at thin will be maintained and repaired.
- The partial-cut prescription works as the even-aged prescription, except in that even though only a portion of the area is treated by this prescription, the full cost for the total area is incurred.
- The Regulation Class 3 prescription works similar to the even-aged prescription; roads are constructed and maintained and repaired upon first entry and they are all maintained and repaired upon subsequent entries.

Road construction and reconstruction costs are obtained from the Construction Cost Guide calculations, compared to the costs for construction of roads, over the past 5 years, for public works and timber sale contracts. Road construction costs are dependent on slope; steeper slopes have a higher road construction cost. Construction costs are exactly calculated for each Regulation Class and Roaded status type within each VCU in order to accommodate the different slopes in these classes between VCUs. The Forest-wide road construction cost is $185,000 per mile and maintenance and repair costs are $50,000 per mile. Road construction/maintenance and repair miles needed for harvests are exactly calculated for VCUs with 100 or more acres of suitable land. For VCUs with less than 100 acres, an average for the administration area was used to mitigate small mapping errors and miscalculations that may occur with small areas.

Regeneration Certification
Information Source: Tongass National Forest, average cost

Occurs With or Varies By: Acres harvested with an even-aged prescription

Assumptions: Occurs for every acre harvested and the cost is incurred at time of harvest. This activity usually takes place from 3 to 5 years after harvest, but because modeling is done on a decadal basis the cost is incurred at time of harvest. It also is assumed that all stands will be certified as regenerated by year five. According to the Tongass silviculturist, when planting occurs, it costs $200/acre. However, only about 3% of treated acres need to be planted. Therefore, the average planting cost of all treated acres is $6 per acre. Planting on Regulation Class 3 lands or in partial cuts is adjusted by the percentage removed (i.e., if a partial cut is 75% of the acre, 75% of the planting cost is incurred). In addition to planting costs, there is a regen/survey cost of $18 per acre that will be included with this cost. The total planting cost used in Spectrum was $24.

Precommercial Thinning
Information Source: Tongass National Forest, implementation cost data based on Region 10 budget allocation

Occurs With or Varies By: Acres receiving a timber prescription permitting this activity.

Assumptions: The Tongass has an active program of precommercial thinning. This improves the health of the stand and permits greater understory development for wildlife. This thinning operation is termed "precommercial" because no revenues are derived from the sale of the harvested trees. The average cost for precommercial thinning on the Tongass is $550 per acre. This silvicultural activity is generally conducted when the stand is between 10 and 20 years old and modeled to occur at age 20.

Yarding/Logging Costs
Information Source: Calculated using procedures in FSH 2409.22 -- Timber Appraisal Handbook.

Occurs With or Varies By: Varies by volume class, logging operability, geographic zone, productivity group, stand age, and prescription. This cost is incurred according to net sawlogs removed per acre and net utility volume removed per acre.

Assumptions: These costs include road maintenance relative to logging, profit and risk relative to yarding, landing construction, and yarding. Logging costs increase as operability becomes more difficult. The logging operability classification of the area heavily influences the logging costs due primarily to the different harvest systems required. The size of the logs influences logging costs. Typically, larger logs result in less logging cost per 1,000 board feet. Volume class, productivity group, stand age, and the use of precommercial thinning is used to estimate the average log size and volume per acre for each unit.

Logging systems include ground-based/shovel, short-span cable and long-span cable. Helicopter costs will also be determined by three categories of distance (0.5 mile, 1.25 mile, and 2+ mile). Helicopter costs are constant costs independent of volume strata and geographic zone, so they can be applied wherever helicopter logging must be used. Young-growth harvest costs were determined initially from FVS outputs at age 80. They were then adjusted for geographic zone, age, and prescription (i.e., clearcut or thin) using South Islands (POW, where the data was collected) as a reference point. Cost curves from 1996 were used as the basis of this adjustment.

Felling and bucking coefficients
Information Source: Based on most recent published collected costs, Region 10 Forest Management (2004).

Occurs With or Varies By: Tracked on a per volume basis (MBF). Varies by Geographic zone and volume class.

Assumptions: Felling and bucking costs were split out separately from logging costs. Costs varied by Geographic zone and volume strata. The forest-wide average felling and bucking cost was $47 per thousand board foot volume.

Outputs(Benefits). The economic benefits associated with timber harvest are based on appraised value. Value is based on tree size, species composition, amount of defect, and other factors. Timber benefits are measured as pond log value. Pond log values used in the Spectrum model are the estimates of price a timber buyer would pay for a log at the mill site, less the markup charged by the logger (profit and risk). To get the stumpage value of this log, all estimated costs that are incurred to get the log to the mill must be subtracted from the pond log value. The resulting stumpage price is assumed to be the price the timber buyer pays for the log (bid price). Bid price represents money to the U.S. treasury.

Sawtimber (board feet and cubic feet)
Information Source: Timber values were determined using timber appraisal methodologies for Southeast Alaska (FSH 2409.22). Values were derived from historic cruise database based on actual collected values (2004). Merchantable volume of existing old-growth timber stands was based on FIA plot analysis by volume strata within each identified Geographic Zone. Yields for regenerated second growth timber stands were derived from permanent study plots and the FVS yield table generation program.

Occurs With or Varies By: At harvest, the volume of merchantable timber produced generates a per mbf revenue that varies by Geographic Zone and volume class. Geographic zone affects this revenue due to differences in species composition and wood quality.

Assumptions: For existing stands, piece size and species composition is determined from a tree-by-tree analysis of the FIA plot summary data. For regenerated stands, piece size and species composition is based on a tree-by-tree analysis of the FVS model outputs. It is assumed that existing old-growth volumes are constant (i.e., through time, growth equals mortality). Young-growth (regenerated) stands grow at a rate determined by the FVS model. The average old-growth pondlog value is $273 per mbf, which is adjusted for profit and risk (economic benefit, or profit, to the logger). Young-growth sawtimber pond log values are also adjusted for profit and risk.

Utility Volume (board feet and cubic feet)
Information Source: No value for utility wood is recognized for Alternatives 1, 2, and 3. Values for Alternatives 4, 5, 6 and 7 are based on Medium Density Fiberboard pond log calculations. Source: "Technical & Economic Feasibility of Constructing a Medium Density Fiberboard Plant in Southeast Alaska". Leonard Guss Associates, 31 May, 2005 and discussions with Dr. Allen Brackley, USDA Forest Service, Sitka Wood Utilization Center. Average percent utility volume was derived using timber measurements methodologies developed by the Region 10 Measurements Specialist. Merchantable volume of existing stands is derived from an analysis of FIA plots located within the suitable land base of the forest. Volume of regenerated stands is obtained from the FVS.

Occurs With or Varies By: At harvest, the volume of merchantable timber produced generates revenue that varies based on Geographic Zone and volume class. Geographic Zone affects this revenue due to differences in species composition and quality.

Assumptions: For existing stands, piece size and species composition is determined from a tree by tree analysis of the FIA plot summary data. For regenerated stands, piece size and species composition is based on a tree-by-tree analysis of the FVS model outputs. It is assumed that existing old growth volumes are constant (i.e., through time, growth equals mortality). The utility volume from regenerated stands is assumed to be negligible and is therefore not counted, whereas the utility component of existing old growth stands averages 16 percent. This difference results from the mixed diameter distribution of old growth stands and the impact of defect to

potential sawlogs. The average utility log pondlog value is $72 per mbf, which accounts for profit and risk.

Spectrum Constraints

Constraints in a linear programming model are the rules that must be followed when determining an optimal problem solution. Without constraints, the solution of a Spectrum model may represent a management strategy that is impractical, inconsistent with the forest plan, or in conflict with Forest Service policy. Thus, constraints are included in Spectrum models to ensure that their results are useful and meaningful.

There are two categories of constraints within a Spectrum linear matrix: implicit and explicit. Implicit constraints are common to all Spectrum models. For example, all acres in the model must be allocated to some prescription (even if it is the “no management” prescription), or the number of acres assigned to each prescription must not be negative. These types of constraints are exercises in logic and need not be discussed further.

Explicit constraints are those constraints added to Spectrum models by planners. These constraints come in many forms and are applied to mimic regulations and laws such as NFMA, standards and guidelines set forth in the forest plan, and on-the-ground operating conditions. An example is the non-declining yield constraint. Proven ability to maintain a constant flow (non-declining yield) of harvested timber volume in perpetuity is Forest Service policy. A constraint is added to the Spectrum data set that forces all timber harvest volumes to be at least as great as the previous decade's harvest volume (see below for further discussion). Another example may be a constraint that forces a certain area to be managed specifically for wildlife habitat. There are many explicit constraints in the Tongass models. They vary by land attributes, geographic area, and by management alternative. The explicit constraints used in the Spectrum models fall into two categories: timber policy constraints and operational constraints. A detailed discussion of the intent of these constraints follows. They are summarized in Table B-2 for comparison of their application across the alternatives.

Timber policy constraints. These constraints are included in the Spectrum models to represent legal or policy requirements of national forest timber management. The primary requirements regarding timber management incorporated into Tongass Spectrum models are:

Non-declining Yield. The Tongass models have a constraint that ensures harvest volume (in board feet) will not decline in any decade over the 160-year planning horizon per national policy. Harvest volumes may increase, but all subsequent harvests must be at least as much as the previous decade’s harvest.

Sustained Yield. The harvest in any decade of the planning horizon must not exceed the Long-Term Sustained Yield that can be maintained on the forest. Long-term sustained yield is measured in cubic feet. It is calculated as the average yearly volume yielded from a chosen management action, summed across all management actions for all stands chosen by the model. For instance, if a management action yields 50 cubic feet every 100 years, the Long-Term Sustained Yield for that management action is 0.5 cubic feet per year.

Culmination of Mean Annual Increment. The age at which a managed stand is harvested is called the rotation age. Agency policy is that rotation age can be no earlier than the age at which 95% of culmination of mean annual increment (CMAI) occurs. CMAI is the age at which the stand achieves its highest average volume. The Spectrum models have constraints that allow timber harvest only when a stand has reached 95 percent of this CMAI age. On the Tongass, this translates to a range of rotation ages of about 60 to 170 years. CMAI varies by stand productivity, management prescription, and administrative area and is calculated using merchantable cubic foot volume.

Table B-2
Timber Policy and Operational Constraints Used for Spectrum Modeling

Constraint	Description	Variation Among Alternatives						
		1	2	3	4	5	6	7
Non-declining Yield	Ensures that a Decade's total harvest volume is at least as much as the previous decade	These constraints are identical between the Alternatives						
Sustained Yield	Prevents the model from harvesting all available timber in the last planning period - limits it to Long-Term Sustained Yield or less	Calculated for each Alternative - Applied the same way*						
Culmination Mean Annual Increment	Prevents the model from harvesting a stand before 95% CMAI is reached	These constraints are identical between the Alternatives						
Strata Harvest Control	Limits the harvest of Old Growth High Volume to their proportion of the total	Calculated for each Alternative - Applied the same way*						
Logging Operability	Limits harvest in Normal Operability (NIC I) to its proportion of the total	Calculated for each Alternative - Applied the same way*						
Watershed Entry	Limit the model to 20% of any watershed less than 30 years old	Calculated for each Alternative - Applied the same way*						
Precommercial Thinning	Limits the total amount of precommercial thinning to a feasible level - 6300 acres per year	This constraint is identical between the Alternatives						
Minimum Timber Constraint	Sets the minimum amount of volume to harvest in certain decades; this is a desired condition of the Alternative	Calculated for each Alternative - Applied the same way*						
Regulation Class 3 Harvest	Limits harvest in Regulation Class 3 to historic proportion of the total	This constraint is identical between the Alternatives						
Goshawk/Marten, Legacy, Retention Standards and Guidelines	Cause the model to accommodate the appropriate standards and guidelines of the Alternative							
	Goshawk/Marten	No	No	No	No	Yes	No	No
	Legacy	Yes	Yes	Yes	No	No	Yes	No
	Old Growth Retention	No	No	No	Yes	No	No	No
Regulation Class Management Intensity	Cause the model to implement the correct management scheme for each Regulation Class	These constraints are identical between the Alternatives						
Modeled Implementation Reduction Factor (MIRF)	Accounts for unmappable unsuitable lands	These constraints are identical between the Alternatives						
Dispersion and Adjacency	Controls on management intensity in the different Regulation Classes	Calculated for each Alternative - Applied the same way[1]						

[1] The constraint level is unique for each alternative but it takes the same form (e.g., High Volume Strata < X, where "X" is unique for each alternative)

Operational Constraints. These constraints are added to Spectrum models to ensure that the results fall within certain Forest-derived guidelines and objectives. Many of these constraints are included to ensure the Forest Plan standards and guidelines are followed. Others are included to make sure the model is "well-behaved." The term well-behaved means that Spectrum results are reviewed for any operationally impossible solutions and constraints are added to deal with these. An example may be the harvest of all of the high-volume strata in the first two decades of the planning horizon. The "strata harvest control constraints" are then added to address this problem (see below). The operational constraints used in the Tongass Spectrum models vary slightly by alternative but are used primarily to control the spatial and volume components of timber management. These constraints are summarized below.

Strata Harvest Control Constraints. In order to ensure that the model does not cut all of the most valuable timber early in the planning horizon, each model is constrained so that the proportion of harvest in the highest volume strata does not exceed the proportion of that stratum

in each administration area. This prevents the model from harvesting all of the most desirable timber in an unsustainable way. This constraint is adjusted to account for the type of land (volume class mix) available in each alternative. For Alternative 5, this constraint limits the harvest of the high-volume strata acres to less than 43 percent of the total harvest of all old-growth acres.

Logging Operability Constraints. The forest has three general classes of logging operability derived from six specific classes of operability. The general classes are normal, difficult, and isolated, and the six specific classes are ground based/shovel, short span cable, long span cable, short distance helicopter, medium distance helicopter and long distance helicopter. Shovel, short span cable and short distance helicopter were considered "normal" operability, long span cable and medium distance helicopter were "difficult" and the long distance helicopter was "isolated." To ensure that the model does not cut all of the cheapest, most accessible acres early in the planning horizon, constraints were added to disperse harvest to the difficult and isolated operability areas in proportion to their occurrence within each Administrative Area. These constraints vary by alternative due to different LUD applications but, in general, limit harvest from normal operability areas to no more than about 90 percent of total harvest acreage per decade.

Watershed Entry Constraints. In order to minimize cumulative watershed impacts from harvest operations, constraints are included to restrict the number of acres that are in an open state in any time period. In general, these constraints limit total harvest acres in any 30-year period to less than 20 percent of the total watershed land area. Because the Tongass models use VCU as the primary land attribute, these constraints are entered for each VCU. Coefficients had to be calculated in each VCU in order to accommodate the fact that only suitable acres are included in the Spectrum model and are only a portion of the total area of most VCUs. In instances where suitable acres are less than 20% of the total acres in the VCU, the constraint will never be violated—even if all suitable acres are harvested. Therefore, these constraints are constructed based on total acres [ownership] in the VCU relative to suitable acres with the following formula:

$C = .2 * T / s$

Where C = constraint percentage, .2 is the 20% limit, T is total acres in the VCU, and "s" is the number of suitable acres.

As an example, consider a VCU with 100 total acres, but only 50 suitable acres. C = .2 * 100/50, or 40%. The constraint added to the model would be 40% of the 50 acres, which is the same as 20% of the 100 acres. Only constraints where C is less than 50% will be applied in order to mitigate model size, based on the assumption that Dispersion and other constraints will cause these constraints to be redundant where C is greater than 50%.

Precommercial Thinning Constraint. All alternatives are limited to a maximum precommercial thinning of 6,300 acres per year. This is the amount that Region 10 considers feasible given budget and personnel limitations. A recent Region 10 report shows that the Forest has treated between 3,500 to 5,500 acres per year (2003-2006). It is recognized that this is not a maximum feasible amount, but suggests that 6,300 is a reasonable estimate of the maximum amount possible.

Minimum Timber Constraint. All alternatives are constrained to meet at least the timber demand associated with the alternative being modeled. This helps to ensure that a full range of ASQs are explored during the decision-making process. These constraints are formulated on the basis that alternatives have been developed to evaluate different possible timber demand scenarios. Therefore, the level of timber demand in an alternative is viewed as a desired condition of that alternative.

Regulation Class 3 Constraints. Of the acres clearcut during the planning horizon, no more than 7% of them can be from lands in Regulation Class 3. This constraint is based on the historic

level of harvest on marginally economically viable lands adjacent to normal timber sales. This constraint prevents the model from scheduling impractical amounts of Regulation Class 3 lands in later decades.

Goshawk/Marten Constraints. These constraints apply to Alternative 5 at the VCU level. The amount of POG that can be harvested before these guidelines are enforced is used to constrain the number of acres that can be clearcut in each applicable VCU. Once that threshold is reached, lands may only receive a less intensive treatment (Old-Growth two-aged management – see "Management Prescriptions" above)

Legacy Constraints. Alternatives 1, 2, 3, 5, and 6 incorporate the legacy constraint instead of the goshawk/marten constraints. This constraint requires 30% of the stand to be left unharvested in 49 VCUs on the Forest that have experienced high rates of past harvest. It is modeled in Spectrum using volume. This simulates leaving the appropriate number of legacy trees at the time of harvest. The constraints apply in perpetuity; if the regenerated stand is harvested later in the planning horizon, it is assumed that the same trees (or appropriate substitutes) will be left living at the site.

Old Growth Retention Constraints. These constraints are applied to Alternative 4. Alternative 4 includes old-growth reserves in four biogeographic provinces and an old-growth retention strategy in the others. Reserve areas are excluded from the model, and the retention strategy is modeled with a series of constraints.

The alternative framework says that within each VCU where timber harvest is scheduled, the following constraints should apply:

1) Harvest no more than 50% of the POG during any 50-year period
2) Retain a minimum of 33% of the VCU in an old-growth forest condition

Constraint 1 is formulated based on the amount of 2006 suitable POG relative to the amount of POG present in 1954 (represents the "original" amount of POG present). If the amount of suitable POG in 2006 is less than 50% of the total amount of 1954 POG, there is no danger of violating Constraint 1, and therefore the VCU is not constrained. In the remaining VCUs, the constraint was formulated so that no more than 50% of the 2006 suitable POG could be harvested in any 50-year period.

Constraint 2 was formulated based on how much of the remaining suitable POG could be harvested before 67% of the 1954 POG was harvested. If it was possible to harvest enough suitable POG to cross the 67% threshold, the constraint was set so that harvest would stop once 67% of the POG was removed. Otherwise, the constraint was not necessary as one could harvest 100% of the remaining suitable POG and still leave 33% or more of the 1954 POG in the VCU.

Model Implementation Reduction Factor Constraints (MIRF). These constraints are designed to accommodate for unmapped unsuitable lands that were missed during the suitability determination. It is assumed that when harvest activities occur, a certain percentage of the assumed suitable land will be off-limits for management due to several economic or ecological considerations. These constraints are applied to each old-growth volume strata of each of the six operability harvest systems as well as to young-growth stands. The constraint is implemented by forcing the model to never harvest a certain percentage of the acres in the model. The effect is to control the maximum amount of acres from the suitable land base that are actually harvested. See below for a discussion of how MIRF factors were determined.

Dispersion and Adjacency Constraints. To meet visual quality and Regulation Class objectives, dispersion and adjacency constraints were incorporated into the models. "Dispersion"

refers to spreading harvests across the landscape rather than focusing all activities in a concentrated area. The dispersion limits are taken from proxies developed by Tongass landscape architects for each LUD. These visual guidelines estimate how much of a viewshed can be "disturbed" at any one time and still meet the adopted scenic integrity objectives of the area. They also specify length of time before harvest of adjacent units is permissible and the maximum size of these harvest units. Table B-7 (below) shows the constraints that were used for each Regulation Class. The “Visual Disturbance” factors were used in the constraints section of the model and the “Adjacency” definitions were defined in the outputs section of the model. Together, these two definitions (as well as treatment options available to each regulation class) distinguish the regulation classes in the model. Detailed information about these constraints is found in the “Regulation Class” section of this appendix (below).

Spectrum Solution Process

The following sections describe some of the steps involved in solving the Spectrum models. The concept of “objective function” is discussed as the final model component. Following that is a brief discussion of how the Tongass evaluated economic efficiency of the alternatives. Last is a discussion of how the Spectrum model was used to gain insight into the management situation of each alternative and make more informed decisions.

Objective Functions

The objective function of a linear programming model defines the overall management objective of the forest quantitatively. It is generally expressed as a “minimize” or “maximize” function. The LP solution software finds the largest (or smallest) value possible of the objective function within the boundaries of the model constraints. Linear programming principles guarantee that the solution is optimal; that is, the best answer possible. Several different objective functions were used to explore the nature of the Tongass management problem. While only the “maximize present net value” objective function was used for the final results, the other ones may have been used at intermediate steps in the analysis process. Some of the objective functions used in the modeling process include:

Maximize Present Net Value. Present Net Value (PNV) is defined as the benefits less the costs of a management prescription, discounted at 4% annually to the present day, summed over all management prescriptions of all Analysis Areas. Because the model is formulated in 10-year time periods, discounting is done from the middle of each period. This is the objective function that was used for all final model runs presented in this Final EIS.

Maximize Timber Volume. Timber volume is tracked for each management action of each Analysis Area and the total amount is maximized. Several forms of this objective function were used; maximize timber volume in a given period or span of periods, maximize the sawlog component of the total timber volume in a given period or over a span of periods, or maximize the volume from an operability class in a period or span of periods. This objective function was used to ensure that desired levels of timber could be achieved. These runs were also used to proportionally allocate the Alternative demand level across the three Administrative Areas based on each area’s potential. However, the maximize timber runs were not used as the final models evaluated in this EIS.

Minimize Harvest from the Unroaded Areas. This objective function was used to determine a management strategy that would meet the desired timber demand level by building as few roads as possible. It was used to help determine appropriate levels of suitable lands in some alternatives.

Minimize Old-Growth Harvest. This objective function was used to determine the minimum amount of old-growth harvest that would sustain the desired timber demand level of an alternative. This information was not used in the final analysis of any alternative, but rather was an intermediate step.

Iterative Process

The Spectrum model was used to test the assumptions and problem formulation strategies used in this analysis. Model outputs were generated and assessed to strengthen the validity of the model. For instance, if it was noticed the model was capitalizing on a certain commodity early in the planning horizon that was out of proportion with a likely feasible implementation (for instance, the model tends to high grade when given the opportunity), the model could be constrained appropriately. Additionally, the Spectrum model was used to formulate feasible constraints in the model. An objective function of "minimize harvest from unroaded areas" can be used to determine the minimum number of unroaded acres that need to be kept in the model to meet the desired demand level. If desired, excess acres could then be constrained to no management or removed from the suitable land base. Timber maximization in later decades can be evaluated to explore trade-offs between harvesting the timber early vs. saving inventory for later decades. If a model solution was infeasible (there is no management strategy that does not violate at least one constraint), the limiting constraints were identified and adjusted appropriately.

One of the strengths of Spectrum or any Linear Programming model is the ability to analyze marginal costs associated with the different constraints. If a solution space is very narrow (there are very few decisions that result in a feasible management strategy), the marginal costs of the constraints can be analyzed to determine which are the "bottlenecks," or constraints that have the largest impacts on meeting the objective. The problem can then be reformulated by relaxing these constraints if desired.

Economic Efficiency

The Spectrum model was used to help measure the economic efficiency of the timber management activities of each alternative. Timber management activities can be thought of as a portion of the net public benefits associated with each alternative. Net public benefits are the "overall long-term value, to the nation, of all outputs and positive effects (benefits) less all associated Forest inputs and negative effects (costs) whether they can be quantitatively valued or not" (36 CFR 219.3). Net public benefit represents the sum of the net value of priced outputs plus the net value of non-priced outputs. The EIS Chapter 3 explains and describes the elements of public benefits that may be a function of Forest planning and management activities. In the Tongass Spectrum analyses, the only economic efficiency directly considered was related to timber management.

Present Net Value Formulation. Economic benefits from the Spectrum model were calculated as Present Net Value, or PNV, of the scheduled timber management activities. This calculation was done by the Spectrum model using pond log values, costs to the logger, and costs to the agency for administering the sale. The formula used to calculate the PNV of each potential management prescription is:

$$PNV = [PLV - LC - AC]/(1 + d)^t$$

PLV = pond log value (adjusted to exclude logger profit and risk)
LC = Logging costs (operability, haul, LTF, camp/commute, felling and bucking, road building)
AC = Agency costs (regeneration certification, sale preparation and administration)
t = time (year) of harvest into the future
d = discount rate (4% annually)

The dollar values of outputs used to calculate PNV in the Spectrum model are pond log values measured at mill sites less the profit and risk to the seller. The costs weighed against these values included all of the expenses incurred from removing the timber from the site to the mill (logging costs, haul costs, LTF costs, road building costs, etc. – see above). This is a more detailed approach than a typical Spectrum application, but is done so to account for the variability in stumpage values that occur over such a large land area that is the Tongass National Forest. Stumpage value is the value of the timber at the site and is considered receipts to the federal government for a timber sale. In other words, it is what a purchaser will pay for the timber after considering all of the expenses (LC in the equation above) that are incurred in removing it to the mill. Stumpage, while not explicitly calculated before it is entered into the Spectrum model, it is an inherent part of the above equation [PLV – LC] that is calculated by Spectrum for all potential management prescriptions.

See the above section on “Activities and Outputs” for more detailed information on each of the costs and timber values used in the Spectrum model.

Supplemental Information on Other Model Assumptions

Stage II Suitability Analysis

Each acre classified as suitable for timber harvest was analyzed to determine the costs and benefits for a range or management intensities (36 CFR 219.14(b)). For the purpose of this analysis, the planning area was stratified into categories of land with similar costs and returns according to the Analysis Area Identifiers described above. The stratification also took into account those factors that influence costs and returns such as physical and biological conditions of the site (affecting logging system) and transportation requirements (by VCU).

Stage II analysis is used to identify management intensities of timber production for each category of land that results in the largest amount of discounted net revenues. Stage II analysis provides insight into the overall economic condition of the suitable land base and what types of land are most cost efficient for management. The costs and benefits used for this analysis are described above and include pond log value, the cost of logging, removing, and transporting the timber to the mill as well as the agency-incurred costs of management. This analysis does not account for the utility volume costs or revenues, as the current market conditions do not favor its removal.

Stage II analysis was conducted for all applicable management intensities: Intensive even-aged management with thinning regimes to very small clearcuts and group selection prescriptions (regulation class 3 areas). Table B-3 shows per-acre weighted average net revenue by category. These figures are representative of the highest value of the earliest treatment available to each land type.

The current economic situation in Southeast Alaska creates some confusion in the interpretation of Table B-3. At an initial glance, it may appear there are no economically viable areas for timber harvest. It is important to realize that within each category of land there can be large differences in economics. For instance, the Regulation Class 1 Ketchikan High Volume Class Normal Operability category (-$478/acre) contains a range of economics from acres of short-span helicopter harvest with a large negative net revenue (-$6,917/acre) to acres of shovel harvest in a roaded area with a large per acre net revenue ($3,257/acre). Therefore, a summary of the positive values in each category is also provided in the final two columns of the table. These figures represent the weighted average net value per acre of only those acres that have positive value. Again, some caution in interpretation must be used; the $1,461/acre of Regulation Class 1 Chatham High Volume Class Normal represents 3,600 acres, whereas the Regulation Class 1 Ketchikan High Volume Class Normal Operability ($488/acre) represents nearly 53,000 acres. A complete economic analysis for each Analysis Area is too lengthy for this appendix and is included in the planning record.

Another potentially confusing aspect of these tables occurs due to the decreasing value of more highly stocked stands. An example of this can be seen in the Regulation Class 1 Chatham Normal Operability, where a “Low” stand is valued at -$1,736 and a “High” stand is at -$2,529. Here is a case where on average, the additional cost of removing the volume from the woods is more than the revenues received for that volume. The Chatham is susceptible to this phenomenon likely due to its average distance from the nearest processing mill. The additional cost incurred from shipping more volume from a “High” stand is cumulatively more than the cost of shipping less volume from a “Low” stand. This same relationship generally holds true when comparing Regulation Classes 1 or 2 with Regulation Class 3. In Regulation Class 3, there is generally less volume removed per acre, and therefore the overall costs per acre are lower. Otherwise, the table generally shows lower economic desirability in more expensive harvest systems and lower volumes per acre. Regulation Classes 1 and 2 numbers are predictably similar due to their difference only in allowable clearcut size, green-up intervals, and adjacency constraints, none of which factor into this economic feasibility study.

Table B-3
Discounted Average Net Revenues by Land Category

		Regulation Class 1			Reg. Class 1 - Positive Values Only	
Admin Area	**Volume Class**	**Normal (net$/acre)**	**Difficult (net$/acre)**	**Isolated (net$/acre)**	**Normal (net$/acre)**	**Difficult (net$/acre)**
Chatham	Low	-1,736	-3,242	-4,567	90	
	Medium	-1,842	-5,437	-8,927	585	
	High	-2,529	-7,557	-12,948	1461	
	Young Gr	-184	-5,095	-7,094	873	
Ketchikan	Low	-1,532	-4,474	-6,809	247	
	Medium	-589	-4,381	-9,702	856	318
	High	-478	-5,191	-13,994	1,288	819
	Young Gr	-28	-1,550	-4,270	349	
Stikine	Low	-1,577	-4,492	-7,134	140	
	Medium	-554	-4,466	-9,386	755	343
	High	-396	-3,503	-13,985	1,177	230
	Young Gr	-193	-939	-3,763	144	

		Regulation Class 2			Reg. Class 2 – Positive Values Only	
Admin Area	**Volume Class**	**Normal (net$/acre)**	**Difficult (net$/acre)**	**Isolated (net$/acre)**	**Normal (net$/acre)**	**Difficult (net$/acre)**
Chatham	Low	-1,657	-3,102	-4,727		
	Medium	-1,865	-5,867	-9,342	505	
	High	-1,913	-7,153	-13,207	1,302	505
	Young Gr	-175	-4,642	-6,934	708	
Ketchikan	Low	-1,388	-4,005	-7,309	171	
	Medium	-607	-4,678	-9,437	967	671
	High	-675	-3,675	-13,923	1,508	438
	Young Gr	-43	-3,133	-8,637	213	
Stikine	Low	-1,679	-4,078	-6,910	228	
	Medium	-1,004	-4,539	-9,542	913	24
	High	-402	-3,739	-13,879	1,095	325
	Young Gr	-165	-2,518	-8,286	277	

		Regulation Class 3			Reg. Class 3 – Positive Value Only	
Admin Area	**Volume Class**	**Normal (net$/acre)**	**Difficult (net$/acre)**	**Isolated (net$/acre)**	**Normal (net$/acre)**	**Difficult (net$/acre)**
Chatham	Low	-949	-1,480	-1,801		
	Medium	-1,080	-2,032	-3,040	115	
	High	-1,012	-2,596	-4,071	163	
	Young Gr	-78	-924	-2,414	293	
Ketchikan	Low	-1,093	-1,607	-2,785	141	
	Medium	-858	-1,950	-3,915	306	
	High	-1,015	-2,751	-4,771	229	
	Young Gr	-49	-548	-3,223	121	
Stikine	Low	-1,119	-1,423	-2,389	36	
	Medium	-947	-2,010	-3,099	223	
	High	-899	-2,204	-4,414	241	
	Young Gr	-16	-279	-1,731	112	

The Regulation Class Process

To recognize the varying intensities of timber harvests that may occur on the landscape, the regulation class concept was developed. Regulation Class is a methodology developed to distill the unique combinations of Land Use Designation (LUD), Distance Zone (DZ), Scenic Integrity Objective (SIO), and Visual Absorption Capacity (VAC) into four management categories, or Regulation Classes. These classes group lands that allow similar allowable harvest unit size, visual disturbance, and re-entry times (adjacency). Regulation Classes are numbered 0 to 3, with 0 being ineligible for management. Most of the following discussion is focused on Regulation Classes 1-3.

Land Use Designation (LUD) For each alternative, a unique assignment and map of Land Use Designations was developed. Every Land Use Designation, or LUD, delineates a unique set of standards and guidelines that apply to that area. For each Alternative, up to 19 LUDs were recognized, but only three were allowed to produce timber counted towards Allowable Sale Quantity (ASQ): Scenic Viewshed, Modified Landscape, and Timber Production. These three LUDs were evaluated in the Regulation Class process. See the supplemental Alternative LUD maps and Chapter 3 of the Forest Plan for more specific information on LUDs.

Distance Zone (DZ) The amount of allowable timber harvesting also is affected by distance zone (DZ). Distance zone is the proximity of an area to a view-point. Distance zone varies from Foreground (within a 0.25 mile), Middle Ground, Background, to Not-Seen, which is completely out-of-view from selected viewing points. Again, available treatment intensity is usually greater on lands with more hidden Distance Zones.

Scenic Integrity Objectives (SIO) Scenic Integrity Objectives are a function of LUD and Distance Zone and describe the desired quality of the scenery to be maintained in each classification. The categories include “High,” “Moderate,” “Low,” and “Very Low” objectives. Further description of SIOs is found in the “Scenery” section of Chapter 4 in the Forest Plan. SIOs for each of the LUD/Distance Zone combinations are shown in Table B-4.

Visual Absorption Capability (VAC) The VAC is a measure of an area's ability to "absorb" (make visually less noticeable) ground disturbing activities (i.e., timber harvesting). VAC is simplified to three categories: Low, Interim, and High. VAC is used to define the intensity of management treatments that can be used to maintain each SIO. Generally, areas with greater VAC can sustain a more intensive treatment while still maintaining the desired SIO. Table B-5 shows the management unit size allowed for each SIO/VAC combination.

Tongass landscape architects developed some general timber harvesting guidelines, or proxies, for various VACs, SIOs, and LUDs. Although the exact harvest intensity an area receives is determined during the timber sale layout stages, estimates of allowable disturbance were needed in order to facilitate modeling. Each LUD has a series of adopted SIO and VAC objectives. Associated with these objectives are the estimated allowable disturbance factors. The proxies for each LUD and SIO/VAC setting were grouped by similar harvest method and unit size, cumulative visual disturbance, and height to adjacent stand criteria. Grouping the proxies of similar standards resulted in the creation of four distinct categories. These groups became the four regulation classes used in Spectrum modeling. These groups range from no harvest allowed to large clearcutting with minimal visual concerns. The GIS is then used to provide Spectrum with the regulation class allocations by alternative for each Analysis Area. Table B-6 summarizes the approximate disturbance factors by LUD, Distance Zone, SIO, and VAC.

Table B-4
SIO for Distance Zone/LUD from Scenery Standards and Guidelines

LUD	Foreground	Middle Ground	Background	Not Seen
Scenic Viewshed	Retention	Partial Retention	Partial Retention	Max Modification
Modified Landscape	Partial Retention	Modification	Modification	Max Modification
Timber Production	Modification	Max Modification	Max Modification	Max Modification

Table B-5
Maximum Unit Size based on Visual Absorption Capability

SIO	Low VAC	Interm. VAC	High VAC
Retention	< 2	5-15	15-30
Partial Retention	5-10	15-40	40-60
Modification	15-40	40-60	80-100
Max Modification	50-75	80-100	80-100

R = Retention, PR = Partial Retention, M = Modification, MM= Maximum Modification

The percentages in Table B-6 are rough estimates intended to depict the possible level of disturbance one may encounter when viewing these areas. For modeling purposes, these visual disturbance zones were aggregated into groups with similar standards and economic response (e.g., logging costs). Because the percent of visual disturbance includes all visible terrain, tests had to be conducted to "recalculate" disturbance thresholds since only suitable lands are being modeled. These tests involved a series of iterative mapping exercises where varying levels disturbance factors were applied to the separate groups. The feasibility of the harvest level was then compared to the standards and guidelines and reviewed by Tongass National Forest landscape architects. This work was conducted under the following assumptions:

1. The items in the database (e.g., distance zone, visual absorption capability) were correct,
2. The standards and guidelines are modeled to their limits, and
3. The "viewshed" was a large area (e.g., as viewed from a boat).

This work indicated a need to further review the scenery components of the database but in general the process worked well in terms of modeling the intent of the standards and guidelines. This work resulted in three distinct regulation classes that permit timber harvest activities. The final allocation of regulation classes to the various disturbance zones is shown in Table B-7.

Table B-6
Percent Allowable Visual Disturbance

Land Use Designation	Distance Zone	SIO	Low VAC	Interm VAC	High VAC
Scenic Viewshed	Foreground	R	8	10	10
	Mid. Ground	PR	8	15	20
	Background	PR	20	20	20
	Not Seen	MM	20	20	20
Modified Landscape	Foreground	PR	8	15	20
	Mid. Ground	M	15	20	25
	Background	M	25	25	25
	Not Seen	MM	25	25	25
Timber Production	Foreground	M	15	20	25
	Mid. Ground	MM	50	50	50
	Background	MM	50	50	50
	Not Seen	MM	50	50	50

Table B-7
Regulation Class Allocation

Land Use Designation	Distance Zone	SIO	Low VAC	Intermediate VAC	High VAC
Scenic Viewshed	Foreground	R	3	3	2
	Mid. Ground	PR	3	3	2
	Background	PR	3	2	1
	Not Seen	MM	1	1	1
Modified Landscape	Foreground	PR	3	3	1
	Mid. Ground	M	2	2	1
	Background	M	2	1	1
	Not Seen	MM	1	1	1
Timber Production	Foreground	M	2	2	1
	Mid. Ground	MM	2	1	1
	Background	MM	1	1	1
	Not Seen	MM	1	1	1

R = Retention, PR = Partial Retention, M = Modification, MM= Maximum Modification

There are two main components of scenery constraints applied to the Regulation Classes in each VCU: the total visual disturbance and adjacency considerations. Total visual disturbance is the percent of land within a viewshed (VCU) that is classified as disturbed (Table B-8). Adjacency refers to the amount of time required before a harvest unit can be placed immediately next to an existing harvest unit (often referred to as the "green-up" period). These constraints are shown in Table B-8.

There are several important things to remember regarding the above table:

1. Disturbance percent is applied to suitable lands only, not the entire viewshed.
2. These values are entered into the models as constraints for each VCU.
3. The disturbance and adjacency factors for Regulation Class 3 are based on the use of small patch cutting (less than 2 acres). Optimally, disturbance and adjacency would not be an issue with carefully planned uneven-aged management (i.e., partial stand removal).

Variation by Alternative. Because LUD is one factor in determining Regulation Class, the breakdown of each of the seven alternatives into regulation class was recalculated for each alternative. A GIS map of Regulation Class was developed and used to intersect with the other layers used in Analysis Area development. Regulation Class was then used as an attribute to help define Analysis Areas.

Table B-8
Generalized Visual Constraints
Regulation Class Visual Disturbance Adjacency

Regulation Class	Visual Disturbance	Adjacency
1	40%	20 Years
2	30%	35 Years
3	20%	50 Years

Model Implementation Reduction Factors (MIRF)

To reiterate what was stated in the "Constraints" section (above), the use of MIRF is designed to accommodate for unmapped unsuitable lands that cannot be directly eliminated from the suitable land base but should be. It is known that when harvest activities occur, a certain percentage of the assumed suitable land will be ineligible for management (unsuitable) due to a number of physical, biological, or economic considerations. However, reasonable assumptions can be made to estimate the average

amounts of these elements on the ground. Their effect on actual suitable land can be incorporated into the Spectrum model as constraints. Constraints are applied to each old-growth volume strata of each of the six operability harvest systems as well as to young-growth stands. The constraints are implemented by forcing the model to never harvest a certain percentage of the acres in the model. The effect is to control the maximum amount of acres from the "pre-MIRF" suitable land base that are actually harvested. A discussion of these elements and their estimated amounts follows.

MIRF Elements. Each of the nine MIRF subfactors used in the 1997 FEIS (Riparian Habitat was actually divided into two subfactors so there were 10 identified in 1997) was re-evaluated for the 2008 Final EIS. These subfactors are listed below and described in the following paragraphs.

- Land Selections – reduction due to the conveyance of selected lands to the State of Alaska and Native interests
- TTRA Stream Buffers – reduction due to unmapped Class I and II stream buffers
- Non-Commercial Forest – reduction due to volume class mapping errors
- Slope/Soil Hazard – reduction due to unmapped steep slopes
- Cost Efficiency – excludes stands with the lowest economic potential from the suitable base
- Riparian Habitat (Class III streams) – reduction due to unmapped Class III stream buffers
- Karst/Caves – reduction due to upgrading of the karst classification to high vulnerability on some areas
- Deer Habitat – reduction due to implementation of deer habitat standards and guidelines (some 1997 alternatives included these)
- Remaining Standards and Guidelines – reduction due to unmapped raptor and murrelet nests, wolf dens, mountain goat habitat, and habitat linkages

Land Selections. This subfactor estimates the reduction in the suitable land base as a result of conveyance of land to the State of Alaska and Native interests. In 1997, it was assumed that past land selections were representative of future land selections. It was also recognized that the subfactor may be overestimating the suitable lands lost because Native Corporations may select townsites near shore and within the 1,000-foot beach fringe.

In 1997, this subfactor was estimated by determining (with GIS) that there was 638,737 acres of encumbered lands and that 186,980 acres remained to be conveyed. This indicated that 29% of the encumbered lands would be transferred out of Forest Service ownership. Then, the amount of encumbered suitable lands was estimated and 29% was applied to those lands, producing the estimated suitable lands likely to be conveyed. This acreage was divided by the total suitable lands to estimate MIRF for this subfactor, which was rounded to be 2%.

In 2006, the following estimates are made using GIS and other knowledge of lands remaining to be conveyed (see the planning record for calculations):

- Total encumbered lands = 260,487 acres (not including encumbered lands in Misty Fiords)
- Current suitable (Alt 5) encumbered lands = 33,589 acres
- Remaining lands to be conveyed (40,000 State and 65,000 Native interests) = 105,000 acres
- Percent of encumbered to be conveyed (105,000/260,487) = 40%
- 40% of current suitable encumbered lands = 13,436 acres
- Total current suitable = 1,044,587 acres
- MIRF subfactor (13,436/1,044,587) = 1%

Therefore, 1% was used for this MIRF subfactor. This percent was applied to all alternatives.

Tongass Timber Reform Act (TTRA) Stream Buffers. This subfactor estimates the reduction in the suitable land base due to unmapped Class I and II stream buffers. In 1997, it was assumed that the loss

of suitable timber was proportional to its occurrence and that streams were randomly distributed across the landscape.

In 1997, this subfactor was estimated using the Forest Service response to the Irland Group report, Chatham data, Central Prince of Wales Island data, and Stikine field reviews. The following TTRA buffer MIRF estimates were made based on each of these studies:

- Irland Study (1992) – 2.50%
- Chatham (1995) – 3.91%
- Central Prince of Wales Island (1995) – 3.62%
- Stikine Field Visit – 2.32%

Based on these estimates, the 1997 MIRF for this subfactor was 2.5%.

For 2006 it was assumed that this percentage is reduced to 2%. This is because of the significant amount of field survey work and the amount of updating of the streams GIS layer that has occurred in the 10 to 15 years since these studies were done.

Non-Commercial Forest. This subfactor estimates the reduction in the suitable land base due to volume class mapping errors. In 1997, it was assumed that reduction in suitable land due to mis-mapping was the same for all three Administration Areas.

In 1997, a statistician at the Pacific Northwest Research Station used the Forest Inventory plot data (1970s) and the revised TIMTYPE volume strata to identify plots designated as high/medium/low volume that actually had less than 8,000 board feet of volume per acre. The 8,000 board feet per acre figure was used as the definition of productive old growth, or POG. This analysis indicated that 2% of the medium volume strata plots and 18% of the low volume strata plots were stocked at less than 8,000 board feet per acre. The reduction for the medium plots was not used because it was judged too small and would overlap with other reduction factors, so 18% MIRF was used for this subfactor only for the low volume strata.

In 2006, 10% MIRF was used for low volume strata for this subfactor. Recent consultation with the Pacific Northwest Research Station statistician concluded that the 18% figure the low volume strata is still reasonable, even with the new inventory data. However, it was decided that there should be recognition of “fall-up” or the determination that areas of Unproductive Forest are misclassified and should actually be POG. It was estimated, based on detailed experience with the inventory data, that 5 to 10% of the Unproductive Forest is POG (> 8,000 board feet/acre). So the following steps were followed:

- The Tongass has 4.22 million acres of Unproductive Forest, 4.95 million acres of POG, and 0.98 million acres of low volume strata POG.
- If 5% of the Unproductive Forest is low volume strata POG, then there are 0.21 million additional acres of low volume strata POG.
- 0.21 million acres represents a 21% increase in the amount of low volume strata.
- If the Forested Muskeg type of Unproductive Forest is not included in Unproductive Forest, then there are 3.15 million acres and 5% of 3.15 million acres is 0.16 million acres. Assuming only half of these acres are actually identified and incorporated into units, this results in 0.08 million acres represents an 8% increase in the amount of low volume strata.

Therefore, being conservative and using only half of the 5% of the “other” Unproductive Forest as “fall-up,” in 2006 an 8% “fall-up” and an 18% fall-down were assumed. Therefore, the MIRF for this subfactor is the net difference, which produces a 10% reduction in low volume strata.

Slope/Soil Hazard. This subfactor estimates the reduction in the suitable land base due to unmapped steep slopes. It represents the additional acreage of steep slopes identified during project implementation that is not already mapped, divided by the mapped suitable acres.

In 1997, this subfactor was based on a draft Baranof MIRF analysis (1996), the Forest Service response to the Irland Group report (1995), Chatham data, Central Prince of Wales Island data, and the Ketchikan

cumulative effects contract study (on suitable and fall-down by project area). Based on these sources, the 1997 MIRF for this subfactor was defined as 32% for Chatham and 3.1% for the Stikine and Ketchikan Areas.

For 2006, the slope data that was developed to produce the suitability layer for the new Tongass LSTA was reviewed. This new layer (which removes slopes >72% and includes more detailed information, including LIDAR) already removes many of the steep slopes that were not accounted for in 1997. A GIS query examined the acres in steep slopes that are not in MMI4. This amounted to 6% of the suitable in the Chatham Area and 3% of the suitable in the Ketchikan and Stikine. In addition, there are two other factors that affect the MIRF for this subfactor: First, there is a certain amount of "fall-up" for areas mapped as MMI4 and areas mapped as >72% slope. These positive factors were not considered in the 1997 MIRF. Second, there is a large amount of area removed due to being mapped as Site Index = 1 and it appears that more areas are added back in (due to "fall-up") than are taken out due to site index. Therefore, for 2006, the Chatham MIRF was reduced for this subfactor to 26% and the Ketchikan and Stikine MIRFs to 1%.

Cost Efficiency. This subfactor excludes the stands with the lowest economic potential from the suitable land base. In 1997, 36 CFR 219.14[c][3] was applied and it was assumed that future economic potential could be estimated using past harvest experience.

In 1997, the subfactor was estimated using the best professional judgment of Bill Wilson and Don Golnick. They assumed that no harvest would be conducted in low volume strata if it was in the Difficult or Isolated Operability Class. In addition, they assumed the same for medium volume strata in the Isolated Operability Class. Therefore, lands with these characteristics had a 100% MIRF subfactor.

In 2006, it was decided that economics should be factored in differently because the Spectrum modeling extends over a 150-year period. It was decided to make the MIRF for this subfactor equal to 25% for Difficult/Low Volume and Isolated/Medium Volume and 50% for Isolated/Low Volume. These subfactors are additive with the other subfactors; therefore, the combined MIRF for these low economic categories ranges from 44 to 79% in Ketchikan, 38 to 73% in the Stikine, and 64 to 99% in the Chatham Area (see attached Excel file).

It should be noted that by design the Spectrum model will tend to harvest the most economically challenging areas only as a means to achieve a desired condition. Even without these subfactors the model is unlikely to schedule these lands for harvest.

Riparian Habitat (Class III Streams). This subfactor estimates the reduction in the suitable land base due to unmapped Class III stream buffers. In 1997, it was assumed that 50% of the Class III streams would need to be buffered and that 50% of the Class III streams were unmapped.

In 1997, the subfactor was estimated to be 14% based on estimating 50% of unmapped Class III stream acreage and then relating it to the suitable. It appears that the amount of suitable used in the calculation was incorrect, making the percentage higher than it should have been.

In 2006, it was decided to be more conservative (although a lower MIRF was estimated). The MIRF for this subfactor was calculated as follows:

- GIS analysis showed 7,557 miles of Class III streams in the development LUDs of the No-Action alternative.
- Since 29% of these development LUDs is suitable forest land, it was estimated that there are 2,191 miles of Class III streams on suitable forest land.
- Assuming all are buffered and the buffers are 100 feet on each side, these stream miles would produce 53,114 acres of buffers.
- Assuming an equal amount will be established in the future: 53,114 divided by 1,044,588 gives a MIRF of 7.6%.
- To be conservative, we rounded this MIRF to 8%.

Karst/Caves. This subfactor estimates the reduction in the suitable land base due to a change in karst classification from low – moderate to high vulnerability. In 1997, it was assumed (based on the professional judgement of J. Baichtal (1996) and others) that 30% of low-moderate lands in Ketchikan should be high vulnerability; similarly, the percentages for the Stikine and Chatham are 10% and 20%.

In 1997, the subfactor was estimated based on professional judgement and GIS queries. For Alternative 11, the MIRF values for this subfactor were: 0.5% for the Chatham Area, 0.3% for the Stikine Area, and 5.9% for the Ketchikan Area.

In 2006, GIS queries were made again, using the new karst rock layer (tkarst06). The MIRF for this subfactor were calculated as follows:

- It was determined there are 100,743 acres of karst rock on suitable lands on the Forest.
- GIS analysis showed these were apportioned among the Administrative Areas as follows: 18.5% (18,637 acres) to the Chatham; 5.2% (5,239 acres) to the Stikine; and 76.3% (76,867 acres) to Ketchikan.
- Applying the 30%, 10%, and 20% factors defined in 1997 for the Administrative Areas produces the following: 3,727 acres of low-moderate should be high vulnerability for the Chatham, 524 acres for the Stikine, and 23,060 acres for the Ketchikan Areas.
- Dividing these by the amount of suitable for these areas (277,016, 354,362, and 413,210, respectively) produces the final MIRFs for this subfactor:
  - Chatham = 1.3%; rounded to 1%
  - Stikine = 0.1%; rounded to 0%
  - Ketchikan = 5.6%; rounded to 6%

Deer Habitat. This subfactor estimates the reduction in the suitable land base due to implementation of the deer standards and guidelines. In 1997, these applied to the high and medium volume strata for Alternatives 3, 4, 5, and 6 of the 1997 Final EIS.

In 2006, this subfactor is not used, because none of the 2006 alternatives include these deer habitat standards and guidelines.

Remaining Standards and Guidelines. This subfactor estimates the reduction in the suitable land base due to unmapped eagle/osprey nests, goshawk nests, murrelet nests, wolf dens, goat habitat, and 600-foot habitat linkages. In 1997, this subfactor was estimated at 1% based on the best professional judgement of Bill Wilson and Don Golnick.

In 2006, it was decided to maintain the MIRF of 1% for this subfactor.

Overall Results. The sum of these subfactors produces the overall MIRF for each category (Administrative Area, volume strata, operability class, alternative). To date, we have identified one MIRF for all alternatives. Specific calculated MIRF values are in the planning record. The range of MIRFs (varying with operability class) for the different volume strata and Administrative Areas are as follows:

	Low Volume	Medium Volume	High Volume
Chatham	49% – 99%	39% – 64%	39%
Stikine	23% – 73%	13% – 38%	13%
Ketchikan	29% – 79%	19% – 44%	19%

Estimation of Past and Future Harvest and Road Construction for Effects Analysis

The quantification of the direct, indirect, and cumulative effects of the alternatives on fish, wildlife, plants, and other resources was based heavily on the estimation of past and future harvest of old growth and young growth and the amount of road construction. These tasks were conducted for both National Forest System (NFS) and non-NFS lands. This section describes the process followed and the major assumptions.

Estimation of Past and Future Harvest

The estimation of the direct, indirect, and cumulative effects of the alternatives on POG habitats and the fish, wildlife, and plants that use these habitats required three major steps. First, it was necessary to assemble the inventory of existing vegetation on both NFS and non-NFS lands. The second step was the estimation of the original POG on NFS and non-NFS lands and the classification of this original POG into POG types for the purpose of evaluating the level of disproportionate past harvest. The third step was the estimation of future harvest and the amount of POG in various POG categories that would be remaining after future harvest on NFS lands under each alternative, and for all lands combined, including factors for harvest of future harvest on non-NFS lands.

Vegetation Inventory

For NFS lands, the existing vegetation information from the Tongass Geographic Information System (GIS) library was used. Specifically, the recently developed Size Density Model (SDM) (see Affected Environment in the *Biodiversity* section) was used for the classification of existing vegetation on the Tongass. Using this model, POG is defined by seven old-growth types: SD67, SD5N, SD5S, SD5H, SD4N, SD4S, and SD4H. Young growth is defined by six types, depending on the approximate age and origin of the stand; natural young growth (e.g., young growth originating from blowdown) is divided into three types (S1, S2, and S3) and young growth that originated from timber harvest is classified into three types (HS1, HS2, and HS3).

For non-NFS lands, a number of sources of information were used to produce the most updated and accurate mapping available for non-NFS lands in Southeast Alaska. These sources included:

- Sealaska Regional Corporation provided recently updated GIS layers for vegetation and harvest on their lands throughout Southeast Alaska; these layers were used for mapping all Sealaska lands.
- The State of Alaska provided GIS layers for harvesting on state lands in Southeast Alaska. These layers were used for most state lands.
- Audubon Alaska and The Nature Conservancy recently completed a conservation assessment for Southeast Alaska (Albert and Schoen 2007) that included the development of a reasonably accurate vegetation map of the entire region based on Tongass GIS vegetation data (SDM mapping), augmented with timber inventory data from Haines State Forest and with classified Landsat Multi-spectral Scanner (MSS) imagery from the Interim Landcover Mapping Program of the U.S. Geological Survey, and 1997 aerial photography. This mapping was used for most of the remainder of Southeast Alaska.
- Forest Service orthophotography and aerial photography was interpreted in some areas to fill in gaps in the above layers.

Based on all of the above information, a Catalogue of Past Harvest for all of Southeast Alaska was developed that itemizes the acres harvested for each land ownership category, landowner, and biogeographic province, and breaks this harvest down by approximate decade, where the decade of harvest is known or can be reasonably estimated. In addition to the spatial information described above,

statistics on the implementation of the Alaska Forest Resources and Practices Act and information on State timber sales in Southeast Alaska were collected from the Alaska Department of Natural Resources, Division of Forestry. This information is presented in Appendix E.

Original POG by Category

Next, the original POG was estimated on NFS and non-NFS lands in each biogeographic province and ecological subsection by category. This was done for the purpose of evaluating the level of disproportionate past harvest.

Original POG is defined in this EIS as the POG that existed, outside of the developed areas associated with towns, prior to all mapped timber harvest. Therefore, all young growth originating from timber harvest (mapped as HS1, HS2, and HS3 on NFS lands) was assumed to be original POG. Natural young growth (mapped as S1, S2, and S3 on NFS lands) was assumed to be in a steady state of succession and replacement; therefore, it was not assumed to be original POG. On the Tongass, about 300 acres of young growth were mapped as having been harvested in the 1700s and 1800s and about 16,000 acres are from the first half of the 1900s. The vast majority (about 438,000 acres on the Tongass) of the harvest occurred since 1950.

In addition to total POG (represented by the seven SDM types), two other categories of POG were used to represent the larger tree types: high-volume POG, which includes the three types with the largest trees (SD5S, SD5N, SD67), and large-tree POG, which is defined as SD67 by itself. To estimate original high volume- and large-tree POG, an estimate was first made of the percentage of past harvest in these categories using timber type mapping from the mid-1980s. The archived tim86 GIS layer from the Tongass GIS library was used and lands that had been harvested since this mapping was done were examined. For NFS lands, these areas were divided into older harvests done prior to the TTRA and harvests after the Act was implemented.

The following compositions of harvest were determined for NFS and non-NFS lands:

- For NFS lands, prior harvest was estimated to have been 29 percent large-tree POG and 64 percent high-volume POG.
- For non-NFS lands, prior harvest was estimated to have been 37 percent large-tree POG and 62 percent high-volume POG.

Future Harvest

Future harvest on NFS lands was estimated based on the acreage of POG scheduled for harvest by the Spectrum model under each alternative assuming the maximum harvest allowed by the ASQ is harvested each decade. The estimate assumes all scheduled suitable POG is harvested (calculated by subtracting alternative-specific reduction factors for MIRF and scheduling from the mapped suitable acreage under each alternative [see the *Timber* section]). Factors are applied separately to each biogeographic province and ecological subsection to develop province- and subsection-specific acreages.

The estimation of future harvest on non-NFS lands was made by examining the amount of POG remaining on these lands and making reasonable assumptions regarding the percentage of that POG that would be harvested in the future. Estimates were conservatively high, in general.

Estimation of Past and Future Road Construction

The estimation of the direct, indirect, and cumulative effects of the alternatives associated with road construction required two major steps. First, it was necessary to assemble the inventory of existing roads on both NFS and non-NFS lands. The second step was the estimation of future road development for NFS lands under each alternative, and for all lands combined, including factors for future road development on non-NFS lands.

Road Inventory

For NFS lands, the existing road information from the Tongass GIS library was used. The infra roads layer was used for the inventory of system roads and the definition of maintenance levels to determine whether they were open or closed. The allroads layer was used to estimate additional unauthorized roads. For non-NFS lands, existing roads were inventoried using the following sources:

- Tongass GIS library layers contain many roads on non-NFS lands.
- Sealaska Regional Native Corporation provided mapping of roads on Sealaska lands.
- The State of Alaska provided GIS layers for roads on many non-NFS lands in Southeast Alaska.
- Other available GIS layers (e.g., ESRI's StreetMap) was used for urban and rural areas around towns and settlements.
- The sources above were supplemented by orthophoto and aerial photograph interpretation to "fill in holes."

Future Road Construction

Future road construction on NFS lands was estimated based on the recently completed logging system and transportation analysis (LSTA) for the Tongass. In areas that the LSTA did not cover, future roads were extrapolated based on the road miles per harvest acreage in the portions of each Value Comparison Unit (VCU) or Wildlife Analysis Area (WAA) that were covered by the LSTA. Projections were made for each VCU and WAA and under each alternative, so that road densities could be calculated for each of these land divisions.

On non-NFS lands, future increases in road density were projected after examining existing road densities and making reasonable assumptions regarding the additional road density that would be developed in the future. Estimates were conservatively high, in general. All non-NFS roads were assumed to be open roads.

Deer Model Assumptions and Application

The TLMP or DeGayner Deer Model was used in the EIS to (1) evaluate reductions in winter habitat capability under each alternative, as indicated by changes in the DeGayner Deer Model habitat suitability index (HSI) scores, (2) estimate the percentage of high value deer winter range that could be harvested under each alternative, and 3) estimate the number of WAAs across the Tongass that exceed the 18 deer per square mile index in the wolf standards and guidelines. Changes in winter habitat capability and harvest of high-value winter range were based on projected 1954 (point at which large-scale timber harvest began) conditions, to be consistent with past analyses done at the Forest planning level. Analyses were run at the WAA level, as this is the land division used by the ADF&G for deer inventories and planning. A cross-walk was developed to reclassify the new Forest-wide vegetation model (the SDM) into the deer model vegetation categories (high, medium, low volume old-growth). High-volume stands included SDM vegetation categories SD5N, SD5S, and SD67; medium volume stands include SD4N, SD4S, and SD5H; and low volume stands include SD4H. HSI scores from this model range from 0 to 1.3 but were standardized to range from 0 to 1.0 by dividing all values by 1.3, because outputs from such models represent a range from 0 to 100 percent habitat suitability, with higher values indicating higher habitat capability. Greater details are documented in the project planning record.

To estimate 1954 habitat suitability, it was necessary to "grow back" the vegetation in previously harvested units. Previously harvested units were assumed to have been stands of POG. The variable for volume class (VolClass) in the Existing Veg layer, which exists for most stands that have recently been harvested, was used as an indicator of their 1954 VolStratum categories. Stands with an Existing Veg VolClass of 4 or 5 were assumed to have been medium volume POG in 1954, following the assumption that few low VolStrata stands were harvested; stands with a VolClass of Null, 3, 6, or 7 were assumed to have been high VolStratum POG. VolStratum 6 and 7 were obviously in high VolStratum and it was assumed that the remainder of the stands that were harvested many years ago were in the high VolStratum also. All stands with a date of origin prior to 1954 were not modified.

Future habitat suitability was based on maximum timber harvest after full implementation of the Forest Plan under each alternative. It was assumed that 25 percent of the harvestable acreage would be in the stand initiation stage (I) and 75 percent of harvestable acreage would be in the stem exclusion stage (E) of stand development after full implementation. In addition, the MIRF, or the percent of the mapped suitable acres not actually harvested due to factors identified during implementation (e.g., karst, unstable slopes and other issues that preclude harvest during timber sale layout), and a scheduling factor was taken into account as they are for the timber volume estimation, the Spectrum ASQ modeling, and other future harvest and road construction estimation.

Accordingly, future WAA-level HSI scores were based on a weighted average of three scenarios, or model runs, which assumes that all harvestable lands are harvested. This approach produces an unbiased estimate of future HSI scores under the assumption that 25% of all suitable forest land is in the I stage, 75% is in the E stage, the remaining harvested young growth (unsuitable) is in the E stage, and all old growth and natural young growth remains the same. No-Harvest Scenario weights account for the area represented by MIRF and scheduling and which is not harvested.

To estimate the percentage of 1954 winter range habitat capability that currently remains, and would remain under each alternative after full implementation of the Forest Plan, the1954 HSI score was divided by the current and future HSI score for each WAA, respectively. This illustrates the cumulative effect of timber harvest on estimated deer habitat capability, from the beginning of large-scale timber harvest on NFS lands in 1954 to the present and to the year 2105.

To take into account effects on deer across the Tongass inhabiting areas that vary naturally in their habitat quality, high quality habitat was defined as the quartile of the current land base with the highest HSI scores within each WAA. This was defined by using the following process:

- Sorting HSI scores within each WAA from highest to lowest by polygon;
- Filtering out all polygons with HSI scores = 0 (this area was not included when identifying the area percentages);
- Identifying the polygons that are in the highest 25% based on the WAA acreage, by accumulating the acreages starting with the polygons with the highest HSI scores and working down until 25% of the area was included; and
- Determining the percentage of these acres (which represent the highest quality deer winter range within each WAA) that are harvested under each alternative.

Deer per square mile were calculated to develop an index of the effects of the alternatives on the wolf standard and guideline that deals with deer habitat capability. For this analysis, habitat capability in terms of deer density was calculated by assuming a density of 100 deer per square mile for an HSI of 1.0. Only WAAs where wolves potentially occur (GMUs 1, 2, 3, and 5) were included and WAAs with naturally very low deer densities (WAAs 4302-4607) were excluded from the analysis.

APPENDIX C
POTENTIAL LAND ADJUSTMENTS

Appendix C

Potential Land Adjustments

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Appendix C
Potential Land Adjustments

Introduction

This appendix addresses certain types of land ownership adjustments involving Tongass National Forest lands that could potentially occur during the period of the Forest Plan Amendment. Adjustment of land ownership within the Tongass boundaries can occur through Congressionally-mandated conveyances, exchanges, and acquisitions or through Forest Service administrative activities. The latter two types of adjustments typically involve small acreages and specific, localized property circumstances, and have little impact on management of the Tongass. Land conveyance processes and land exchanges can involve larger acreages and can be relatively wide-ranging in geographic scope. Because these types of adjustments could have more substantial implications for Forest management, this appendix provides more detailed information about specific potential actions that have been proposed by parties other than the Forest Service in recent years. The discussion of the possible ramifications of potential conveyances or exchanges is an overview and is intended for informational purposes only. It does not represent a National Environmental Policy Act (NEPA)-type analysis of the potential environmental impacts of such actions. If the Forest Service were to propose such a land adjustment action or accept for review a proposal from another entity, the Forest Service would evaluate the proposal under NEPA and standard Forest Service processes for land adjustments.

Legislated Alaska Conveyances

Land ownership status within the Tongass is complicated by several ongoing Alaska land conveyances created under various federal legislation (USDA Forest Service 2003b). The Alaska Native Allotment Act of 1906 provided for Native individuals who had occupied lands prior to their designation as National Forest to apply for conveyance of up to 160 acres, under conditions prescribed by the Act and federal regulations. As of August 2006, approximately 4,500 acres in 44 Native allotments had been conveyed, with an additional 3,500 acres pending adjudication by the Bureau of Land Management (BLM).

The 1958 Alaska Statehood Act authorized the State of Alaska to select 400,000 acres of vacant and unappropriated land from within the Tongass and Chugach National Forests in Alaska, to further the development and expansion of Alaskan communities. To date, under this provision of the Statehood Act, the state has received title to approximately 258,600 acres located in the Tongass National Forest. Approximately 37,400 acres remain to be conveyed to the state from the Chugach and Tongass National Forests.

The Alaska Native Claims Settlement Act (ANCSA) established processes for transfer of federal land to Alaska Native village corporations and regional corporations, and to Native individuals. ANCSA provided for the conveyance of 23,040 acres of surface estate lands (a full township, 36 square miles) to each of the 10 Native village corporations and 2 urban corporations located in Southeast Alaska. ANCSA provided that the subsurface estate under the village and urban corporation land would be conveyed to the Native regional corporation. ANCSA also included other provisions addressing land conveyances to Native regional corporations. Under Section 12c of ANCSA, 11 regional corporations were to share in the selection of 16 million acres. Section 14(h)(8) set aside a pool of 2 million acres to be transferred to the Native regional corporations in the State after certain other conveyances are completed. After the specified conveyances have been implemented, the remaining land in the pool will be divided among the regional corporations based on population, with approximately 22 percent of the balance going to Sealaska Corporation, the regional corporation for Southeast Alaska. Finally, ANCSA provided for selection and transfer of up to 160 acres to Native individuals who had occupied that land as a primary place of residence on August 31, 1971.

To date, approximately 571,000 acres within the Tongass have been conveyed under ANCSA. Each of the 10 Native village corporations and 2 urban corporations in Southeast Alaska has selected its authorized acreage; virtually all of that land has been conveyed, amounting to a total of approximately 279,000 acres. Approximately 292,000 acres have been conveyed to date to Sealaska Corporation, in addition to the subsurface estate under the lands owned by the village and urban corporations. Sealaska has selected about 171,000 additional acres. It is expected that approximately 64,000 acres of these lands will be conveyed to Sealaska.

Potential Future Conveyances

The major Alaska land conveyances described above (those occurring under the Alaska Statehood Act and ANCSA) have been authorized by Acts of Congress and implemented through additional legislation and regulations. In recent years there have been a number of other formal and informal proposals that, if authorized, might result in the transfer of Tongass National Forest System (NFS) lands out of federal ownership. Information currently available to the Forest Service about these conveyance proposals is provided below. For each proposal, the text includes background information, a description of the conveyance proposal, and a discussion of the potential implications for land ownership and management of the Tongass. Because the proposed legislation for the respective conveyances does not generally specify where land selections would be made, it is not possible at this time to identify the types of Tongass lands and resources that would likely be affected by the proposals. Consequently, the discussion of forest management implications for the potential conveyances is necessarily quite general.

Southeast Alaska Native Land Entitlement Finalization Act

A proposal was identified in the Draft EIS entitled Sealaska Proposed Comprehensive Tongass-wide Land Exchange. Since the Draft EIS was published, the potential land exchange has evolved into a legislative proposal entitled Southeast Alaska Native Land Entitlement Finalization Act, which was subsequently introduced into Congress as H.R. 3560. This bill, as introduced, more closely resembles a conveyance rather than a land exchange as earlier described. The text describing the original proposal has been maintained under the Potential Land Exchange section of this appendix so readers can compare the current proposal to the original proposal identified in the Draft EIS.

H.R. 3560 is to provide for the completion of certain land selections under ANCSA, and for other reasons. H.R. 3560 defines its purpose as the vehicle to redress the inequitable treatment of the regional corporation for Southeast Alaska by allowing Sealaska to select its remaining entitlement under section 14 of the ANCSA (43 U.S.C.1613). These selections are to come from designated Federal land in Southeast Alaska, outside the ten Southeast Alaska village withdrawal areas. In general, H.R. 3560 authorizes Sealaska to select and receive conveyance of its remaining land entitlement from three categories including economic development lands; sites with sacred, cultural, traditional, or historic significance; and Native enterprise sites.

Proposal and Current Status

H.R. 3560 was referred to the House Committee on Natural Resources, U.S. House of Representatives, in Washington D.C. on September 18, 2007. A hearing was held by the same Committee on November 14, 2007. Testimony was presented by officials from the Departments of the Interior and Agriculture for the Executive branch, along with representatives of the Sealaska Corporation and Southeast Alaska Conservation Council. At this time no additional hearings or committee assignments have been identified and it is not clear whether or not this proposal will move further through the legislative process.

The goal of the H.R. 3560 is to finalize Sealaska's entitlement equitably; secure ownership of places of sacred, cultural, traditional, and historic importance; maintain its existing resource development and management operations; and continue economic opportunities for the Native people in Southeast Alaska. While not clearly defined in the Act, those lands identified as entitlement are assumed to be similar to those described in the Potential Land Exchange section of this appendix. For brevity, this section will not repeat the information described in that section. Maps (Sealaska ANSCA Land Entitlement

Rationalization Pool, dated May 17, 2007) have been made available that define the locations of the potential land acquisitions, which further refine what was presented in the Draft EIS. Upon completion of the land conveyance from the Tongass to Sealaska, all encumbrances (327,000 acres according to the Bill) currently held by the regional corporation would be removed.

Two new items presented by H.R. 3560, were not addressed in the Draft EIS. These include sites with sacred, cultural, traditional, or historic significance (sacred sites) and Native enterprise sites. The sacred sites encompass no more than 2,400 acres of known locations (identified on maps entitled "Places of Sacred, Cultural, Traditional, and Historic Significance, dated May 17, 2007" and "Traditional and Customary Trade and Migration Routes, dated May 17, 2007"). An additional 1,200 acres is set aside and may be used by Sealaska to acquire new discoveries. The known sites are depicted across the extent of the Tongass National Forest and prohibit commercial timber harvest; shall not be subject to additional covenants; and provide for varying uses of the sites by Sealaska.

Native enterprise sites encompass no more than 5,000 acres and are identified on a map entitled "Native Enterprise Sites dated May 17, 2007." These sites are identified across the extent of the Tongass National Forest and prohibit commercial timber harvest; shall not be subject to restrictive covenants; provide for access from the site to NFS lands 15 miles away from the exterior boundary of the site; and provide for varying uses by Sealaska.

Forest Management Implications

The Forest Service conducted preliminary analysis of the economic development lands in the Draft EIS. Based on how these lands are described in H.R. 3560, it is likely that the effects of the Act would be similar to what is presented for the Sealaska Proposed Comprehensive Tongass-wide Land Exchange in the Potential Land Exchange section of this appendix. Rather than repeat that analysis here, readers are directed to that text for reference.

Sites with sacred, cultural, traditional, or historic significance as well as Native enterprise sites could potentially affect management of many resources and issues on public lands, including subsistence, recreation, wildlife and fish, timber (including second growth), karst, travel management, and heritage resources. These potential effects are difficult to determine from the proposed legislation due to the vagueness of its language. More information, than what can be derived from the bill and testimony, would be necessary in order to adequately address this issue.

From the review the Forest Service conducted in the Draft EIS only on economic development lands, it was determined that implementation of the Sealaska proposal would require a Forest Plan Revision based on the magnitude of the changes in land use designations. With the addition of the sacred and Native enterprise sites, this determination is still warranted as a result of net losses in the Conservation Strategy, the lack of ability in making up key lands associated with the old-growth reserves, effects on the Allowable Sale Quantity, and impacts associated with other existing uses. Additionally, the lands to be exchanged to the federal government generally do not have existing road systems, and costs for developing roads on these lands would likely constrain the ability to supply timber economically. The combined impacts on the availability of timber from the Tongass could have a significant adverse effect on the supply of timber to mills on Prince of Wales Island and surrounding areas.

Table C-1 (at the end of this appendix) has been updated to reflect the acreages included in the legislative proposal and assumes like acreages for the economic development lands as described in the Draft EIS. It indicates the acreage of the NFS lands that could be transferred to Sealaska via the entitlement and conveyance components of the proposal, and the acreages of the current Sealaska lands that could be conveyed to the U.S. This table displays the acreages of the entire pool of parcels. The actual acreage conveyed would likely be less than listed.

Additionally, the U.S. Fish and Wildlife Service recently published a determination not warranting the listing of the Queen Charlotte Goshawk (Accipitier gentilis laingi) in Alaska (Federal Register on November 8, 2007). This determination was made, in part, based on the habitat protection measures on federal lands. Should the proposed legislation be implemented a high probability exists that this

determination would be revisited, given the current harvest level that has taken place on Prince of Wales Island, where the legislation would give emphasis to lands being acquired by Sealaska.

University of Alaska Lands

The following discussion is based on information obtained from the University of Alaska and Senate Bill 293.

By separate acts passed in 1915 and 1929, Congress granted approximately 360,000 acres of surveyed land to the University of Alaska to be used to generate revenue to support the University's educational mission (University of Alaska 2005). Only about 100,000 acres had been surveyed and conveyed to the University by the time of statehood in 1959, and the Statehood Act extinguished the University's right to receive the balance of its federal land grants. At that time the State of Alaska also took on management responsibility for the University lands, and allowed several municipalities to select University grant lands for their municipal entitlements without compensating the University. Through multiple settlements of lawsuits filed by the University, the University subsequently gained title to additional lands and timber harvest rights. The University of Alaska now owns and manages approximately 183,000 acres of land, of which approximately 170,000 acres are managed for investment purposes. Because the University received only a portion of the acreage total granted it by Congress, and that figure was smaller than the university land grant for virtually all other states, the University has sought additional grant lands through proposed state and federal legislation.

Proposal and Current Status

Under the terms of Senate Bill 293, introduced in Congress on February 3, 2005, the University of Alaska will be allowed to select up to an additional 250,000 acres of federal land that would be managed to provide income for the university system. If enacted, the university would not be allowed to select lands within a federal conservation system area (e.g., a national park or a wilderness area) or Tongass NFS lands other than those within development Land Use Designations (LUDs), and their selections would be limited to areas of second-growth timber where timber harvest occurred after January 1, 1952. Senate Bill 293 was not passed by Congress. As of September 2007, the bill has not been re-introduced.

Forest Management Implications

The proposal to allow conveyance of federal lands to the state to provide income to support the University of Alaska exists in concept only at this time. The Forest Service is aware of no maps indicating areas of interest for selection for such purpose, or statements from policy makers identifying areas that might be of interest. Therefore, it is not possible to determine specifically how enactment of such a conveyance process might affect management of the Tongass.

Based on the purpose of the University of Alaska Lands Bill, however, it is possible to identify the broad outlines of possible implications for the Forest. Because the purpose of the program is to generate income, lands with relatively high timber production capability and accessibility are a logical focus of land selection under such an act. Areas known or suspected to have high mineral resource potential will also be of interest. While some areas of the Chugach National Forest and some lands under the jurisdiction of the BLM will also be of interest, it is reasonable to assume that a substantial portion of any lands selected under such a conveyance program will be located on the Tongass.

Under the current Forest Plan, there are approximately 3.6 million acres within development LUDs and nominally available for selection, based on the language of Senate Bill 293. The Biodiversity section of this EIS indicates approximately 453,000 acres of the Tongass are second growth resulting from timber harvest (about 234,000 additional acres are in natural young growth). About 240,000 of these acres are in the 0-70 year age category and are on lands suitable for timber harvest. Therefore, this latter figure represents the lands that could be taken as the approximate area eligible for selection. Therefore, it is conceivable that land selection for the University of Alaska could absorb essentially all second-growth land in development LUDs on the Tongass. While this is possible, the Forest Service does not consider that to be a realistic possibility, given the availability of large areas of federal lands with income-generating potential elsewhere in the state.

If the University of Alaska Lands Bill is enacted, it is evident that any lands within the Tongass selected by the University would be productive timber lands currently supporting second-growth timber of varying ages. Because little, if any, of that timber is ready for harvest relatively soon, there would likely be minimal direct effect on near-term sales and harvest volumes for the Tongass. Nevertheless, removal of productive forest land from the development LUD land base would necessarily cause a commensurate reduction in the ASQ for the Forest, and therefore indirectly result in reduced harvest volumes from the Tongass in the relatively near term. Conversely, it can reasonably be assumed that any Tongass lands selected by the University under such a program will be open for timber harvest by the University and will provide a supply of wood as soon as that is economically viable. Therefore, over the long term it appears likely that the total harvest volume would not be much different with enactment of the University lands legislation, although the mix of sources would change somewhat. Timber from University lands would presumably be available for export, however, in which case the supply of wood to processors in Southeast Alaska could be reduced somewhat.

Unrecognized Southeast Alaska Native Communities

Under the Alaska Native Claims Settlement Act (ANCSA), corporations representing Native residents of 10 Southeast Alaska communities were each allowed to select 23,040 acres of surface estate for conveyance from the U.S. to those village corporations. ANCSA also provided the same conveyance rights to two Native urban corporations in Southeast Alaska. Native residents of Haines, Ketchikan, Petersburg, Tenakee Springs, and Wrangell were not addressed in those ANCSA provisions presumably because they did not meet the eligibility requirements. For a number of years there have been legislative proposals to extend land conveyance rights to the Native residents of these five communities to place them on an equal footing with other Southeast Alaska communities.

Proposal and Current Status

The Unrecognized Southeast Alaska Native Communities Recognition and Compensation Act (Senate Bill 1746), introduced most recently on June 29, 2007, proposes to allow Alaska Native residents of Haines, Ketchikan, Petersburg, Tenakee Springs, and Wrangell to organize as five Urban Corporations and to each receive 23,040 acres of surface estate lands and other compensation. Sealaska Corporation would receive the subsurface estate to these lands. The language in the bill does not identify the specific areas that would be available for selection and conveyance.

Forest Management Implications

If enacted, Senate Bill 1746 would presumably result in the transfer of up to 115,200 acres of current NFS lands out of federal ownership. Such an action would represent a reduction of approximately 0.7 percent in the total Forest land base. Given the limited existing information about how the proposal might be implemented, it is difficult to speculate as to which types and acreages of NFS lands would be affected. It is also unknown if selections would be allowed within congressionally designated areas such as Wilderness and LUD II areas. If it is assumed that selections would occur from available lands in areas close to the respective communities, selections under such a program could affect LUDs as follows:

Haines – Semi-Remote Recreation and Remote Recreation, with some Modified Landscape on either side of Lynn Canal

Ketchikan – Semi-Remote Recreation, Scenic Viewshed and Timber Production

Petersburg – Modified Landscape, Scenic Viewshed, Timber Production and Old-Growth Habitat

Tenakee Springs – Modified Landscape and Timber Production

Wrangell – Modified Landscape, Scenic Viewshed, Timber Production and Old-Growth Habitat

Based on the distribution of Tongass lands near the subject communities, it appears that Native selections under such a program could be concentrated within moderate development and intensive development LUDs. Alternatively, newly-formed village corporations might choose to select productive timberlands, to maximize the revenue potential from their lands. In either case, it appears likely that a

large majority of the total selected acreage would occur in development LUDs. Consequently, a conveyance program such as outlined in Senate Bill 1746 would likely result in forest management implications similar to those discussed above for the proposed University of Alaska conveyances. Based on the respective potential acreage figures (up to approximately 250,000 acres vs. about 115,000 acres), passage of Senate Bill 1746 or similar legislation could affect approximately half as much land on the Tongass as the University land proposal. Adoption of such a proposal would likely result in a minor reduction in the land base of suitable timber and a small corresponding decrease in the ASQ.

Alaska Native Veterans

The 1906 Native Allotment Act established a conveyance process under which individual Alaska Natives could select and receive title to up to a 160-acre parcel of vacant, unappropriated, and unreserved nonmineral federal land. Allotments may be made in national forests if founded on occupancy and use of the land prior to the establishment of the forest. In 1971, ANCSA repealed the Native Allotment Act and extinguished this right for Alaska Natives to claim allotments. The 1998 Alaska Native Veterans Allotment Act (Public Law 105-276) amended ANCSA to provide Alaska Native veterans another opportunity to apply for a Native allotment of up to 160 acres of land. This act was intended to compensate for the fact that Natives serving in Vietnam may not have been able to apply for their allotments prior to closure of the allotment program. This situation applies to approximately 2,800 Alaska Natives who served in the military during the Vietnam conflict. The 1998 legislation contained several provisions regarding federal land status, prior use of the claimed land and eligible military service dates that may be viewed by some as barriers to Native veterans obtaining their allotments.

Proposal and Current Status

The Alaska Native Veterans Land Allotment Equity Act, introduced most recently on August 2, 2007, as House Bill 3350, proposes to redress certain obstacles created by the 1998 Alaska Native Veterans Allotment Act. The Bill allows Alaska Natives who served in the military between August 5, 1964 and May 7, 1975 (the starting and ending dates of the entire Vietnam conflict) to each claim 160 acres of vacant federal land. Unlike the 1998 legislation, Alaska Natives filing under this program would not have to demonstrate substantially continuous use or occupancy of the subject land for at least five years that is potentially exclusive of others. Based on the estimated number of eligible Alaska Natives and the allotment size, this legislation could, if passed, result in the conveyance of up to approximately 448,000 acres of federal land in Alaska.

As of November 2006, the current Congress had not taken action on Senate Bill 2000 and passage is not likely to occur before this Congress adjourns. Future action would require reintroduction of the bill in the next Congress, which will convene in 2007.

Forest Management Implications

- The Forest Service is not aware of any information indicating how much Tongass land might be selected for Native allotments if this legislation is passed. It is unknown how many of the approximately 2,800 Alaska Native Vietnam veterans addressed by Senate Bill 2000 would actually select and claim land for allotments. In addition, many of those veterans no doubt live elsewhere in the state and would be inclined to select allotments in regions other than Southeast Alaska. Alaska population statistics indicate that Native Alaskans living in Southeast Alaska comprise about 12 percent of the total statewide Native population (Alaska Department of Labor and Workforce Development 2006). If Alaska Native Vietnam veterans are distributed geographically in the same proportion and selected allotment lands within their home region, the maximum area of Tongass lands potentially subject to selection under such an allotment program would appear to be in the range of 50,000 to 55,000 acres.

- It is not known what type of lands Alaska Native Vietnam veterans would be inclined to select under such an allotment program. Because the individual parcels would be small, many claimants might be inclined to select parcels that would be desirable for homesites or locations for hunting and fishing camps. Alternatively, some might select lands with income potential from timber resources. An allotment program such as proposed in House Bill 3350 could have

implications similar to those described above for the proposed Unrecognized Southeast Alaska Native Communities Recognition and Compensation Act, including a reduction in the suitable timber land base and ASQ on the Tongass. To the extent such effects would occur, they would be considerably less extensive based on the respective acreages involves, and would be minor from a Forest-wide perspective. Because an Alaska Native Vietnam veteran allotment program could result in a relatively large number of small, scattered private inholdings around the Tongass, perhaps a more important forest management effect would be to complicate land ownership administration by the Forest Service in areas where allotments were selected.

Alaska State Forest

The Alaska Department of Natural Resources, Division of Forestry manages extensive areas of current State-owned lands that are forested. Those lands include two designated state forests, the Haines State Forest and the Tanana Valley State Forest, which together comprise over 2 million acres and about 2 percent of all State-owned land (Alaska Department of Natural Resources 2006). The two state forests are managed to provide a sustained yield of many resources, primarily timber, while allowing other beneficial uses of the public land and resources. The state forests also provide fish and wildlife habitat, clean water, opportunities for recreation and tourism, and minerals. The Haines State Forest contains approximately 286,000 acres of land north of Haines in Southeast Alaska, generally in the Chilkat River watershed and surrounding the Chilkat Bald Eagle Preserve.

Various State of Alaska officials or interests have at times advocated for the establishment of an additional Alaska State Forest, to be managed to provide income for state government programs. A new state forest conceivably could be created through state legislation creating a new management unit on existing state-owned lands, or through federal legislation establishing a new conveyance process to transfer additional federal lands to state ownership for management as a state forest. If such a proposal were ever implemented through federal legislation, it would presumably include conveyance of existing Tongass and/or Chugach National Forest lands with timber production capability to the State of Alaska.

Proposal and Current Status

- The Forest Service is aware of no formal, public proposal to create an Alaska State Forest. To date, no federal legislation to implement such a proposal has been introduced in Congress, and State documents do not indicate the size and location envisioned for a state forest. The Forest Service is aware of public discussion of one concept for such a management unit, which involved a 2-million-acre area on or near Prince of Wales Island. Creation of a state forest in such a location would require transfer of extensive areas of current Tongass NFS lands to the state. Because there has been no formal proposal or action on a proposal, establishment of an Alaska State Forest in Southeast Alaska should be considered a speculative possibility.

Forest Management Implications

With respect to the types of potential changes, the implications for future management of the Tongass from establishment of a new, large-scale state forest would be similar to those described for the proposed University of Alaska Lands bill, although the affected area would likely be much larger. Consistent with Alaska State Senate Bill 149 that was signed into law on August 8, 2003; a new Alaska state forest would presumably be managed for timber resources while allowing for other beneficial uses of public land and resources. Therefore, future management and human uses of Tongass lands conveyed to the state under such a proposal might be managed more intensively for timber production than under current management and uses. The state would likely be inclined to select productive timber lands for inclusion in a new state forest, and would emphasize timber production as a primary uses of those lands. Based on current Alaska state forest management policies, the new state forest lands would also presumably continue to support other resource values such as water, fish and wildlife habitat and recreation, but to a lesser extent than for timber. To the extent that future state forest management paralleled current Tongass management under Forest Service administration, the available multiple resource values from those lands could change significantly under such a proposal. The prospects for such a change cannot be predicted at this time.

Potential Land Exchanges

Administrative land exchanges, in which NFS lands can be conveyed to another entity in exchange for lands of equal value, are another form of land ownership adjustment. Complex land exchanges are sometimes authorized by Congress through special legislation. The Forest Service has completed several land exchanges involving relatively small acreages of Tongass NFS lands. These adjustments are summarized in Chapter 3 of the EIS and include exchanges involving the Kake Tribal Corporation, the Alaska Pulp Corporation and the Kennecott Greens Creek Mining Company, Inc.

There have also been discussions regarding potential future land exchanges between the Forest Service and a number of Native Corporations and other entities that could influence land ownership on the Tongass. As before, for each potential exchange the text includes background information, a description of the conveyance proposal, and a discussion of the potential implications for land ownership and management of the Tongass. In one case, a land adjustment package proposed by the Sealaska Corporation, the Forest Service has received a specific proposal identifying the NFS lands proposed for inclusion in the land adjustment. For that case, the level of available information allows a more specific discussion of the types of lands that would be affected and how their conveyance or exchange might influence forest management.

Shee Atika Cube Cove Proposed Land Exchange

Shee Atika, Incorporated, is an Alaska Native Village Corporation established under ANSCA, representing the historical Native interests of Sitka, Alaska. Through ANSCA, Shee Atika received approximately 23,040 acres in the vicinity of Cube Cove on Admiralty Island. Admiralty Island, for the most part, represents the Admiralty National Monument and surrounds Shee Atika in-holdings. Over the period of enactment of ANSCA to the mid 1990's, Shee Atika harvested the vast majority of the old-growth forests on these lands and at present has no active management taking place. An extensive road system is in place beginning at a log transfer facility in Cube Cove and extending throughout the limits of their lands primarily in the lower reaches of the valleys. The conditions of the roads are unknown.

Proposal and Current Status

Shee Atika formally approached the Forest Service on September 20, 2007, after the Draft EIS was published, proposing a mutual interest agreement to explore the possible exchange of certain NFS lands for Shee Atika surface estate located at Cube Cove. In exchange, Shee Atika is interested in acquiring lands (both surface and subsurface estate) within the Tongass National Forest located on West and North Yakobi Island and on western Chichagof Island. A map depicting the lands they wish to acquire in whole or in part was presented as a general description.

Sealaska, the Alaska Native regional corporation, owns the subsurface estate under the Shee Atika inholdings at Cube Cove. Shee Atika has informed Sealaska of its intent to enter into discussions with the Forest Service. At this time, Shee Atika and the Forest Service have met once to discuss the land exchange concept in general terms only and neither party has made any binding commitments on proceeding further.

Shee Atika's goal for the proposal is to maintain a viable resource and land base for its shareholders. Lands Shee Atika has identified an interest in acquiring are in the Semi-Remote Recreation LUD with a small portion of congressionally designated LUD II within the boundaries.

Table C-1 (at the end of this appendix) has been updated to reflect the acreages included in the proposed land exchange. It indicates the acreage of the NFS lands that could be transferred to Shee Atika via the land exchange components of the proposal, and the acreages of the current Shee Atika lands that could be conveyed to the U.S. This table displays the acreages of the entire pool of parcels. The actual acreage exchanged would likely vary depending on the final lands pool identified, values determined through appraisal, and site-pecific issues raised by the public.

Forest Management Implications

The Forest Service has conducted a cursory evaluation of how the Shee Atika proposal, if implemented as presented, would affect the Tongass Land Management Plan. The evaluation was based on the assumed existing character and resource condition of the respective lands that would be conveyed from Shee Atika to the U.S. and vice versa. It focused on the potential effects on the ability to implement the Old-Growth Conservation Strategy and on necessary changes to the Allowable Sale Quantity for the Tongass. The evaluation also considered subsequent effects on sawmills, karst and cave resources, heritage resources, subsistence hunting and fishing, and public access.

From the limited review, the preliminary determination by the Forest Service is that implementation of the proposal would not require a revision but may require an amendment to the Forest Plan, based on the magnitude of the changes in land base designations. The evaluation assumed that, if all lands in the proposal were transferred, there would be no significant loss of old-growth reserves, no effect on sawmills, no effect on known karst and cave resources, potential effect on heritage resources, no significant effect on subsistence hunting and fishing, and limited effect on public access. This analysis is premised on the limited knowledge given the nature of the proposal and the limited understanding by the Forest Service of what Shee Atika interests are in the lands acquired.

Mental Health Trust Land Exchange

The Trust Land Office (State of Alaska, Department of Natural Resources) manages about one million acres for the Alaska Mental Health Trust land on behalf of the Alaska Mental Health Trust Authority. Resource categories managed by the Trust Land Office include coal, gas, materials, minerals, oil, real estate and timber. The Trust Land Office generates revenues from the Trust land through a variety of methods including sales, long-term leases and short-term land use licenses. Revenues generated from Trust land management are used by the Trust Authority to improve the lives and circumstances of Trust beneficiaries throughout the State of Alaska.

Proposal and Current Status

The Trust Land Office (State of Alaska, Department of Natural Resources) representing the Mental Health Trust Authority, presented a conceptual proposal to the Forest Service on November 20, 2007, after the Draft EIS was published. This proposal offers to exchange approximately 20,000 acres of lands managed by the Trust Land Office in Southeast Alaska for an equal value of Tongass National Forest lands on Prince of Wales Island. The parcels the Trust has offered for exchange are adjacent to or in the immediate vicinities of Skagway, Juneau, Petersburg, Wrangell, Sitka, and Ketchikan. The lands being offered for exchange for the most part are adjacent to NFS lands and, in many cases, form the backdrops, in whole or in part, to the communities identified. Maps depicting these parcels have been provided to the Forest Service for further review and consideration. The lands the Trust has interest in acquiring from the Forest Service are located on Prince of Wales Island and have generally been identified as lands containing the majority of their timber base in young-growth stands. These lands are identified in concept on a map showing areas around Coffman Cove, Staney Creek, Thorne Bay North, Kasaan, Hollis, Twelve Mile Arm, and Polk Inlet.

The Trust has identified two interests as the primary uses of the lands considered for acquisition. These interests include sustained harvest of young-growth timber stands and small parcel developments. The Trust has identified an interest in discussing the possibilities of making all or a portion of the timber volume harvested available to Southeast Alaska processors; allowing access to continue subsistence harvesting by rural residents; and either maintaining or avoiding the Conservation Strategy which the Tongass Forest Plan uses as a foundation for wildlife habitat management.

This proposal, while new, was presented to the Tongass Futures Roundtable for information on December 3, 2007. The Forest Service at this point is considering the concepts of the proposal and has made no agreements on whether or not it will pursue this exchange further.

Forest Management Implications

Given that only preliminary discussions of the proposal have taken place and specific details of the exchange are not available, only general considerations can be made regarding effects. The Forest Service has conducted a cursory evaluation of how the Trust proposal, if implemented as presented, would affect the Tongass Land Management Plan. The evaluation was based on the assumed existing character and resource condition of the respective lands that would be conveyed from the Trust to the U.S. and vice versa. It focused on the potential impacts on the ability to implement the Old-Growth Conservation Strategy and on necessary changes to the Allowable Sale Quantity for the Tongass. The evaluation also considered subsequent effects on sawmills, karst and cave resources, heritage resources, subsistence hunting and fishing, and public access.

From the limited review, the Forest Service preliminary determination is that implementation of the proposal would not require a revision but may require an amendment to the Forest Plan, based on the magnitude of the changes in land base designations. The evaluation indicated that, if all lands in the proposal were transferred, there may not be a significant loss of old-growth reserves; there may not be an effect on sawmills; a potential exists to affect karst and cave resources; a potential effect could occur to heritage resources; there may be an effect on subsistence hunting and fishing; and there is potential for a limited effect on public access. This evaluation is premised on the limited knowledge given the nature of the proposal and the limited understanding by the Forest Service of what the Trust's interests are in the lands acquired.

Table C-1 (at the end of this appendix) has been updated to reflect the acreages included in the proposed land exchange. It indicates the acreage of the NFS lands that could be transferred to the Trust via the land exchange components of the proposal, and the acreages of the current Trust lands offered for consideration that could be conveyed to the U.S. This table displays the acreages of the entire pool of parcels. The actual acreage exchanged would likely vary depending on final lands identified, values determined through appraisal, and site-specific issues raised by the public.

Sealaska Proposed Comprehensive Tongass-wide Land Exchange

The potential exchange that has received the most attention and discussion is known as the Sealaska Proposed Comprehensive Tongass-wide Land Exchange (USDA Forest Service 2005b). This land adjustment package was proposed by the Sealaska Corporation, the Native regional corporation for Southeast Alaska. The package includes two components; one involves an exchange of existing lands owned by Sealaska for existing NFS lands, and the other involves adjustments to Sealaska's land conveyance rights under ANCSA.

ANCSA established processes for transfer of federal land to Alaska Native village corporations and regional corporations, and to Native individuals. ANCSA included two separate provisions addressing land conveyances to Native regional corporations. Under Section 12(c) of ANCSA, 11 regional corporations were to share in the selection of 16 million acres. Section 14(h)(8) set aside a pool of 2 million acres to be transferred to the Native regional corporations in the State after certain other conveyances are completed. After the specified conveyances have been implemented, the remaining land in the pool will be divided among the regional corporations based on population, with approximately 22 percent of the balance going to Sealaska.

Under the applicable ANCSA provisions Sealaska selected approximately 463,000 acres for potential conveyance to the corporation. To date, the U.S. has conveyed approximately 293,000 acres to Sealaska. Sealaska has selected about 171,000 additional acres, which are distributed among nine withdrawal areas defined by ANCSA for Native selections. Based on current information from the Bureau of Land Management, approximately 64,000 of those acres will eventually be conveyed to Sealaska to complete the corporation's land entitlement under ANCSA. (Native corporations were allowed and encouraged to select lands in excess of their entitlements, and the final amount of the Sealaska entitlement has not yet been determined.) Sealaska has approximately 20,000 acres of unconveyed ANCSA entitlement under Section 14(h)(8), in addition to approximately 44,000 acres of 14(h)(8) lands resulting from the 2004 Alaska Land Transfer Acceleration Act, P.L. 108-452.

Proposal and Current Status

In August 2002 Sealaska Corporation submitted a proposal to the Forest Service to exchange approximately 100,000 acres of NFS lands for Sealaska Corporation lands and selection rights under ANCSA. As noted above, Sealaska has approximately 20,000 acres of remaining entitlement under Section 14(h)(8), plus approximately 44,000 acres from P.L. 108-452. The Tongass-wide exchange proposed by Sealaska involves lands throughout Southeast Alaska.

The goals of the proposed exchange are to consolidate NFS lands and Sealaska lands and to finalize Sealaska's remaining land selection rights under ANCSA. Approximately 171,000 acres of the Tongass are encumbered by Sealaska land selections. Resolution of Sealaska's remaining ANCSA land entitlement would remove these selection rights in existing ANCSA withdrawal areas as part of the exchange.

The proposed land exchange package would enable Sealaska to acquire other lands outside of the ANCSA withdrawal areas, in addition to the selected Native heritage 14(h)(1) parcels. This is not authorized under ANCSA except through a land exchange. Land exchanges are discretionary, voluntary real estate transactions between Federal and non-Federal parties. At present there is no binding land exchange agreement signed by the Forest Service and Sealaska that would enable Sealaska to receive lands outside of the withdrawal areas. In the most recent version of its proposal, Sealaska defined what it termed an "entitlement pool" of approximately 123,000 acres, all of which are located outside of the ANCSA withdrawal areas. Sealaska consciously defined the entitlement pool to include substantially more acres than its maximum entitlement amount, to allow flexibility in resolving the proposal. Under the proposal, lands from this entitlement pool of current NFS lands would be conveyed to Sealaska as a substitute for its current entitlement rights. The affected acreage occurs in approximately eight blocks located on Prince of Wales Island (northern, central and southern portions) and on Kosciusko, Tuxekan and Heceta Islands. In addition, Sealaska would transfer to the U.S. lands from a pool of approximately 68,000 acres of existing corporation lands distributed among five withdrawal areas in exchange for lands from a pool of 74,000 acres of current NFS lands. Those lands occur in five blocks located on Kuiu, Kosciusko, Heceta and central Prince of Wales Islands and on the Cleveland Peninsula, and are generally adjacent to areas Sealaska would receive from the entitlement pool. Sealaska would also relinquish claim to the 171,000 acres of lands it has selected within the ANCSA withdrawal areas. Without an appraisal, it is difficult to determine how many acres would be transferred or exchanged under this proposal. Federal law requires that lands or interests to be exchanged must generally be of equal value, based on market value as determined through an appraisal. Both Section 22(f) of ANCSA and Section 1302(h) of ANILCA provide that exchanges shall be based on equal value and contain provisions for cash payments to equalize land values. If the parties agree to an exchange and the Secretary of Agriculture determines it is in the public interest, exchanges may be made for other than equal value.

The Forest Service completed a draft feasibility report on a similar version of this proposal in 2003. After lengthy discussions and several modifications to the proposal, in 2005 the Forest Supervisor informed Sealaska that he was not willing to move forward with the exchange because of a lack of substantial agreement on the parcels to be exchanged, concerns over a variety of resource issues, and the need for a revision to the Forest Plan to accommodate the exchange due to the magnitude of the resulting changes in LUD designations. The response also indicated that the proposal lacked support from local communities and could result in a further decline in the current timber industry dependent on the Tongass for its supply.

There has been no further formal action on the proposed exchange since 2005. The proposed Alaska Land Transfer Acceleration Act of 2003 (Senate Bill 1466) included provisions to implement Sealaska's proposed land exchange, but Congress did not pass this bill. Congress subsequently approved the Alaska Land Transfer Acceleration Act (PL 108-452) in 2004, without the Sealaska exchange provisions. New legislation to authorize the proposed exchange has not been introduced to Congress, although such legislation remains a possibility. Sealaska has been working internally on refinements to the proposed exchange and has shared a variety of preliminary maps with the Forest Service, but to date has not submitted a revised formal exchange proposal for Forest Service review.

Forest Management Implications

The Forest Service conducted a preliminary evaluation of how the Sealaska proposal, if implemented, would affect the Tongass Land Management Plan. The analysis was based on the existing character and resource condition of the respective lands that would be conveyed from Sealaska to the U.S. and vice versa. It focused on the potential impacts on the ability to implement the Old-Growth Conservation Strategy and on necessary changes to the allowable sale quantity for the Tongass. The analysis also considered subsequent effects on local sawmills, karst and cave resources, heritage resources, subsistence hunting and fishing, and public access.

Table C-1 (at the end of this appendix) summarizes the acreages included in the most recent version of the proposed land adjustment and their general location. It indicates the acreage of the entire pool of NFS lands that could be transferred to Sealaska via the entitlement and conveyance (exchange) components of the proposal, and the acreages of the pool of current Sealaska lands that could be conveyed to the U.S. The actual acreage conveyed or exchanged would likely be much less than the listed acres.

From the review the Forest Service determined that implementation of the Sealaska proposal would require a Forest Plan Revision, based on the magnitude of the changes in land use designations. Our analysis showed that, if all lands in the pools were to be transferred, there would be a significant loss of old-growth reserves on the Tongass. There would also be a significant reduction in the Tongass allowable sale quantity (ASQ). In order to make up for the loss of old growth reserve acres, some areas currently in development LUDs would likely be precluded from timber production. This would further reduce the ASQ. In addition, the lands to be exchanged to the U.S. generally do not have existing road systems, and costs for developing roads on these lands would likely constrain the ability to supply timber economically. The combined impacts on the availability of timber from the Tongass could have a significant adverse effect on the supply of timber to mills on Prince of Wales Island and surrounding areas.

In addition, the Sealaska proposal presented to the Forest Service does not provide any assurances that important resources on the lands to be exchanged to Sealaska would be protected to the same degree as under national forest management. Specifically, the proposal does not ensure that the conditions and requirements of the National Historic Preservation Act would be met to protect heritage resources, nor are there assurances that karst and cave resources would be protected. The lands proposed for conveyance to Sealaska also include at least one Research Natural Area and a Special Interest Area. Finally, there are no provisions in the Sealaska proposal that would allow for continued access to lands for subsistence and community recreation purposes. Consequently, resource values to the public from the affected lands could be lost, and subsistence and recreation uses currently occurring on those lands could be shifted to other areas on the Tongass.

Several of the Sealaska parcels that would potentially be exchanged to the United States have high recreation and scenic values and are along established highways or cruiseship and ferry travel routes. Several parcels are important to local communities for dispersed recreation and subsistence activities. Two parcels are noteworthy for heritage resources including one site that is eligible for listing on the National Register of Historic Places. Other of the parcels are known to have well developed karst and/or karst that has been determined to be of high vulnerability. Several of the Sealaska parcels have been harvested. Generally, the unharvested parcels are adjacent to Tongass National Forest lands that have been allocated to non-development LUDS. If acquired by the United States, these parcels might also be allocated to non-development LUDs and may not contribute to the Tongass allowable sale quantity.

Cape Fox Land Entitlement Adjustment

The Cape Fox Corporation is the Native corporation established under ANCSA for the Village of Saxman, which is located near Ketchikan. While Cape Fox was granted entitlement to 23,040 acres within a defined withdrawal area, as were all Native village corporations in Southeast Alaska, its ability to select lands was constrained by the proximity to Ketchikan (Bureau of Land Management 2003). While other village corporations were prevented from making selections within 2 miles of the boundary of home-rule

cities, Cape Fox was not allowed to select lands within 6 miles of Ketchikan. In addition, all villages were required to take title to all available land within the core township surrounding the village and were only allowed to select lands within the respective withdrawal areas defined by ANCSA. As a result of these multiple ANCSA restrictions, the only land within the core township available for conveyance to Cape Fox was a 160-acre parcel that Cape Fox did not want, but that the United States was required to transfer to Cape Fox.

For some time there has been interest in legislative action to adjust the selections and conveyances available to Cape Fox. Under ANCSA, village corporations receive only the surface estate for the lands conveyed to them, while the subsurface estate to those lands was transferred to the respective Native regional corporation, which is Sealaska Corporation in the case of Cape Fox. Therefore, to avoid creation of a split estate condition between NFS surface lands and Sealaska subsurface rights, adjustment of Cape Fox selections and conveyances also requires adjustment of Sealaska selections and conveyances.

Sealaska Corporation, Shee Atika, Inc. (the urban Native corporation for Sitka), and the Forest Service have conferred regarding a possible land exchange and purchase since November of 1999, when Shee Atika expressed interest in selling its surface estate to approximately 23,100 acres at Cube Cove, within the Admiralty Island National Monument and Kootznoowoo Wilderness. In April 2000 Sealaska proposed exchanging their subsurface estate to these Cube Cove lands, or other Sealaska subsurface lands or land interests, in exchange for the surface and subsurface of NFS lands of equal value at the Kensington and Jualin Mines near Berners Bay, north of Juneau.

By the fall of 2001 it became clear that the non-federal lands at Cube Cove were no longer offered as part of the exchange proposal, apparently because their preliminary appraisal figures for fair market land values did not meet Shee Atika's expectations. In March 2002 Sealaska revised its proposal to offer approximately 5,200 acres of Sealaska subsurface lands and land interests in exchange for NFS surface and subsurface lands at the Kensington and Jualin Mines. This proposal was captured in a Congressional bill, S. 2222, along with other proposals by Cape Fox Corporation. S. 2222 was passed by the Senate in the 107th Congress, but not by the House.

Proposal and Current Status

Several versions of a Cape Fox Land Entitlement Adjustment bill were introduced to both houses of the 107th Congress in 2002, but were not passed. On April 30, 2003, Congressman Young introduced H.R. 1899, the Cape Fox Land Entitlement Adjustment Act of 2003, in the 108th Congress. On June 26, 2003, Senator Murkowski introduced a similar bill in the Senate, as S. 1354.

H.R. 1899 and S. 1354 provided for an additional 99 acres of ANCSA selection area at Clover Passage (on Revillagigedo Island), for selection by Cape Fox and Sealaska Corporations. The corporations would select these 99 acres from within their existing ANCSA entitlements. These bills also require the Forest Service to offer a land exchange and, if accepted by Cape Fox, to complete a land exchange with the Cape Fox and Sealaska Corporations. Through this land exchange:

1. Cape Fox Corporation would receive the surface and subsurface estates to 2,663.9 acres of NFS lands at the Jualin Mine.

2. Sealaska Corporation would receive the surface and subsurface of NFS lands to equalize values of Sealaska subsurface lands and land interests they convey to the United States. Sealaska Corporation would select NFS lands of equal value from within a 9,329-acre pool of NFS lands at the Kensington Mine.

3. The Forest Service would receive lands and land interests of equal value from within: (a) a pool of approximately 2,900 acres and a public trail easement, offered by Cape Fox (surface) and Sealaska (subsurface) on Revillagigedo Island; (b) 2,506 acres of Sealaska split estate subsurface, located at Upper Harris River and Kitkun Bay (Group 2 Lands); and (c) approximately 2,698 acres of Sealaska subsurface land interests at Kitkun Bay and Dora Lake West, which remain as Sealaska entitlement (Group 3 Lands). Lands in (b) and (c) above are located on Prince of Wales Island and are left over from the Haida Land Exchange Acts and the

Sealaska/Forest Service Split Estate Exchange Agreement of 1991. Cape Fox will choose the lands to be conveyed to the United States from the approximately 2,900-acre pool in (a) above.

Senator Murkowski held a legislative field hearing in Anchorage August 6, 2003, to provide an opportunity for public input and comments on the proposal. She also held a public town meeting in Juneau on September 20, 2003, and an additional legislative hearing March 10, 2004, in Washington, D.C. The Administration supported the legislation, with some minor changes to clarify valuation standards, extend required time frames, and provide for environmental survey and remediation standards. The 108th Congress did not pass the legislation, however.

On April 7, 2006 Senator Murkowski introduced S. 2615, "to provide equitable treatment for the people of the Village Corporation established for the Native Village of Saxman, Alaska, and for other purposes," in the 109th Congress. This bill waived the requirement under ANCSA Section 16(b) that the U.S. convey and Cape Fox receive the 160-acre parcel discussed above, and provided for conveyance of the surface estate for the 99 acres at Clover Passage to Cape Fox (with the subsurface estate going to Sealaska). This bill did not address the other land conveyances proposed in H.R. 1899/S. 1354 (see items 1-3 above), although it did state that conveyance of the 99 acres identified in Section 3(a) of the bill would be considered to fulfill the entitlement of Cape Fox under ANCSA Section 16(b). This bill was not passed by the 109th Congress. The bill was mostly recently introduced on January 8, 2007 as Senate Bill 203 in the 110th Congress.

Forest Management Implications

The Cape Fox land entitlement adjustment proposal introduced in 2003 is a relatively complex package of selections, conveyances and exchange actions that could affect a number of NFS parcels and have a variety of effects on Tongass management. Under that proposal, Cape Fox and Sealaska would convey to the Forest Service the surface and subsurface rights to approximately 2,900 acres on Revialgigedo Island, and Sealaska would convey to the Forest Service the subsurface rights to approximately 5,200 acres on Prince of Wales Island. Surface management of those lands on Revillagigedo Island would likely remain unchanged, while the Forest Service would need to administer a split-estate condition for the lands on Prince of Wales Island. In return, Cape Fox would receive surface and subsurface rights to nearly 2,700 acres of NFS lands and Sealaska would select up to 9,300 acres of NFS lands with a value equal to the 5,200 acres of subsurface rights. The Native corporations would presumably receive lands with high mineral values located near existing mineral resources (the Jualin and Kensington mines), which could change the jurisdiction over future mining activities. While these conveyances could ultimately be of note from a financial perspective, they would affect relatively small areas and probably would not change the likelihood of expanded future mineral development in the subject locations.

Senate Bill 2615, introduced in 2006, and the current version, Senate Bill 203 would have a minor effect upon Tongass management. The 99-acre parcel to be conveyed to Cape Fox Corporation is adjacent to lands owned by Cape Fox, other private owners, and the State of Alaska. Currently this parcel is managed as scenic viewshed, a moderate development LUD. This bill would also complete Cape Fox Corporation's ANCSA entitlement resulting in the removal of selection encumbrances on approximately 800 acres of NFS lands.

Summary Discussion

Table C-1 summarizes the key parameters of the proposed land conveyance and exchange programs discussed in this appendix. For each proposal, the table indicates the maximum acreage of Tongass lands that could be transferred to other ownership, acreage that could be added to the Tongass land base, the general location of the action (if identified in the proposal), whether the proposal is intended to complete an existing entitlement, and the type of land involved (if known or inferred).

Table C-1
Summary of Potential Land Adjustments

Conveyance or Exchange Proposal	Max. acres from NFS	Max. Acres to NFS	Likely Tongass Location	Entitlement Completion?	Type of Land
University of Alaska Lands, Senate Bill 293	250,000	0	Unknown	No	*Second-growth cut since 1952*
Unrecognized SE AK Native Communities, Senate Bill 1306	115,200	0	Near Haines, Ketchikan, Petersburg, Tenakee Springs, Wrangell	No	*Development LUDs?*
Alaska Native Veterans Land Allotment Equity Act, Senate Bill 2000	55,000 est.	0	Unknown	No	*Homesites, recreation lands?*
Alaska State Forest proposal	2,000,000	0	Prince of Wales island	No	*Timber Production*
Southeast Alaska Native Land Entitlement Finalization Act* or Sealaska Proposed Comprehensive Tongass-wide Land Exchange	203,000	68,000	Widely distributed	Yes, outside of ANCSA withdrawal areas. Also exchange other lands	*Varied*
Shee Atika	±23,000	±23,000	West and North Yakobi & Northwest Chichagof	No	*Semi-Remote Recreation*
Mental Health Trust	±20,000	±20,000	Prince of Wales Island	No	*Timber Production (young growth)*
Cape Fox Entitlement Adjustment, Senate Bill 2615	99	0	North of Ketchikan	Yes, outside of ANCSA withdrawal area	*Moderate Development LUD*
Total	2,666,000	111,000			

*Assumes economic development lands similar to what depicted in DEIS. An additional 3,600 acres are added for sacred, cultural, traditional, or historic significance, as well as 5,000 acres for Native enterprise sites.

When considered as individual actions, several of the land adjustment proposals discussed above appear to be relatively minor in scope and potential effect, and/or the implications of the proposal for Tongass management are difficult to determine due to lack of specificity in the proposal. Conversely, some of the proposals could result in substantial changes to the NFS land base and prompt corresponding adjustments in Tongass management.

The Forest Service believes that it is unlikely that all of the identified conveyance and exchange proposals would be enacted and/or implemented. Because some of the proposals involve larger acreages and it is conceivable that multiple proposals could be adopted; however, it is appropriate to consider the range of implications for management of the Forest. Pertinent observations based on considering the conveyance and exchange proposals collectively include the following:

- These proposals generally target, or would be likely to focus interest on, Tongass lands that are currently managed for resource development activities. Conveyance of these lands out of federal ownership would decrease the acreage available for development activities on the Tongass.
- If all of the proposals were enacted and implemented, it could conceivably result in transfer/exchange/conveyance of over 2 million acres from the Tongass, representing approximately 15 percent of the current NFS land base.

- Conveyance of large blocks of land under several of these proposals would consolidate certain other ownerships while likely further fragmenting the federal land ownership pattern within the Tongass.
- While new owners of former Tongass National Forest lands would presumably pursue resource development objectives on much or most of the affected acreage, it is unlikely that all new owners would continue the currently applicable protection measures for cultural and ecological resources, or continue to supply timber to local mills at current rates.
- It is unlikely that all new owners would allow public access to the affected lands for subsistence, recreation, and similar public uses, resulting in a reduction in the set of opportunities currently available for these purposes.

As it has in the past, the Forest Service will evaluate any new or modified proposals for administrative land exchanges for their consistency with applicable NFS planning and management direction. The Forest Service will follow Congressional direction in implementing future land adjustments that might be enacted by Congress, and will modify Tongass National Forest planning and management as needed in response to such changes.

APPENDIX D
OLD-GROWTH HABITAT CONSERVATION STRATEGY, WILDLIFE STANDARDS AND GUIDELINES, AND WILDLIFE VIABILITY

Appendix D

Old-Growth Habitat Conservation Strategy, Wildlife Standards and Guidelines, and Wildlife Viability

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1. INTRODUCTION

This appendix provides a description of the background, rationale, and assumptions, for the changes to the Tongass old-growth habitat conservation strategy, proposed by the alternatives evaluated in the 2008 Forest Plan amendment Final Environmental Impact Statement (FEIS). In addition, it describes the assumptions and rationale for application of the wildlife viability ratings to the alternatives. This appendix brings forward and updates information contained in Appendix N to the 1997 FEIS.

Chapter 2 addresses the old-growth habitat conservation strategy. It includes a summary of the historical background, a description of the 1997 strategy including modifications to the strategy between 1997 and 2007, and an overview of the new science that is relevant to the strategy. Sections 2.1 and 2.2 begin by presenting the historical background of the strategy and describe the strategy, as it was proposed in 1997. These two sections are largely summarized from Appendix N to the 1997 FEIS. Section 2.3 summarizes the modifications to the strategy that have occurred through Forest Plan amendments and land adjustments from 1997 through 2007 and Section 2.4 summarizes new relevant science that has been developed since 1997.

Modifications to the strategy proposed by the 2008 FEIS alternatives are described in Section 2.5. In this FEIS, Alternative 5 (No Action) incorporates the 1997 strategy, as modified between 1997 and 2007, while the six action alternatives propose modifications. Alternatives 1, 2, 3, and 6 propose the same refined network of Old-Growth Habitat Land Use Designations (LUDs) and incorporate the same changes to the wildlife standards and guidelines, but differ in the amount and distribution of some of the other non-development LUDs that also comprise the reserve system. Section 2.5 describes the background, rationale, and modifications to the strategy proposed by these four alternatives. These modifications include changes to the old-growth reserve (OGR) network, changes in other non-development LUDs, and changes to species-specific standards and guidelines. Alternatives 4 and 7 propose more extensive changes to the conservation strategy and standards and guidelines. Section 2.5 also summarizes the rationale and changes to the strategy incorporated in these alternatives. The changes for all of the alternatives are compared to Alternative 5 (the 1997, as amended, Forest Plan).

In 1995/1996 and 1997 a series of expert risk assessment panels were conducted to evaluate the various alternatives used in the 1997 FEIS and predecessor documents. The purpose of the panels was to evaluate various alternatives for the likelihood of maintaining sufficient, well distributed habitat to maintain viable populations of old-growth associated wildlife species over a 100-year horizon. These panel assessments, along with new information and an alternate method, were used as a tool to evaluate wildlife viability for the 2008 FEIS alternatives. Chapter 3 describes the panel assessments, summarizes results of the panel assessments that are relevant to the 2008 alternatives, discusses new relevant science, and then summarizes the application of the panel assessments to the 2008 alternatives, including rationale and assumptions. Section 3.1 presents historical background for the Tongass wildlife risk assessment panels and ratings, Section 3.2 describes the panel assessment process, and Section 3.3 summarizes the 1995/1996 and 1997 panel assessment results. These first three sections of Chapter 3 are largely summarized from the risk assessment panel reports and Appendix N to the 1997 FEIS. Section 3.4 summarizes new science related to wildlife viability assessment that has been developed since 1997. The application of the 1995/1996 and 1997 panel assessments to the 2008 FEIS alternatives is described in Section 3.5. Finally, Section 3.6 presents an alternative approach to assessing viability.

Chapter 4 presents a summary of the major conclusions that are relevant to the 2008 Forest Plan amendment and the alternatives evaluated in the EIS. Finally, Chapter 5 lists the references cited.

2. OLD-GROWTH HABITAT CONSERVATION STRATEGY

2.1. Historical Background of the Conservation Strategy

2.1.1. Overview

An integrated science-based old-growth forest habitat conservation strategy was developed and adopted during the 1997 Forest Plan Revision process. The old-growth strategy has two basic components. The first is a forest-wide reserve network that protects the integrity of the old-growth forest by retaining blocks of intact, largely undisturbed habitat. The OGRs include a system of large, medium, and small Habitat Conservation Areas (HCAs) allocated to the Old-Growth Habitat LUD, and full protection of all islands less than 1,000 acres in size. The reserve network also includes all other non-development LUDs. These include Wilderness, National Monument, Legislated LUD II, Wild River, Remote and Semi-Remote Recreation, Research Natural Area, Municipal Watershed, and all other LUDs that essentially maintain the integrity of the old-growth ecosystem. The second component of the old-growth habitat conservation strategy is management of the matrix, e.g., the lands with LUD allocations where commercial timber harvest may occur. Within the matrix, components of the old-growth ecosystem are maintained by standards and guidelines to protect important areas and provide old-growth forest habitat connectivity. The analysis presented in this section describes the rationale for the strategy and its specific components.

Development of the old-growth strategy relied on several key scientific documents that provided the basic foundation for addressing wildlife viability. These included the Interagency Viable Population Committee (VPOP) Conservation Strategy (Suring et al. 1993), the Pacific Northwest Research Station Peer Review of the VPOP Strategy (Kiester and Echkardt 1994), and the VPOP Response to the Pacific Northwest Research Station Peer Review (Suring et al. 1994). In addition, the Alexander Archipelago Wolf (Person et al. 1996) and Northern Goshawk (Iverson et al. 1996) conservation assessments provided the basis for design of some components of the strategy as well as a basis for examining whether the old-growth strategy would sustain viable and well-distributed populations of these two species. This section provides a discussion of the major features, findings, and recommendations of each of the three conservation planning (VPOP-related) documents, a consideration of features and recommendations in each document, and the integration of features in the deliberative process to arrive at an overall strategy to address viability of old-growth associated species. As such, it represents a summary of much of the information presented in Appendix N to the 1997 Forest Plan.

2.1.2. Habitat Reserve Approach

There is a substantial science base for an old-growth habitat reserve approach for addressing wildlife viability. Habitat reserves have often been the focal point of conservation strategies since the pioneering work of MacArthur and Wilson (1967) on the theory of island biogeography: that the equilibrium number of species on an island generally depends on island size, and island distance from (usually mainland) source populations. Reserves are viewed as islands of undisturbed or natural habitat within a landscape of management-altered or dissimilar habitat. Reserves attempt to protect the integrity of an isolated landscape. From this theory, five general concepts of reserve design have evolved in conservation planning (Thomas et al. 1990):

- Well-distributed species are less prone to extinction than species confined to small portions of their range;
- Larger reserves supporting many pairs of individuals are superior to smaller reserves supporting only a few pairs;
- Reserves that are close together are better than ones far apart;
- Reserves should have the least amount of induced fragmentation possible; and

- Reserves should be connected, either through specific corridors (such as beach fringe or riparian areas) or through maintaining habitat characteristics similar to the reserves on the lands between them.

A reserve-based strategy relies on blocks of intact, largely undisturbed habitats (such as old-growth forest) of the appropriate size, spacing, and composition to meet a desired design that will maintain viable, well-distributed populations of one or more species. The HCA network used for the conservation of spotted owl habitat in the Pacific Northwest is a classic example (Thomas et al. 1990).

Potential drawbacks of a reserve approach are the failure to consider natural disturbance processes-the dynamic nature of ecosystems, and not being able to preserve landscape integrity (Irwin and Wigley 1992). These can be overcome by combining a reserve system with some type of matrix management approach (Thomas et al. 1990, Franklin 1993). As a complement to reserves, matrix management can serve at least three important roles: 1) providing habitat at smaller spatial scales, 2) increasing the effectiveness of the reserves, and 3) improving landscape connectivity.

2.1.3. VPOP Strategy

The Interagency Viable Population Committee (VPOP) performed pioneering work in designing a landscape conservation strategy to address wildlife viability. Their strategy and extensive supporting analysis are contained in *A Proposed Strategy for Maintaining Well-Distributed, Viable Populations of Wildlife Associated With Old-Growth Forests in Southeast Alaska* (Suring et al. 1993). VPOP was commissioned by the Tongass Land Management Plan (Forest Plan) Revision Team to provide recommendations for sustaining habitat to help ensure the maintenance of well-distributed viable populations of all old-growth associated wildlife species across the Tongass. VPOP systematically screened all wildlife species and identified those old-growth associated species they considered to be most sensitive to habitat loss and fragmentation of the old-growth ecosystem. Their 'coarse filter' landscape strategy designed to consider the entire complement of old-growth associated species, included a system of large (40,000-acre) and medium (10,000-acre) HCAs with spacing and habitat composition requirements well distributed across the Tongass. Small (1,600-acre) HCAs in each major watershed (>10,000 acres) and individual species-specific management guidelines also were recommended.

Landscape connectivity was an integral feature of the original VPOP landscape conservation strategy (Suring et al. 1993). VPOP reviewed the available literature and concluded that there was limited empirical support for corridors but that this should not preclude their inclusion in landscape conservation planning. They reasoned that landscape habitat connectivity was an important component of conservation planning to facilitate animal dispersal and movement, whether specifically designed as corridors or through overall management of a habitat matrix. They recommended a 500-foot beach fringe buffer Forest-wide and 200-foot buffers on anadromous fish streams. Breaks in these buffer corridors should be less than 65 feet to facilitate flying squirrel dispersal.

VPOP mapped the large and medium reserves and provided guidance for locating the small reserves, stating that their mapping effort represented only one possible application of the OGR system across the forest. VPOP concluded that their strategy represented "the minimum amount and distribution of habitat necessary to assure a high likelihood of maintaining viable, well-distributed populations of old-growth associated wildlife species across the Tongass National Forest" (p. 37).

2.1.4. Pacific Northwest Research Station Review

The Forest Service Pacific Northwest Research Station was requested by the Alaska Region to conduct an independent scientific peer review of the VPOP strategy. Kiester and Eckhardt (1994) obtained technical reviews from 18 scientists from North America with substantial knowledge and experience in species ecology or conservation biology. Kiester and Eckhardt (1994) synthesized these technical reviews and published all reports in the document *Review of Wildlife Management and Conservation Biology on the Tongass National Forest: A Synthesis with Recommendations* (Pacific Northwest Research Station Review).

The general concepts in VPOP's multiscale habitat conservation strategy received positive support from the scientists involved in the Pacific Northwest Research Station Review: Beckman (p. 37): "The proposal of HCAs of three sizes somewhat uniformly scattered across the landscape seems like a reasonable strategy..."; Forsman (p. 48): "...proposed network of conservation areas is a reasonable start in combination with protection of known (goshawk) nest areas within the matrix."; Hansen (p. 50): "The core approach of this report (strategy) is scientifically sound and generally consistent with modern conservation biology."; Jarvis (p. 71): "The strategy is an innovative and bold attempt to apply species, community, and ecosystem concepts to applied management."; Lande (p. 78): "...a good initial attempt to develop a strategy for maintaining biodiversity."; Lidicker (p. 87): "The strategy outlined is a giant step in the right direction, but improvements are needed..."; Marcot (p. 101): "...the process and basis for the proposed conservation strategy is scientifically sound given our current knowledge base..."; and Walters (p.194): "...the overall management strategy that considers landscape level features is excellent. The approach is well-grounded in the best current information in conservation biology...". Kiester and Eckhardt (p. 5) concluded in their summary review that "the Strategy (VPOP) receives high marks. It represents a solid attempt to integrate species viability concerns with the HCA approach."

The Pacific Northwest Research Station Review identified several weaknesses in the VPOP strategy. For example, corridors were considered inadequate, there was insufficient attention directed to the matrix lands, and HCAs were considered to be too small by many scientists. Kiester and Eckhardt (1994 p. 5) concluded that "the particular pattern of HCAs that it [the VPOP strategy] suggests will not ensure viability of all species"--although no individual species were specifically identified. Careful examination of all reports by the 18 scientists that participated in the Pacific Northwest Research Station Review revealed repeated concerns relative to brown bears and wolves (Lande p. 82; Lidicker p. 91; McLellan p. 132, Paquet p. 143; Pletscher p. 147; Powell p. 156, and in the summary by Kiester and Eckhardt, p. 16, 17) and that 40,000-acre large HCAs recommended by VPOP were too small to sustain populations of these wide-ranging species. Lande recommended that at least one very large HCA be maintained in each ecological province or island (p. 81); Lidicker recommended a "few large areas, one per island or island group" (p. 91); McCullough (p. 116) recommended fewer but larger HCAs to support continuous populations; and Pletscher (p. 147) suggested an "inverse HCA" concept of very large preserved landscapes with small areas allocated for timber harvest.

Importantly, Kiester and Eckhardt (1994, p.3) noted that the Pacific Northwest Research Station Review only considered the network of mapped VPOP large and medium HCAs and Congressionally protected areas such as Wilderness, Monuments and Legislated LUD II areas. The VPOP reserve network was not examined in the context of the entire forest plan or a fully articulated planning alternative containing the strategy. The scientists were unable to consider other LUDs that effectively function as reserves and conserve the old-growth ecosystem—a very important component incorporated into the development of the old-growth habitat conservation strategy in the revised Forest Plan and this analysis.

Corridors and landscape connectivity received considerable attention among the scientists involved in the Pacific Northwest Research Station Review, and somewhat differing opinions emerged regarding how to address landscape connectivity. Lidicker recommended 1,000-foot corridors (p. 91), while Lande (p. 82) recommended corridors of up to 4,000 feet wide. Other scientists questioned the value of explicitly designed corridors. McCullough (p. 116) noted that "corridors are of considerable debate" and recommended larger reserves to minimize reliance on dispersal corridors; Paquet (p. 137) stated "there are few controlled data with which to assess the conservation role of corridors, thus it is difficult to support or refute their value" but added "…maintenance or restoration of connectivity in the landscape is a prudent strategy"; Pletscher (p 147) stated "There are few empirical studies documenting the value of narrow corridors" and recommended more attention be focused on overall management of the matrix; and Powell (p. 154) agreed with VPOP regarding uncertainty of corridors and recommended more attention be given to the intervening landscape matrix to facilitate wildlife movement and dispersal. Kiester and Eckhardt (p. 17) stated that overall landscape connectivity was an essential component of an old-growth conservation strategy and wider corridors were necessary (especially for marten), particularly relative to ecological pinch points, but cautioned that corridors are "virtually untested in practice."

In their summary chapter, Kiester and Eckhardt (1994) provided many recommendations that specifically relate to forest planning and features of landscape design:

- Existing largest blocks of contiguous high-volume old-growth forest should not be further fragmented by timber harvesting or road building.
- Incorporate larger reserves.
- Incorporate wider corridors.
- Do not differentially cut low altitude, high-volume old growth
- Consider an inverse HCA concept.

They provided many other sound management recommendations not directly related to landscape planning design, such as adaptive management, biological inventory, gap analysis, and population viability analyses.

2.1.5. VPOP Response

Suring et al. (1994) specifically responded to individual recommendations made in the Kiester and Eckhardt (1994) review of the VPOP Conservation Strategy in the document: *Response to the Peer Review of: A Proposed Strategy for Maintaining Well-distributed, Viable Populations of Wildlife Associated with Old-Growth Forests in Southeast Alaska* (VPOP Response). In this brief (11 pages with appendices) response, Suring et al. (1994) indicated that the document represented an "initial response" outlining additional elements that would be considered in their preparation of a final Conservation Strategy as provided for in the peer review process, stating "additional support will be needed by the Committee (VPOP) from the Forest Service to adequately incorporate the recommendations of the peer reviewers into our manuscript and to publish that manuscript" (Suring et al. 1994, p. 3).

Within the VPOP Response, seven specific recommendations were made that were responsive to Pacific Northwest Research Station Review comments. All recommendations were considered during the Viability Synthesis Workshop (Iverson and Rene, 1997) to identify building block concepts for forest plan alternative development. All VPOP Response recommendations were analyzed spatially and quantitatively (Iverson 1996a). In doing so, the Forest Plan interdisciplinary team (IDT) concluded that the features described in the recommendations would not collectively represent a fundamentally different alternative than existed within the range for forest plan alternatives considered in the Revision planning process and that general concepts recommended (e.g., larger reserves and wider corridors) were already addressed.

Specifically, from the Pacific Northwest Research Station Review recommendation to "keep landscape options open, and do not further fragment existing large blocks of high-volume old growth," the VPOP Response generated the following recommendation: "it is important that the largest remaining patches not be fragmented. This may (emphasis added) be accomplished by restricting logging and road building to areas other than the three largest old-growth forest patches within each ecological province" (p.8). The Pacific Northwest Research Station Review referred to blocks of old growth while the VPOP response referenced "patches"; the Pacific Northwest Research Station Review recommendation specifically mentioned "high-volume" old growth—VPOP did not; the VPOP Response only recommended that the three largest old-growth forest patches be protected—the Pacific Northwest Research Station Review suggested all blocks. Despite slight but important differences between these two recommendations, the Forest Service concluded that minimizing additional fragmentation of large areas of old-growth forest with a focus on the high-volume class strata was the basic intent of the recommendations.

Noting the limitations in their original conservation strategy identified by the Pacific Northwest Research Station Review, the VPOP Response considered the diversity of opinion among the scientists concerning corridors and provided a series of explicit corridor recommendations. They recommended that a beach fringe corridor of 3,300 feet be established Forest-wide within which only selective uneven-aged management could be applied. They also recommended that 1,000-foot and 1,600-foot no harvest corridors be designated to connect medium and large HCAs, respectively. These corridors should be located below 800 feet in elevation.

2.2. The 1997 Old-Growth Conservation Strategy

The 1997 Forest Plan IDT carefully reviewed the landscape design recommendations contained in the documents discussed above. In consideration of all multiple-use issues and concerns, they designed a habitat strategy that was responsive to the recommendations contained in these documents. This strategy represents the integration of many elements, some of which are specific to addressing wildlife viability, others of which respond to other issues, such as Congressional legislation (Wilderness, National Monument, and Legislated LUD II), riparian habitat management from the Anadromous Fish Habitat Assessment, or the allocation of lands to Remote and Semi-Remote Recreation in recognition of recreation and tourism uses.

After considering the Pacific Northwest Research Station Review by prominent scientists and considering all other available information, the IDT incorporated the VPOP HCA strategy as the cornerstone of the old-growth forest habitat strategy in the 1997 revised Forest Plan. This represents a fundamental 'coarse filter' approach to addressing wildlife viability and the conservation of biodiversity. In addition, a variety of other coarse filter standards and guidelines provided connectivity between the reserves. At the "fine filter" level, species-specific standards recommended by VPOP (e.g., brown bear, goshawk, wolf, great blue heron, etc.) were fully considered in light of additional information such as conservation assessments, panel assessment results, etc. and appropriate standards and guidelines were incorporated into the Threatened, Endangered, and Sensitive Species and Wildlife sections of the Forest Plan for species that needed additional protection measures to assure their viability and well-distributed status.

The following sections describe the strategy. First, the Forest-wide reserve network is discussed. Next, the management of lands outside the reserve network (the "matrix") is described with subsections on each category of standards and guidelines that affect this management.

2.2.1. Forest-wide Habitat Reserve Network

2.2.1.1. Introduction

The coarse-filter approach was designed to maintain a functional and interconnected old-growth ecosystem, which in turn will maintain the component parts (composition and structure) and processes (function) of that ecosystem (p. 3-11, U.S.D.A. 1997c). In general, the home range and dispersal capabilities of old-growth associated species of concern were considered in determining the size, spacing, and number of reserves.

The system of Forest-wide habitat reserves adopted by the Forest Plan consists of large, medium, and small reserves. Of the estimated 5 million acres of productive old growth (POG) in 1997, the reserve system sets aside 3.6 million acres, and nearly 1 million additional acres are protected through the various standards and guidelines prescribed for management of the lands outside the reserves (U.S.D.A. 2003). The percentage of POG reserved within each of the 21 biogeographic provinces on the Tongass ranges from 38 to100 percent (Iverson and DeGayner 1997). The percent of the reserve system that is high-volume old growth (greater than 25,000 board feet per acre) is slightly higher than the Forest-wide average (44 percent and 43 percent, respectively) (U.S.D.A. 1997a).

2.2.1.2. Description and Design Features of the Reserve Network

A summary description of the reserve types, as they were defined in the 1997 Forest Plan, is provided below. In addition, details regarding the design features of the reserve network are presented following the description.

Description and General Design of Each Reserve Type

Large Reserves:

- There are 38 large reserves on the Tongass. These are contiguous landscapes, typically at least 40,000 acres in size and including at least 20,000 acres of POG forest. At least 10,000 acres of POG was intended to be in the high-volume stratum. Large reserves consist of a variety of non-development LUDs including the Old-Growth Habitat LUD.

- Large reserves are intended to be no more than 20 miles apart and are distributed across the entire Forest. Large reserves within the range of brown bears were intended to have at least one Class I anadromous fish stream.

Medium Reserves:

- The Tongass includes 112 medium reserves. These are contiguous landscapes of approximately 10,000 acres including at least 5,000 acres of POG forest. At least 2,500 acres of the POG was intended to be in the high-volume stratum. Medium reserves consist of a variety of non-development LUDs including the Old-Growth Habitat LUD.
- Medium reserves are intended to be no more than 8 miles from the nearest large or medium reserve and are distributed across the entire Forest.

Small Reserves:

- The Tongass includes a network of 237 small reserves, which are defined by Old-Growth Habitat LUDs. They generally contain at least 16 percent of the area of a value comparison unit (VCU) in a contiguous landscape, with at least 50 percent of the area in POG forest.
- They typically contain a minimum of 400 acres of POG.

Small Islands:

- The Tongass Forest Plan protects all islands less than 1,000 acres from additional harvest of old-growth forest. These areas are mapped as non-development LUDs, typically Semi-Remote Recreation.

Additional Design Features and Assumptions of Reserve Network

This section describes additional design criteria and assumptions used to design the OGRs system. A basic assumption was that future reviews of most individual medium and large OGRs or reviews of the entire conservation strategy would need to consider the total acres of old-growth habitat and other non-development LUDs that maintain the integrity of the old-growth forest ecosystem and contribute to a Forest-wide system of reserves within National Forest System lands. Islands less than 1000 acres that are designated as non-development LUDs may be excluded from acreage calculations.

General Design Criteria

A. OGRs were located so that spacing is maintained in the four cardinal directions.
B. Reserves are more circular rather than linear in shape to maximize the amount of interior (secure from the effects of forest edge) forest habitat.
C. The amount of early seral habitat within mapped reserves was minimized to the extent feasible. In VCUs where managed stands constitute a high portion of the total acres, including seral habitat that previously supported high volume stands to the OGR was favored if it achieved a more circular shape, maintained connectivity or included rare habitats (e.g., karst).
D. The amount of roads and log transfer facilities within mapped reserves were minimized to the extent feasible.
E. Riparian, beach and estuary habitats were considered as contributing elements to OGRs.
F. Site-specific factors in placing reserves were considered to help meet multiple biodiversity or wildlife habitat objectives. Factors included, but were not limited to:
    1. The largest remaining blocks of contiguous old growth within a watershed. Old-growth forest that constitutes scattered fragments of unsuitable timberland generally did not contribute to meeting small reserve design.
    2. Rare features such as underrepresented forest plant associations or stands with some of the Forest's highest volume timber stands.
    3. Known or suspected goshawk nesting habitat.
    4. Known or suspected marbled murrelet nesting habitat.

5. Important deer winter range to maintain important deer habitat capability to meet public demand for use of the deer resource.

There was no requirement to ensure connectivity among all small OGRs or between small OGRs and non-development LUDs (which form parts of large and medium OGRs). POG forest occurring within other features of the strategy (e.g., beach fringe, riparian, other non-development LUDs) contributes to overall landscape connectivity in the evaluation. It was anticipated that there would be a need to provide additional corridors only in rare situations. Medium and large OGRs were designed to provide connectivity between other old-growth LUDs and other non-development LUDs. The following parameters were used to ensure OGRs maintained connectivity.

A. Only one connection in one direction was necessary.
B. The beach fringe serves as a connector.
C. The connection did not have to be the shortest distance.

Additional Criteria for the Design of Small OGRs

This subsection provides a summary of additional criteria that were used in the design and layout of small OGRs.

A. Small OGRs were not required under the following circumstances:
   1. In VCUs where the total acres and acres of POG within non-development LUDs met or exceeded the minimum acreage criteria.
   2. In VCUs with a computational allocation of less than 800 acres of POG forest. An OGR may have been designed contiguous with old-growth acres in a non-development LUD in an adjacent VCU.
   3. In VCUs that were partially designated as very large, large, or medium OGRs even if these did not meet the minimum acre criteria for a small OGRs. In some cases, small OGRs have been designated in these VCUs for specific purposes.

B. Small OGRs may have been designated under the following circumstance:
   1. VCUs that have been separated may have been combined for computational purposes. These VCUs are denoted by an integer other than zero as the fourth digit of the VCU number (e.g., 5971, 5972, 5973). An OGR was located in at least one of these VCUs. In some cases, small OGRs were designated in more than one of these VCUs for specific purposes.

2.2.1.3. Rationale for the Reserve Network

The mapped system of 150 large and medium HCAs originally designed by VPOP as “one possible application of the proposed strategy” was integrated into the Forest Plan through allocation to the Old-Growth Habitat LUD and other non-development LUDs. Spatial modifications to the original VPOP large and medium HCAs were made; this is provided for in the VPOP report as long as HCA design criteria for size, spacing, and composition are maintained (Suring et al. 1993, p. 30). In their HCA composition analysis, Suring et al (1993) also identified limitations in their mapped strategy. Subsequent modifications were made to large and medium HCAs to correct limitations. Modifications were made for several reasons:

- The original VPOP delineation did not meet minimum HCA criteria (e.g., St. James Bay Large HCA);
- The original delineation incorporated large amounts of fragmented clearcut landscape (e.g., Couverden and Kelp Bay large HCAs);
- The original VPOP delineation exceeded minimum criteria (Ratz Harbor, Aaron’s Creek medium HCAs);
- The integrity of the original HCA was substantially compromised by recent timber harvest that was inconsistent with HCA objectives (Game Creek Large HCA); and
- The reserve location was adjusted to achieve multiple-use objectives such as timber harvest.

Even after these modifications, all large and medium HCAs do not precisely match the specific VPOP size, spacing and habitat composition design criteria. Based on a detailed analysis of how well the original mapped VPOP reserves and the design criteria were integrated into the 1997 Forest Plan (Iverson 1997), VPOP found that over 90 percent of the 149 HCAs they mapped forest-wide met the minimum spacing criteria, and those that did not were generally isolated islands or within Wilderness (Suring et al. 1993, Table 8, 9). Very few HCAs were completely moved (Iverson, 1997); thus the current location of mapped reserves is considered in general compliance with the original VPOP design. While site-specific compliance is not always perfect, either exceeding or occasionally deficient in VPOP design criteria, fine-tuning application of the strategy would take many iterations. As VPOP concluded, "a 'perfect' application of this conservation strategy does not exist" (Suring et al. 1993, p. 35). Furthermore, standards and guidelines in the Old-Growth LUD provide for the examination of the size, spacing, and composition criteria for each reserve at the project level and provide for necessary adjustments to ensure minimum design criteria are met.

Small (1,600-acre) HCAs in each 10,000-acre watershed were recommended by VPOP, to be mapped during project implementation. VPOP identified two objectives for small HCAs (Suring et al. 1993, p. 28): "to provide temporary functional habitat for animals dispersing between large and medium HCAs and to ensure that species of concern have a relatively high likelihood of occurring in each 10,000+ acre watershed." The IDT identified and explicitly mapped the small reserves in the Forest Plan as part of the Old-Growth LUD. These small reserves also contribute to the overall landscape matrix outside large and medium HCAs (see Section 2.2.2 Matrix Management). Approximately 237 small reserves were mapped. These included nearly 267,000 acres of POG forest within a total of 480,000 acres (Appendix 1 to Appendix N of the 1997 Forest Plan Revision FEIS). These reserves represent an important component of the Forest-wide old-growth habitat conservation strategy.

The need for larger habitat reserves (larger than provided by VPOP) and minimizing fragmentation, in general, and specifically for brown bears and wolves, was a consistent recommendation expressed by the Pacific Northwest Research Station Review scientists. The 1997 Forest Plan, in response to observations of the Pacific Northwest Research Station Review scientists and management considerations contained in the interagency wolf conservation assessment, contained at least one very large reserve within each of the 21 biogeographic provinces across the Tongass to address large-scale distribution of large OGRs (Appendix 5 to Appendix N of the 1997 Forest Plan Revision FEIS). This action was specifically responsive to Lande's recommendation (p. 81, in Kiester and Eckhardt 1994) of one large reserve per province and to other scientist's concerns that VPOP's HCAs were too small. A quantitative definition of large was not provided in any reference; however, multiples in excess of the VPOP large HCAs of 40,000 acres may be considered as 'large' (1-2 times as large) or 'very large' (3 or more times as large).

The VPOP Response also recommended the following: "it **may** (emphasis added) also be necessary to establish 0.5- to 1-mile buffers around all large and medium HCAs as a "special management zone" permitting removal of up to 25 percent of the standing volume in 5-acre units using uneven-aged timber management. This recommendation relates to the need for larger old-growth forest reserves. This feature has been incorporated into the Forest Plan in a different way than proposed in the VPOP Response. As discussed above, at least one very large reserve per province was allocated. Furthermore, the VPOP Response recommendation would have permitted substantial harvest (up to 25 percent) of the expanded area. The Forest Plan protects entire reserves without selective harvest and associated additional reduction of old-growth forest.

Both the Pacific Northwest Research Station Review and VPOP Response expressed concern for disproportionate harvest of higher volume old-growth stands. VPOP Response specifically recommended (p. 9) that "it is necessary to defer logging and road building in volume class 6 and 7 old-growth forest (as determined by field reconnaissance) below 800 feet elevation until a biological survey is completed." The Forest Plan Revision IDT recognized the concern for higher volume stands and took a broader approach toward protecting larger reserves and intact landscapes, which necessarily include higher volume stands. The IDT did not believe that a focus on protecting small isolated stands of the former volume class 6 and 7 that may be imbedded within a mosaic of clearcuts, susceptible to windthrow, was a prudent management approach to addressing conservation of old-growth associated species.

The final component of the reserve strategy addresses potentially endemic taxa (species or sub-species) that may exist on small islands. MacDonald and Cook (1994) reported 27 mammalian taxa endemic to Southeast Alaska. Many may have limited dispersal capabilities and are restricted to individual islands (e.g., Coronation Island vole); some may also be susceptible to loss and fragmentation of old-growth habitat. Populations existing on small islands (oceanic or habitat fragments) are more susceptible to local extinction (Wilcove et al. 1986, Burkey 1995). The archipelago of Southeast Alaska contains over 22,000 islands (Iverson 1996b) and uncertain but likely high levels of biotic endemism (MacDonald and Cook 1994). Lidicker (in Kiester and Eckhardt, 1994, p. 91) identified a concern for small island endemic taxa and recommended that no logging occur on islands of less than 1,000 acres to reduce risks to these taxa, and further recommended that at least one reserve be maintained on larger islands. The Other Mammal Assessment Panel expressed similar concerns relative to endemic taxa (Julin 1996).

In response to these concerns about endemic taxa with possibly unique gene pools that may be restricted to small islands, the Forest Plan protected all islands less than 1,000 acres from additional harvest of old-growth forest, in direct response to the Lidicker recommendation and concern expressed by the Other Mammal Assessment Panel.

2.2.2. Matrix Management

The second component of the old-growth forest habitat conservation strategy is management of the area outside reserves (the “matrix”) that is subject to timber harvest. This topic was of notable concern to the Pacific Northwest Research Station Review scientists who suggested that more attention be directed to this component of landscape conservation planning. They particularly noted the need to provide enhanced landscape connectivity and to manage human disturbance of the land similar to natural disturbance regimes (Kiester and Eckhardt 1994: Hansen p. 52; Lande p. 82; Lidicker p. 87; McCullough p. 109; McClellan p. 133).

Some management protections within the matrix are spatially explicit, such as the 1,000-foot beach and estuary fringe, and the riparian buffers for maintaining the integrity of the aquatic and riparian ecosystems. In addition, other forest-wide standards and guidelines preclude or significantly limit timber harvest in areas of high hazard soils, steep slopes, karst terrain, visually sensitive travel routes and use areas, and in timber stands technically not feasible to harvest. Finally, a number of species-specific standards and guidelines provide additional protection to old growth within the matrix.

2.2.2.1. Beach/Estuary Fringe and Riparian Habitats

Beach and estuary fringe, and riparian habitats, have special importance as components of old-growth forests, serving as wildlife travel corridors, providing unique wildlife habitats, and providing a forest interface with marine or riverine influences that may distinguish them as separate ecosystems within the larger old-growth forest ecosystem. Riparian areas are important for fisheries in providing, among other resources, the source of large woody debris that creates pools for rearing habitat, and in controlling stream temperatures and the amount of sediment reaching streams. Riparian areas provide habitat for terrestrial species associated with aquatic environments (amphibians, for instance, or mammals such as river otter and beaver), and for terrestrial species for which fish from streams are important food (brown and black bears). Considering the dendritic nature of riparian systems that begin high in watersheds, these riparian areas provide forested corridors connecting higher elevation regions in upper watersheds with lower elevation forests in valley bottoms. Riparian areas often contain plant species which can live only where water is available year-round. Riparian soils often support large spruce trees and some of the most highly-productive stands of old growth.

The beach fringe, the forested area adjacent to salt-water shorelines, is thought to be an important wildlife travel corridor, a transition zone between interior forest and salt water influences, and a unique habitat (or micro-climate) in itself. The beach fringe is a very important feature on the Tongass given the extensive amount of shoreline (more than 13,000 miles) that exists on the more than 22,000 islands. The beach fringe provides horizontal or low-elevation connectivity between watersheds, many of which otherwise have very steep sides and/or non-forested ridgetops. In conjunction with riparian areas, which provide connectivity within watersheds, the beach fringe is thought to be a component of the major travel corridor system used by many resident wildlife species.

Interagency habitat capability models developed previously for management indicator species of the Tongass produced the highest habitat suitability value in POG forests within the 500-foot beach fringe zone for the bald eagle, marten, and river otter (Suring 1993). The beach fringe was rated second only to the 1,000-foot estuary fringe for brown and black bears in overall habitat quality, and higher deer habitat values generally occur in high-volume old growth below 800-foot elevation, much of which occurs in the beach zone with a moderating maritime-influenced microclimate. A revised marten habitat capability model rated the beach fringe old-growth forests highest among all habitat components (Flynn 1995).

There are indications that the value of the beach zone habitat may extend beyond 500 feet. Gende et al. (1998) reported reduced bald eagle nesting densities and success in landscapes adjacent to clearcuts and recommended a beach buffer zone of at least 1,000 feet. The 1,000-foot beach fringe was also used frequently by radio-marked goshawks (Iverson et al. 1996). The importance of the beach fringe zone has long been recognized, and was a component of the Retention Factor Method used in the 1979 Tongass Plan, as amended (USDA Forest Service, 1986) (specifically recognizing the importance of the 1,000-foot beach fringe for brown/black bear, 600-foot for furbearers, and 0.25 mile inland from the beach for deer winter range).

In developing the old-growth forest habitat strategy, the information described above and the available literature relative to Southeast Alaska were carefully examined. The Forest Plan Revision IDT concluded that explicit corridors should be a component of a landscape conservation strategy, that a 1,000-foot beach and estuary fringe corridor was clearly justified by the available information but that no evidence supported a 3,300-foot buffer recommended by the VPOP Response. The IDT further reasoned that a 1,000-foot no-harvest beach and estuary fringe corridor was comparable or possibly superior to a 3,300-foot corridor that permitted up to 25 percent volume removal in 5-acre patch cuts as recommended by the VPOP Response. Accordingly, the Forest Plan establishes a Beach and Estuary Fringe Forest-wide Standard and Guideline that prevents timber harvest within 1,000 feet inland from mean high tide. The 1,000-foot beach fringe serves many functions: providing more effective landscape linkages between habitat reserves, protecting long-term bald eagle habitat capability, buffering the primary beach fringe zone (0 to 500 feet) from windthrow (Hodges 1982, Harris 1989), maintaining a functional interior forest condition within the entire primary beach fringe (Concannon 1995), and sustaining very important habitat for goshawks (Iverson et al. 1996).

In addition, the Forest Plan incorporated, as a minimum, the riparian habitat recommendations in the Anadromous Fish Habitat Assessment (AFHA 1995). Riparian habitat buffers also provide elevational corridors within forested watersheds. Mapping the small old-growth habitat reserves (see above) also provides additional landscape connectivity. Together, the beach and riparian habitat management features and the mapping of small reserves represented a substantial response to the landscape linkage element of conservation planning and significantly contributed to management of the overall matrix among habitat reserves.

2.2.2.2. Landscape Connectivity Standard and Guideline

The Forest Plan contains a standard and guideline that provides for the maintenance of a contiguous forested corridor, where it exists, connecting each large or medium habitat reserve to at least one other reserve. This standard and guideline is to be implemented during the environmental analysis for projects proposing to harvest timber, construct roads, or otherwise significantly alter vegetative cover. In addition, young-growth treatments to accelerate old growth characteristics to help increase connectivity for wildlife are encouraged.

2.2.2.3. Species-Specific Standards and Guidelines

A variety of species-specific standards and guidelines were adopted to strengthen the conservation strategy for individual species and species groups. Many of these have positive effects for a variety of old-growth-associated species. For some species, like the northern goshawk and the American marten, additional habitat conservation measures were prescribed in areas of the Forest where intensive timber harvest had occurred.

Stand level habitat management objectives, that contributed to maintaining features of old-growth forest within the matrix, were established in the 1997 Forest Plan Revision to reduce the adverse effects of clearcut timber harvest on marten and goshawk habitat use by retaining important forest structure during harvest. These habitat management measures were added to the Forest Plan in response to panel assessments (see Section III.B). In the North and Central Prince of Wales Biogeographic province, where risks of sustaining habitat for goshawks was greatest (Iverson et al. 1996), the 1997 Forest Plan Revision standards and guidelines provide for the retention of forest structure during harvest in VCUs where over 33 percent of the original POG has been harvested and harvest units are over 2 acres. This management standard and guidelines maintains an average of at least 30 percent canopy closure after harvest and requires that an average of at least 8 large (20 to 30 inches diameter at breast height [DBH]) trees/acre are retained at harvest. The objective of this provision was to retain some foraging habitat value after harvest; silvicultural prescriptions that provide for retention were considered to be superior to clearcut harvest (Iverson et al. 1996).

Similar stand level structural retention standards and guidelines in the Forest Plan were established to manage high value marten habitat. These standards and guidelines applied to the five higher risk biogeographic provinces identified by VPOP (Suring et al. 1993, p. 41) (East Chichagof, Kupreanof/Mitkof, Etolin Island and Vicinity (except Zarembo), Revilladagado Island and Vicinity, and North and Central Prince of Wales Island). In VCUs within these provinces where over 33 percent of the original POG had been harvested, including additional future harvest, high value marten habitat was to be managed to retain important forest structure for marten. Harvest units over 2 acres in size in high value marten habitat (e.g., high volume timber strata and below 1,500 feet in elevation) retained after harvest: an average of over 30 percent canopy closure, an average of at least 8 large trees/acre (20 to 30 inches DBH), an average of at least 3 large decadent (20 to 30 inches DBH dead or dying trees) trees/acre, and an average of at least 3 pieces/acres of large (20 to 30 inches DBH) down logs. For all other VCUs within these five provinces, the following structure was retained in harvest units in high-value marten habitat: approximately 10 to 20 percent of original stand structure will be retained with an average of 4 large trees/acre (20 to 30 inches DBH), an average of 3 large decadent trees/acre (20 to 30 inches DBH), and an average of at least 3 pieces/acres of large (20 to 30 inches DBH) down logs.

For both the goshawk and marten stand management standards and guidelines above, harvest units under 2 acres did not need to maintain any of the prescribed amounts of forest stand structure. However, to provide for retention of important forest structure, the effective silvicultural rotation was increased to 200 years.

In addition, other fine-filter species-specific standards and guidelines contribute to the old-growth strategy. These include standards and guidelines for raptor nest habitat protection, wolf den protection, brown bear foraging habitat along certain streams, and others. The major species-specific standards and guidelines include:

- Brown Bear Foraging Habitat: Establish forested buffers, where available, of approximately 500 feet from the stream at sites where additional protective measures are needed to provide cover among brown bears while feeding, or between brown bears and humans.
- Heron and Raptor Nest Protection: Protect active rookeries and raptor nesting habitat with a forested 600-foot windfirm buffer, where available.
- Marbled Murrelet Nest Protection: Protect identified marbled murrelet nests with a 600-foot radius of undisturbed forest habitat.
- Wolf Dens: Maintain a 1,200-foot forested buffer, where available, around known active wolf dens.
- Mountain Goat Travel Corridors and Winter Habitat: Identify and maintain travel corridors between important seasonal sites. Where feasible, maintain important mountain goat winter habitat capability.

2.2.2.4. Other Non-Wildlife Standards and Guidelines

In addition, although the conservation strategy was designed without consideration of the contribution of standards and guidelines that restrict timber harvest to protect resources other than wildlife, there are many other standards and guidelines that restrict or limit timber harvest. These other Forest-wide

standards and guidelines preclude or significantly limit timber harvest in areas of high hazard soils, steep slopes, karst terrain, visually sensitive travel routes and use areas, and in timber stands technically not feasible to harvest.

2.2.3. Analysis of the 1997 Old-Growth Strategy

Appendix N to the 1997 FEIS presented an analysis of the 1997 Old-Growth Strategy. This analysis documented the amount of habitat protection produced by the Forest Plan and compared it with the recommendations of VPOP and other recommendations. The following section summarizes this analysis (see Section IV.A.6 of Appendix N to the 1997 FEIS for the details).

2.2.3.1. Amount and Distribution of Old-Growth Forest

The analysis presented in Appendix N to the 1997 FEIS noted that the first and most prominent feature of the old-growth habitat strategy in the 1997 Forest Plan was the substantial amount of POG forest that is protected forest-wide in both the reserves and in the matrix areas that are allocated to timber management (70.1 percent in reserves and 19.0 percent in the matrix). A total of 84 percent of the POG that was present in 1954 was estimated to be present in 100 years assuming the maximum timber harvest levels per decade allowed in the 1997 Forest Plan. This is equivalent to an estimated 90 percent of existing POG.

Adequate distribution of old growth habitats, and not necessarily the forest-wide total amounts, was a principal element of the VPOP conservation strategy (Suring et al. 1993). The proportion of old-growth protected in reserves varied by biogeographic province, but ranged from 38 percent (Kupreanof/Mitkof Province) to 100 percent (Admiralty and West Chichagof Provinces). Within protected old-growth forests, all volume classes of POG were protected as well. High-volume old growth generally contains the largest trees and averages 35,000 board feet per acre (Julin and Caouette 1997). An average of 44 percent of the POG in reserves was estimated to be high volume, whereas 43 percent of the old growth forest-wide was high volume. The proportion of high-volume old growth in reserves in 18 of 21 provinces equaled or exceeded the proportion present in the province as a whole.

The 1997 Forest Plan exceeded the minimum strategy recommended by VPOP relative to sustaining viable wildlife populations. While fully integrating the large and medium VPOP HCAs and the mapping of the small reserves, the 1997 Forest Plan protected substantial additional POG forest to further reduce risks to wildlife viability and enhance protection of biological diversity. For comparison, reserves allocated in the Forest Plan with at least 5,000 contiguous acres of POG (the minimum POG requirement for VPOP medium HCAs) exceeded the amount recommended by VPOP by 147 percent forest-wide (Appendix 2 of Appendix N to the 1997 FEIS). Old-growth allocated to reserves exceeded the amount recommended by VPOP in 20 of 21 biogeographic provinces, ranging from 9 to 460 percent over VPOP recommendations. This comparison was conservative: it did not include old-growth forest in contiguous reserves with less than 5,000 acres of POG, and did not include the substantial old-growth forest that would remain in the matrix.

The old growth strategy was noted to contain at least one large contiguous reserve relative to the province size in each of the 21 biogeographic provinces across the Tongass to address large scale distribution of large OGRs (Appendix 5 of Appendix N to the 1997 FEIS). Seventeen of the 21 provinces have at least 1 very large reserve (e.g. over 180,000 contiguous acres). For example, in the North Central Prince of Wales Province, a contiguous reserve of 200,584 acres (Honker/Sarkar/Karta) was provided in the Forest Plan—5 times larger than a VPOP large HCA (40,000 acres). Two provinces had a large reserve exceeding 75,000 acres; the two remaining provinces were intermediate sized-islands or aggregates of smaller islands and had contiguous reserves of from 30 to 40,000 acres and virtually all federal lands within the province were in a reserve land allocation (Dall Island and Southern Outer Islands).

High-quality old-growth forest was mapped in the largest reserves as well. The proportion of high-volume old growth (used as one indirect measure of old-growth habitat quality) in the largest reserves was equal to or greater than the proportion of high-volume old growth throughout the province in 16 of 21 provinces forest-wide (Appendix 5, of Appendix N to the 1997 FEIS). Many of these reserves previously existed

(e.g., Admiralty and Misty Fiords National Monuments), while others were explicitly created to achieve this objective (South and Central Prince of Wales Island, Kupreanof/Miktof and East Chichagof Island).

The comprehensive old-growth habitat strategy in the Forest Plan was also responsive to the Pacific Northwest Research Station Review recommendation to not further fragment existing blocks of high-volume old growth by incorporating many existing roadless areas in reserves. An average of 89 percent (range 55 to 100 percent in each of 21 biogeographic provinces) of the Tongass was roadless (Appendix 4), an indirect measure of unfragmented (from clearcut harvest) landscapes. An average of 84 percent of the roadless acreage on the Tongass was allocated to "non-development" LUDs in the 1997 Forest Plan and would, thus, retain the roadless and unfragmented character of the landscape. A substantial portion of the Tongass would remain roadless and unfragmented in the Forest Plan

Additional concerns regarding habitat fragmentation were expressed by the VPOP Response that recommended that the three largest old-growth forest patches within each ecological province should be protected from logging and roadbuilding. An examination of how well the old-growth strategy in the Forest Plan responded to these general recommendations to maintain large blocks of old-growth forest was conducted. However, it was noted that there are various ways to define forest blocks or "patches". Without some patch definition restrictions, virtually all old-growth forest on any island could be considered one contiguous and interconnected patch.

Two analyses were conducted to examine the recommendation regarding preservation of large blocks of old-growth forest. The first examined the concept of contiguous blocks of interior old-growth forest. Interior forest was defined as greater than 300 feet into the forest from the productive/nonproductive forest edge. The resulting five largest interior forest blocks in each biogeographic province were compared to the Forest Plan land allocations to determine the proportion of these blocks protected in a reserve. Forest-wide, 73 percent of the area of these five largest interior old-growth blocks was protected for a total of 476,000 acres (Appendix 6 to Appendix N of the 1997 FEIS). A small portion of these acres may no longer meet the definition of interior forest acres after the maximum timber harvest levels allowed in of the Forest Plan for 100 years are harvested. The proportion varied by province, from 38 percent protected in the East Baranof Biogeographic Province to 100 percent on West Chichagof, Admiralty, and North and South Misty Fiords Biogeographic Provinces.

A second analysis examined the largest contiguous blocks of only high volume old-growth forest and the proportion protected in reserves in the Forest Plan. Overall, within a biogeographic province, these high-volume blocks were much smaller than the interior forest blocks of all POG (Appendix 6 and Appendix 7 to Appendix N of the 1997 FEIS). Forest-wide, an average of 83 percent (province range: 36 to 100 percent) of the five largest contiguous high-volume blocks in each province was protected in reserves for a total of 225,000 acres (Appendix 6 to Appendix N of the 1997 FEIS). These first two methods of many possible delineations of "large blocks" provided somewhat different results. There was no analysis to support the "three largest old-growth forest patches" recommendation—certainly nothing compared to the in-depth analysis VPOP contributed in their initial conservation strategy (278 pp.) or the scientific reviews provided by the Pacific Northwest Research Station Review 18 scientists (282 pp.). Nonetheless, the Forest Plan provides substantial (73 to 83 percent) protection to old-growth blocks considered in this analysis.

Regarding the matrix, it was noted that the allocation of forest stands and landscapes to some form of timber harvest did not mean that all trees and stands would be harvested leaving only a continuous "sea of second growth." There are numerous standards and guidelines limiting timber harvest in these matrix lands to protect specific resource and landscape components. An average of at least 57 percent (Appendix 8 to Appendix N of the 1997 FEIS) of the original (pre-1954) POG in these landscapes (the three timber harvest LUDs) would not be harvested and would remain standing throughout the planning horizon of 100 years, even with application of the maximum allowable timber harvest under the Forest Plan. A total of 69 percent of all existing POG in the matrix would remain after full plan implementation.

The relative quality of habitat within the three principal features of the matrix, the beach and estuary fringe, riparian habitat management areas, and other lands not available for timber harvest, are identified at both the province and VCU spatial scales. The beach and estuary fringe accounted for 15 percent of the POG protected in the matrix; riparian habitat accounted for about 24 percent, and the "other lands"

accounted for the remaining 61 percent. As discussed earlier, the proportion of high-volume old growth was one measure of habitat quality: the beach fringe averaged 45 percent and the riparian areas averaged 43 percent high-volume old-growth forest.

2.2.3.2. Island Effects

The potential risk to island endemic species that may be closely associated with old-growth forests was evaluated by conducting an analysis of islands of varying sizes (Iverson 1996b). This evaluation revealed a very low risk to islands ranging in size from 1,000 to 10,000-acres in Southeast Alaska. It was noted that there are 58 islands of this size range, but only 8 had POG forest that was suitable for timber harvest in the Forest Plan representing only 2.2 percent of the POG on these islands (Table D-1). However, long-term risk may be elevated on some of these 8 islands considering past as well as potential additional harvest (e.g., Shelikof, Sokolof, Marble, and Orr Islands).

Risks were slightly higher for islands ranging from 10,000 to 100,000 acres, with 7 of 19 having suitable POG potentially available for harvest. Heceta Island was identified as the largest island in this category (41,000 acres of federal land) with POG suitable for timber harvest. Several of these islands could also have elevated risks due to the cumulative effects of past as well as potential additional harvest (e.g., Tuxekan, Catherine, Suemez, and Heceta Islands. However, most POG (92 percent) and most scheduled for timber harvest (95 percent) occurs on the largest islands exceeding 100,000 acres. The Forest Plan wouldl not add additional risk to islands under 1,000 acres and would minimize risks to islands under 50,000 acres, with a cumulative maximum of 2,100 acres of old-growth forest that may be harvested over the next 100 years. This analysis assumed maximum allowable harvest every decade for 100 years under the Forest Plan. Furthermore, the analysis assumed a potential harvest of nearly 600,000 acres of POG, whereas only 474,000 acres are actually scheduled for potential harvest.

In recognition of the uncertainty about island endemic species and their vulnerability, the Forest Plan contained a “survey and manage” standard and guideline designed to substantially reduce the risk to endemic mammals on these islands. If surveys indicate the presence of these taxa, proposed projects would be designed to ensure their long-term persistence on the island.

Table D-1.
Analysis of the Range of Island Sizes across the Tongass National Forest and the Amount of Productive Old-Growth at Potential Risk (in 1997)[1,2]

Island Size[3] (acres)	No. of Islands	Total Area	Total POG	No. Islands w/POG Suitable for Harvest	Acres POG	% POG	1995 Second Growth
1 to 1,000	461	68,807	43,201	0	0	0	3,660
1,001 to 10,000	58	196,503	95,647	8	2,105	2.2	13,659
10,001 to 100,000	19	502,271	272,552	7	25,759	9.5	29,710
Over 100,000	19	16,018,366	4,652,201	18	579,064	12.4	356,440
Total	**557**	**16,785,947**	**5,063,601**	**33**	**606,928[(4)]**	**12.0**	**403,469**

[1] From Table 7 in Appendix N to the 1997 Forest Plan FEIS.
[2] The proportion of the POG that is suitable for timber harvest over the next 100 years in the Forest Plan is a measure of relative risk to potential island endemic taxa that may be associated with old-growth forests.
[3] Includes only federal lands.
[4] Only 474,000 (80 percent) of these suitable acres are scheduled for harvest over the 100-year planning period.

2.2.3.3. Habitat Connectivity

The analysis in Appendix N of the 1997 FEIS noted that there is general agreement among scientists that habitat connectivity is an important component of a landscape conservation strategy (Kiester and Eckhardt 1994, Lidicker 1995). There is, however, uncertainty regarding how connectivity should be achieved in an integrated conservation strategy: through explicitly designed corridors; by designing larger reserves thereby decreasing dispersal distances and facilitating population interchange; or by using an overall matrix management design (e.g., the “50-40-11” matrix prescription designed to provide marginal foraging habitat between reserves for dispersing northern spotted owls [Thomas et al. 1990]).

In light of the uncertainty regarding a variety of approaches to provide landscape connectivity, a further review and analysis was conducted by the 1997 Forest Plan IDT. Thus, the 1997 Forest Plan incorporated a combination of all three landscape conservation design approaches to address landscape connectivity. It has not relied on a single strategy. Beach and riparian corridors of specific widths were established that provide significant within-island habitat connectivity; habitat reserves were enlarged (see Old-Growth Habitat Reserves above) often minimizing dispersal distances between many reserves; and standards and guidelines that govern management of the matrix outside reserves (including beach and riparian buffers) were partially designed to contribute to retaining a substantial old-growth forest component to provide connectivity. If site-specific project analyses identify deficiencies in landscape connectivity, the Forest Plan Old Growth Habitat LUD provided the opportunity to re-examine small habitat reserves, which may be adjusted to provide the necessary connectivity (see Small Old-Growth Habitat Reserves, below).

An additional approach to achieve landscape connectivity is to use timber harvest practices that retain some forest structure within the stand after harvest. Application of the marten and goshawk stand level management standard and guidelines was anticipated to contribute to maintenance of potentially important stand structure in landscapes with substantial amounts of even-aged clearcut harvest with little within-stand residual structure. The goshawk management standard and guideline was to be applied to the most heavily harvested and fragmented VCUs on Prince of Wales Island. The marten standard and guideline was to apply in the same VCUs plus additional VCUs in the North Central Prince of Wales, Revilla/Cleveland and Vicinity, East Chichagof, Mitkof/Kupreanof, and Etolin and Vicinity provinces. Since the marten standard and guideline applied to VCUs that currently exceeded 33 percent of POG harvested, as well as VCUs that would exceed that amount through future projects, this standard and guideline was anticipated to apply to additional VCUs in the future. Retention of these substantial amounts of within-stand structure served to minimize the adverse impacts of additional timber harvest.

Another feature of connectivity identified by the Pacific Northwest Research Station Review were critical links or “pinchpoints” connecting major landscapes within islands (Marcot in Kiester and Eckhardt 1994, p. 103). Such pinchpoints must be carefully protected (Kiester and Eckhardt 1994, p. 17). The 1997 Forest Plan IDT identified six such landscape pinchpoints, all relatively narrow areas between larger land units where future alterations in habitat could significantly reduce natural connectivity and limit the ability of land-based species to disperse or migrate. These areas and the degree of protection afforded by the 1997 Forest Plan at the time of its adoption include:

1. The portage between Tenakee Inlet and West Port Frederick on Chichagof Island is a narrow neck of land connecting northeast Chichagof Island to the main body of the rest of the island. This is in the East Chichagof biogeographic province. This area is completely protected with a large old-growth habitat reserve using the Old-Growth Habitat LUD.
2. The area connecting Lisianski Inlet with the North Arm of Peril Strait is a narrow region that connects two major portions of Chichagof Island. This area is fully protected as a Legislated LUD II area.
3. The area between Port Camden, Bay of Pillars, and Three-Mile Arm on Kuiu Island (Kuiu Island biogeographic province), a narrow neck of land connecting the northern and eastern part of the island to the rest of Kuiu Island. This area is protected with the Old-Growth Habitat LUD through a combination of several adjacent small old-growth habitat reserves.
4. The narrow area between Lindenburg Peninsula and the remainder of Kupreanof Island is largely protected by the Petersburg Creek Duncan Salt Chuck Wilderness. The remaining small area not included in the Wilderness between Portage Bay and Duncan Salt Chuck is primarily peatland; the 1,000-foot beach fringe provides additional connectivity.
5. The Neck Lake area between Whale Passage and El Capitan Passage on Prince of Wales Island (North Central Prince of Wales biogeographic province) has had significant past and on-going forest management activities. It also is a relatively narrow piece of land connecting the extreme northern end of Prince of Wales Island to the remainder of the island. A cross-island connection is nearly protected with a small reserve around Neck Lake and fully protected further south with

the very large natural setting reserve around Sarkar Lakes. Connectivity is also provided on both sides of the narrow pinchpoint with the 1,000-foot beach fringe corridor.

6. Sulzer Portage is between West Arm Cholmondeley Sound and Portage Bay at the head of Hetta Inlet on Prince of Wales Island. This relatively narrow neck of land joins the southeast part of Prince of Wales Island to the remainder of the island, connecting North Central and South Prince of Wales biogeographic provinces. This area has had considerable timber harvesting on both national forest and adjacent private lands. Due to a recent transfer of land ownership the area is now all private land, dividing the northcentral and south portions of Prince of Wales Island with a non-national forest strip 1 to 2 miles wide. Continued timber harvesting is anticipated on these private lands, with the potential of creating dispersal barriers. However, clearcuts and advanced second growth forests (50 to 100 years old) are unlikely to create complete barriers to movement for deer, wolves, marten and squirrels or other species of concern.

2.2.3.4. Summary

In summary, the Appendix N analysis noted that the 1997 Forest Plan IDT concluded that the original VPOP strategy was a sound and effective landscape approach to address the long-term conservation of old-growth associated wildlife species. VPOP used a coarse filter conservation planning approach to develop a comprehensive, multi-scale landscape conservation strategy. They incorporated the entire community of old-growth associated species into their analysis and focused on those species with the greatest viability or distribution concerns in the development of their strategy. Additional scientific information, such as conservation assessments and recommendations contained in the Pacific Northwest Research Station Review, were incorporated into the Forest Plan to further strengthen the original VPOP strategy. The VPOP Response was considered as a brief “initial response” of some possible considerations that may have been integrated into a final report. While VPOP Response recommendations were not explicitly incorporated, many of the elements of the VPOP Response were addressed in concept in the Forest Plan (wider corridors, larger reserves, protection of high-volume old-growth, etc.).

The old-growth habitat conservation strategy in the 1997 Forest Plan was carefully crafted in response to these fundamental conservation planning documents. Based upon consideration of the best available information related to conservation planning, the Appendix N analysis concluded that the 1997 Forest Plan provided a sufficient amount and distribution of habitat to maintain viable populations of old-growth associated species after 100 years of Plan implementation. Due largely to uncertainty, the 1997 Forest Plan did not, however, represent a “no risk” conservation strategy; rather it represented a balance of wildlife conservation measures that consider the best available scientific information and reflect an acceptable level of risk for continued species viability.

2.3. Modifications to the Strategy between 1997 and 2007

Since 1997, there have been 24 project analyses that have modified small or medium OGR boundaries and adjacent LUDs (Table D-2). Overall, these changes have resulted in an increase in reserve area and an increase in the amount of POG included within reserves. The net result of these amendments is that the acres suitable for timber harvest have been reduced by approximately 16,000 (Table D-2). The 2007 Forest Plan (defined as the 1997 Forest Plan, as amended through 2007) reflects these changes.

In addition to these changes in OGR boundaries, a number of ownership adjustments and other slight LUD modifications have been made. The combined effect of these changes on the areas within reserves and the matrix is shown in Table D-3. This table shows that while the total area of the Forest decreased by about 110,000 acres, primarily due to land adjustments, the acreage of development LUDs decreased by 112,000 acres and the acreage within reserves increased by about 2,000 acres over the period 1997 through 2007.

Table D-2.
Summary of Changes in Suitable Acres due to Forest Plan Amendments that Produce the 2007 Forest Plan[1]

Project Name (acres)	Small or Medium OGR	Project Year	Non-dev to Dev LUD Suitable Acres	Dev to Non-dev LUD Suitable Acres	Net Change in Suitable Acres
Canal Hoya	Small	1998	0	151	-151
Chasina	Small	1998	0	78	-78
Cholmondeley	Small/Medium	2003	894	6,873	-5,979
Control Lake	Small	1998	446	142	+304
Couverden	Small	2005	0	790	-790
Crystal Creek	Small	1998	481	1,153	-672
Doughnut	Small	2000	0	19	-19
Finger Mountain	Small	2003	0	593	-593
Fire Cove Salvage	Small	2002	186	633	-447
Kensington Mine	Small	2004	0	1,615	-1,615
Kuakan	Small	2000	416	542	-126
Luck Lake	Small	2000	257	794	-537
Madan	Small	2003	377	1,501	-1,124
Nemo Loop (Thoms Lake)	Small	1998	177	932	-755
Niblack	Small	1998	252	0	+252
Overlook	Small	2006	354	578	-224
Polk Small Sales	Small	2000	0	153	-153
Salty	Small	2000	99	126	-27
Scott Peak	Small	2006	1,089	1,962	-879
Sea Level	Small	1999	185	500	-315
Threemile	Small	2004	458	826	-368
Todahl Backline	Small	1998	2	363	-361
Tuxekan	Small	2006	431	1,614	-1,183
Woodpecker	Small	2003	180	130	+50
Total			**6,284**	**22,068**	**-15,784**

[1] The 2007 Forest Plan is defined as the 1997 Forest Plan, as amended through 2007.
Source: Non-significant Forest Plan Amendment for Tuxekan Project, October 2006

Table D-3.
Summary of Acreages in Reserves and Matrix under the 2007 and the 1997 versions of the Forest Plan

Alternative	Reserves			Matrix	Total	Percent of Forest in Reserves
	Old-Growth Habitat LUD	Other Non-Development LUDs	Total in Non-Development LUDs			
2007 Forest Plan[1/]	1,182,424	11,985,410	13,167,834	3,605,974	16,773,808	78.5%
1997 Forest Plan[2/]	1,131,059	12,034,860	13,165,919	3,717,081	16,883,000	78.0%

[1/] Based on the 2007 Forest Plan (defined as the 1997 Forest Plan, as amended through 2007) and Tongass GIS.
[2/] Based on 1997 Forest Plan table on p. 4-2 and Table 3-77 of 1997 FEIS.

Table D-4 summarizes the POG acreage in reserves and the matrix for the 2007 and 1997 versions of the Forest Plan. The 2007 acreage of POG within OGRs, including all non-development LUDs is 3,518,425, which represents 71.1 percent of all POG on the Forest (Table D-4). Within the matrix, there is an additional 925,051 acres of old growth (18.7 percent) that is protected within the Beach and Estuary Fringe, Riparian Management Areas, and other unsuitable areas. This estimate includes unsuitable areas that are not yet mapped (e.g., Riparian Management Areas along unmapped streams, unmapped unstable slopes, unmapped high vulnerability karst lands). Finally, there is an estimated 28,598 acres of

POG that is suitable, but would not be scheduled due to economics and other factors. As a result, the 2007 Forest Plan results in the protection of 90.3 percent of all existing POG on the Forest, assuming the full Allowable Sale Quantity (ASQ) is harvested each decade. Table D-4 also compares these acreages and percentages with the same acreage categories in 1997, at the time that the Forest Plan Revision was adopted.

The maximum percentages that could be harvested are similar between the 1997 Forest Plan and the 2007 Forest Plan when one looks at only the larger POG types. Under the 2008 Forest Plan, a total of 71.3 percent of the high-volume POG (SD Model types 5N, 5S, and 67) and 67.8 percent of the big-tree POG (SD Model type 67) would be included within reserves. Overall, 88.9 percent of the existing high-volume POG and 88.6 percent of the big-tree POG would not be harvested.

Table D-4.
Summary of Productive Old-Growth Acreage in Reserves, Protected in the Matrix, and Suitable for Timber Harvest in 2008

Year	POG Area in Reserves	Matrix POG Protected or Not Scheduled for Harvest	Matrix POG Suitable and Scheduled for Harvest (represents the maximum POG to be harvested)	Total Existing POG[1/]
2007 Forest Plan[2/] (acres)	3,518,425	970,176	462,556	4,951,156
2007 Forest Plan[2/] (percent)	71.1%	19.6%	9.3%	100.0%
1997 Forest Plan (acres)	3,551,482	1,038,492	473,597	5,063,571[2/]
1997 Forest Plan (percent)	70.1%	20.5%	9.4%	100.0%

[1/] Note that the Tongass land base has changed since 1997 due to land adjustments and harvest has occurred.
[2/] The 2007 Forest Plan is defined as the 1997 Forest Plan, as amended through 2007.
Sources: Table 3.9-12 in Biodiversity Section for 2008 numbers; Appendix N to the 1997 Tongass FEIS and Appendices to Appendix N for 1997 numbers.

2.4. New Relevant Science since 1997

This section describes new information related to conservation planning and science developed since 1997. It summarizes general information on conservation strategies, as well as species-specific information that are particularly relevant to the Tongass Conservation Strategy.

2.4.1. Conservation Strategies

2.4.1.1. General

Haufler (2006) conducted a comprehensive review of conservation science produced since 1997 and its relationship to the Tongass Forest Plan. In his review, he described major types of conservation strategies, as well as concepts that form the basis for those strategies (e.g., landscape ecology, corridors and landscape linkages, and habitat loss and fragmentation) and related new science (new science related to population viability was also addressed but is summarized in Section 3.0), and related these to the science behind the Tongass Conservation Strategy. This effort included a review of recent literature as well as recently completed and on-going conservation initiatives to identify approaches and strategies used by agencies and other organizations in their conservation planning efforts. This section provides a summary of that review.

The term “conservation strategy” refers to the framework and the underlying basis and assumptions used in planning to maintain or enhance biological diversity (Haufler 2006). Most conservation strategies share the common objective of conserving biodiversity, which has been succinctly defined by the United Nations Environment Programme (1991) as: “the variety of and variability within and among living organisms and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems.” To do so, the concepts of representation (i.e., addressing the range of

environmental conditions in the planning area), resiliency (i.e., being capable of withstanding natural and human-caused changes in the environment), and redundancy (i.e., consisting of a sufficient number of areas to withstand larger scale stochastic events) have been emphasized as being important in delineating effective reserve designs (Shaffer and Stein 2000).

Conservation strategies can be distinguished based on whether they take a coarse filter or fine filter approach to conserving biodiversity. Coarse filter strategies focus on ecological communities or functional ecosystems where planning incorporates an appropriate mix of ecosystems that will maintain or enhance biological diversity and ecosystem integrity within a landscape (Haufler 2006). Recent approaches that form the basis of coarse filter strategies include the habitat diversity approach (i.e., maintaining or restoring adequate amounts of existing vegetation communities; Groves (2003), the historical reference approach (i.e., prioritizing conservation efforts based on a comparison of existing and historical conditions; Haufler 2000, Poiani et al. 2000), and the historic range of variability approach (i.e., maintaining the landscape within the historic ranges of variability; Aplet and Keeton 1999). However, there is little agreement on how to apply coarse filter approaches, with few examples of well designed coarse filter initiatives.

In contrast, fine filter conservation strategies focuses on species or groupings of species to address the ecological objective of maintaining the species or groupings of species within a landscape. Fine filter approaches include the use of umbrella species, indicator species, keystone species, flagship species, ecological engineers, focal species, declining species, at-risk species to represent other, co-occurring species. Groves (2003) and Noon and Dale (2002) provide an overview of these species-specific approaches. Under a fine filter strategy conservation areas are often identified using indices such as species richness, species diversity, or are based on biological hotspots, with the objective of protecting the maximum number of species (Chaplin et al. 2000). However, there is generally poor support in the literature for the fine filter approach because of the difficulty in identifying appropriate species to serve as surrogates, or whether this is even possible (Carignan and Villard 2002), and the inability of this approach to adequately represent all levels of biodiversity (e.g., landscape and ecosystem levels; Schwartz 1999, Chaplin et al. 2000, Groves 2003).

A central element in conservation planning, as indicated above under the two basic frameworks for conservation strategies, is the identification of conservation areas such as reserves or reserve networks. Conservation strategies may differ in their view of conservation areas, with some placing priority on their protected status (e.g., wilderness) such that they are kept separate from human influence (i.e., a compositionalism viewpoint; Callicott et al. 1999), with others emphasizing the functional capabilities of protected areas which may include working landscapes (the functionalism view; Callicott et al. 1999; Haufler et al. 1990, 2000). Though the latter view recognizes that reserves are an important tool for conserving biodiversity, it strives to balance human and conservation needs and focuses on providing functional ecosystems.

Another element that distinguishes conservation strategies is their primary focus. That is, whether they are concerned with rare or declining species or ecosystems or with representation of all species or ecosystems (Haufler 2006). A rarity focus typically devotes funding and effort to the identification of rare or declining elements (e.g., old-growth forest) and the protection of these elements in reserves. A representation focus strives to maintain the full spectrum of ecosystem elements (i.e., all forest structural stages) in adequate amounts and distribution across the planning landscape.

Haufler (2006) noted that most conservation strategies combine many of the approaches described. This more comprehensive approach to conservation planning enables the testing of the effectiveness of each plan element (e.g., implementing a fine filter approach to test the effectiveness of the coarse filter approach; Haufler 1999, 2000) and also addresses the shortcomings of any one strategy or view point.

2.4.1.2. Landscape Ecology

Landscape ecology and the associated concepts of scale, landscape effects, and habitat networks, have also received considerable attention in recent literature and have become a fundamental part of conservation planning. At the landscape scale, the influence of spatial arrangements, amounts, and sizes of habitat patches in landscapes, and the relationships of these factors with ecological processes are

important advances (Turner 2005, Freemark et al. 2002). Both the grain (patch-based versus landscape-based) and extent (delineation of planning areas) of landscape analyses have been identified as critical elements in conservation planning, as they influence the results and implications of modeling efforts (Bassett and Edwards 2003).

2.4.1.3. Landscape Linkages and Corridors

Since the 1990s, a common element of conservation planning has been to ensure that adequate connectivity between habitat reserves is maintained to facilitate movement across the landscape and thus exchange between populations. Traditionally, connectivity has been viewed in the form of structural, often linear, elements of the landscape (i.e., riparian buffers) that literally act as corridors through which species move between larger habitat patches within the surrounding matrix. However knowledge of species ecology and dispersal capabilities, coupled with new understanding of landscape ecology, has broadened this view to include linkage zones, or areas within the landscape that may not physically connected but include appropriate habitat elements that provide functional connectivity (Tischendorf and Fahrig 2000). Landscape linkages address movement capabilities, habitat patches, landscape configurations, matrix conditions, barriers, and their ability to maintain continuous populations (Haufler 2006).

2.4.1.4. Habitat Loss and Fragmentation

Numerous recent empirical studies have evaluated the effects of habitat loss and fragmentation on a variety of species. Results of these studies indicated that 1) habitat and fragmentation are not independent, with the degree of habitat fragmentation influencing the magnitude of direct effects from habitat loss (Goodsell and Connell 2002); 2) fragmentation and resulting distribution of remaining habitat is of primary concern in managed landscapes where there has already been substantial habitat loss/conversion (Freemark et al. 2002); 3) interior and specialist species, as well as those that are rare or isolated will be the most affected by habitat loss and fragmentation (Bender et al. 1998, Davies et al. 2000), 4) habitat conversion may benefit some species (McGarigal and McComb 1999); 5) the amount and configuration of remaining habitat were influential in the landscape occupancy (Villard et al. 1998, McIntyre and Wiens 1999, Radford 2005); 6) the quality of remaining habitat may be more important than the quantity (Braden et al. 1997). Notably, studies evaluating the effects of fragmentation in various landscapes indicated that some of the negative effects of fragmentation on vertebrates observed where ecosystems have been converted to urban or agricultural uses have not been found in landscapes where timber harvest is the primary land use (Freemark 2002)

Theoretical studies have also been conducted that provide some insight on how the effects of habitat loss may operate. With (1999) described two perspectives that have resulted from these efforts. One is based on the theory of island biogeography where the objective is to identify the appropriate distribution of habitat patches which are compared to island surrounded by a matrix of non-habitat. The other is based on landscape permeability and the ability of species to move through the landscape (dispersal abilities), and views that landscape as a mosaic consisting of a spatially complex variety of habitat conditions.

The issue of habitat adequacy, or the threshold at which the amount of remaining habitat is insufficient to facilitate species persistence, has also been the subject of recent research. Risks of extinction tend to display non-linear responses as the effects of habitat fragmentation increase (With and King 1999, Flather et al. 2002). Under theoretical studies, threshold effects of habitat loss have been noted at 60 to 80 percent (Flather et al. 2002, Fahrig 1997). However, empirical studies have found the adequacy question difficult to isolate because of complexities in landscape mosaics, matrix conditions, temporal changes, and the various habitat needs of different species. Empirical studies note species losses typically above a 90 percent threshold (Radford and Bennett 2004, Virkkala and Toivnen 1999).

2.4.1.5. Relationship to the Tongass Conservation Plan

The conservation strategy was described as a “habitat-based wildlife conservation strategy that employed old-growth associated umbrella species to design a coarse filter/fine filter approach for species

conservation" (Haufler 2006). Based on Haufler's (2006) review, the science underpinning the Tongass conservation strategy is supported by recent literature. New information suggests that additional consideration of windthrow effects, which may occur at greater magnitudes than once thought (Kramer et al. 2001) and have farther reaching effects on habitat selection of some species (DeGayner et al. 2005), and a finer scale analysis of the distribution of plant associations (e.g., VanHees and Mead 2005) may be warranted to enhance the existing coarse filter component of the conservation strategy (Haufler 2006). At this time, plant association mapping for the Tongass does not exist, and the development of such mapping would be an enormously expensive undertaking. In lieu of evaluating how representative are the reserves based on plant associations, ecological subsection and biogeographic province mapping was used in conjunction with old-growth types as a surrogate. Likewise, a finer-scale assessment of viability for some species, particularly endemics (see *Wildlife* section for discussion of new science related to endemism on the Tongass) may be warranted to ensure the coarse filter component of the conservation strategy is meeting the needs of all species, including those that are rare or occupy limited distributions (Haufler 2006). However, Haufler (2006) concluded that "the developments in the field of conservation science produced since 1996 indicate that the conservation strategies used in the plan are still valid at the present."

In April 2006, an Interagency Conservation Strategy Review workshop was held to review the Tongass Land Management Plan conservation strategy in light of new information since 1997 (USDA Forest Service 2007). The objectives of the workshop were to:

1. Facilitate robust discussion between an interagency workgroup and invited scientific and technical experts regarding new information attained since 1997 that may be relevant to the conservation strategy; and
2. Generate and discuss science-informed "Considerations" relative to the strategy."

Considerations included identification of the need to attain additional information or conduct additional analysis regarding a scientific question or issue, the need for change to the conservation strategy, or other investments or work. The workshop included technical presentations regarding recent and current studies on species and species groups of concern on the Tongass. A broad conclusion of the workshop was that the conservation strategy continues to be supported by science (USDA Forest Service 2007). Although the information presented emphasized that there is still uncertainty associated with managing wildlife habitat on the Tongass, the new information presented has increased our knowledge of species/habitat relationships, reinforced the idea that retaining old growth in a system of Forest-wide reserves is appropriate for many species, and reiterated that having a very conservative approach to conservation of old-growth-associated species is still warranted and supported by science.

2.4.2. Species-Specific Science

This section presents a summary of the new information for individual species that is relevant to the Tongass Conservation Strategy, with focus on those species that are directly relevant to proposed changes to the Conservation Strategy. The majority of this information was presented at the April 2006 Interagency Conservation Strategy Review workshop and is summarized in a report (USDA Forest Service 2007). Reference to this information, as well as more complete discussion of this new information, can be found throughout the *Wildlife* section in Chapter 3 of the FEIS. This section summarizes the key highlights of information with particular focus on goshawk and marten, since these two species have specific standards and guidelines amended.

2.4.2.1. Northern Goshawk (including the Queen Charlotte goshawk subspecies)

The results of 10 years of research on the Queen Charlotte goshawk in Southeast Alaska were summarized at the Conservation Strategy workshop (Flatten et al. 2001,2002; Lewis 2005; Lewis et al. 2001, 2006). This research was in various studies, some of which is published and some of which is available in agency reports. A total of 69 adult goshawks (37 females and 32 males) were radiotagged from 1992 to 2001. Using 2-year and 1-year tags on females and males, respectively, greater than 2,800 relocations were recorded over approximately 500 km^2 of the Tongass National Forest.

Nest trees are typically found in the largest trees available relative to the nest stand. Basal area was higher at the nest tree (> 60 percent) than the surrounding stand (< 60 percent). Aerial photo analysis also showed a difference between the amount of forest, productive forest, and canopy cover at the nest site versus random sites; however, although it was statistically significant, it may not be biologically significant. Eighty-nine percent of the 63 nest sites evaluated had multi-storied canopies.

Two large spatial scales (816 ha and 2,088 ha) were used to provide a summary of the vegetation surrounding 78 known nest sites based on GIS analyses. POG on NFS land represented 37 to 40 percent of the circular areas around these nest sites on average, followed by unproductive forest on NFS land at 24 percent, and NFS young growth at 9 to 10 percent. Nonforest on NFS land made up 5 percent and non-NFS land and saltwater made up the remaining 23 to 25 percent (see EIS planning record). Sixty-eight to 70 percent of the POG on NFS land inside the circles was protected in reserves or in the matrix. Use by adult males and females during the nesting and non-nesting season showed a consistently higher use of POG forest in proportion to availability. Habitat use of the 1,000-foot beach and estuary buffer was higher for females than for males during nesting and non-nesting seasons and peaked again at approximately 3,000, and 4,000 feet from the beach fringe.

Using the same approach discussed above, a hypothetical post-fledging area (PFA) was developed using a radius centered on a nest site and determined by the mean distance moved by northern goshawk juveniles (approximately 1,500 m) from the nest. Based on habitat categories of suitable (medium- and high-volume old growth), low-volume old growth, harvested, and nonproductive forest, approximately 45 percent of the mean PFA was in nonproductive forest, followed by suitable habitat (39 percent), low-volume old growth (8 percent), and harvested (4 percent). Results of this hypothetical PFA analysis indicate that about 40 percent of the PFA on average will be medium- or high-volume POG, of which 55 percent was in a Timber LUD or non-NFS lands.

Adult goshawk home ranges were large, much larger than most other home ranges documented in North America. Median home range sizes ranged from 3,900 ha to 11,800 ha for adult females during the nesting and non-nesting season, respectively. Male home ranges were slightly larger in size ranging from 4,300 ha to 11,900 ha during the nesting and non-nesting seasons, respectively.

Movements by nesting pairs within a territory between year 1 and year 2 ranged from 0.1 to 3.2 km with the majority (67 percent) moving less than 0.4 km. Female goshawks tend to move much greater distances between nests in sequential years than males with approximately 35 percent of females leaving their nesting area, re-pair, and nest in a new area the next year. However, of 24 nesting territories, 54 percent remained within 0.36 km radius of the previous years nest and all movements were within 3.2 km of the nest site. Nesting pairs split up more often and between-year nesting dispersal of adult female goshawks is much higher than anywhere else they have been studied in detail in North America.

The diet of goshawks in Southeast Alaska is dominated by a few key prey (grouse, medium-sized birds, and red squirrels, where present). Prey rich areas include the northern half of the Tongass National Forest, where blue grouse and red squirrel are the dominant prey items taken. On Prince of Wales Island (POW) and other islands where sooty grouse and red squirrel are not present, spruce grouse, Steller's jay, and ptarmigan are the dominant prey items taken. Small mammals make up a small portion of the overall diet in this area. Ten nests were monitored as part of the study and of all food deliveries to the nest, 78 percent of the goshawk diet in Southeast Alaska consisted of bird species, with grouse the most commonly delivered prey item. From a broader diet pattern using stable isotope and prey associations, forest-dwelling prey items are, not surprisingly, dominant, but there is also a component of tidal and wetland prey species in their diet.

Recent studies confirm the importance of management for prey in relation to goshawk productivity (Kenward 2007). Salafsky et al. (2007) recommend that goshawk management strategies incorporate forest management practices that increase the abundance and diversity of available prey resources. The differences in prey species abundance and distribution across the Tongass may help explain some of the variation in productivity, territory size and nest site selection (Lewis et al. 2006, see also compiled information in U.S. Fish and Wildlife Service 2007).

In a review of over 180 publications on goshawk habitat relationships, Reynolds (2004) reported that, although goshawks predominantly nest in mature and old-growth forest characterized by closed-canopy stands of large, dense trees, there is considerable variation in nest sites among populations, with goshawks in Oregon and Nevada nesting in stands with canopy cover as low as 31 percent. Reynolds (2004) also reported that outside of the nesting season, the variation in habitats used by goshawks is even greater (multiple forest age classes, edges, and openings) and is apparently related to differences among habitat in prey abundance and availability (i.e., goshawks may nest or forage more often in habitat where prey is more abundant). Reynolds (2004) concluded that the main factors limiting goshawks were habitat structure for both nesting and foraging (rather than composition) and prey. This idea was also demonstrated by Reynolds et al (1992) who used a food web-based, ecological approach to develop forest management recommendations for goshawks in the Southwest United States. Taking into account both goshawk habitat requirements and the habitat requirements of 14 of their prey species, Reynolds et al. (1992) recommended that no more than 60 percent of a desired landscape of goshawk and prey habitats consist of mature to old-growth forests, and that post-fledging family areas (i.e., the area immediately surrounding the nesting area) should include habitat attributes important to prey species, including snags, downed logs, woody debris, large trees, openings with herbaceous and shrubby understories, and an intermixing of forest vegetative stages. Reynolds et al. (2006) concluded that management prescriptions based on the ecology (e.g., composition, structure, pattern, and dynamics) of a forest ecosystem, is a more appropriate basis for developing desired forest conditions that support goshawks and their prey.

Management recommendations for goshawks have been incorporated into multiple Forest Plans across the United States. Many of these are based on Reynolds et al. (1992), which includes recommendations for goshawk habitat for a variety of spatial scales, including nest sites and post-fledging family areas. These recommendations are specific to habitats in the southwestern United States, though they have been used in other geographic areas. While information from these studies regarding goshawk habitat relationships is useful across a broad geographic areas, specific recommendations for standards and guidelines is less useful. Because of significant differences in habitat and the extent of human influences on natural processes between Alaska and the Southwest, specific management prescriptions have limited applicability to Southeast Alaska.

In addition to these findings, limited new research has shown goshawk use of young-growth stands. Although POG is still considered the optimal nesting habitat for this species, non-productive forest types and second-growth stands are also used by goshawks for movement and foraging (and sometimes nesting), emphasizing the importance of matrix lands in goshawk management (McClaren 2004, Boyce et al. 2006, Reynolds et al. 2006). Some nests have been found in maturing second-growth (previously harvested) stands (Bosakowski et al. 1999, McClaren 2003). On Vancouver Island, most second-growth stands supporting nests were 60 to 80 years old, and suitable structure was apparently achieved in as little as 50 years (McClaren 2003). Additionally, Doyle (2004b) found that blue grouse, an important prey species for goshawks on the Queen Charlotte Islands, selected stands with more open canopies indicating that there may be a threshold below which timber harvest would not adversely affect grouse, or goshawks as their predators. On Douglas Island in Southeast Alaska, goshawks have been observed to nest in 80-90 year old stands (Kim Titus, Alaska Department of Fish and Game. pers. comm., 2007).

Management of the nest stands around known goshawk nests continues to be an important factor in goshawk conservation; some Forest Plans incorporate management of an area around the nest for fledglings (USDA Forest Service 2006). With respect to nest site management, Reynolds et al. (1992) recommended nest buffers of 30 acres, with maintenance of at least 3 known nests and 3 replacement nests (totaling 180 acres) within a 600 acre post-fledging family area. Thus, they recommend that 30 percent of the post-fledging family area should be retained for nesting habitat, with rest in a variety of successional stages. Management for goshawk nests is complicated by the difficulty in finding nests, particularly in the remote terrain of Southeast Alaska, where detection rates appear to be lower than in other areas (U.S. Fish and Wildlife Service 2007). Goshawks often have multiple alternate nests within a territory, which further complicates management of nest sites (USDA Forest Service 2007). Recent research in the southwestern U.S. confirms the difficultly in managing for goshawks only at the nest scale because detectability of goshawks is highly variable among individuals as a result of extensive year-to-year and spatial variation in breeding. Goshawks do not always nest every year, often skipping nesting

for one or more years; this behavior is most likely due to prey abundance and availability (Reynolds et al. 2005).

2.4.2.2. American marten

Several new studies and concerns related to the conservation of marten were presented at the Interagency Conservation Strategy Review: An Assessment of New Information Since 1997 in April 2006 (USDA Forest Service 2007). Marten experts reviewed and summarized new information relevant to Tongass management issues. New information was presented relative to the level of endemism in marten on the Tongass. Preliminary molecular analyses distinguish two lineages of marten and indicate that they have very different evolutionary histories (Stone and Cook 2002, Small et al. 2003, Cook et al. 2006). The two lineages (*americana* and *caurina*) are considered by some to be two species, but have not been formally identified as such. The *caurina* lineage is known to inhabit only two islands within the archipelago (Admiralty and Kuiu Islands; Cook et al. 2006). There are two contact zones (i.e., zones where the lineages coincide) in North America, one in Southeast Alaska and one in Montana (Cook et al. 2006). In addition, there are records that marten were introduced on many islands in Southeast Alaska in including Prince of Wales, Baranof, Chichagof and nearby smaller islands (MacDonald and Cook 2007). The authors speculate that the endemic lineage of marten (*caurina*) may have occurred on more islands than Kuiu and Admirality and may have been extripated by introductions of *americana*.

Between 1990 and 1998, studies were conducted on Chichagof Island to assess marten habitat selection at multiple scales, demographics, diet, and prey availability. Results indicated that marten numbers fluctuated greatly over time in response to food availability and trapping mortality (Flynn et al. 2004). Habitat requirements reflect a strong interaction between food, cover, climate, and predation, with forest cover being particularly important for travel, dens and resting sites, hunting and avoiding predation, and staying dry. Martens selected forest stands with increasing amounts of structure (e.g., selected stands with a greater number of large trees and multiple stories); with stronger selection occurring in winter. Important habitat features included large logs and stumps in decay classes 4 and 5 and the bases of large live trees, which they use for dens and resting sites. Habitat data were consistent with the Forest Plan definition of high value marten habitat.

Several studies have indicated that marten are sensitive to fragmentation (Hargis et al. 1999, Flynn et al. 2004). Based on metapopulation theory, spatially isolated populations will persist in suitable habitats if regularly recolonized (Ruggiero et al. 1994).

To determine whether the results of the Chichagof Island studies were applicable across the Tongass, eight study areas in Southeast Alaska were established between 2001 and 2003, representing different marten populations (Flynn et al. 2004). Hypotheses include 1) marten abundance is greater than or equal to 25 marten per large OGR (which was an assumption for the Forest Plan Conservation Strategy) and 2) marten densities would be greater on areas with habitat composition similar to OGRs, but with more diverse and abundant food resources.

This study indicated that only the Chichagof Island site had abundance estimates of greater than 25 females per OGR and only the Point Couverden and Thomas Bay sites had upper confidence intervals greater than 25 females per OGR. A large variation in small mammal abundance was observed, with long-tailed voles only abundant on Chichagof Island, Keen's mice common except on the mainland, and red-backed voles occupying a limited distribution but numerous where they occurred (e.g., Etolin Island, Point Couverden, Thomas Bay, and Yakutat). Marten fed on long-tailed voles when they were available, and generally avoided Keen's mice and red-backed voles. However, when vole numbers were low, marten switched to salmon. Marten numbers were best predicted by long-tailed vole abundance (positive correlation) and Keen's mice abundance (negative correlation); red-backed voles were not a significant factor. The ungulate index was marginally significant and fragmentation indices were correlated with marten density.

Based on these results, marten experts at the Conservation Strategy Review concluded that the OGR system appears to be an appropriate model for marten conservation, though they felt that management needed to be tailored to specific island populations (Cook and McDonald 2001, Cook et al. 2001). They believe that OGRs may not provide enough habitat in themselves to maintain healthy populations and

additional conservation measures may be necessary, such as managing matrix lands as productive habitat and maintaining corridors between OGRs (Flynn et al. 2004). Studies of marten home ranges have shown that they encompass areas of timber harvest and roads, elevating the importance of matrix management in providing functional connectivity across the landscape for marten (Flynn et al. 2004).

Studies on Mitkof Island indicated that martens selected for POG and used a wide variety of POG types but used some clearcuts 26 to 40 years of age; on Mitkof these clearcuts where characterized by abundant understory forage and small mammals (Flynn et al. 2004). Home ranges of marten were well distributed across the landscape and included areas with timber harvest and roads. Although they selected against it, they seemed to readily travel across areas of noncommercial forest as well as POG and clearcuts with established conifer cover. Prey quality and quantity appear to be very important in predicting marten abundance and distribution.

2.4.2.3. Other Species

Research has also identified new endemic species, and refuted species thought to be endemic. Regardless, changing the list of endemic species considered by the panel assessment would not change the fact that they occupy limited distributions and some are sensitive to habitat conversion related to timber harvest. However, new science is continuing to emphasize the importance of the Alexander Archipelago as a center for endemism from a global perspective (Cook and MacDonald 2001, Cook et al. 2006).

Recent research on small endemic mammals in Southeast Alaska has focused on documenting distribution and increasing information regarding genetic variation. There has been little work, except for marten and flying squirrel, directed at habitat relationships. Therefore, while we know more about endemic mammalian abundance and distribution across the Tongass, there is not much additional information to support significant changes to the Conservation Strategy for endemic mammals.

Recent analyses presented at the Tongass Conservation Strategy Review Workshop (2006) updated the relationship between road density and wolf mortality related to legal and illegal hunting and trapping. This analysis was based on a regression analysis of average wolf harvest by Wildlife Analysis Area (WAA) between 1990 and 1995 against total road density for lands below 370 m elevation. Results presented the probability of an overkill (average harvest of greater than 30 percent of the population) or destructive harvest (harvest greater than 90 percent of the population occurring once between 1985 and 1999) of the wolf population on Prince of Wales Island, taking into account road density and whether the road system was connected to a main road system with access to a ferry. Results indicated that the probability of overkill for WAAs with road density greater than 0.7 miles per square mile at 40 percent, if the WAA is connected to a main road system and 13 percent if not. Results also indicated that 32 percent of WAAs on Prince of Wales Island had road densities indicative of a high probability of overkill and 52 percent had road densities indicating a high probability of having had at least one destructive harvest between 1985 and 1999. These results indicated that roads exerted a strong influence on wolf mortality, particularly when connected to main road systems. However, it is important to note that roads themselves do not decrease habitat capability for wolves, but increased density of roads may lead to higher hunting and trapping mortality through improved human access. There are other methods available to address unsustainable hunting and trapping mortality including changes to both State and Federal hunting and trapping regulations and increased enforcement.

2.5. Modifications to the Strategy under 2008 Forest Plan Amendment

The comprehensive science-based conservation strategy included in the 1997 Forest Plan is a scientifically sound foundation from which to base management decisions. Its system of large, medium and small OGRs across the Forest was implicitly designed to assure well distributed, viable wildlife populations. Alternative 5 of the 2008 Forest Plan Amendment Final EIS maintains the 2007 Forest Plan (1997 Forest Plan, as amended through 2007) old-growth conservation strategy, as described in Sections 2.2 and 2.3. Alternatives 1, 2, 3, and 6 of the 2008 Forest Plan Amendment Final EIS retain the main components of the conservation strategy (i.e., the OGR system and non-development LUDs, the beach

fringe, riparian buffers); in addition, they expand the areas within the Forest-wide reserve network and incorporate some modifications to the standards and guidelines. This section describes the differences between the 2007 Forest Plan's conservation strategy, as represented by Alternative 5, and the conservation strategy proposed under Alternatives 1, 2, 3, and 6.

Alternatives 4 and 7 differ from the other five alternatives in that they eliminate or modify significant portions of the conservation strategy and these are also addressed in this section and compared with Alternative 5 as well as the 1997 Forest Plan. Alternative 4 modifies the coarse filter component by identifying Old-Growth Habitat LUDs in only four of the most heavily modified biogeographic provinces (North Central Prince of Wales, Kupreanof/Mitkof Islands, Dall Island and Vicinity, and East Chichagof Island) in addition to maintaining two individual reserves including the Wright Lake (mainland southeast of Wrangell), and Myers Chuck (Cleveland Peninsula northwest of Ketchikan) reserves and creating one near Eva Lake (northeast Baranoff Island) in an area currently designated as Semi-Remote Recreation. In addition, all VCUs outside of these biogeographic provinces would be required to retain 33 percent of their old growth with no requirement to consider spacing, location, size, shape, or composition in the design of the retained acres, as is provided by the 2007 Forest Plan Old-Growth Habitat Reserve Criteria (see Section 2.2.1.2, *Description and Design Features of the Reserve Network*). As under all other alternatives, OGRs are also provided by other non-development LUDs, although, with the exception of Alternative 7, the acreage is less under Alternative 4 than under all other alternatives. Alternative 7 maintains substantial area in non-development LUDs, but entirely eliminates the Old-Growth Habitat LUD and would not have a specific retention requirement.

Of the other alternatives, Alternatives 1, 2 and 3 all have significantly less old-growth harvest as compared to Alternative 6. This Appendix therefore focuses on effects to Alternative 6 because this is the benchmark by which to measure effects to these three other alternatives. Adverse effects to wildlife would be less under Alternatives 1, 2 and 3 based on the volume of old growth projected to be harvested and this is fully discussed in the Wildlife Section of the FEIS.

2.5.1. Changes to Forest-wide Reserve Network (coarse-filter approach)

The Forest-wide Reserve network is expanded under Alternatives 1, 2, 3, and 6, relative to Alternative 5 (the 1997 Forest Plan Revision as amended). This expansion includes additional acreage in the Old-Growth Habitat LUDs relative to Alternative 5 and relative to the original 1997 Forest Plan. The expansion of the Old-Growth Habitat LUDs is the same for all four alternatives. In addition, the acreage in non-development LUDs is expanded for each of the four alternatives, with the amount of the expansion varying by alternative. As noted above, Alternative 4 identifies a smaller area than Alternative 1, 2, 3, 5, or 6 in Old-Growth Habitat LUDs and Alternative 7 does not identify any area.

2.5.1.1. Changes to Old-Growth Habitat LUDs

The original 1997 Plan noted that small OGRs had received less analysis and mapping precision than was necessary to meet the Plan standards. Large and medium OGRs received a rigorous review to be sure that they achieved the conservation strategy objectives (1997 Forest Plan, p. 3-82). However, the small OGRs received differing levels of reviews. Therefore, the Forest Plan and the Tongass National Forest Land and Resource Plan Implementation Policy Clarification (referred to as TPIT; USDA Forest Service 1998;) provided for the further evaluation and possible adjustment of the locations of small OGRs (USDA Forest Service 1997, Forest Plan, p. 3-82).

The 1997 Forest Plan standards and guidelines for OGRs state that during project level environmental analyses for project areas that include or are adjacent to a mapped OGR, the size, spacing and habitat composition of mapped reserves may be further evaluated (USDA Forest Service 1997, Forest Plan, p. 3-82). TPIT (USDA Forest Service 1998, p. 1) stated that an interagency team of biologists (referred to as the interagency team) would jointly evaluate the location and composition of the small OGR as mapped in the Forest Plan using criteria in Forest Plan Appendix K. The objective of the interagency team review described above was to develop a consensus biological recommendation on small reserve locations that was consistent with the Forest Plan. The Forest Service line officer retained decision authority to implement recommended changes or modify them. Because changes in OGRs resulted in a change in LUD, a Forest Plan amendment was required to implement changes.

As described in Section 2.3, analysis and mapping refinement of OGRs associated with 24 project areas has been conducted since 1997 (Table D-2). These adjustments were incorporated into the Forest Plan via non-significant Forest Plan amendments. Efforts to complete this higher level of analysis and mapping on all other small reserves have been ongoing since 1997. As part of the current Forest Plan Amendment process, the Forest worked with the Alaska Department of Fish and Game (hereafter referred to as ADFG) and the U. S. Fish and Wildlife Service (hereafter referred to as FWS) to complete a more comprehensive review and mapping effort. This process was conducted in 2006 and 2007 and included the development of a biological recommendation for adjustment of OGR boundaries, a refinement of that proposal with Forest Service Ranger District staff, and a further refinement by the Forest Supervisor. This refinement process was conducted in order to consider multiple-use objectives in addition to pure biological ones. The final proposal is included in Alternatives 1, 2, 3, and 6 of the Final EIS. Alternative 5 retains the 1997 Plan (as amended) reserve network and the reserves of Alternatives 4 and 7 are not affected by this proposal.

The final proposal for modifying small OGR boundaries was based on reviewing all small OGRs and a few medium reserves. As a result, OGR locations were generally finalized for all but 13 small OGRs. OGR locations are expected to change in the future only if a project occurs near these 13 reserves or under other limited circumstances (see Appendix K to the Final EIS). The net result of the review was an increase of 39,000 acres in the Old-Growth Habitat LUD, from 1,182,000 to 1,221,000. In addition to this expansion, some areas containing Old-Growth Habitat LUDs were converted to other non-development LUDs (e.g., Special Interest Area and Semi-Remote Recreation) and remain a part of the OGR network. These areas are discussed in the next subsection and the net result of all these changes is summarized in Section 2.5.1.3.

Not only was the total acres in the Old-Growth Habitat LUD increased, but the quality of the small OGRs was also improved. Updated local information was used, in many cases, to increase the protection of key old-growth species habitat, including known goshawk nests, important black bear, mountain goat and brown bear habitat, riparian habitat, anadromous streams and beach fringe. In addition, connectivity was another consideration in updated small OGRd locations. Rationale for making these adjustments were documented in an OGR tracking table for the refinement effort (located in the planning record).

2.5.1.2. Changes in Other Non-Development LUDs

The Old-Growth Habitat LUDs discussed in the previous subsection are a critical piece of the OGR network, but many other non-development LUDs represent important parts as well. Although the area in Old-Growth Habitat LUDs is the same for Alternatives 1, 2, 3, and 6, the total area in other non-development LUD categories varies. Alternatives 4, 5, and 7 vary in both their Old-Growth Habitat LUD and their other non-development LUD acreage. The acreage in many individual non-development LUD categories is constant regardless of the alternative (e.g., wilderness, LUD II, research natural area); however, the acreage in three non-development LUD categories (other than Old-Growth Habitat) differs among alternatives. These categories include: Special Interest Area, Semi-Remote Recreation, and Remote Recreation. Special Interest Area acreage was expanded by 47,000 acres relative to Alternative 5 (the 1997 Forest Plan, as amended), under Alternatives 1, 2, 3, 4, 6, and 7. The change in Semi-Remote and Remote Recreation acreages varies by alternative. For Alternative 6, the area in these two LUDs increased by 63,000 acres compared with Alternative 5. For Alternatives 1, 2, and 3, these LUD acreages increased by 2,681,000, 1,591,000, and 717,000 acres, respectively, while for Alternatives 4 and 7 the LUD acreages decreased by 379,000 and 308,000 acres, respectively.

The net increase in non-development LUD acreage (not counting the Old-Growth Habitat LUD) relative to Alternative 5, would be 110,000 acres for Alternative 6 and would range from 763,000 to 2,728,000 acres for Alternative 3, 2, and 1 in that order, respectively. Under Alternatives 4 and 7, non-development LUDs other than Old-Growth, would decrease by 333,000 and 261,000 acres, respectively. While it is recognized that not all acres within these LUDs are old growth, there would be a net increase in the reserve system under Alternatives 1, 2, 3, and 6 that is proportional to the increase in non-development LUD acres and a proportional decrease under Alternatives 4 and 7.

2.5.1.3. Net Changes to the Forest-wide Reserve Network

The acreage in reserves, given the above changes in the Old-Growth Habitat LUD and other non-development LUDs, is compared with the acreage in the matrix for the alternatives and compared with the 1997 version of the Forest Plan in Table D-5. This comparison shows that the 1997 version of the Plan included 78.0 percent of the Forest in reserves. As a result of land adjustments and OGR changes between 1997 and 2007, the 2007 Forest Plan (equivalent to Alternative 5) now has 78.5 percent of the Forest in reserves. Alternatives 1, 2, 3, and 6 would each result in a higher percentage yet, ranging from 79.4 percent in reserves under Alternative 6 to 95.0 percent in reserves under Alternative 1. Under Alternative 4, the percentage in reserves would be reduced to 71.8 percent, and under Alternative 7 this percentage would be reduced to 69.9 percent.

Table D-5.
Summary of Acreages in Reserves and Matrix under the Alternatives compared with the Forest Plan in 1997

	Reserves					
Alternative	**Old-Growth Habitat LUD**	**Other Non-Dev. LUDs**	**Total in Non-Dev. LUDs**	**Matrix**	**Total**	**Percent of Forest in Reserves**
Alternative 1	1,221,173	14,712,270	15,933,443	840,359	16,773,802	95.0%
Alternative 2	1,221,173	13,623,148	14,844,321	1,929,485	16,773,806	88.5%
Alternative 3	1,221,173	12,748,685	13,969,858	2,803,945	16,773,803	83.3%
Alternative 4	393,360	11,652,756	12,046,116	4,727,686	16,773,802	71.8%
Alternative 5 (1997 Forest Plan)	1,182,424	11,985,410	13,167,834	3,605,974	16,773,808	78.5%
Alternative 6	1,221,173	12,095,212	13,316,385	3,457,420	16,773,805	79.4%
Alternative 7	0	11,724,107	11,724,107	5,049,695	16,773,802	69.9%
1997 Forest Plan	1,131,059	12,034,860	13,165,919	3,717,081	16,883,000	78.0%

Sources: Final EIS Chapter 2 for the Alternative numbers; Appendix N to the 1997 Tongass FEIS and Appendices to Appendix N for 1997 numbers.

A summary of POG acres in reserves and in various matrix categories is provided in Table D-6. This table presents POG acreages for the Forest-wide reserve network under Alternatives 1, 2, 3, and 6, given the above changes in the Old-Growth Habitat LUD and other non-development LUDs, as well as under Alternatives 4, 5, and 7, which do not include the above changes in the Old-Growth Habitat LUD. The table also compares these alternatives with the 1997 version of the Forest Plan. Based on these numbers, the 1997 version of the Forest Plan included 70.1 percent of the existing POG in reserves; combined with the protected and unscheduled POG in the matrix, 90.6 percent of the current POG was protected or not scheduled to be harvested. Again, Alternatives 1, 2, 3, and 6 would each result in higher percentages for both of these categories, with 72.0 percent of the POG in reserves and 91.0 percent of the existing POG protected or not scheduled for harvest under Alternative 6.

Under Alternative 5 (the 2007 Forest Plan), 71 percent of the existing high-volume POG (SD Model types 5N, 5S, and 67) and 68 percent of the existing large-tree POG (SD Model type 67) would be included within reserves (Table D-6). Overall, 90 percent of the existing high-volume POG and 89 percent of the large-tree POG would not be harvested. These percentages would all remain the same or increase under Alternatives 1, 2, 3, or 6 because of the changes made to OGRs and other LUDs, which resulted in a greater portion of the forest types consisting of larger trees being included within reserves. Under Alternative 6, for example, 73 percent of the high-volume POG and 70 percent of the large-tree POG would be included within reserves. Overall, 90 percent of the existing high-volume POG and 89 percent of the large-tree POG would not be harvested. Alternatives 1, 2, and 3 would protect higher percentages of high-volume and large-tree POG in reserves and in the matrix. Under Alternatives 4 and 7, on the

other hand, lower percentages would be protected. Approximately 57 to 60 percent of the high-volume POG and 53 to 57 percent of the large-tree POG would be in reserves under Alternatives 7 and 4, respectively. Overall, 82 to 85 percent of the high-volume POG and 80 to 84 percent of the large-tree POG would be protected from harvest.

Table D-6.
Estimated Acreage and Percentage of All Existing POG, High-Volume POG, and SD67 POG in Reserves[1] and Matrix Lands (minimum protected vs. maximum harvested)[2] by Alternative

Alt.	POG Category	Amount in Reserves[1]		Amount in Matrix[2]				Total Existing POG[3]	
				Minimum Protected		Maximum Harvested			
		Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
1	All POG	4,615,995	93%	249,182	5%	85,972	2%	4,951,148	100%
	High-Volume POG	1,862,441	93%	104,444	5%	41,460	2%	2,008,345	100%
	SD67 POG	477,813	89%	43,253	8%	16,385	3%	537,451	100%
2	All POG	4,167,367	84%	569,270	11%	214,511	4%	4,951,149	100%
	High-Volume POG	1,674,500	83%	232,318	12%	101,529	5%	2,008,346	100%
	SD67 POG	425,744	79%	77,417	14%	34,291	6%	537,451	100%
3	All POG	3,866,467	78%	771,255	16%	313,426	6%	4,951,148	100%
	High-Volume POG	1,572,277	78%	294,628	15%	141,440	7%	2,008,345	100%
	SD67 POG	401,011	75%	90,844	17%	45,596	8%	537,451	100%
4	All POG	2,965,670	60%	1,329,005	27%	656,473	13%	4,951,148	100%
	High-Volume POG	1,203,702	60%	511,928	25%	292,714	15%	2,008,345	100%
	SD67 POG	307,863	57%	145,418	27%	84,169	16%	537,451	100%
5	All POG	3,518,425	71%	970,176	20%	462,556	9%	4,951,156	100%
	High-Volume POG	1,431,634	71%	378,068	19%	198,647	10%	2,008,349	100%
	SD67 POG	364,183	68%	113,501	21%	59,767	11%	537,451	100%
6	All POG	3,563,600	72%	942,410	19%	445,103	9%	4,951,114	100%
	High-Volume POG	1,458,202	73%	352,379	18%	197,760	10%	2,008,342	100%
	SD67 POG	375,671	70%	103,085	19%	58,696	11%	537,451	100%
7	All POG	2,807,478	57%	1,336,275	27%	807,396	16%	4,951,148	100%
	High-Volume POG	1,143,122	57%	502,283	25%	362,940	18%	2,008,345	100%
	SD67 POG	287,295	53%	144,188	27%	105,968	20%	537,451	100%
1997 Forest Plan	All POG	3,551,482	70%	1,038,492	21%	473,597	9%	5,063,571	100%
	High-Volume POG[4]	1,562,652	72%	373,857	17%	219,268	10%	2,155,788	100%
	SD67 POG[4]	--	--	--	--	--	--	--	--

[1] Reserves include all non-development LUDs (e.g., Old-Growth Habitat, Semi-Remote Recreation, Remote Recreation, Wilderness, National Monument, etc.).
[2] Matrix includes all development LUDs (Timber Production, Modified Landscape, Scenic Viewshed, and Experimental Forest). Maximum harvested assumes the maximum acreage permitted by the Allowable Sale Quantity is harvested each decade.
[3] Note that the Tongass land base has changed since 1997 due to land adjustments and harvest has occurred.
[4] High-volume POG numbers were derived from percentages given in Appendices 3 and 8 to Appendix N of the 1997 Tongass FEIS; numbers were not available for SD67 POG. There are differences in the method of calculation for high-volume POG between 1997 and 2008, so the absolute numbers should not be compared – only the percentages.

Sources: Table 3.9-12 in Biodiversity Section for the 2008 alternative numbers; Appendix N to the 1997 Tongass FEIS and Appendices to Appendix N for 1997 numbers.

2.5.2. Changes to Standards and Guidelines (fine-filter approach)

This section describes and provides background/rationale for the changes to standards and guidelines proposed under the seven alternatives. The first section provides a summary listing of the primary

changes in standards and guidelines from the 1997 Forest Plan. Following this section, a series of sections provide background and rationale for the most important individual changes.

2.5.2.1. Overview of Changes to Standards and Guidelines by Alternative

Most of the standards and guidelines identified in the 1997 Forest Plan remain the same for all of the alternatives. The standards and guidelines for Alternative 5 would be exactly the same and most standards and guidelines related to the conservation strategy do not change under Alternatives 1, 2, 3, and 6. This includes key supporting standards, like the 1,000-foot beach buffer and riparian buffers that were deemed critically important for wildlife connectivity; these are brought forward into the amended Plan under these alternatives. However, there are four primary changes, four additional important but non-substantive changes, and some minor editorial changes to standards and guidelines that relate to Alternatives 1, 2, 3, and 6. The four primary changes associated with these alternatives are listed in a subsection below, followed by the important non-substantive changes (minor changes are not listed).

In addition, many of the changes associated with Alternatives 1, 2, 3, and 6 and several additional important changes are associated with Alternatives 4 and 7. These changes are identified in separate subsections below.

Primary Changes Associated with Alternatives 1, 2, 3, and 6

1. Added a new Forest-wide Legacy Forest Structure (hereafter referred to as Legacy) standard and guideline that requires retention of 30 percent of the acreage in harvest units greater than 20 acres in size for VCUs with high amounts of past and/or anticipated future timber harvest. This replaced the goshawk foraging standard and guideline and the marten standard and guideline that required varying degrees of retention of old growth trees in harvest units.
2. Changed the goshawk nesting habitat standard and guideline for confirmed and probable nests to allow timber harvest or other activities if, based on annual monitoring, the nest site is found to be inactive for 2 consecutive years. (note – active nest sites include sites that are occupied, whether or not there is actual nesting documented).
3. Added a stipulation to allow for alternative goshawk nest site management with projects under contract. If a new nest is located within an area that is under a timber sale or other contract, the activity may proceed if at least 300 acres of POG, including at least one contiguous block of 100 acres, remains within a 0.75-mile circular radius of the nest. Timing restrictions would apply to allow that year's brood to successfully fledge from the nest.
4. Clarified that the landscape connectivity standard was to provide connectivity between large and medium reserves only. Also, given the assessment of small OGRs done for the amendment (see below), no additional areas were determined to need additional assessment at the project level and this is reflected in the amended standard.

Other Important Clarifying Changes Associated with Alternatives 1, 2, 3, and 6

1. The endemic terrestrial mammal standard was changed to allow for use of existing data on endemic mammal distribution. Surveys would only be necessary where existing information is not adequate to assess project level effects.
2. Edited the marten road standard to clarify that road management would be considered only where road access and associated human caused mortality has been determined to be the significant contributing factor to unsustainable marten mortality and this would be done in collaboration with the Alaska Department of Fish and Game (ADF&G).
3. Edited the wolf road standard to clarify that road management would be considered only where road access and associated human caused mortality has been determined to be the significant contributing factor to unsustainable wolf mortality, and this would be done in collaboration with ADF&G. It also directs an assessment of both total and open road density when human access considerations are necessary. The wolf standard was changed so that both access management on National Forest System lands and hunter/trapper harvest regulations are considered.

4. Edited the wolf standard to clarify the use of the deer habitat capability model and standardized this to a habitat capability of 18 deer/square mile. The wolf standard was also changed to direct biologists to consider local knowledge of habitat conditions, spatial location of habitat and other factors rather than solely relying upon model results.

Changes Associated with Alternative 4

All of the changes associated with Alternatives 1, 2, 3, and 6 also apply to Alternative 4, except the Legacy standard and guideline. Neither the Legacy nor the goshawk foraging standard and guideline and marten standards and guidelines apply to Alternative 4. In addition, as noted in the introduction to Section 2.5, Alternative 4 has a standard that requires a minimum of 33 percent of POG be retained in VCUs outside of the four biogeographic provinces that include areas with designated Old-Growth Habitat LUDs.

Changes Associated with Alternative 7

All of the changes associated with Alternatives 1, 2, 3, and 6 also apply to Alternative 7, except for the Legacy standard and guideline and the goshawk nest buffer standard and guideline. Neither the Legacy nor the goshawk foraging and marten standards and guidelines apply to Alternative 7 and there would be no nest buffer standard and guideline that is specific to goshawks; only the general heron and raptor nest protection standard and guideline would apply. In addition, riparian buffers along Class III streams are not required under Alternative 7 and the beach and estuary fringe is reduced to 500 feet.

2.5.2.2. Legacy Standard and Guideline – Alternatives 1, 2, 3, & 6

Background from 1997 Tongass Land and Resource Management Plan

The Legacy Forest-wide standard and guideline is an ecological, rather than single-species approach, that retains old-growth forest structure within harvest openings greater than 20 acres in areas that have had or are anticipated to have high timber harvest. The legacy standard and guideline evolved from considerations presented at the Interagency Conservation Strategy Review workshop (summarized in USDA Forest Service 2007). This standard and guideline was developed after discussions with ADFG and FWS at several interagency meetings in 1997. It replaces the species-specific goshawk foraging and marten standards and guidelines from the 1997 Forest Plan Revision to provide protection for goshawk, marten and other wildlife species across a broader landscape. Goshawk foraging and marten standards and guidelines, that prescribed retaining canopy cover in high risk biogeographic provinces, were conservation measures added to the Forest Plan in the Record of Decision to provide additional protections and to increase the already high likelihood that implementing the Forest Plan would maintain habitat to provide for viable populations of goshawks and moderate likelihood that implementing the Forest Plan would maintain habitat to provide for viable populations of marten. This subsection provides a summary of the background for the new Legacy standard and guideline by describing the history of the goshawk foraging and marten standards and guidelines.

American Marten

The risk assessment panel convened in 1997 indicated that there was a better than equal likelihood that implementation of Alternative 11 for 100 years would result in significant gaps in marten habitat distribution on the Tongass (DeGayner 1997). Alternative 11, with modifications, was the Alternative selected in the Record of Decision for the 1997 FEIS. Their interpretation of the outcomes that were used as the basis for risk assessment is as follows (a complete description of the panel assessments with the 5 outcomes is described later in this document in the Wildlife Viability Ratings section). Outcome III, defined as providing habitat to maintain breeding populations but with significant gaps in historic distribution, was interpreted by the panelists as an array of potential conditions. At one end of this array were gaps in habitat as small as the territory of a single marten. At the other end this array was conditions with broad gaps in habitat distribution and significant limitations on population interactions. The panelists considered some part of this array of conditions as meeting the definition of viable and well-distributed. The panelists assigned a total of 91 likelihood outcome points to the sum of Outcomes 1 + II + III. This included 38 likelihood points in Outcomes I and II, which they considered to represent a viable and well distributed

condition. It also includes 55 likelihood points in Outcome III, some portion of which represents a viable and well distributed condition. The panelists indicated there was a very low likelihood that marten would exist only in refugia or be extirpated from the Tongass after 100 years of Forest Plan implementation with a combined Outcome IV and V score of 9. The panelists indicated that matrix management was the feature of the 1997 Alternative 11, as rated, that contributed to the assignment of likelihood points to outcomes that were not well-distributed. They indicated that clearcut silviculture on a 100-year rotation would result in further fragmentation of marten habitat.

The panel evaluators defined the spatial scale of a gap to be one vacant marten territory. A marten territory was considered to be from one to three square miles. The consequence of a gap is some measure of reduced gene flow within the population. Panel evaluators indicated that a population can accommodate a certain, but unknown, level of gaps and still remain viable. The greater the size and number of gaps, however, the higher the risk of reducing gene flow. To avoid creation of gaps by forest management practices, panel evaluators recommended uneven aged harvest, in contrast to clear cutting in blocks, be coupled with a reduced level of timber harvest in the matrix lands. The panel recognized the high degree of natural fragmentation on the Tongass National Forest. The panel could not, however, identify the threshold of POG remaining at which a landscape or a territory would not be suitable for marten reproduction (DeGayner 1997).

The panel was very conservative in their assessment of the definition of a gap, which lead to the assignment of most points in Outcome III. The overall assessment of a moderate likelihood of maintaining viable marten hinged on the 55 likelihood points in Outcome III and the fact that some undetermined portion of this outcome likelihood represented a viable and well distributed condition. It is also important to note that the panel assessed the 1997 Alternative 11 without the additional conservation measures that were added at the decision stage. Even without these additional measures, the panel projected no likelihood that marten would be extirpated from the entire forest under this alternative. Forest Plan was strengthened at the decision stage subsequent to the panel assessment, primarily due to the level of concern about the likelihood of marten populations remaining well-distributed across the Tongass for at least 100 years.

The measures used to strengthen the alternative were based on comments provided by the panelists, information drawn from past studies on marten, and information on existing habitat conditions on the Tongass. Three different measures were applied to Alternative 11 to improve the likelihood of maintaining habitat to support well-distributed populations of marten.

1. Within the five higher risk biogeographic provinces, stands would be managed under practices other than clearcutting.
2. Access management would be used to reduce marten mortality in areas where mortality rates due to trapping/hunting have been identified as a serious risk to marten populations.
3. Additional assurance of maintaining connections between habitat blocks throughout the Tongass would be considered.

Implementation of the above strategy increased the likelihood of maintaining habitat that supports well-distributed marten populations. While it was anticipated that there would likely be gaps in this distribution, there was a low likelihood that there would be significant isolation among marten populations resulting from implementation of the 1997 Forest Plan.

Goshawk

Alternative 11 of the 1997 Forest Plan was rated as having very low likelihood of goshawks existing in refugia or being extirpated from the Tongass after 100 years of Forest Plan implementation. However, because the goshawk was considered for listing under the Endangered Species Act, Alternative 11 was reviewed at the decision stage to determine if features of the alternative could be modified to improve the projected outcome. An additional measure for goshawk habitat was prescribed for Prince of Wales Island where POG was fragmented by past management actions. In VCUs, where over 33 percent of POG has been converted to young stands by past management, any additional management of POG was restricted to 2-acre clearcuts or managed to leave significant structure in harvested stands. Taken in combination

with other measures already in place in the Forest Plan, these additional measures increased the already high likelihood of providing habitat sufficient to maintain viable and well-distributed goshawk populations.

New information Since 1997

Scientific Literature: A considerable number of new studies on goshawks and marten relevant to the Tongass situation have been conducted since 1997. Many new studies and concerns related to the conservation of marten and goshawk were presented at the Interagency Conservation Strategy Review: An Assessment of New Information Since 1997 in April 2006 (USDA Forest Service 2007). This information is summarized along with other studies in Section 2.4.2.

Implementation of Goshawk Foraging and Marten Standards and Guidelines and Forest Plan since 1997: The 1997 goshawk foraging and marten standards and guidelines, coupled with the associated Tongass Plan Implementation Team (TPIT) Clarifications, are lengthy and complex. This complexity has lead to inconsistent interpretation and application across the Tongass (Conservation Strategy Review 2007). In addition, translating canopy cover to standard silviculture terminology has been problematic. The TPIT worked collaboratively to attempt to clarify these standards and guidelines in 1998 and allowed flexibility in the implementation of these standards. Unfortunately, this clarification was lengthier than the original standard and guideline and did not necessarily result in increased clarity. One result of the TPIT clarification was to allow flexibility to clump leave trees when operability concerns or ecological reasons made uniform placement difficult or impossible.

There have also been issues during the implementation of goshawk foraging and marten standards and guidelines. Recent compiled information indicates the lack of consistency in their Forest-wide application, despite the TPIT clarifications. A survey of Tongass District wildlife biologists done in 2007 indicates a high degree of inconsistency and uncertainty in the application of goshawk foraging and marten standard and guidelines (Fadden 2007a). Biologists were not consistent in their interpretation of the standards and guidelines and believed that there was not consistent interpretation Forest-wide. In addition, it was not necessarily clear to biologists how these standards and guidelines actually benefited marten and goshawk.

Review of a sample of planned timber sales since 1997 also demonstrates the inconsistency in application on the ground, with the goshawk foraging and marten standards being implemented using a simple percentage of the stand on some timber sales, using basal area on others, and using trees per acre on others (Fadden 2007b). All of the measures resulted in different effects on the ground, ranging from a clumped leave patches to partial harvest scattered across the unit. Within most timber sales reviewed, implementation of both marten and goshawk standards did take into account other leave areas (stream buffers, karst, etc.), which counted towards the final target (Fadden 2007b). Recommendations in this report included the need to simplify these standards to provide for more consistent application.

Monitoring of timber harvest implemented since 1997 indicates that, overall, timber harvest is occurring at a scale much less than was anticipated in the 1997 Forest Plan EIS. Annual timber harvest has been much less than the Forest Plan Allowable Sale Quantity (ASQ) of 267 mmbf. In 2004, actual harvest was 17 percent of the ASQ and in 2005, harvest was 24 percent of the ASQ. In addition, there is trend toward a decrease in size of traditional clearcuts and a decrease in opening size. Since 1997, the average clearcut harvest size is 11 acres (Conservation Strategy Review 2007). As a consequence, the effects on wildlife have been considerably lower than the level predicted by the 1997 Forest Plan FEIS.

The trend toward smaller opening sizes coupled with the increased use of partial harvest are factors that make timber sales less economical, as well as more difficult to log. A combination of factors including market issues and increased fuel and logging costs are also factors in timber sale economics; however, when coupled with less volume per acre and higher logging costs due to partial harvest, it has exacerbated the economic issues, particularly at the scale of an individual timber sale (as presented at the Interagency Conservation Strategy Review: An Assessment of New Information Since 1997 in April 2006; USDA Forest Service 2007).

The 1997 Forest Plan sought to provide for economic considerations while implementing conservation measures for species of concern. Monitoring of timber sale economics indicates that this approach,

which has resulted in significantly smaller timber harvest unit size and more partial harvest, is likely contributing to significant difficulties in implementing economic timber sales. More information regarding timber sale economics can be found in the *Economic and Social* section of the Final EIS.

While this information indicates the challenge in providing for economic timber sales, the trends discussed above represent several positive consequences for wildlife. The main positive consequence is that more habitat for old-growth associated species is retained as old growth. The second consequence is the ameliorating effects of forest succession. Negative effects to goshawk and marten are strongly associated with the effects of past large-scale timber harvest on the Tongass. Past harvest resulted in much larger openings than are allowed under the 1997 Forest Plan, often occurring within riparian areas and beach buffers, which are high value wildlife habitats. Neither riparian areas nor beach buffers are harvested under the 1997 Forest Plan, nor would they be harvested under 2008 FEIS Alternatives 1, 2, 3, or 6. As young forests mature, they gradually become more suitable for goshawks and marten. Previously, little emphasis was given to the young second-growth component of the matrix in terms of its ability to contribute structure, function, or value to wildlife. However, there appears to be a growing perception that, with active management, young stands can contribute at least some of the values commonly associated with old-growth (Barbour et al. 2005). Key features of old-growth forest include large, old decadent trees, multiple canopy layers, standing snags, down woody debris, and a diverse and abundant herb layer. These features can be maintained or created by retaining structures and organisms at the time of regeneration harvest of old-growth forest and through active management of young, even-aged stands. Some potential approaches to even-aged management involve thinning of older, "commercial"-aged young-growth stands (Deal 2001, Deal and Tappeiner 2002, Deal et al. 2002), including red alder (*Alnus rubra*) in the reforestation of harvested areas to expedite the production of large-diameter conifers (Deal 1997, Deal et al. 2004, Hanley et al. 2006), and the initial use of alternatives to clearcutting (McClellan et al. 2000). It should be emphasized that additional research on the implementation of these techniques is needed.

For example, both pre-commercial and commercial thinning of young-growth stands have beneficial impacts to black-tailed deer by opening up the forest and promoting the growth of understory vegetation. Likewise, active young-growth management has the potential to benefit both marten and goshawk through an increase in small mammal populations (red squirrels and red-backed voles, major prey items of these species, benefit from more open forests with abundant understory vegetation) and by speeding the succession of older young-growth stands toward old-growth condition (Hanley 1996, 2005). Thinning also may benefit forest-dwelling birds, some of which are prey for goshawk (Dellasala et al. 1996). Although the time frame in which young-growth stands become suitable habitat for some old growth associated species is beyond the lifespan of the 10-15 years of this Forest Plan, it is something to be considered as part of a long-term vision for management of the Tongass. It must be noted however that their research on the effectiveness of young-growth management is on going and peer-reviewed results are not yet available. The evidence in support of the potential short and long term benefits of young-growth management for multiple values is derived from a series of demonstration projects that have tested various second-growth management methods (e.g., Zaborske et al. 2002; Deal et al. 2004; McClellan 2004, 2005; McClellan et al. 2005; Wipfli et al. 2003), retrospective assessments (Hanley and Barnard 1998), and other observations. Thus, there remains uncertainty about the true benefits of second-growth management to wildlife. Although active management will likely improve habitat conditions in young conifer stands, significant questions remain regarding the types of treatments, treatment timing, and cost/benefit tradeoffs.

This does not imply that young growth is the same quality habitat as old growth, nor does it ignore the negative consequences of the stem-exclusion phase, which is characterized by dense young trees that shade out most of the understory and thus, provide low habitat value for most wildlife species. But once stands transition out of this stage, they gradually begin to provide the components of good quality wildlife habitat, including larger trees, small canopy gaps, a diverse understory, snags and downed logs. Stands typically do not begin to take on the characteristics of old growth until they reach at least 150 years of age (Alaback 1982). However there is some evidence that some species associated with older forests may in fact use much younger stands (for example, goshawks - see Section 2.4.2.1).

Besides the benefits of succession, another benefit of aging young-growth stands is the increased potential value of these stands for commercial forest products and their ability to replace old growth trees for a significant portion of the supply of timber in Southeast Alaska in the future. Managing young-growth forests in Southeast Alaska is likely to become an increasingly important component of forest management on the Tongass in the coming years. Young-growth stands can be treated through thinning and other intermediate treatments to concentrate growth in fewer, larger trees, improve lumber quality, and/or to enhance habitat conditions for wildlife. Treatments applied to young stands may have a profound effect on the types of materials available in the future, including log diameter, knot size, and wood strength (see *Timber* section of Final EIS for more discussion).

Overall the consequence of substantially less harvest of old growth in the past decade coupled with the increased growth and potential value of young growth for wildlife is beneficial and supports that assumptions made regarding risks to species viability made in the 1997 Plan were conservative. This conclusion is supported by observations that some old growth associated species use younger forests that anticipated in the 1997 Forest Plan (for example, goshawks), that a shift to more commercial forest products coming from young growth forests is occurring and is likely to accelerate over the next two to three decades, and that the beneficial effects to wildlife by less harvest of old growth over the past decade than is greater than was anticipated under the 1997 Forest Plan. This is particularly significant in places with the oldest young growth, which includes some portions of Prince of Wales Island. Of the 187,000 acres of past harvest on Prince of Wales Island, 8,000 acres are now age 50 or older, 42,000 acres are now age 40 to 49, and 54,000 acres are now age 30 to 39. Within 20-30 years, much of the young growth on Prince of Wales Island may be approaching suitable nest habitat for goshawks.

Annual Monitoring and ADFG Reports: According to the 2006 Tongass National Forest Annual Monitoring and Evaluation Report, habitat capability for marten was expected to decrease slightly because of timber harvest activities and road construction across the Tongass. However since timber harvest levels have been substantially less than anticipated, this report documents that effects anticipated to marten under the Forest Plan have been less than anticipated. The most recent ADF&G Furbearer Report (Alaska Department of Fish and Game 2004) suggests that marten populations are stable or increasing across most of the Tongass; the exception potentially being near Juneau. In 2003, over 2700 marten were trapped in Southeast Alaska and both trappers and agency personal reported stable or increasing marten populations in most Game Management Units (GMUs). The two areas with the highest harvest levels are GMUs 2 and 4, which include Prince of Wales Island and Chichigof Island, areas with some of the highest past timber harvest on the Tongass. The link, if any, between habitat changes on the Tongass National Forest and changes in the marten population is difficult to determine. Fluctuations in prey abundance or spatially different trapping pressure are confounding factors. Areas on the Tongass with the most timber harvest continue to have stable or increasing marten populations and trapping regulations have not changed significantly on the Tongass.

Queen Charlotte Goshawk Status Review and Findings: The U.S. Fish and Wildlife Service was petitioned to list the Queen Charlotte goshawk as endangered in May 1994. In June 1995, the Service published a 12-month finding that listing was not warranted. The finding was challenged in U.S. District Court, which remanded the finding to the FWS with instructions to base the finding on the existing management plan for the Tongass National Forest, rather than one in development at the time. The FWS released a new finding (also “not warranted”) in August 1997, which was also challenged in April 1998, and which the court remanded again to the FWS in July 1999, with instructions to provide a reliable population estimate for the subspecies The government appealed this decision in the U. S. Court of Appeals, which overturned the requirement for a population estimate, but remanded the case to the District Court for further consideration of the remainder of the finding. In May 2004, the District Court remanded the finding to the FWS with instructions to evaluate whether Vancouver Island in British Columbia is a “significant portion” of the subspecies’ range and, if so, to determine whether the bird should be listed (U. S Fish and Wildlife Service 2007)

In order to reach an informed decision with respect to the court’s remaining questions on the significance of Vancouver Island and whether the subspecies should be listed, the FWS recently updated the status of the subspecies range-wide. In addition, the FWS published a new finding in November 2007 regarding the status of the Queen Charlotte goshawk. In this report, they concluded that Vancouver Island is a

significant portion of the Queen Charlotte goshawk's range and that listing the subspecies on Vancouver Island is warranted. In addition to addressing the court's remand, they assessed whether listing was warranted for the Queen Charlotte goshawk beyond Vancouver Island. Their review indicated that the subspecies' populations in British Columbia and Alaska each constitute distinct population segments (DPSs) of the Queen Charlotte goshawk. Based on differences in forest management, with substantially greater habitat loss in British Columbia, they found that they had sufficient information about biological vulnerability and threats to the goshawk to determine that the entire British Columbia DPS warrants listing as threatened or endangered. They also found that the best available information on biological vulnerability and threats to the goshawk does not support listing the Alaska DPS as threatened or endangered at this time. Of note are the following key items from the FWS review:

- The majority of POG that existed in Southeast Alaska prior to large-scale logging would remain over time. Most (77 percent) of this habitat is on the Tongass.
- There is no data to indicate how much goshawk populations have declined as a result of timber harvest. Based on one approach, the FWS believes that populations may have declined by 15 percent in Southeast Alaska and as much as 45 percent in British Columbia.
- The most important factor related to goshawk demographics is adult survival. Adult survival is a function of prey abundance and availability.
- Southeast Alaska is relatively prey-poor for goshawks, especially on the islands of the south Tongass. For example, Prince of Wales Island lacks red squirrels and sooty grouse, which are important prey for goshawks on the mainland and islands in the north Tongass. Many studies from across the range of the goshawk suggest that prey availability is one of the most important factors regulating goshawk population size in Southeast Alaska.
- Studies from across the range of the goshawk suggest they select nest stands that have a higher proportion of mature and old forests than random sites.
- Goshawks use a wide range of habitats for foraging within the matrix, including non-forest, young forest, low-volume forests, and clearcuts.
- Goshawks, even juveniles, can travel relatively long distances across salt water, indicating that there are not likely to be barriers to goshawk movement among the islands in Southeast Alaska.

Importance of Retention of Forest Structure After timber harvest and Spatial Considerations

While the benefits of leaving old growth structure after timber harvest are well documented in the scientific literature, the need to leave it after timber harvest on the Tongass is not as clear, given the conservation strategy, the fact that slightly over 90 percent of the existing POG is protected under the 2007 Forest Plan and that there are economic consequences of leaving structure post timber harvest (see Section 2.3). However, past timber harvest has been concentrated in certain portions of the Tongass. While it is true that Forest-wide, the vast majority of old growth would be retained, there are biogeographic provinces and watersheds that have and are predicted to have much higher reductions in old growth than the average. For example, as reported in the 2008 FEIS, the North Central Prince of Wales biogeographic province currently has 74 percent of the original POG and it is anticipated that this would be reduced to 63 percent of the original POG after 100 years of timber harvest at maximum levels allowed by the Forest Plan under Alternative 6. Considering only large tree POG, North Central Prince of Wales province would retain 57 percent of original large-tree POG; however, the East Baranof province would retain only 31 percent. In these and similar areas, there would be elevated risk that there could be gaps in distribution of some species and reduction in connectivity between old-growth patches after 100 years of timber harvest at maximum levels allowed by the Forest Plan.

Many studies validate the importance of retention of legacy trees and patches of old growth after timber harvest for many forest associated species (Masurek and Zielinski 2004, Carey 2000). Retention of this old growth structure affects forest developmental pathways, indirectly affecting wildlife abundance by retaining necessary structural features in both mature and young forests (Deal 2007). In Southeast Alaska, many bird species utilize legacy trees as nesting, foraging, perching, and roosting sites (Sidle and

Suring 1986). The lack of these structural features within forests can negatively impact many old growth associated species (Bunnell *et al.* 1999, 2002, Aubry *et al.* 1999, Bevis *et al.* 2002, Deal 2001, 2007). Work on flying squirrels in Southeast Alaska indicates the importance of the matrix in providing adequate dispersal habitat in order to maintain connectivity between OGRs. Flying squirrels, being arboreal, require these structural components and are found primarily in mature and old growth forests but are also found at lower densities in peatland –scrub forests (Smith and Person 2007).

While numerous studies validate the importance of retention of this structure, research is not available, especially for Southeast Alaska, to guide specific silvicultural prescriptions or to help prescribe specific amounts of leave trees for individual wildlife species. Most Forest Plans in other parts of the United States have incorporated various retention prescriptions. The closest plan ecologically to Southeast Alaska is the Northwest Forest Plan that covers Oregon and Washington. The Northwest Forest Plan requires green-tree retention in at least 15 percent of the area within logging units. It is recommended that at least 70 percent of this retention be implemented in patches or clumps of up to one hectare (about 2.5 acres). In addition to this green-tree retention, the retention of snags and large decadent trees within these green-tree retention clumps is recommended. These prescriptions were developed based on the professional judgment and collective biological knowledge of individuals who have studied the ecological processes characterizing the forests of the Pacific Northwest (Aubry et al. 1999). A large-scale and long-term experiment (the Demonstration of Ecosystem Management Options (DEMO) study) to evaluate the ecological effects and public perception of green-tree retention in western Washington and Oregon is underway. Among the key findings to date are that the pattern of retention is not as important as the amount of retention; however, the retention of 2.5-acre clumps can provide refuges with ecological and mircroclimatic conditions that enable many sensitive species to persist, at least in the short term (USDA Forest Service 2007).

In Southeast Alaska, research has described the characteristics of wind-created openings (Nowacki and Kramer 1998). Understanding the range of natural wind disturbance gaps can help in the development of management prescriptions. Within the four areas studied by Nowacki and Kramer (1998), mean gap size sustaining large-scale wind events ranged from 10 to 39 acres in four study areas, with the range in size of individual gaps from 1 to 1,000 acres. Within gaps, there was also a range in the amount of remnant trees remaining after a windthrow event, with some remnant structure in most gaps. Most gaps had a range from 0 to 50 percent of the stand remaining post wind event.

The 1997 Forest Plan used a harvest unit threshold of 2 acres, for the implementation of goshawk foraging and marten standards and guidelines. No documentation of why this acre threshold was used can be found in the 1997 FEIS; however, there is reference to the practice of group selection in the timber section of the 1997 FEIS. The group selection method prescribes the removal of small groups of trees to create openings in the stand. The forest created, using this method, is a mosaic of small groups of trees of uniform age and height with the goal of regenerating an uneven-aged stand structure across the landscape. Group sizes range from 0.1 acre to approximately 2 acres in size. Research and experience with this method is extremely limited in Southeast Alaska. The ideas behind using this method in Southeast Alaska are to protect excessively steep or unstable soils and reduce the impacts to scenic and wildlife resources.

Rationale for Legacy Standard and Guideline

The legacy standard and guideline as a replacement for the species-specific goshawk foraging and marten standard and guidelines is proposed for the following reasons:

1. It provides a science-based measure of retention of old-growth habitat characteristics (large trees, down logs, snags) Forest-wide rather than only in places where there were concerns related to goshawk and marten. This will provide habitat protections in high risk biogeographic provinces across the forest for more species of concern (including endemic small mammals and forest birds) than the goshawk and marten standards and guidelines in the 2007 Forest Plan.
2. It provides an alternate method for retaining connectivity and prey base for marten and goshawk at the watershed scale. Legacy would apply in 49 VCUs Forest-wide in 7 biogeographic provinces. Goshawk foraging standards under the 2007 Forest Plan apply in 22 VCUs on Prince

of Wales Island only (1 province). Marten standards for high risk provinces under the 2007 Forest Plan apply in 12 VCUs in 2 provinces. Marten standards for moderate risk provinces in the 2007 Forest Plan apply in 107 VCUs in 6 provinces. These standards for low risk provinces apply in 112 VCUs in 6 provinces.

3. Overall, considered in combination with other improvements to the Conservation Strategy, including increased quality of small OGRs, increased old-growth protection in key areas, and increased quantity (acreage) of OGRs, habitat for viable populations of goshawk and marten across the Tongass would be maintained.
4. The Legacy standard and guideline is simpler to implement and will likely have more consistent implementation Forest wide than the previous goshawk foraging and marten standards and guidelines.

These four reasons are explained in detail below.

1. Providing a science-based measure of retention of old-growth habitat characteristics (large trees, down logs, snags) Forest-wide and the value to multiple species.
A review of current science, as described previously, supports both the value of the retention of old growth structure to a wide range of species and the value of taking a broader approach, rather than taking a single-species approach as did the goshawk foraging and marten standards. While the value of retaining old-growth forest components within landscapes managed for timber production has a sound basis in science, there is no scienific basis to support specific prescriptive standards for marten, goshawk or most individual species. In other words, while there may be a scientific basis that supports that partial harvest has less impact to goshawk or marten habitat than clearcutting, there is no scientific basis to support any specific management prescription. Clearly, there is a gradient of the value of habitat conditions for many species, with large contiguous blocks of old growth being most beneficial for many old growth associated species in Southeast Alaska and large expanses of clearcut forest being the least beneficial. But without specific studies indicating what specific prescriptions are of most value, the management decision for these prescriptions are made by considering the risk to the resource (in this case wildlife habitat needs) with the feasibility requirements for other management (in this case, economic timber harvest).

Furthermore, while 1997 Forest Plan prescribed retention of 10 to 30 percent canopy cover as a measure to help maintain connectivity for marten and to maintain foraging habitat for goshawk, there is no scientific basis to support that this relatively low amount of retained canopy cover in a stand provides measurable protection specific to goshawk or marten or their prey. Also there is no scientific basis to support that this degree of retention of canopy cover is effective for maintaining connectivity in fragmented landscapes. The studies summarized previously indicate that more than significantly more than 30 percent canopy cover would need to be retained to meet these objectives. While increased amounts of retention post timber harvest may benefit old growth associated species, including marten and goshawk, they present conflicts in providing for economical timber harvest.

Based on current science, leaving old growth structure post timber harvest in clumps is preferable to leaving the structure in a more uniform configuration across a clearcut because clumps of trees are more likely to be used by a variety of wildlife species, they may benefit other organisms in the forest, and they are more windfirm than scattered trees. As noted above, the DEMO study in western Washington and Oregon has found that many plant and animal species that are sensitive to timber harvest were able to persist in retention clumps of 2.5 acres, indicating that such patches may serve as local sources of recolonization into adjacent harvested areas as the new stand develops (USDA Forest Service 2007).

Leaving structure in clumps rather than scattered is also more efficient for logging with the consequence of reduced logging costs in cable-yarding harvest units. The recently completed logging system and transportation analysis (LSTA) for the Tongass indicates that only 35 percent of the remaining suitable old growth is planned for cable yarding (see Table 3.13-2 in the *Timber* section of the Final EIS). The remaining 65 percent is planned for ground-based logging systems, such as shovel logging, or helicopter. With ground-based or helicopter logging, there is substantial flexibility in terms of how retention trees could be left without significantly affecting logging costs. If only the normal operability ground is considered (excluding the difficult and isolated operability classes), the percentage of ground-based and

helicopter yarding would still be 61 percent. Therefore, there is considerable flexibility available to project IDTs for the majority of future old-growth harvest units, to design retention spatial patterns in a way that is beneficial to wildlife and does not negatively affect timber sale economics.

The legacy standard and guideline addresses the high degree of endemism within the islands of the Tongass and a degree of uncertainty in managing for endemic species because of gaps in information about species distribution and habitat needs. While recent science addresses concerns regarding endemic mammals related to risks of extinction due to island factors and small population sizes and connectivity within islands, there remains a lack of a scientific basis to help managers develop species-specific conservation measures. Therefore, taking an ecological approach to leaving legacy that spans the entire Tongass and focuses on watersheds with a high degree of past timber harvest (harvest that occurred prior to the 1997 Forest Plan) is an approach that, in the absence of science to support other measures, will most likely help ensure connectivity for a wide range of species.

2. Providing an alternate method for retaining connectivity and prey base for marten and goshawk at the watershed scale.

The objectives of the 1997 Forest Plan goshawk foraging and marten standards and guidelines were to improve connectivity for marten by reducing fragmentation, improve habitat conditions to provide for dispersal for goshawks between OGRs and to maintain foraging habitat for both goshawks and marten in the matrix in biogeographic provinces with a high degree of past timber harvest. This was done through the retention of forest stand structure important to these species and their prey (large trees, snags, and down logs) through several standards and guidelines, including those specific to goshawk foraging and marten habitat.

The legacy standard and guideline would apply under Alternatives 1, 2, 3, and 6 for the 2008 Forest Plan Amendment Final EIS within seven high-risk biogeographic provinces, as compared to the 1997 goshawk foraging standard and guideline, which applied one biogeographic province on Prince of Wales Island, and the marten standards and guidelines, which applied in two high-risk biogeographic provinces and three additional moderate-risk biogeographic provinces (Table D-7).

One of the factors contributing to the high likelihood of maintaining sufficient habitat for viable populations of goshawks in the 1997 Forest Plan was the application of a 300-year 'ecological' rotation. While not a rotation as defined in traditional silvicultural terminology, the concept is applied at larger, landscape scale. Application of a 300-year 'ecological' rotation generally results in 1/3 of the productive forest landscape in 0-100 year-old stands (low value to goshawks or most of their prey), 1/3 in 100-200 year old stands (moderate value to goshawks and their prey), and 1/3 in 200-300 or older (old growth) stands (highest value to goshawks and their prey). These proportions of habitat within the scale of goshawk use areas (i.e., median home range of approximately 10,000 acres) across a large landscape would provide habitats with a high likelihood of sustaining well distributed populations. Both extended traditional rotations and the concept of a 300-year 'ecological' rotation were viewed favorably by members of the Goshawk Assessment Panel for sustaining long-term goshawk habitat (Iverson, 1996). Panel members, as did authors of the Goshawk Assessment, concluded that maintaining conifer stands in intermediate age stand structure from 100 to 200 years would, in part, supply stand structure for goshawk prey production, and thus, goshawk foraging opportunities.

Alternatives 1, 2, 3, and 6 for the 2008 Forest Plan Amendment FEIS include the Legacy standard, which requires 30 percent of a stand to be retained in higher risk VCUs for even-aged harvest units over 20 acres in size. Most (over 80 percent) of VCUs within the suitable land base are categorized as low or medium risk because these VCUs currently have more than 67 percent of their historical old growth remaining and will not have more than 67 percent harvested after 100 years of harvesting at the maximum ASQ level.. Because these VCUs will continue to be managed on at least an ecological 300-year rotation, these VCUs have a high probability of maintaining adequate wildlife habitat for many species, including marten and goshawk.

This approach addresses the potential cumulative effects from previous harvest and provides for the retention of a representation of old-growth components across all VCUs managed for timber production. In low and moderate risk VCUs, the representation of old-growth components is provided for by the mix of non-development LUDs, OGRs, and other standards and guidelines. In high risk VCUs, this is provided

for by the legacy standard plus the mix of non-development LUDs, OGRs and other standards and guidelines.

Implementing the legacy standard and guideline in high risk VCUs will help ensure connectivity between OGRs within the matrix where connectivity may have been affected by past harvest practices. There is a high likelihood that VCUs with little past harvest will have a high degree of connectivity even after 100 years of implementing the Forest Plan because of the suite of protective measures that are in place under Alternatives 1, 2, 3, 5, and 6.

Table D-7 provides a summary of the number of VCUs where the legacy, goshawk, and marten standard and guidelines apply. There are two scenarios within which the legacy standard and guideline differs from the goshawk foraging and the marten standards and guidelines. First, there is no requirement to leave 30 percent legacy in harvest units 20 acres or smaller in size. Legacy would only be left in harvest units that are greater than 20 acres and this number was selected because it represents a typical harvest unit, based on analysis of the Logging System Transportation Analysis (LSTA). This typical harvest unit

Table D-7.
Number of VCUs where the Proposed Legacy Standard applies, compared with the number of VCUs where the Goshawk and Marten Standards apply, by Biogeographic Province

			Marten Standard & Guideline[1/]		
Biogeographic Province	**Legacy Standard & Guideline**	**Goshawk Standard & Guideline**	**Currently >33% Harvested[2/]**	**>33% Harvested in the Future**	**<33% Harvested Now & in the Future**
Yakutat Forelands	3	-	-	-	-
Yakutat/Glacier Bay Upland	-	-	-	-	-
East Chichagof Island	-	-	-	16	30
West Chichagof Island	-	-	-	-	-
East Baranof Island	1	-	-	-	-
West Baranof Island	4	-	-	-	-
Admiralty Island	-	-	-	-	-
Lynn Canal	-	-	-	-	-
Northern Coast Range	-	-	-	-	-
Kupreanof/ Mitkof Islands	-	-	-	22	13
Kuiu Island	-	-	-	-	-
Central Coast Range	-	-	-	-	-
Etolin Island and Vicinity	2	-	-	12	10
North Central Prince of Wales Island	31	22	9	30	31
Revilla Island/Cleveland Peninsula	3	-	3	23	19
Southern Outer Islands	5	-	-	-	-
Dall Island and Vicinity	-	-	-	-	-
South Prince of Wales Island	-	-	-	-	1
North Misty Fiords	-	-	-	-	-
South Misty Fiords	-	-	-	-	-
Ice Fields	-	-	-	-	-
TOTAL	49	22	12	103	104

[1/] Marten standards and guidelines include one level of retention in VCUs with >33 percent harvest and one level for VCUs with <33 percent harvest. The VCUs listed in the first column under marten will always follow the >33 percent harvest retention rules and the VCUs in the third column under marten will always follow the <33 percent harvest retention rules. The VCUs in the middle column start out under the <33 percent harvest retention rules and switch after the 33 percent harvest threshold is reached.

[2/] The VCUs listed in this column under marten are additional to VCUs that are counted under the Goshawk standard and guideline.

is what is available for harvest after considering landforms, land suitability, Tongass Timber Reform Act riparian buffers and other resource considerations mapped for the LSTA. For wildlife species sensitive to forest fragmentation, smaller clearcuts are better than larger clearcuts. Legacy was retained only in units greater than 20 acres in response to the challenge of providing economic timber sales while conserving wildlife habitat. This was chosen because of the lack a clear scientific basis for determining what sized clearcuts are absolute barriers to wildlife, because there is no clear scientific basis to support that 10 to 30 percent canopy cover retention mitigates the effects of clearcutting on wildlife and in order to address timber harvest logistical and economic considerations.

Because legacy only applies in openings greater than 20 acres in size, there is a risk of increased negative consequences for goshawks and marten at the stand scale than was anticipated in the 1997 Record of Decision (but not in the 1997 FEIS, see discussion in 3 below). However, considering that wildlife encounter both natural and human caused fragmentation on the Tongass, opening sizes from natural wind events range up to 1,000 acres, but are typically less than 40 acres, and there are few actual barriers (except saltwater) for many species on the Tongass, wildlife movements will continue to be facilitated through managed landscapes. While there would be openings as large as 20 acres without retention of legacy, a typical timber sale layout will have a mix of unit sizes and configurations. The combination of all the protective measures specific in the Forest Plan, including riparian buffers and implementation of other standards and guidelines, will result in timber sale layout that has significant more leave as compared to pre 1997 Forest Plan timber harvest practices.

The second scenario where legacy differs is that marten standards require two additional measures of retention that are not prescribed with the legacy standard and guideline. First, marten standards under the 2007 Forest Plan require 30 percent canopy cover retention in VCUs that would, in the future, have > 33 percent of the VCU harvested in what are considered high risk biogeographic provinces for marten. Alternatives that adopt the legacy standard and guideline would not require this additional measure; however, these VCUs are considered to be moderate risk overall, because a higher percentage of their harvest will have occurred under more protective standards and guidelines and a higher percentage of retention will be present, compared with VCUs that are rated as high risk by the legacy standard and guideline. Second, marten standards require a smaller level of retention (10-20 percent) in VCUs that would never exceed 33 percent harvest. Again, alternatives that adopt the legacy standard and guideline would not require this additional measure; these are considered to be low risk VCUs, which will have an even higher percentage of retention within the matrix due to the fact that the harvest percentage is low and/or a greater percentage of the harvest will have occurred under more protective standards and guidelines (which require more retention).

Observations from implementing the Forest Plan since 1997 indicates that there are multiple standards and guidelines that provide residual forest structure (trees, snags, down logs) that are retained within timber harvest units. Besides marten and goshawk standards, these include scenery, riparian buffers (including class III streams), soils, and karst standards. In addition, logging system limitations (such as blind leads) also result in portions of stands being retained that are often unreachable with cable logging systems. Partial harvest has also occurred more frequently than anticipated, due to a variety of factors, not just marten and goshawk standards and guidelines. These observations indicate that there is significant structure being retained within watersheds as a result of the Forest Plan standards and guidelines and this structure will provide habitat for many wildlife species, including marten and goshawk.

3. Overall, considered in combination with other improvements to the Conservation Strategy, including increased quality of small OGRs, increased old-growth protection in key areas, and increased quantity (acreage) of OGRs, habitat for viable populations of goshawk and marten across the Tongass would be maintained.

Under the 1997 Plan, the viability assessment for marten (with the assumption of the maximum timber harvest levels allowed over 100 years) of the selected Alternative indicated a moderate likelihood of maintaining viable and well distributed populations of marten across the Tongass. The viability assessment for goshawk indicated a high likelihood of maintaining viable and well distributed populations of goshawks across the Tongass. These determinations were made prior to additional conservation measures added in the Decision. The 1997 Forest Plan and the 2008 Forest Plan EIS both assume that matrix lands would be somewhat fragmented by timber harvest and recognized the risks to wildlife within

a fragmented landscape. It was assumed that a consequence of implementation of timber harvest at maximum levels allowed in the Forest Plan over 100 years was that there would be a reduction in wildlife habitat capability in those watersheds that had significant amounts of fragmentation due to timber harvest, hence the importance of the reserve system. Research focused on the conservation strategy since 1997 has confirmed an assumption of the 1997 Forest Plan that for some species, the OGR system alone may not retain viable populations. This was why the Forest Plan approach of both a reserve system and matrix management was adopted in 1997. Under Alternative 6, total reserve area (non-development LUDs) has been increased by over 150,000 acres and protections are even greater under Alternatives 1, 2 and 3, when considering all additions to non-developments LUDs including small OGRs, increases to geologic special interest areas for karst and increases for other resources. A substantial portion of these additions is POG.

The potential effects to marten described for Alternative 6 in the Final EIS for the 2008 Tongass Forest Plan Amendment are within the range of effects predicted in 1997. These effects would be less under Alternatives 1, 2, and 3. The 1997 Tongass Forest Plan EIS estimated there would be a moderate likelihood that marten populations would remain viable with the selected Alternative throughout the Tongass, before the marten standard and guideline was added in the 1997 ROD to further reduce risk. Alternatives 1, 2, 3, and 6 also reduce risks to marten viability through increased protective measures for marten above and beyond what the viability panels assessed. These additional measures include increased old growth acres retained in both OGRs and other non-developments LUDs; retention of the marten road density and landscape connectivity standards and guidelines; and the addition of the legacy standard and guideline.

Furthermore, the level of risk to goshawk and marten viability described in the 1997 FEIS would be realized only under a certain set of conditions, as follows.

- Timber is harvested continually at the maximum level allowed under the Plan (the ASQ level annually) for 100 consecutive years, with no change in applicable standards and guidelines during that entire period. In essence, the panels did not assess the risks associated with a 10- to 15-year decision, but with a 100-year decision. This risk is relatively low because timber has not been harvested on the Tongass at or near the maximum ASQ level throughout a single planning cycle, let alone several. The first Tongass Forest Plan was adopted in 1979, and was in effect through May of 1997. It had an annual average ASQ of 549 MMBF of total volume. Total volume harvested from 1980 through 1996 averaged 327 MMBF annually, only 60 percent of the ASQ. Since adoption of the 1997 Forest Plan, total volume harvested has averaged 84 MMBF annually, only 32 percent of the annual average ASQ of 267 MMBF.
- If timber harvest rises to the ASQ annually over the next 10-15 years the planning process ensures that any issues that may emerge regarding sustaining viable populations of wildlife species on the Tongass will be addressed. Plans must be revisited through a public process every 10-15 years. Each time, the latest scientific information is examined to determine what changes may be needed. The Forest Service and other State and Federal agencies will continue to monitor implementation of the Forest Plan and its results. If a viability-related problem were to develop, it would be addressed.
- Standards currently in effect are far more protective than those of 20 or 40 years ago. It is highly likely that standards will continue to become more effective over the next several decades through adaptive management as the scientific understanding of how to minimize the adverse environmental effects of human activities continues to improve.

In addition, consideration of the increasing value of aging young-growth stands is crucial when assessing habitat values in the matrix. As young growth matures, habitat becomes more suitable for a variety of forest-dwelling prey. The matrix also increases in value for foraging goshawks, for providing nest sites for goshawks and to provide a variety of habitat conditions beneficial to marten. In addition, not all existing young growth will be managed in the future on an 80 to 100 year rotation. Of the approximately 440,000 acres of harvested lands on the Tongass, 45 percent is within non-developments LUDs and will be managed to enhance future old-growth habitat.

Overall, implementing the legacy standard and guideline increases the likelihood that the matrix will provide many more functions than just connectivity and will help ensure the persistence of all species on

the Tongass. While adoption of this standard and guideline a degree of increased risk with respect of the conservation of goshawk and marten specifically because the legacy standard applies in less VCUs that the 1997 marten standards and guidelines applied and because it applies only in openings greater than 20 acres, this risk does not change the overall conclusion that there is a moderate to high degree of likelihood that sufficient habitat will be maintained to provide for viable populations of marten and goshawk.

4. The Legacy standard and guideline is simpler to implement and will likely have more consistent implementation Forest wide than the previous goshawk foraging and marten standards and guidelines.
The legacy standard and guideline is simpler and clearer than the goshawk and marten standards. The intent is similar – retain forest structure in units after timber harvest. The standard is clear that this structure is meant to be within the harvest units, not on the edge, though it does provide for exceptions when logging systems preclude this. The Forest Plan monitoring plan requires monitoring for a variety of wildlife questions. Adjustments can be made through this adaptive management process if it is determined that our objectives are not being met.

In addition, the goshawk foraging and marten standards and guidelines, with the TPIT clarifications, have often been implemented very similarly to how we expect the legacy standard and guideline to be implemented. Particularly in units harvested with cable yarding systems, patches of old growth have been left as a proportion of the unit, rather than as dispersed trees or as by retention of canopy cover. Observations indicate that canopy cover is difficult to measure and implement and, therefore, a portion of the stand has been left to meet the standards and guidelines. Therefore in high risk VCUs, implementation of the legacy standard and guideline will be the same on many Ranger Districts as was done using goshawk foraging and marten standards and guidelines.

2.5.2.3. Goshawk Nest Buffer Standard and Guideline – Alternatives 1, 2, 3, 4, & 6

Background

Under Alternatives 1, 2, 3, 4, and 6, the goshawk nest buffer standards and guidelines were modified to read as follows:

1. Preserve nesting habitat around all confirmed and probable goshawk nests. If, based on annual monitoring, a previously active nest is found to be inactive for 2 consecutive years, protection measures for the site may be removed.
2. When a new nest is located within an area that is under a timber sale or other contract, the activity may proceed if at least 300 acres of POG, including at least one contiguous block of 100 acres, will remain within a 0.75-mile circular radius of the nest. Timing restrictions on some activities will be applied to allow that year's brood to successfully fledge from the nest.

The purpose of change 1 was to allow for future tiimber harvest in areas if evidence indicates goshawks have discontinued use of the nest stand. Note that this considers active nest sites very conservatively and include sites that are occupied, whether or not there is actual nesting documented.

The purpose of change 2 was to allow a measure of flexibility when goshawk nests are found during implementation of a timber sale or other contract. This is of particular concern during timber sale contracts, but also could occur during implementation of other contracts. Goshawks predominately have alternate nests within a territory. When found, active nest sites are protected with a 100-acre nest buffer, but there is a high likelihood that the pair will move to an alternate nest site in subsequent years. Since timber sales are planned several years in advance of actual harvest, the likelihood of this happening before harvest, when a timber sale is under contract, is compounded. When goshawks move to an alternate nest, it is particularly problematic for management if they move into a timber sale unit or within a road location after a contract has been awarded. In this case, unless the purchaser and Forest Service can come to a mutual contract agreement, the government becomes liable to claims when the nest is

buffered and the unit or portion of unit is dropped from the contract. Therefore, it is desirable to have flexibility to address these contract issues on a case-by-case basis.

New science relevant to goshawks and the conservation strategy is summarized in Section 2.4.2.1.

Rationale

The use of alternate nest sites within a territory coupled with the year-to-year variation in actual nesting makes it difficult to determine if goshawks are actively nesting within a nest stand or territory. Research indicates that goshawks commonly have multiple alternate nests within a territory. Alternate nests may occur within the 100 acre nest buffer or could elsewhere within the territory. Within one study in Southeast Alaska, only 54 percent of alternate nests occurred within 100 acres of known nests, indicating that goshawks commonly move nests outside known nest stands (USDA Forest Service 2007). This, coupled with the difficulty in finding nests in Southeast Alaska means there is some risk that observers will fail to detect an active nest within the territory. In addition, because goshawks do not necessarily nest every year and may go several years between successful nesting attempts, there is some risk that managers will not be absolutely certain a nest site is abandoned after inventorying for only 2 years. It is labor intensive to find goshawk nests and verify actual reproduction in a territory. This is even more costly in the remote, inaccessible terrain of Southeast Alaska. Since goshawks may not attempt to nest for 2 or more years and individual goshawks are highly variable in the number of years between successful nesting attempts, the only method for managers to be absolutely assured that goshawks are no longer using a territory would be cost prohibitive. Using 2 years allows some measure of assurance that managers will not inadvertently harvest an active nest stand, but this is not without risk. There is some risk that a once active nest stand will be logged because not all nesting goshawks are detected and because some goshawks pairs may return to nest in a stand after two or more years absence. In addition, there is some risk that the nest stand may become unsuitable for future nesting.

Standards and guidelines outline relatively conservative criteria for what constitutes confirmed and probable nests. Observers do not need to actually find the nest to confirm a stand as a nest stand requiring a 100 acre buffer. A confirmed stand is one where evidence suggests nesting is highly likely and mangers can be relatively assured that they have identified the actual nest tree. Characteristics of confirmed nests include goshawks observed on or near a nest; nestlings or branchers (young not able to fly) observed on or near a nest; goshawk feathers or eggs obtained from the nest or one or more nest structures indicative of goshawk were found with goshawk prey remains, but without positive identified goshawk on the nest and without positive identified feathers from nest. A probable nest is one where evidence suggests nesting is likely nearby, but there is less assurance that managers know where the actual nest tree is. Characteristics of probable nests include aggressive, territorial breeding season adults vocalizing or attacking an observer (without locating a nest); or adults observed during the breeding season in a territory and recently fledged young were observed (without locating a nest).

The fact that timber harvest occurs at all within a goshawk nest territory presents some risk that the goshawk pair will not successfully nest and may ultimately abandon the territory. However, most goshawk nesting habitat on the Tongass will not be affected by timber harvest. Assuming goshawks occupy suitable habitat across the entire the Tongass, most goshawk territories would be protected by virtue of the fact that the majority (71 to 72 percent) of existing POG is protected in reserves (Table D-8).

Providing protection for goshawk nest stands continues to be an important component of goshawk conservation measures in the Amended Forest Plan under Alternatives 1, 2, 3, 5 and 6. Goshawk nests and nest territories are protected in a variety of ways, including the implementation of 100-acre nest buffers within timber harvest areas. Within the matrix, an additional 17 to 18 percent of the existing POG would be protected within the matrix by a suite of buffers and standards and guidelines. Finally, at least an additional 1 percent of existing POG would not be scheduled and would not be harvested primarily because of economics; however, based on the recent history of harvest levels on the Tongass, this percentage could be substantially higher. In total, over 90 percent of the existing POG would be protected over the life of the Forest Plan under Alternatives 5 and 6.

Table D-8.
Summary of POG Protection under Alternatives 5 and 6.

	Alternative	Protected in Reserves (OGRs, Wilderness, Nat. Mon., LUD II, and other Natural Setting LUDs	Protected in Matrix (beach fringe, riparian and other areas protected from harvest by standards and guidelines)	Minimum POG Not Scheduled for Harvest	Total protected
% of 1954 POG *	Alternative 5	65.3%	16.9%	0.8%	83.0%
	Alternative 6	66.2%	15.9%	1.1%	83.2%
% of 2006 POG	Alternative 5	71.0%	18.4%	0.9%	90.3%
	Alternative 6	72.0%	17.3%	1.2%	90.5%

* The % of 1954 POG is the % of POG that was present in 2005 compared to the amount of POG that was estimated to be present prior at the onset of large-scale timber harvest.

It is not possible to estimate how many goshawk nests will be found in the future within units in active timber sales under contract. However, it is likely to be a relatively rare circumstance; since 1997, this issue of has occurred only once, where the nest moved multiple times within the timber sale contract area.

There is no scientific basis in Southeast Alaska to support a management strategy for goshawks that relies on retaining a prescribed threshold of suitable habitat in matrix lands instead of having perpetual nest buffer protections, as was done for management of goshawks in the southwest. While such a strategy would ideally provide flexibility to address timber harvest and goshawk nest conflicts, there are no studies that guide development of a habitat threshold. Science supports that the retention of old growth in matrix lands is an important component of goshawk conservation, especially within biogeographic provinces that are anticipated to be at higher risk for goshawks because they do not maintain a 300-year ecological rotation (Iverson et al.1996). But there are no known thresholds for how much old growth can be harvested before goshawks will abandon a territory. However, as described in Iverson et al. (1996), one estimate of the minimum proportion of old growth in breeding use areas in Southeast Alaska was 23 percent for males and 28 percent for females, respectively. It is instructive to assess the quality and protection status of habitat around known nest sites on the Tongass. Such information supports that known goshawk nests, many of which have been found during timber sale planning and thus are in matrix lands, have a high degree of habitat protection.

During the 1997 Forest Plan process, stand-level analysis was conducted to examine past timber harvest at various spatial scales around known goshawk nests. It also examined additional future risk to known goshawk nesting areas compared to land allocations and standards and guidelines in the Forest Plan. A sample of 36 known goshawk nest areas in Southeast Alaska was used for this analysis. This sample of nests is biased towards goshawks discovered in landscapes predominantly allocated to timber management and may not necessarily be representative of the entire goshawk population in Southeast Alaska. Within this sample, relatively little POG had been harvested around known goshawk nests. The proportion harvested increased with distance from the nest, with 3 percent (range: 0 to 50 percent) within the 0.25 mile radius (radius area = 140 acres), 12 percent (range: 0 to 57 percent) within a 1-mile radius (radius area = 2,040 acres), and 14 percent (range: 0 to 61 percent) within a 3-mile radius (radius area = 18,000 acres). Only 2 of 36 nests (6 percent) had any harvest within the 140-acre area around the nest and only 60 acres within the 0.25 mile radius had been harvested after the nest was discovered. Similarly, only 160 acres at three nests had been harvested within a 1-mile radius once the nest was located.

In addition, this analysis indicated that a total of 20 of 36 (56 percent) goshawk nest sites known at that time occurred in a protected natural setting LUD. Nearly 40 percent of the entire area of all three spatial analysis areas (0.25-, 1-, and 3-mile radii from the nest) would be protected in a reserve in the Forest Plan, despite potentially being a biased sample toward landscapes predominantly allocated to timber

harvest. This reiterates the importance of the non-development LUDs in the overall protection of goshawk nest sites.

A summary of recent research given at the Conservation Strategy Review Workshop (US Forest Service 2007) looked at hypothetical post-fledging areas (PFAs) around 78 known goshawk nests, which indicated that these contained, on average, 39 percent medium- and high-volume old growth, 45 percent productive forest, 8 percent low-volume forest and 4 percent clearcuts. Results of this hypothetical PFA analysis indicated that an average of about 40 percent of the PFAs were medium- or high-volume POG, of which 55 percent was in the development LUDs or non-National Forest System lands.

More detailed analysis was done for the Forest Plan amendment looking at the same issue of protection of habitat around known goshawk nests but included an assessment of two different sized hypothetical PFAs. Both measurements have similar results and therefore, the issue of the actual size or shape of the circle is probably not biologically meaningful. For a 1-mile radius circle, 27 percent of circle was protected POG, 13 percent was POG mapped as suitable for harvest, 10 percent was young growth, 24 percent was unproductive forest, 5 percent was non-forest, non-NFS lands was 14 percent (this land contains POG, young growth, unproductive forest, and non forest), and saltwater was 9 percent. However, this analysis was done using the mapped suitable POG. If the difference between as the mapped suitable and what is actually suitable on the ground (due to a variety of factors, such as steep slopes, new streams, and other standards and guidelines) and scheduled for harvest, the acres of POG protected would increase to about 31 percent of the circle and the acreage of POG not protected would decrease to about 9 percent of the circle.

All of these analyses indicate that goshawk nests on the Tongass are afforded a relatively high level of protection, including both nests that occur within non-development LUDs and those in the matrix lands of development LUDs. In most cases there would be other potential nesting habitat within the goshawk's territory if nest stand was inadvertently logged. The analysis described above is a potential future monitoring tool to see whether newly found goshawk nests in the matrix have similar conditions.

There is the risk that timber harvest will occur within an occupied or historic goshawk nest stand, given that goshawks do not always respond during surveys and thus, there is some risk of overlooking goshawks during timber sale planning. This risk exists with or without changing this standard. However, the risk is reduced during the entire process from planning to layout to contract implementation since stands are visited multiple times and, therefore, it is less likely that a truly occupied stand would be overlooked. In addition, the Tongass will continue to do goshawk surveys for timber sale planning prior to NEPA decisions.

Overall, at least 90 percent of existing POG would be protected or not be scheduled for harvest under either Alternative 5 or 6 after 100 years (assuming the maximum timber harvest levels allowed in these Alternatives). While there is some uncertainty in how many nest stands would be affected by this change in standard and guideline, given the degree of POG retention within goshawk territories in the matrix that provide potential habitat for both alternate nest sites and foraging habitat and that the vast majority of nesting habitat is protected over the life of the Plan, implementation of this standard may affect nest occupation by individual pairs but not substantially affect goshawk populations across the Tongass.

Overall, nest protection within the matrix, while an important component of the conservation strategy, is a relatively small component of the overall conservation strategy because timber harvest will occur within a small portion of suitable goshawk habitat. The U.S. Fish and Wildlife Service, in their 2007 finding (Federal Register 2007. Vol. 72 no. 216 pp. 63123-63140) acknowledged this issue of goshawk nest protections and concluded the following, which confirms the value of the key components of the conservation strategy for goshawks:

> "Nest buffers of 100 ac (40 ha) of POG, as specified in the Forest Plan, are intended to protect individual nests from disturbance. Larger buffers would likely enhance goshawk conservation by providing better habitat for fledglings in the immediate vicinity of the nest, but lack of larger buffers is not expected to reduce fecundity or survival to an unsustainable level because OGRs, which typically protect much larger patches of old growth forest, and other retained forest patches are reserved in each watershed, and we expect goshawks to nest in these reserves as the forest

> around them is increasingly harvested. In some cases, suitable nesting habitat in nearby reserves may already be occupied by nesting pairs, but the territoriality of goshawks is likely to prevent this in most cases."

They also discuss concerns that have been raised about the adequacy of the conservation strategy to maintain goshawk populations and conclude that:

> "In spite of the shortcomings discussed above, we find that the full suite of standards, guidelines, and land designations contained in the 1997 Forest Plan are likely to provide adequate habitat protection to sustain goshawks in Southeast Alaska into the foreseeable future, largely because adequate amounts of old and mature productive forest will be protected in reserves, retention areas, and inoperable stands, in large and small patches, throughout the harvested matrix. "

2.5.2.4. Landscape Connectivity – Alternatives 1, 2, 3, 4 (partially), & 6

The Forest-wide Landscape Connectivity standard and guideline was changed to clarify when the issue of connectivity was important to assess during project implementation. It was also changed given that changes in the small OGR boundaries have improved connectivity between all medium and large OGRs and no areas will need specific consideration during project implementation (see *Biodiversity* and *Wildlife* sections of the Final EIS).

The conservation strategy did not assume that there was connectivity between small OGRs and the mediums and large OGRs. Connectivity would be provided for by beach fringe, riparian buffers, other standards and guidelines, other unsuitable POG, and unscheduled POG. While it may be desirable to consider local connectivity issues within a project area during NEPA analysis, this is not necessary in order to provide for viable and well distributed populations – this was provided by the Forest-wide reserve network of old growth in non-development LUDs.

The other portion of this standard that was added was to consider young-growth treatments that accelerate old growth conditions on unsuitable acres. There are significant acres of young growth in non-development LUDs that could provide connectivity quicker with active management.

Under Alternative 4, this standard and guideline would only apply within the four biogeographic provinces that include small OGRs (see *Biodiversity* and *Wildlife* sections of the Final EIS).

2.5.2.5. Endemic Mammals – Alternatives 1, 2, 3, 4, 6, and 7

The Forest-wide Endemic Terrestrial Mammal standard and guideline was changed to clarify what kinds of information should be used for assessing endemic mammals during NEPA analysis. The standard allows for use of existing information on endemic mammals to be used for project planning where available. The Forest has invested significant funds into numerous cooperative projects with several universities as well as with the Pacific Northwest Research Station. The result of this investment is a significantly better understanding about mammalian distribution in Southeast Alaska, than existed prior to the 1997 Forest Plan (for example, MacDonald and Cook 2007). This is not to imply that we have information on species distributions on all islands of Southeast Alaska. However, on many islands, particularly the larger islands, there is adequate presence/absence data for NEPA analysis. There is some inherent risk to endemic mammals under all alternatives because of their inherent endemism, their distribution amongst islands, and the lack of complete knowledge of their distribution and habitat relationships.

Other guidelines added to the 1997 Plan in response to the panel assessments would also benefit both the endemic and widely-distributed mammals. The connectivity guideline will provide additional measures to maintain connectivity of large and small reserves and other non-development LUDs in places where beach fringe and riparian habitat management areas do not provide adequate connectivity. Guidelines for structural retention for goshawk and marten habitat as well as the legacy standard and guideline will also benefit other mammal species. The increased quality and quantity of the OGR system under Alternatives 1, 2, 3, and 6 will also benefit many endemic mammals, particularly those as most risk, which includes the Prince of Wales flying squirrel.

2.5.2.6. Marten – Alternatives 1, 2, 3, 4, 6, and 7

The American marten Forest-wide standard and guideline was changed to clarify when to consider road density management. The standard clarifies that consideration of access as an issue for marten management should only occur when it is demonstrated that mortality is exceeding sustainable levels and that the most significant factor causing this human access on roads.

This change does not change the intent of the standard; however, it clarifies when it should be implemented. Other minor edits were also done to this standard and guideline that do not change the intent of the standard, but clarify it for more consistent implementation.

2.5.2.7. Wolf – Alternatives 1, 2, 3, 4, 6, and 7

The Alexander Archipelago Wolf Forest-wide standard and guideline was changed to clarify when to consider road density management. It also incorporated information from the Conservation Strategy Review that indicated that both open and total road density were important factors to consider when assessing road effects on wolves. The standard clarifies that consideration of access as an issue for wolf management should only occur when it is demonstrated that mortality is exceeding sustainable levels and that the most significant factor causing this human access is roads.

This change does not change the intent of the standard; however, it clarifies when it should be implemented. Other minor edits were also done to this standard and guideline that do not change the intent of the standard, but clarify it for more consistent implementation. It continues to outline the need for a cooperative interagency analysis to identify regions where wolf mortality is apparently excessive. In such areas we would attempt to determine if the mortality is unsustainable and identify the probable causal factors of the excessive mortality. If road access and specific roads are identified as contributing to excessive mortality, then road closures or access management recommendations can be made and actions taken. In addition, seasons, harvest methods and bag limits need to be considered as population management tools by the ADF&G and Federal Subsistence Board as a cooperative approach to managing wolf mortality at a sustainable level.

The 1997 Forest Plan did not prescribe a rigid open road density limit and one is not proposed in this amendment. The Wolf Assessment Panel recommended not using a specific road density “rule of thumb.” This was contrary to recommendations in Suring et al (1993) where a road density limits from 1 to 1.25 mile of open road per square mile were recommended, depending on geographic location. Establishing a rigid road density level was not done because the resulting arbitrary closure roads to meet this density was determined to provide no management assurance that wolf conservation objectives would be achieved. Furthermore, it could unnecessarily limit overall public use of an established road system that may otherwise have no specific adverse impact on wolf mortality. Management recommendations for road and access management, if necessary, would result from the site-specific analysis discussed above that would identify a problem requiring a local and cooperative management resolution. Road densities above or indeed below these referenced densities may be appropriate to effectively manage road-access related wolf mortality. This approach is also taken by the amended Forest Plan.

Changing the standard and guideline to consider total rather than just open road density takes into account updated science supporting the relationship between wolf mortality and both open and closed roads. The standard and guideline also retains a range of road densities, based on research from several locations, including Alaska, Minnesota, and other states, that guide managers to determine the need to take action to address wolf mortality concerns. Based on research described in Section 2.4.2.3, the risk of unsustainable wolf mortality is higher on islands with roads that connect to communities than islands with no roads or roads that do not connect to a community. Given this variability in risk, adopting a range instead of one number allows better consideration of more site specific management that directly addresses actual human use.

2.5.2.8. Elimination of Legacy and Goshawk/Marten Standards and Guidelines – Alternatives 4 & 7

Alternatives 4 and 7 were developed because of the need to evaluate alternatives that satisfied higher timber volume demand levels than the 2007 Forest Plan. As such, methods of increasing timber volume

levels were evaluated that caused the least impact to the conservation strategy. The elimination of the requirement to leave legacy or reserve trees within harvest units, as prescribed by the Legacy and the Goshawk and Marten standards and guidelines, was one of the key methods identified. As noted above and in Section 3, neither of these standards and guidelines were assumed for the viability panel ratings.

2.5.2.9. Minimum 33 Percent POG Retention – Alternative 4

Alternative 4 is different from the other alternatives in that it identifies Old-Growth Habitat LUDs in only four biogeographic provinces (North Prince of Wales Island, Kupreanof/Mitkof, Dall Island, and Northeast Chichagof), in addition to several individual reserves (Myers Chuck, Lake Eva, Wright Lake) in other provinces. This concept was first analyzed under Alternative 6 in the 1997 FEIS. Overall, Alternative 4 includes only 393,360 acres of Old-Growth Habitat LUDs, compared with 1,182,424 acres for Alternative 5. In order to provide for a minimum level of POG in VCUs outside of these four provinces, a new standard would require that a minimum of 33 percent of POG be retained in each VCU that occurs outside of the four biogeographic provinces. However, this requirement would not have a major effect on POG retention because few VCUs would result in less than 33 percent POG retention and the majority of those that would occur within the four biogeographic provinces.

2.5.2.10. Reduction of Beach Fringe – Alternative 7

Additional modifications were made to the standards and guidelines under Alternative 7 to respond to public comments so that this alternative could provide a higher level of timber volume and improve timber sale economics, while minimizing effects on the conservation strategy. This item and the next two items fall into this category; however, the reduction of the beach fringe is the most significant. Under Alternative 7, the beach fringe buffer would be reduced from 1,000 feet to 500 feet from the shoreline. This concept was first analyzed under Alternative 2 in the 1997 FEIS. Because this low-elevation band typically contains larger trees, is more easily accessible, and adds a substantial amount of suitable forest land, this modification has a large effect on available timber volume and average timber sale economics. On the other hand, it would negatively affect many wildlife and plant species that use or inhabit beach fringe habitats more extensively than most other Tongass habitats, and would negatively affect old-growth connectivity.

2.5.2.11. Elimination of Class III Stream Buffers – Alternative 7

As noted in Section 2.5.2.10, additional modifications were made to the standards and guidelines under Alternative 7 to respond to public comments so that this alternative could provide a higher level of timber volume and improve timber sale economics, while minimizing effects on the conservation strategy. The elimination of the requirement to leave riparian buffers along Class III streams is one of these modifications. It would not produce a substantial additional timber volume, but could result in more economic timber sales, since Class III stream buffers are thought, by many, to be a key factor in timber sale economics.

2.5.2.12. Elimination of Goshawk-Specific Nest Buffer Standard and Guideline – Alternative 7

As noted in Section 2.5.2.10, additional modifications were made to the standards and guidelines under Alternative 7 to respond to public comments so that this alternative could provide a higher level of timber volume and improve timber sale economics, while minimizing effects on the conservation strategy. Elimination of the goshawk-specific nest buffer standard and guideline is another modification that contributes to this goal. Only the general heron and raptor nest protection standard and guideline would apply to confirmed or probable goshawk nests. This means that active nests would receive forested 600-foot wind-firm buffers, where available, and that road construction through the buffer would be discouraged. Disturbance during the active nesting season would be prevented and protection measures could be removed if the nest is inactive after 2 consecutive years of monitoring.

3. WILDLIFE VIABILITY RATINGS

3.1. Historical Background for Tongass Viability Ratings

Direction under the National Forest Management Act (36 CFR 219.19:43048) states that “fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area.” For planning purposes, a viable population is defined as “one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area.” Furthermore, “habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that individuals can interact with others in the planning area.”

To meet these requirements, decision-makers for the 1997 Forest Plan revision effort relied in part on the findings of structured risk assessment panels, consisting of subject matter experts. The panels were charged with the task of providing unbiased scientific information on the relative risk associated with implementing each plan alternative to the continued persistence across the landscape of selected species or species groups. These risk assessment panels consisted of four evaluators (drawn from various Federal agencies and Alaska state government), a local subject matter expert available as a resource person, a facilitator, a scribe, and a silent observer (Shaw 1999).

The approach of using professional judgment to assess viability risk had been used in the Pacific Northwest for the development of the Northwest Forest Plan (FEMAT 1993, Starkey 1998). In addition, this approach was selected for the Tongass because of the considerable uncertainty regarding the ecology and distribution of many wildlife species and there was generally inadequate information on which to base predictive models. In addition, the timeframe for the planning process was too short to facilitate the collection of additional data on which to base predictive models (Shaw 1999).

Thus, seven wildlife panel assessments were conducted: one for goshawk, marten, brown bear, wolf, marbled murrelet, "other terrestrial mammals," which included both endemics and widely distributed species, and black-tailed deer. These old-growth associated species and species groups were selected because collectively their ecologies incorporated the breadth of forest habitat features and other attributes of environmental variation represented across the Forest (Shaw 1999)., and because they were thought to be representative of a subset of species that are sensitive to disturbance and potentially at risk of either becoming locally extirpated or jeopardizing cultural or subsistence uses. Risk assessment panels were also conducted for sustainability of the fisheries resource, old-growth forest ecosystems, the social and economic values of forest resources to residents of southeast Alaska, and subsistence use of forest resources (e.g., black-tailed deer and salmon), but these are not discussed further in this appendix.

Panel assessments were initially conducted in fall 1995 and winter 1995-96 to evaluate the risks of nine draft Forest Plan alternatives. Following public comment, and taking into account results of these panel assessments, some plan alternatives were modified and additional plan alternatives were developed that were not subject to the panel assessment process. Consequently, a second set of risk assessment panels was convened in the spring of 1997, which evaluated seven alternatives including a modified version of Alternative 2 (equivalent to 2008 Alternative 7) and a new Alternative 11 (equivalent to 2008 Alternative 5); Alternative 6 (similar to 2008 Alternative 4) was not reevaluated. Evaluators were the same during both panel assessments for the marten and the other terrestrial mammals group, but one or more evaluators changed for the other panel assessments.

In the 1997 FEIS, which was developed before the second set of panels was conducted, Alternatives 10 and 11 were not subjected to risk assessment panels as were the full array of draft alternatives. In the description and analysis of panel results in the 1997 FEIS (Chapter 3, *Biodiversity* and *Wildlife* sections), there was a strong correlation between the acres of POG scheduled for harvest in an alternative and the mean outcome scores for that alternative. As the number of acres harvested increased among alternatives, the mean outcome scores also increased, resulting in greater risk that habitat may not be sufficient to maintain viable and well distributed populations.

Based upon this strong relationship that emerged, the likely effects of Alternatives 10 and 11 were inferred from the acres of old-growth forest scheduled for harvest in these two alternatives, the features of these alternatives as compared to the paneled alternatives, and the relative importance of these features as judged from panel discussions for individual species. Using this approach the likely effects of Alternatives 10 and 11 were discussed in the *Biodiversity* and *Wildlife* sections of the FEIS. Because this strong relationship facilitated development of an effects analysis and time and expense of reconvening all panels was a consideration, alternatives 10 and 11 were not originally subjected to panel risk assessment.

To examine if these inferences were appropriate and presented an accurate analysis of likely effects of implementing Alternatives 10 and 11. This second set of six risk assessment panels included the northern goshawk, Alexander Archipelago wolf, brown bear, American marten, fisheries resources, and other terrestrial mammals. These panels followed the same process as the panels conducted in late 1995 and early 1996. The conclusions from this second set of panels were consistent with the inferences made based on the strong relationship between acres harvested and viability scores (see Appendix N to the 1997 FEIS).

Therefore, this same approach for making inferences is being used in the 2008 Forest Plan Amendment FEIS. Additional factors which solidify the accuracy and reasonableness of this approach are that all of the 2008 alternative harvest levels are within the range of harvest levels analyzed by the panels and four of the seven 2008 alternatives are similar to alternatives directly evaluated by the panel assessments.

Section 3.2 describes the 1995/1996 and 1997 panel assessment process and Section 3.3 summarizes the wildlife panel assessment results. Section 3.3 reviews recent science related to viability analysis and Section 3.4 describes the application of the 1995/1996 and 1997 panel assessments to the 2008 alternatives. Finally, Section 3.5 presents an alternative approach to addressing viability.

3.2. Description of the 1995/1996 and 1997 Panel Assessment Process

3.2.1. Panel Process

The panel assessments evaluated alternatives in terms of their ability to maintain habitat sufficient to support the continued existence of well-distributed, viable wildlife populations across the Tongass over a 100-year planning horizon (10 decades of implementation). The panels were conducted with a modification of the Delphi process that was used, tested, and judged effective in the President's Northwest Forest Plan.

To assess relative levels of risk to wildlife species or species groups, a likelihood approach was used where evaluators individually assigned 100 "likelihood" points by alternative to five potential outcomes, based on the available scientific information. Outcomes included:

- Outcome I: Habitat is of sufficient quality, distribution, and abundance to allow the species to maintain well-distributed breeding populations across the Tongass. The concept of well distributed must be based on knowledge of the species' distributional range and life history.
- Outcome II: Habitat is of sufficient quality, distribution, and abundance to allow the species to maintain breeding populations distributed across the Tongass. However, some local populations are more ephemeral because of reduced population levels and increased susceptibility to environmental extremes and stochastic events associated with reduced habitat abundance and distribution. Vacated habitats may become recolonized in the future.
- Outcome III: Habitat is of sufficient quality, distribution, and abundance to allow the species to maintain some breeding populations, but with significant gaps in the historic distribution in the Forest. These gaps are likely permanent and will result in some limitation of interactions among local populations. The significance of gaps must be judged relative to the species' distributional range and life history.

- Outcome IV: Habitat only allows continued species existence in refugia, with strong limitations on interactions among local populations. The significance of extirpations across islands or regional landscapes must be evaluated relative to the species' distribution, range, and life history.
- Outcome V: Habitat conditions result in species extirpation from Federal land.

Likelihood points assigned to these outcomes do not represent absolute probabilities per se, rather they represent a relative measure of how likely future outcomes are, based on reasoned professional judgment (Shaw 1999). Thus they can be used to compare alternatives, and serve as a measure of the evaluators' certainty about a particular outcome, but by themselves do not represent the percent probability of a given outcome.

For each species, evaluators independently assigned outcome scores to each alternative. For the endemic and widely distributed groups, evaluators selected what they determined to be the most vulnerable species or group of species, which varied by alternative due to the location of activities proposed under each alternative and the geographic distribution of many island endemics (Shaw 1999). However, like the single-species panels, each group was assigned only 100 points per alternative. The only species for which likelihood ratings were not used was the Sitka black-tailed deer, for which the panel assessment relied on the deer habitat capability model to predict potential outcomes (See *Wildlife* section in Chapter 3 for a description).

Panel evaluators were instructed to evaluate the effect that implementation of the alternatives for 100 years would have on the abundance and distribution of habitats suitable to support well distributed and persistent populations of species assessed. One hundred likelihood outcome points were distributed among five possible outcomes. In addition, panel evaluators were asked to appraise features used to construct alternatives (e.g., reserves, beach buffers) as to their contribution to maintaining habitat for species assessed. These qualitative appraisals of specific features and the panel discussions were used by the authors of the written summaries prepared for each panel, to interpret the quantitative evaluation of alternatives as indicated by the assignment of likelihood points by outcome and to identify important ecological considerations. (Summary reports for each panel were developed and are included in the planning record and at http://www.fs.fed.us/pnw/tlmp_app/.)

In the presentation of panel assignment of likelihood outcome points in each table below, the 'after' likelihood outcome ratings are used to compare among alternatives since these second ratings benefit from professional interaction and a likely greater understanding of differences among features in alternatives. The 'before' ratings occurred following presentations on alternatives and local information on each species, but before the merits of individual alternatives were discussed among panel evaluators. The average rating for all panelists also is used, rather than focusing on differences among individual evaluators.

3.2.2. Concepts of Viable and Well Distributed Populations

In the discussion and analysis of the first set of panel results in the 1997 FEIS, Outcomes I and II were often combined as an expression of likelihood of sustaining habitat sufficient to support viable and well distributed populations. Conversely, Outcomes III, IV, and V were often combined in effects analysis as representing increased risks of not maintaining the habitat necessary to sustain viable and well distributed populations. By virtue of its description, Outcome III was difficult to interpret due to the statement that "significant gaps" would be created and the "significance of gaps must be judged relative to the species distributional range, and life history." There was considerable variability in the interpretation of this concept by individual panelists. The original panelists convened in late 1995 and early 1996 were not specifically queried about the relationship between outcomes and the maintenance of viable well-distributed populations. These conclusions were generally inferred, based largely upon whatever discussion occurred during panel deliberations. In general, the IDT inferred that Outcome III represented a condition where gaps were significant enough to substantially preclude interaction among populations of the species. In this condition, a species would not be well distributed, and continued existence of the species across the planning area would be at risk.

Because of the difficulty the IDT encountered in interpreting the first set of panel results relative to the maintenance of well distributed and viable populations, the second set of panelists were provided an opportunity to directly and explicitly discuss these issues. The same five outcomes were used in the second panels conducted in 1997. However, focused discussion provided additional information relative to Outcome III and the panelists' interpretation of gaps in distribution, well distributed populations, and viability.

Outcome III, defined as providing habitat to maintain breeding populations but with significant gaps in historic distribution, was interpreted as an array of conditions. For some of the panels, one end of this array was any condition where gaps in habitat existed as small as the territory of a single animal or single pair of animals of the species being assessed. At the other end, this array could include conditions with broad gaps in habitat distribution and significant limitations on population interactions. The panelists considered some part of this array of conditions as meeting their concept of viable and well distributed. They indicated that the concepts of well distributed and viable, as they used them for the purposes of assessing risk, were not necessarily synonymous. Their views on well distributed habitat dealt primarily with the likelihood that modified habitat would, because of gaps, no longer be able to support a continuous territory-to-territory distribution of resident individuals or groups. That is, some previously occupied territories might become permanently vacant within a 100-year timeframe.

The panelists interpreted viability as a condition in which populations could continue to interact and interbreed within their historic distribution across the Tongass National Forest. They felt that a distribution that included some gaps could still be considered viable as long as there was still interaction among the population segments on the forest and those population segments were distributed across the species range. For example, the marten panel understood that their concept of a habitat gap being as wide as a previously occupied home range likely had little if any effect on species interaction or interbreeding. Thus, in the panelists' interpretation, the criterion of well distributed was more restrictive than the criterion of viable.

The panelists were not providing a legal interpretation of the requirement in the National Forest Management Act of 1976 (NFMA) regulations to provide for viable populations. In the discussion of population viability in the NFMA regulations, the concept of "well-distributed" is tied to the ability to continue interactions among individuals of a species, not necessarily to the maintenance of a territory-to-territory distribution of the species. The interpretation of well distributed is expressed most clearly in the stipulation that maintenance of a viable population requires providing habitat to support "at least a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area" (36 CFR 219.19). This has been interpreted to mean that the condition of viable and well distributed allows for gaps within a species distribution as long as the population segments of the species continue to interact and are distributed throughout the planning area. Thus, the concept of well distributed used by the panelists was more stringent than the concept as applied in the NFMA regulations.

It is difficult to determine how many likelihood points were assigned to the outcome of a viable population since the panelists considered that only some part of the array of conditions under Outcome III met their definition of viable. Thus, the likelihood of maintaining habitat sufficient to support well distributed and viable populations is appropriately presented as being within the span of scores that bracket Outcome III. Consequently, in some of the tables in the following discussions, ratings are expressed as being greater than the sum of likelihood scores for Outcomes I and II, but less than the sum of likelihood scores for Outcomes I, II and III. Expression of data as a range also illustrates the uncertainty in the process and the variability in the professional judgments regarding the concepts of viable and well distributed populations. Use of a range also avoids presenting a single absolute value that might suggest a level of precision that does not exist in this assessment process.

Finally, in some of the following tables, 1995/1996 panel outcome scores are expressed in the same manner of bracketing scores as for the 1997 scores discussed above. Expression of the first panel information in this manner is for comparative purposes only. These combinations do not infer any conclusions on behalf of the 1995/1996 panels because they did not specifically discuss viable and well distributed populations relative to the specific outcomes.

3.3. Summary of 1995/96 and 1997 Panel Assessment Results for Wildlife

3.3.1. Northern Goshawk

3.3.1.1. General Observations on the Goshawk Panels

Panelists noted the apparent low relative density of nesting goshawks in Southeast Alaska. Less than 40 total nest sites had been identified by the time of the assessments after nearly 5 years of inventory effort across the Forest (Iverson 1996a). Low prey diversity compared to other goshawk populations across North America was considered a principle factor, resulting in a higher sensitivity to habitat modifications which may reduce prey diversity and abundance.

The primary factor used by panelists in rating the likelihood of alternatives to support a viable and well-distributed goshawk population was net proportion of all old growth on the Tongass that would be harvested in 100 years (Iverson 1996a, 1997a). This was based on science current at the time of the panel assessments that indicated the strong selection by goshawks for POG forest and the avoidance of all other habitat types (especially early and mid seral conifer forests), though panelists noted that the reliance on this factor was somewhat general due to the lack of more specific information on goshawks in Southeast Alaska and what specific old-growth acres would be harvested.

The 1995 panel assessment used 20 percent of the POG harvested as a threshold level beyond which local persistence and viability were concerns (Iverson 1996a). Most notable was north Prince of Wales Island where in excess of 20 percent of the POG had been harvested. Significant concern arose over this and increased proportions of unsuitable early seral forest on the landscape. This concern was generated from the relatively low density of nesting goshawks discovered relative to the inventory effort in those landscapes. In addition, potential signs of ecological stress was indicated by large home ranges, nonbreeding, and differential winter and breeding use areas. Thus, qualitative judgments concluded that alternatives resulting in this or a greater percentage of the net POG harvested could result in negative overall landscape consequences to sustaining resilient, adaptable, and well distributed goshawk populations in Southeast Alaska. While such thresholds were considered by the 1997 panel, they did not make any conclusions regarding harvest thresholds due to the lack of information and other uncertainty (Iverson 1997a). They suggested that to draw conclusions relative to harvest thresholds, further information was needed on the demographic performance of goshawks under different situations.

In addition, alternatives that proposed standards and guidelines to maintain important landscape components such as riparian, beach and estuary buffers were rated as having higher likelihoods of supporting well-distributed goshawk populations. These habitats are used by goshawks when old-growth forest is present and they also generally support greater prey diversity and net prey productivity. The ability of stands to provide structure adequate to support prey populations and goshawk foraging opportunities was also considered important and related to the length of rotation and harvest method proposed under the alternatives.

The concept of habitat reserves was seen as a less important landscape design feature, since management of the landscape matrix as a whole was felt to have a greater net influence on goshawk habitat suitability, distribution and persistence. Large (40,000 acre) and medium (10,000 acre) habitat reserves as proposed were generally considered too small to sustain more than one or two pairs of goshawks. Roads were not considered an adverse element, thus roadless features of reserves did not generally contribute to overall habitat suitability.

Panelists concluded that at some, albeit low, minimum level, forest management was not considered adverse to overall goshawk habitat suitability and likely contributed to stand diversity.

Given the wide ranging nature of goshawks, the panels emphasized the importance of matrix management to providing habitat capable of supporting viable and well-distributed goshawk populations. However, elements of the reserve system (i.e., large and medium habitat reserves and legislated

conservation areas) were deemed important because by default they reduced the net acreage of old-growth harvested.

3.3.1.2. Goshawk Panel Results

The final average panel ratings for northern goshawk are displayed in Table D-9. Alternative 1 in 1997 essentially represents a no-harvest alternative. Nearly two-thirds of all likelihood points were assigned to Outcome I, which indicates that well distributed goshawk breeding populations would be maintained across the Tongass. However, Outcome II received nearly a third of likelihood scores, suggesting that even with no further reduction in old-growth forest, goshawk populations would likely experience reductions and local persistence may be more ephemeral or irregular as a result of the local concentration of habitat loss from past timber harvest. Implied in this conclusion is that additional harvest would be additive to an existing effect.

Because of the significant amount of legislatively reserved lands and the net amount of POG that would likely remain under even the most aggressive timber harvest alternatives, panelists believed there was little chance for total extirpation of the goshawk population from Southeast Alaska. The highest rating for Outcome V (extirpation) was only 8 (for 1997 Alternative 7). Moderately high net scores for Outcomes I and II occurred for 1997 Alternatives 4 and 5 (65 and 74-85, respectively). These alternatives had in common the use of extended 200-year rotations. Panelists generally believed that forest structure resulting from mid-seral mature forest developmental stages (100 to 200 years old) was more beneficial to goshawks and their prey than a combination of reserves and shorter, 100-year rotations.

The 1997 panel assigned 71 likelihood points to 1997 Alternative 11 for the sum of Outcomes I and II, and 97 likelihood points to the sum of Outcomes I, II and III. Even though this alternative was based on a 100-year rotation, its ratings were second highest of all alternatives that proposed to continue timber harvest, only slightly lower than the rating given to Alternative 5. In addition, Alternative 11 was rated as having very low likelihood of goshawks existing in refugia or being extirpated from the Tongass after 100 years of Forest Plan implementation with a combined Outcome IV and V score of 3.

Alternatives 3, 6, and 10 (1997) had intermediate combined Outcome I and II scores of 52, 50, and 48, respectively. In spite of partial or complete application of habitat reserves, the higher overall old-growth harvest levels, coupled with the 100-year rotation perpetuated a less suitable early seral forest stand structure and was a drawback for these alternatives. Conversely, panelists attributed moderate uncertainty that either of these two alternatives would maintain well distributed populations, with a combined score of Outcomes III, IV and V of 48 (1997 Alternative 3), 50 (1997 Alternative 6), and 53 (1997 Alternative 10). This suggested there was a nearly even chance that either permanent gaps in the distribution would occur or goshawks may exist only in refugia under these three alternatives in 100 years; and in either case interaction between individuals would likely diminish. The forest-wide system of old-growth habitat reserves proposed in 1997 Alternatives 3 and 10 alone imbedded in a matrix of early seral forest structure managed on a 100-year rotation were rated by the panelists to be of insufficient size to support goshawk populations without gaps in distribution or refugia populations occurring.

Alternatives 2, 7 and 9' (1997) were rated by panelists as having a relatively high likelihood (76-80, 88, and 77-92, respectively) that in 100 years gaps in distribution would be likely to occur or populations would exist only in isolated refugia or be extirpated (Outcomes III, IV, or V). When Alternative 9 was analyzed in 1997 with a lower harvest, results were nearly the same producing a likelihood of 90.

Variation in ratings for alternatives assessed in both 1995 and 1997 ranged up to 18 points based on the sum of likelihood points assigned to Outcomes I, II and III (Table D-9). Of those alternatives reviewed in both 1995 and 1997, 1997 Alternatives 1, 5, 2, and 9' were ranked in order (based on average weighted outcomes) from least to highest risk to goshawk habitat in both of the assessments. The 1997 panels also confirmed the judgment in Chapter 3 of the 1997 FEIS, based on a detailed analysis of VCUs, that 1997 Alternatives 5 and 11 had the highest likelihood of sustaining goshawk habitat across the forest of all alternatives that proposed to continue timber harvest. However, the analysis in Chapter 3 resulted in a conclusion that 1997 Alternative 11 had a slightly higher likelihood of maintaining goshawk habitat than 1997 Alternative 5.

Table D-9.
Northern Goshawk Panel Results[1]

	1997 Forest Plan Revision FEIS Alternatives												
Outcomes	**Pre 1954**	**1**	**5**	**11**	**4**	**10**	**3**	**6**	**8**	**2**	**9**	**9'**	**7**
1997 Panel													
I	89	63	35	23		8				1	0	0	
II	11	38	50	48		40				19	10	8	
III	0	0	15	28		48				61	61	61	
IV	0	0	0	3		5				16	26	29	
V	0	0	0	0		0				5	3	3	
Potential POG Harvest (1,000s of acres)	- 414	0	463	475	495	670	571	732	--	853	1,042	1,403	1,200
1995 Panel													
I		66	23		23		17	6	0	0		0	0
II		31	51		42		35	44	27	24		23	12
III		3	25		29		34	33	41	40		42	40
IV		0	1		6		14	17	29	33		32	40
V		0	0		0		0	0	3	4		3	8
Potential POG Harvest (1,000s of acres)	--	0	572	--	618	--	736	954	955	1,107	--	1,403	1,557
Range Between Outcomes I + II and I + II + III													
1997 Panel	100	100	85-100	71-97	--	48-96	--	--	--	20-61	10-61	8-61	--
1995 Panel	--	97-100	74-99	--	65-94	--	52-86	50-83	27-68	24-64	--	23-66	12-52

[1] Mean likelihood outcome scores by evaluators in 1997 are shown at the top of the table. Scores from the 1995 panel are shown in the middle of the table. Scores were assigned by both panels for Alternatives 1, 2, 5, and 9'. Alternatives 1 and 9' are identical between panels in both features and acres of POG harvested. Alternatives 2 and 5 are identical in features but with fewer acres of POG harvested in 1997 relative to 1995. A range for all alternatives is shown at the bottom of the table for the likelihood of maintaining habitat to support viable and well distributed goshawk populations. Only 'after' scores are shown. The - 414,000 value for POG harvest under Historic represents the acreage harvested since 1954.

3.3.1.3. Effects of Added Habitat Management Measures

Even though 1997 Alternative 11 was rated second highest in terms of viability among all alternatives that proposed to continue timber harvest and had a very low likelihood of goshawks existing in refugia or being extirpated from the Tongass after 100 years of Forest Plan implementation, because it was the selected alternative and because the goshawk had been considered for listing under the Endangered Species Act, 1997 Alternative 11 was reviewed to determine if features of the alternative could be modified to improve the projected outcome.

The conservation assessment for northern goshawk (Iverson et al. 1996) evaluated the effect of various management practices on goshawk nesting and foraging habitat, and also identified specific geographic locations where goshawk habitat had been highly fragmented. Based on this information, an additional measure for goshawk habitat was prescribed for Prince of Wales Island where POG had been fragmented by past management actions. This measure applied in VCUs where over 33 percent of POG had been converted to young stands by past management. In those VCUs, any additional management of POG was to be either restricted to 2-acre clearcuts or be managed to leave significant structure in harvested stands.

This standard and guideline applied to management activities in VCUs on Prince of Wales Island with a high percentage of past harvest. Approximately 55 percent of the total original POG had been converted to young forest in these VCUs. For any additional harvest of POG in these VCUs, the standard and guideline had the effect of either implementing a 200-year uneven-aged management regime or leaving structure equivalent to 30 percent of the cover of the original stand. Neither of these practices was expected to produce high-value nesting habitat, but they were expected to result in moderate to high value foraging habitat (Iverson et al. 1996). This structure, in combination with matrix management provisions for beach fringe and riparian management areas, was believed to facilitate goshawk dispersal among large and medium reserves on Prince of Wales Island. Goshawks were also considered to benefit in other provinces by the measures put in place for marten and for connectivity. Again, these had the effect of facilitating dispersal among goshawk populations in reserves. Taken in combination with other measures already in place in 1997 Alternative 11, these increased the already high likelihood of providing habitat sufficient to maintain viable and well-distributed goshawk populations and, had they been added prior to the panel assessments, may have increased the likelihood points.

3.3.2. American Marten

3.3.2.1. General Observations on the Marten Panels

Forest structure at the stand scale and integrated across the landscape was the most important factor in panel ratings and discussion due to the close association of marten with lower elevation and higher volume old growth and because these stands have also received a disproportionate amount of timber harvest (Iverson 1996b, 1997b). Structural complexity, associated with older forest stands, was also deemed important for providing habitat to support adequate prey populations of small mammals. The ability of alternatives to provide structural complexity was related to the proposed harvest rotation, which was a primary factor in the panel ratings. The panels considered 100 years an inadequate amount of time to produce structural elements such as large trees, snags, and downed logs that are used by marten and provide prey habitat. Maintaining the old-growth forest within the beach and riparian habitat zones was considered important by panelists, particularly for landscape connectivity and prey habitat diversity.

Both marten panels agreed that large and medium reserves as designated by the VPOP provide important habitat features for marten (Iverson 1996b, 1997b). Both panels indicated, however, that the VPOP approach to establishing a system of well distributed OGRs was only minimally acceptable for marten. The approach was judged to be minimal primarily because its spatial distribution of reserves could allow for the creation of “gaps” in marten distribution within harvested matrix lands.

Roads were a minor consideration in panel ratings in relation to their impact on human access. As with wolves, it was not the direct effect of the number of road miles or road density proposed under the

alternatives, but rather increased trapping pressure and related mortality resulting from increased access which could be mitigated through appropriate road management, seasons, and bag limits.

3.3.2.2. Marten Panel Results

The final average panel ratings for American marten are displayed in Table D-10. Alternative 1 (1997) provided the greatest likelihood of maintaining well distributed marten populations across their current range on the Tongass. It had a mean likelihood rating of 54 (in 1995) to 84 (in 1997) for Outcome I. The 1995 panelists indicated that even with no further timber harvest and road construction, there was still a reasonable likelihood that local populations would be reduced or gaps that limit populations would be created with little interaction within the species range, as indicated by a combined score of 46 for Outcomes II and III. Concentration of past timber harvest in specific provinces and past harvest primarily in the high-volume classes which were concentrated at lower elevations contributed to this conclusion. In contrast, however, the much higher ratings given by the 1997 panel indicated they thought that past timber harvest would create few gaps in marten distribution (combined score of only 17 for Outcomes II and III).

Panelists concluded that there was no likelihood of extirpation of marten from the entire Tongass National Forest under all alternatives in 1997 and under most alternatives in 1995. In 1995, Alternatives 2, 9, and 7 were considered to have some chance of extirpation (likelihood scores of 15-25 for Outcome V). Anticipated timber harvest, especially in the remaining high-volume class stands at lower elevation, and road construction, contributed to this conclusion.

The likelihood that in 100 years an alternative would result in either significant gaps in distribution, populations existing in relatively isolated refugia, or local extirpations, may be an indication that marten populations would not remain well distributed across the forest. This cumulative likelihood is the sum of Outcomes III, IV, and V. From this perspective, 1995-1997 Alternatives 2, 7, 8, 9 and 9' were given cumulative ratings of 80 to 91, depending on the panel and the alternative. Alternative 6 (1995) also had a relatively high cumulative likelihood outcome of 72. Extensive planned roading, continued fragmentation of habitat, and most importantly, a significant reduction in the important high-volume old-growth forest component were factors cited by panelists that contributed to these conclusions. Even (1995-1997) Alternatives 3, 10, and 11, with their significant reserve components had combined Outcome III, VI, and V ratings of 56 to 70, suggesting a better-than-even chance that well distributed populations may not be maintained across the Tongass in 100 years. All of these alternatives had in common a 100-year timber harvest rotation.

Alternatives 4 and 5 (1995-1997) were rated intermediate by the panelists in their likelihood of maintaining persistent and well distributed marten breeding populations, with combined scores for Outcome I and II of 60 and 66-70, respectively. Extended 200-year timber harvest rotations was the most important design feature for sustainable approaches to providing marten habitat.

Alternative 10 (1997) was intermediate between 1997 Alternatives 2 and 3 in both design features and acres of old growth harvested; thus risks to maintaining viable marten populations were considered intermediate between these two alternatives. In spite of having a system of large, medium and unmapped small reserves that would reduce risks relative to 1997 Alternative 2, the 100 year rotation, only a 500-foot beach fringe, and smaller riparian buffers in 1997 Alternative 10 was considered as possible long-term risks to marten.

Table D-10.
American Marten Panel Results[1]

	1997 Forest Plan Revision FEIS Alternatives												
Outcomes	**Pre 1954**	**1**	**5**	**11**	**4**	**10**	**3**	**6**	**8**	**2**	**9**	**9'**	**7**
1997 Panel													
I	90	84	1	0		0				0	0	0	
II	9	9	65	36		30				19	13	11	
III	1	8	29	55		59				64	53	50	
IV	0	0	5	9		11				18	35	39	
V	0	0	0	0		0				0	0	0	
Potential POG Harvest (1,000s of acres)	- 414	0	463	475	495	670	571	732	--	853	1,042	1,403	1,200
1995 Panel													
I		54	17		15		4	3	3	3		3	3
II		25	53		45		40	25	17	6		6	6
III		21	24		37		41	42	42	55		46	27
IV		0	6		3		15	30	35	21		24	39
V		0	0		0		0	0	3	15		21	25
Potential POG Harvest (1,000s of acres)	--	0	572	--	618	--	736	954	955	1,107	--	1,403	1,557
Range Between Outcomes I + II and I + II + III													
1997 Panel	99-100	93-100	66-95	36-91	--	30-89	--	--	--	19-83	13-66	11-61	--
1995 Panel	--	79-100	71-95	--	60-97	--	44-85	28-70	20-62	8-64	--	9-55	9-36

[1] Mean likelihood outcome scores by evaluators in 1997 are shown at the top of the table. Scores from the 1995 panel are shown in the middle of the table. Scores were assigned by both panels for Alternatives 1, 2, 5, and 9'. Alternatives 1 and 9' are identical between panels in both features and acres of POG harvested. Alternatives 2 and 5 are identical in features but with fewer acres of POG harvested in 1997 relative to 1995. A range for all alternatives is shown at the bottom of the table for the likelihood of maintaining habitat to support viable and well distributed goshawk populations. Only 'after' scores are shown. The - 414,000 value for POG harvest under Historic represents the acreage harvested since 1954.

Alternative 11 (1997) had additional features that further increased the likelihood of maintaining viable goshawk populations relative to 1997 Alternative 3, such as mapped small reserves in all watersheds, and allocation of four additional medium and small reserves. The 1,000-foot beach and riparian protection were similar among 1997 Alternatives 11 and 3, but 1997 Alternative 11 had substantially fewer old growth acres scheduled for harvest (475,000) and thus lower risk than 1997 Alternative 3 (571,440). Total acres harvested in 1997 Alternative 11 was even fewer than 1997 Alternative 4 (495,000), in spite of the 200-year rotation. Alternative 11 (1997) did not have a two-aged silvicultural prescription that maintained forest structure considered important by panelists, but the net acres old growth disturbed might have offset either the potential advantage of two-aged management in 1997 Alternative 3 or two-aged management and a 200-year rotation in 1997 Alternative 4.

Of those alternatives reviewed in both 1995 and 1997, Alternatives 1, 5, 2, and 9' were ranked in order from least to highest risk to marten habitat in both assessments (Table D-10). The 1997 panel results also were consistent with conclusions drawn concerning the relative ranking of all alternatives based on other evidence in Chapter 3 of the 1997 FEIS and other information in the planning record. This includes the conclusion that outcomes of 1997 Alternative 11 would be similar to those of 1997 Alternative 3.

3.3.2.3. Effects of Added Habitat Management Measures

American martens were one of the primary species considered in the design of the original VPOP strategy. By design, each large HCA was intended to support at least 25 female martens, medium HCAs to support at least 5 female martens, and small HCAs at least 1 female. Each large HCA was designed to support a population with high likelihood of at least short-term persistence. The design distance between large HCAs was 25 miles, approximating the maximum dispersal distance recorded for marten, and medium and small HCAs were spaced more closely. Forested corridors were to provide for dispersal among HCAs. All corridors were to be at least 330 feet wide, and riparian and beach fringe habitats were considered appropriate corridors where they provided connections among the HCAs. This network of interconnected HCAs was intended to support a number of local populations that could interact as a metapopulation, thus providing for long-term viability.

Three of the scientists involved in the Kiester and Eckhardt (1994) review identified limitations in this strategy for marten. Benkman, Lidicker, and Powell questioned the use of the maximum marten dispersal distance to establish spacing among HCAs. Benkman cautioned that this strategy would only work if the medium and small HCAs provided connections among the large HCAs. Lidicker added that the condition of the matrix ought to be considered when establishing distances among HCAs. Powell indicated that marten would generally not travel directly between HCAs, so the actual distances they would have to cover would exceed the design distance. None of these reviewers commented directly on the size of large or medium HCAs, but both Benkman and Powell noted that the small HCAs would be unlikely to support even one pair of marten by themselves. A number of the reviewers in Kiester and Eckhardt (1994) commented in general that the utility of corridors for wildlife dispersal had not been demonstrated. None of these comments were specific to marten, possibly because marten are known to make extensive use of riparian zones (Bissonette et al. 1989, Clark et al. 1987).

The VPOP strategy is most fully represented in 1995-1997 Alternative 3. The risk assessment panel convened in 1995 rated this alternative intermediate between 1995 Alternative 1 (no further harvest) and 1995 Alternative 9 (continuation of the existing plan). They indicated that there was a better than equal likelihood that implementation of this alternative for 100 years would result in significant gaps in marten habitat distribution on the Tongass. They projected no likelihood that marten would be extirpated from the entire forest under this alternative.

The risk assessment panel convened in 1997 gave Alternative 11 a similar risk rating to that given to Alternative 3 in 1995. Alternative 11 (1997), as rated by the panel, provides for a wider beach fringe buffer than 1997 Alternative 3, but it also relies more heavily on even-aged management in the matrix. Panelists noted that the projected matrix conditions had a significant influence on their ratings. The panelists convened in 1997 also clarified their interpretation of the outcomes that were used as the basis for risk assessment. Outcome III, defined as providing habitat to maintain breeding populations but with significant gaps in historic distribution, was interpreted as an array of conditions. At one end of this array was any condition where gaps in habitat existed as small as the territory of a single marten. At the other

end, this array could include conditions with broad gaps in habitat distribution and significant limitations on population interactions. The panelists considered some part of this array of conditions as meeting the definition of viable and well-distributed. The panelists assigned a total of 91 likelihood outcome points to the sum of Outcomes 1 + II + III. This included 36 likelihood points in Outcomes I and II, which they considered to represent a viable and well distributed condition. It also included 55 likelihood points in Outcome III, some portion of which represents a viable and well distributed condition. The panelists indicated there was a very low likelihood that marten would exist only in refugia or be extirpated from the Tongass after 100 years of Forest Plan implementation with a combined Outcome IV and V score of 9. The panelists indicated that matrix management was the feature of 1997 Alternative 11, as rated, that contributed to the assignment of likelihood points to outcomes that were not well-distributed. They indicated that clearcut silviculture on a 100-year rotation would result in further fragmentation of marten habitat.

Alternative 11 (1997) was strengthened subsequent to the panel assessment because that assessment indicated a level of concern about the likelihood of marten populations remaining well-distributed across the Tongass for at least 100 years. The measures used to strengthen the alternative were based on comments provided by the panelists, information drawn from past studies on marten, and information on existing habitat conditions on the Tongass. Three different measures were applied to 1997 Alternative 11 to improve the likelihood of maintaining habitat to support well-distributed populations of marten.

The first directs the management of high quality marten habitat in five biogeographic provinces where marten habitat was considered to be at higher risk. These five biogeographic provinces were identified by the VPOP risk assessment as the highest risk provinces of the 21 provinces across the Tongass National Forest (Suring et al. 1993). High value habitat is defined in the Interagency Marten Habitat Capability Model (Suring et al. 1993) as consisting of high-volume old-growth stands at elevations below 1,500 feet. Within the high-risk provinces, these stands were to be managed under practices other than clearcutting. In VCUs where 33 percent or more of the POG had been or was projected to be harvested, further harvest in any high-value marten habitat would retain at least 30 percent canopy closure, 8 large live trees per acre, 3 large decadent trees per acre and 3 logs per acre. Where less than 33 percent of POG had been harvested, further harvest in high-value marten habitat would retain 10-20 percent canopy closure, 4 large live trees per acre, 3 large decadent trees per acre, and 3 logs per acre. These habitat management measures were based on studies showing marten use higher in partially logged areas than clearcut areas (Soutiere 1979); a study reported by Hargis and Bissonette (1997) and Hargis et al. (1999) indicating that the proportion of clearcut harvesting at a landscape scale is a key determinant of marten success; and numerous studies showing the importance of large wood structure to marten (Baker 1992, Buskirk et al. 1989, Corn and Raphael 1992, Raphael and Jones (1997).

The second measure provided for access management to reduce marten mortality in areas where mortality rates due to trapping/hunting had been identified as a serious risk to marten populations. The third measure provides additional assurance of maintaining connections between habitat blocks throughout the Tongass. It required an analysis of the effectiveness of features such as small reserves, beach fringe and riparian buffers in providing for connection between old-growth blocks in medium and large reserves and other natural setting LUDs. Where these measures do not provide for full connectivity, additional habitat was to be allocated to provide for connectivity of old-growth habitats.

With all measures in place, 1997 Alternative 11 was modified to provide for a network of large and medium-sized HCAs, capable of supporting 25 and 5 female marten each, respectively. Connection between HCAs was provided by protected habitats in riparian and beach fringes, small HCAs, and additional old-growth habitat designated for connectivity where these protected habitats were not adequate. Connections through the riparian and beach fringe were believed to be effective for marten based on studies that have shown preferential use by marten of riparian zones (Buskirk et al. 1989, Raphael and Jones (1997), Spencer and Zielinski 1983). The matrix between the reserves also contained significant, although fragmented, old-growth habitat. An average of 57 percent of the pre-1954 POG was estimated to remain unharvested in the matrix areas through the planning horizon of 100 years. The percent of old growth remaining in the matrix varies by province, but in those provinces considered at highest risk the additional habitat measures described above were to be applied in the matrix. In addition

to all of the above habitat measures, road access was to be managed to reduce marten mortality where mortality had been identified as a significant risk.

Full implementation of the above strategy was believed to increase the likelihood of maintaining habitat that would support well-distributed marten populations. While there would likely be gaps in this distribution, it was estimated that there was low likelihood that there would be significant isolation among marten populations resulting from implementation of 1997 Alternative 11.

3.3.3. Alexander Archipelago Wolf

3.3.3.1. General Observations on the Wolf Panels

Important assessment factors for wolves were deer habitat capability, wolf mortality, and wolf dispersal capabilities; genetic information indicating the existence of the Alexander Archipelago subspecies was new at the time of the panel assessments and was also considered, though not as a major factor. Deer habitat capability was ranked as the most important factor influencing panel evaluators' ratings because of the close link between wolf persistence and deer habitat capability (Iverson 1996c, 1997c). Thus, alternatives that contributed to greater deer habitat capability, as determined by the deer habitat capability model (see *Wildlife* section of Chapter 3 for a description), and thus greater numbers of deer, were ranked as more likely to sustain viable and well-distributed wolf populations. Deer habitat capability can be reduced directly by timber harvest, which may increase deer vulnerability to predators, especially in winters of heavy snowfall.

Roads were a primary factor associated with wolf mortality identified by the panels; however, the panels agreed that the main issues were related to human access and attitudes (i.e., issues of season and bag limits, proper access management, and human education), rather than the miles of road or road densities proposed by the alternatives. It was recognized that increased road densities contributed to increased legal and illegal mortality. Thus, the value of maintaining roadless refugia was identified as a means of providing deer habitat capability and controlling human access, and alternatives that maintained such areas were ranked as more likely to sustain viable and well-distributed wolf populations.

Wolf population distribution and the interaction of populations with respect to gaps was also an issue discussed by the panel, given the dispersal capabilities of wolves. A gap in wolf distribution was defined as approximately 100 square miles between populations, or the estimated size of a wolf pack territory on Prince of Wales Island. The most current genetic information available at the time suggested that interchange among wolf populations was occurring across major island groups in Southeast Alaska. However, there was disagreement on this point between local experts and evaluators since direct ecological evidence suggested the existence of dispersal barriers or at least severe limitations to such dispersal, especially between Prince of Wales Island and neighboring islands and the mainland, as demonstrated by available radio-telemetry data (Iverson 1996c). The panel did highlight the potential ecological concerns associated with insular populations of wolves.

3.3.3.2. Wolf Panel Results

The final average panel ratings for Alexander Archipelago wolf are displayed in Table D-11. For all 1997 alternatives, it was concluded that there was virtually no chance of extirpation of the wolf from the Tongass National Forest (Outcome V). All alternatives had only 1 of a possible 100 points assigned to this outcome, with the exception of Alternatives 9 and 9' in the 1997 panel, which had 3 points assigned. This likely represents a chance catastrophic event that, in combination with normal Forest Service activity, would result in the complete extirpation of wolves.

Alternative 1 (1997) provided the greatest relative likelihood of maintaining stable well distributed wolf populations across their current range on the Tongass. However, panelists indicated that even with no action, past management activity that reduced deer habitat capability on some portions of the forest (north and central Prince of Wales Island were specifically identified) would at least result in some likelihood of locally reduced population levels (the sums of Outcomes II, III, and IV were 12 – 19, depending on the panel). Outcome II for Alternative 1 was explained as the likely result of natural fluctuations in wolf populations in response to prey availability and other environmental factors.

Table D-11.
Alexander Archipelago Wolf Panel Results[1]

	1997 Forest Plan Revision FEIS Alternatives												
Outcomes	**Pre 1954**	**1**	**5**	**11**	**4**	**10**	**3**	**6**	**8**	**2**	**9**	**9'**	**7**
1997 Panel													
I	89	88	55	58		54				20	18	18	
II	8	6	29	25		26				43	30	30	
III	1	3	13	14		16				34	44	44	
IV	1	3	3	3		3				3	6	6	
V	1	1	1	1		1				1	3	3	
Potential POG Harvest (1,000s of acres)	- 414	0	463	475	495	670	571	732	--	853	1,042	1,403	1,200
1995 Panel													
I		80	48		34		59	26	7	35		3	3
II		14	34		39		25	38	43	25		31	26
III		3	16		24		14	31	40	30		48	51
IV		2	1		2		1	4	9	9		18	19
V		1	1		1		1	1	1	1		1	1
Potential POG Harvest (1,000s of acres)	--	0	572	--	618	--	736	954	955	1,107	--	1,403	1,557
Range Between Outcomes I + II and I + II + III													
1997 Panel	97-98	94-97	84-97	83-97	--	80-96	--	--	--	63-97	48-92	48-92	--
1995 Panel	--	94-97	82-98	--	73-97	--	84-98	64-95	50-90	60-90	--	34-82	29-80

[1] Mean likelihood outcome scores by evaluators in 1997 are shown at the top of the table. Scores from the 1995 panel are shown in the middle of the table. Scores were assigned by both panels for Alternatives 1, 2, 5, and 9'. Alternatives 1 and 9' are identical between panels in both features and acres of POG harvested. Alternatives 2 and 5 are identical in features but with fewer acres of POG harvested in 1997 relative to 1995. A range for all alternatives is shown at the bottom of the table for the likelihood of maintaining habitat to support viable and well distributed goshawk populations. Only 'after' scores are shown. The - 414,000 value for POG harvest under Historic represents the acreage harvested since 1954.

Because of the intensity of proposed harvest activity and anticipated significant regional reductions in deer habitat capability, Alternatives 2, 7 and 9 were rated by the 1995 panel to have some likelihood (range 9-19) of creating populations that would exist in refugia with severely restricted interaction between them (Outcome IV) (Iverson 1996c); the points for this outcome were dropped considerably by the 1997 panel, ranging from 3 to 6 for Alternatives 2, 9, and 9' (Iverson 1997c).

The likelihood of an alternative resulting in a situation in 100 years where either gaps in distribution occur, populations exist in refugia, or total extirpation may be a general indication that wolf populations would not remain well distributed across the Tongass compared to historical distributions. This cumulative likelihood is considered the sum of Outcomes III, IV, and V. The 1995 and 1997 versions of Alternatives 7, 8, 9, and 9' all had relatively high cumulative likelihood outcomes, ranging from 50 to 71. Moderate likelihoods existed for Alternatives 2 (40) and 6 (36). These cumulative outcomes are generally directly related to the total harvest levels and associated reductions in deer habitat capability and all have in common a 100-year timber harvest rotation timber management regime.

Overall, the results of the 1995 and 1997 evaluations were consistent. Of those alternatives reviewed in both 1995 and 1997, Alternatives 1, 5, 2, and 9' were ranked in order from least to highest risk to wolf habitat in both assessments (Table D-11). In the 1997 evaluation, Alternatives 11, 10, and 5 were all given relatively high ratings, and these were similar to ratings given to Alternative 3 in 1995. These results are consistent with the discussion of alternatives in Chapter 3 of the 1997 FEIS, except that the analysis in Chapter 3 clearly distinguished Alternative 11 as the most favorable for wolves among the alternatives that propose to continue timber harvest, primarily due to the more extensive reserve system in Alternative 11.

3.3.4. Brown Bear

3.3.4.1. General Observations on the Brown Bear Panels

Important assessment factors identified by the brown bear panel included acres harvested, roads and access management, large reserves and legislated conservation areas, and riparian habitat management. Alternatives that harvested more acres were given a lower likelihood of maintaining habitat sufficient to support a viable and well distributed brown bear population. The driving force behind this relationship were the cumulative effects of timber harvest (i.e., the combination of clearcuts, road construction, and risks to salmon populations on bears), though direct effects, such as the temporary displacement of bears due to their tendency to avoid recently clearcut areas, were also taken into account (Iverson 1996d, Meade 1997). Likewise, alternatives that did not include effective access management or proposed a greater number or road miles were rated as having a lower likelihood of supporting viable and well-distributed brown bear populations. This was related to the potential for direct effects such as the increased potential for brown bear mortality due to legal hunting, illegal killing, and defense of life and property, as well as the creation of either temporary or permanent gaps in the distribution of the brown bear population. Indirect effects associated with the extent of proposed road construction related to the risks posed to anadromous salmon, the primary food source of brown bears (the panels relied on the 1996 fish and riparian panel results to assess this).

Large OGRs and legislated conservation areas where timber harvest is not permitted were considered a critical factor in the rating of these alternatives due to their function in providing roadless refugia for brown bears. Thus, alternative that allocated a greater number of acres to these reserves were rated as having a higher likelihood of supporting viable and well-distributed brown bear populations. The spatial distribution of these areas was also taken into account, as was the likelihood that they would persist in a roadless state over time.

Two aspects of riparian habitat management were identified as being important to brown bears: the maintenance of riparian habitat capable of sustaining salmon habitat and populations over time and providing sufficient forest cover to maintain important brown bear feeding and loafing areas. Alternatives that provided greater protection to riparian areas were considered more likely to provide adequate travel corridors to foraging areas, loafing areas, and vegetative cover capable of reducing adverse encounters among brown bears (i.e., sows with cubs) and between bears and humans.

3.3.4.2. Brown Bear Panel Results

Average panel ratings are shown in Table D-12. Panelists unanimously agreed that brown bears were not likely to be extirpated in 100 years from the Tongass National Forest under any alternative. All panelists rated Outcome V as 0 for all alternatives; wilderness and LUD II (legislated) areas essentially assured brown bear persistence somewhere in Southeast Alaska in 100 years. Alternative 1 was rated highest in total likelihood of maintaining brown bears in their current distribution, with combined scores of Outcomes I and II of 93, although certain populations would experience some reduction in overall density (a 76 score for Outcome II). The likelihood rating of 6 for Outcome III was due to the extent of past roading and an anticipated future growth in human use of existing roads, in spite of little or no additional timber harvest.

Due to the planned extensive timber harvest and associated road construction, Alternatives 7 and 9' had the highest likelihoods of limiting distribution of brown bears such that they might exist only in isolated refugia, with Outcome IV scores of 40 and 25-41, respectively.

Panelists generally agreed that either Outcomes III, IV, or V would not represent well distributed populations based upon the assessment criteria they were provided. Alternatives 2, 7, 8, 9, and 9' all had scores over 50 for Outcomes III, IV, and V combined. All of these alternatives had in common relatively extensive planned timber harvest and all were managed with a 100-year rotation. The panelists believed that these five alternatives presented the greatest relative long-term risk to the maintenance of well distributed brown bear populations in 100 years.

Alternative 3 ratings did not appear to reflect the panelists' conclusion that riparian habitat protection was a significant feature in brown bear management. Alternative 3 hds the widest riparian buffers on most channel types, yet was rated similarly to Alternatives 4, 5, 6, 10, and 11 with combined Outcome I and II scores of 60, 55, 65-67, 51, 56, and 68, respectively. The extended rotations in Alternatives 4 and 5 inferred greater dispersion of future timber harvest into roadless watersheds and were rated similar to Alternatives 3 and 6 in spite of much less total planned harvest of old growth. Alternative 11 had the highest likelihood of maintaining viable long-term brown bear populations due the extensive reserve system that should significantly address the road issue that is adverse to bears. It also has strong riparian protection. Nonetheless, all these alternatives had a reasonable likelihood of maintaining brown bear populations at least in their current distribution in spite of the potential for development of temporary gaps in distribution.

Subpopulations in Southeast Alaska were rated separately. Panelists generally had greater concerns for the mainland bear populations than the populations on Chichagof/Baranof and Admiralty Islands. The mainland population was rated consistently lower than Chichagof/Baranof for all alternatives in combined Outcomes I and II. These ratings supported discussion that focused significant concern on the low density population that may already exist in relatively isolated regions. Anticipated future roading and human access development would exacerbate this natural situation and place these populations at additional risk.

Overall, the results of the 1995 and 1997 evaluations were consistent. Of those alternatives reviewed in both 1995 and 1997, Alternatives 1, 5, 2, and 9 were ranked in order from least to highest risk to brown bear habitat in both assessments (Table D-12). However, the panel results suggested that Alternatives 5 and 11 would produce similar outcomes for brown bears, while analysis based on the components of the alternatives (Chapter 3 of the 1997 FEIS) indicated that Alternative 11 was more effective than Alternative 5 in reducing risk to bears. Alternative 11 has a much greater reserve system than Alternative 5, including additional large reserves on Northeast Chichagof Island in a landscape that was identified as high risk by the 1995 panels. In addition, Alternative 11 provides more substantial riparian protection than Alternative 5, and this feature was identified as important for bears.

Table D-12.
Brown Bear Panel Results[1]

	1997 Forest Plan Revision FEIS Alternatives												
Outcomes	**Pre 1954**	**1**	**5**	**11**	**4**	**10**	**3**	**6**	**8**	**2**	**9**	**9'**	**7**
1997 Panel													
I	81	16	0	0		0				0	0	0	
II	19	76	65	68		56				49	16	16	
III	0	6	33	25		33				41	63	59	
IV	0	0	3	8		11				10	21	25	
V	0	0	0	0		0				0	0	0	
Potential POG Harvest (1,000s of acres)	- 414	0	463	475	495	670	571	732	--	853	1,042	1,403	1,200
1995 Panel													
I		40	8		8		10	6	1	4		0	0
II		53	59		47		50	45	28	35		14	16
III		8	34		37		36	38	50	38		45	44
IV		0	0		8		4	11	21	24		41	40
V		0	0		0		0	0	0	0		0	0
Potential POG Harvest (1,000s of acres)	--	0	572	--	618	--	736	954	955	1,107	--	1,403	1,557
Range Between Outcomes I + II and I + II + III													
1997 Panel	100	93-100	65-98	68-93	--	56-89	--	--	--	49-90	16-79	16-75	--
1995 Panel	--	94-100	67-100	--	55-92	--	60-96	51-89	29-79	39-77	--	14-59	16-60

[1] Mean likelihood outcome scores by evaluators in 1997 are shown at the top of the table. Scores from the 1995 panel are shown in the middle of the table. Scores were assigned by both panels for Alternatives 1, 2, 5, and 9'. Alternatives 1 and 9' are identical between panels in both features and acres of POG harvested. Alternatives 2 and 5 are identical in features but with fewer acres of POG harvested in 1997 relative to 1995. A range for all alternatives is shown at the bottom of the table for the likelihood of maintaining habitat to support viable and well distributed goshawk populations. Only 'after' scores are shown. The - 414,000 value for POG harvest under Historic represents the acreage harvested since 1954.

3.3.5. Other Terrestrial Mammals

3.3.5.1. General Observations on the Other Terrestrial Mammals Panels

This panel identified two groups of mammals associated with POG for evaluation: widely distributed taxa (widely distributed group), and endemic taxa (endemic group).

Widely distributed group included:

- black bear (Ursus americanus)
- Canada lynx (Lynx canadensis canadensis)
- wolverine (Gulo gulo luscus)
- fisher (Martes pennanti)
- northern flying squirrel (Glaucomys sabrinus zaphaeus)
- river otter (Lutra canadensis mira)
- mountain goat (Oreamnos americanus columbiae)
- silver-haired bat (Lasionycteris noctivagans)
- California Myotis (Myotis californicus caurinus)
- Keen's Myotis (Myotis keenii keenii)
- little brown Myotis (Myotis lucifugus alascensis)
- long-legged Myotis (Myotis volans longicrus).

The endemic group included:

- Prince of Wales Island flying squirrel (*Glaucomys sabrinus griseifrons*)
- beaver (Castor canadensis phaeus)
- Keen's mouse (Peromyscus keeni sitkensis)
- red-backed vole (Clethrionomys gapperi stikinensis)
- red-backed vole (Clethrionomys gapperi solus)
- red-backed vole (Clethrionomys gapperi wrangeli)
- red-backed vole (Clethrionomys gapperi phaeus)
- Admiralty Island meadow vole (Microtus pennsylvanicus admiraltiae)
- Sitka meadow vole (Microtus oeconomus sitkensis)
- ermine (Mustela erminea aiascensis)
- ermine (Mustela erminea initis)
- ermine (Mustela erminea celenda)
- Admiralty Island ermine (*Mustela erminea salva*)
- Suemez Island ermine (*Mustela erminea seclusa*)

Because multiple species were considered by the panel, likelihood scores given to the most vulnerable or sensitive taxon within a group were applied to the entire group in 1995, thus these panel ratings result in conservative scores. The 1997 panel assessment rated the species as a group due to the underlying uncertainty level for the ratings of the endemic group due to the lack of ecological knowledge for many of the species.

The panel recognized that certain endemics may yet be discovered while other endemics may be more common than originally thought. The panel identified that the greatest concern for endemic species was their restricted ranges, which naturally increased their risk of extinction, and that being an endemic species equated to increased risk. Thus the panel predicted that all of the proposed alternatives had some likelihood of causing extirpation within the endemic group and likelihood increased with higher levels of timber harvest proposed. For the endemic group, Alternative 2 was determined to have a low likelihood of maintaining viable and well-distributed populations due to the absence of a reserve network and the amount of timber harvest proposed. Alternative 6 and 11 were both determined to have a moderate likelihood of maintaining viable and well-distributed endemic mammal populations, with Alternative 11 being the best, due to proposed harvest levels and rotation length (100 versus 200 years).

3.3.5.2. Other Terrestrial Mammals Panel Results

Average panel ratings are shown in Tables D-13 and D-14. Alternative 1 was generally considered by the panels as the alternative least likely to negatively impact taxa under consideration. The panels predicted a higher likelihood that the *widely distributed group* would experience ephemeral range distribution gaps (Outcome II) in both 1995 and 1997; the *endemic group* was predicted to occur more frequently in refugia (Outcome IV) in 1995, but the 1997 panel predicted a higher likelihood for Outcome II, as for the widely distributed group. Panelists assigned these outcomes based upon historical levels of timber-related activities. The panels suggested that Alternative 1 could be improved by restoring old growth in extensively harvested areas (northern Prince of Wales Island for example).

Alternatives 5 and 11 were regarded by panelists as the second and third least likely alternatives to negatively impact taxa under consideration. The panels offered higher likelihoods that the *widely distributed group* would experience both ephemeral and permanent range distribution gaps (Outcomes II and III) that could affect viable populations well-distributed across the planning area. Little brown Myotis was cited as one animal whose local populations would be more ephemeral under this alternative; it was predicted that fisher could experience significant gaps in its historic range. The *endemic group* would more likely have range distribution gaps or be restricted to refugia under Alternatives 5 and 11 (Outcomes III and IV). These circumstances would increase the risk of extirpation as a result of isolation. Prince of Wales Island flying squirrel was noted as one animal that would likely only exist in refugia. Panelists stressed that reserves should be carefully located within the ranges of vulnerable wildlife and that corridors be truly functional.

Panelists ranked Alternatives 3, 4, 6, and 10 as intermediate among the alternatives in terms of likelihood of negatively impacting taxa under consideration. For the *widely distributed group*, likelihood scores were fairly evenly distributed among Outcomes II, III, and IV; scores for outcome extremes (I and V) were consistently lower for these alternatives. Likelihood scores were similarly distributed for the *endemic group*, except scores were higher for Outcome V, particularly for Alternatives 3 and 6 in 1995. For most of these alternatives, local populations of Sitka mouse could become more ephemeral (Outcome II); northern flying squirrel could experience permanent gaps in its historic range or exist only in refugia (Outcome III or IV); fisher could exist only in refugia (Outcome IV).

The panel considered Alternatives 2, 7, 8, 9, and 9' to be most likely among alternatives to create wildlife viability problems. The panel predicted that implementation of these alternatives would result in high likelihoods that both the *widely distributed and endemic groups* would exist only in refugia (northern flying squirrel for example) or would become extirpated (Keen's Myotis for example). It was suggested that these alternatives could be improved by incorporating longer rotations, uneven-aged management, and higher levels of riparian habitat protection.

For the widely distributed group, it was determined that Alternative 2 had a very high likelihood of resulting in conditions of either refugia or extirpation in 100 years (not viable; combining Outcomes IV and V). Conversely Alternative 11 was rated as having a relatively high likelihood of not resulting in conditions of refugia or extirpation in 100 years because of its forest-wide reserve system. Alternative 6 was rated as being in between Alternatives 2 and 11 (Table D-13).

There was general consistency in the 1995 and 1997 evaluations of other terrestrial mammals, although there was variation in the ratings assigned to alternatives by the two panels. Of those alternatives

Table D-13.
Widely Distributed Mammals Panel Results[1]

	1997 Forest Plan Revision FEIS Alternatives												
Outcomes	**Pre 1954**	**1**	**5**	**11**	**4**	**10**	**3**	**6**	**8**	**2**	**9**	**9'**	**7**
1997 Panel													
I	75	24	3	10		3				0	0	0	
II	17	45	36	28		23				3	0	0	
III	7	28	53	44		53				15	9	4	
IV	1	4	6	16		19				68	68	70	
V	0	0	3	3		4				15	24	26	
Potential POG Harvest (1,000s of acres)	- 414	0	463	475	495	670	571	732	--	853	1,042	1,403	1,200
1995 Panel													
I		23	3		1		5	5	5	0		0	0
II		44	38		34		31	19	10	9		3	3
III		25	49		41		34	25	20	18		9	8
IV		9	9		21		19	36	33	29		35	31
V		0	3		3		11	15	33	45		54	59
Potential POG Harvest (1,000s of acres)	--	0	572	--	618	--	736	954	955	1,107	--	1,403	1,557
Range Between Outcomes I + II and I + II + III													
1997 Panel	92-99	69-97	39-92	38-82	--	26-79	--	--	--	3-18	0-9	0-4	--
1995 Panel	--	67-92	41-90	--	35-76	--	36-70	24-49	15-35	9-27	--	3-12	3-11

[1] Mean likelihood outcome scores by evaluators in 1997 are shown at the top of the table. Scores from the 1995 panel are shown in the middle of the table. Scores were assigned by both panels for Alternatives 1, 2, 5, and 9'. Alternatives 1 and 9' are identical between panels in both features and acres of POG harvested. Alternatives 2 and 5 are identical in features but with fewer acres of POG harvested in 1997 relative to 1995. A range for all alternatives is shown at the bottom of the table for the likelihood of maintaining habitat to support viable and well distributed goshawk populations. Only 'after' scores are shown. The - 414,000 value for POG harvest under Historic represents the acreage harvested since 1954.

Table D-14.
Endemic Mammals Panel Results[1]

	1997 Forest Plan Revision FEIS Alternatives												
Outcomes	**Pre 1954**	**1**	**5**	**11**	**4**	**10**	**3**	**6**	**8**	**2**	**9**	**9'**	**7**
1997 Panel													
I	59	6	1	3		1				0	0	0	
II	26	34	9	16		13				0	0	0	
III	13	31	45	36		34				8	8	4	
IV	2	28	41	41		46				70	71	73	
V	0	1	4	4		6				23	21	24	
Potential POG Harvest (1,000s of acres)	- 414	0	463	475	495	670	571	732	--	853	1,042	1,403	1,200
1995 Panel													
I		13	5		4		8	8	6	0		0	0
II		20	18		14		15	18	11	5		3	3
III		18	16		19		21	18	16	11		9	8
IV		43	51		50		36	28	28	30		29	26
V		8	10		14		20	30	39	54		60	64
Potential POG Harvest (1,000s of acres)	--	0	572	--	618	--	736	954	955	1,107	--	1,403	1,557
Range Between Outcomes I + II and I + II + III													
1997 Panel	85-98	40-71	10-55	19-55	--	14-48	--	--	--	0-8	0-8	0-4	--
1995 Panel	--	33-51	23-39	--	18-37	--	23-44	26-44	17-33	5-16	--	3-12	3-11

[1] Mean likelihood outcome scores by evaluators in 1997 are shown at the top of the table. Scores from the 1995 panel are shown in the middle of the table. Scores were assigned by both panels for Alternatives 1, 2, 5, and 9'. Alternatives 1 and 9' are identical between panels in both features and acres of POG harvested. Alternatives 2 and 5 are identical in features but with fewer acres of POG harvested in 1997 relative to 1995. A range for all alternatives is shown at the bottom of the table for the likelihood of maintaining habitat to support viable and well distributed goshawk populations. Only 'after' scores are shown. The - 414,000 value for POG harvest under Historic represents the acreage harvested since 1954.

reviewed in both 1995 and 1997, Alternatives 1, 5, 2, and 9' were ranked in order from least to highest risk to habitat of the widely-distributed group in both assessments (Table D-13). Differences between Alternatives 2 and 9' were slight in both assessments. Additionally, ratings of all these alternatives improved substantially from the 1995 to the 1997 assessment. The same pattern held true for the

endemic mammal group (Table D-14). Relative rankings of the four alternatives reviewed by both panels remained constant, but the ratings for each of the alternatives improved from the first to the second panel. These results also generally support the conclusion drawn in Chapter 3 of the 1997 FEIS that, of the alternatives that propose to continue harvesting timber, Alternative 11 poses the least risk to these species groups. However, the difference for these species between Alternative 11, as evaluated by the panelists, and Alternative 5 is small. Subsequent to the assessment by the panelists, additional measures were added to Alternative 11 to benefit these species groups.

3.3.5.3. Effects of Added Habitat Management Measures

As noted above, the other terrestrial mammals associated with POG were broadly divided into two groups: widely-distributed species and endemic species. A total of 26 taxa within these two groups were explicitly considered by the panels asked to provide judgments for the other terrestrial mammals. Two of these 26 taxa, northern flying squirrel and river otter, were the focus of specific measures in the original VPOP strategy. Small HCAs were adopted by the VPOP committee to provide for distribution of northern flying squirrels in every major watershed (i.e., every 10,000 acres). The size of these HCAs was intended to allow them to support 20 to 40 squirrels. VPOP also recommended that travel corridors be maintained between patches of flying squirrel habitat. They considered beach fringe and riparian zone to be suitable corridors, and recommended that additional corridors be designated in areas where these did not provide adequate connectivity.

The Prince of Wales river otter is strongly associated with saltwater beach fringe and freshwater riparian habitats (Larsen 1983, Noll 1988, Woolington 1984). VPOP's conservation recommendation for river otter was maintenance of beach fringe, estuary fringe, and riparian habitat associated with streams and lakes.

The review of Kiester and Eckhardt (1994) provided little comment on this aspect of the VPOP strategy. However, one of the common themes of many of the reviews was the lack of knowledge of all the taxa present on the Tongass and the distribution of species among islands. Kiester and Eckhardt (1994) recommended a thorough biological survey of the Tongass, and an evolutionary analysis of small mammals. Lidicker (in Kiester and Eckhardt 1994) recommended that no timber harvest take place on islands less than 1,000 acres or those that could be considered unique because of their isolation or known presence of endemics.

In the 1995 evaluation, the VPOP strategy, most fully embodied in Alternative 3, was assessed as having the third highest likelihood, for those alternatives that propose continuing timber harvest, of maintaining both the widely-distributed and the endemic groups of mammals. In this assessment, substantial likelihoods of not maintaining species well-distributed were projected for all alternatives, including Alternative 1 which called for no further timber harvest. These results were based, at least in part, on effects of past harvest, lack of knowledge of many of the mammal species, and risks inherent to endemic species. Alternative 11, as evaluated in the 1997 panel assessments, differed in several important ways from Alternative 3. It eliminated all islands less than 1,000 acres from the timber base as recommended by Lidicker (in Kiester and Eckhardt 1994). It extended the beach fringe to 1,000 feet, but also relied more heavily on short-rotation clearcutting than did Alternative 3. Of the alternatives evaluated in 1997 that propose continued timber harvest, it ranked second highest in likelihood of maintaining viable populations of the widely-distributed and endemic mammals. Despite its favorable ranking relative to the other alternatives, it still was projected to have substantial likelihood of not maintaining well-distributed populations. Alternative components that were viewed favorably by this panel included the presence of a reserve system, the amount of old growth that would be retained in the matrix, and a process for site-specific analysis particularly related to endemic mammals.

In response to the 1997 panel assessment, additional guidelines were added to Alternative 11 to increase the likelihood that viable populations of endemic mammals would be maintained. These guidelines

require that surveys for endemic mammals be completed prior to projects that would substantially alter vegetation on islands of 50,000 acres or less. Surveys were also to be conducted on larger islands if an initial assessment indicates high likelihood that endemic mammals are present on the site. Where endemic taxa are detected by the surveys, projects were to be designed to provide for continued persistence of the taxa. As an additional measure, ongoing research of endemic taxa on the Tongass was to be accelerated.

Other guidelines added to Alternative 11 in response to the panel assessments also benefited both the endemic and widely-distributed mammals. The connectivity guideline provided additional measures to maintain connectivity of large and small reserves and other non-development LUDs in places where beach fringe and riparian habitat management areas do not provide adequate connectivity. Guidelines for structural retention for goshawk and marten habitat also benefited other mammal species.

The Prince of Wales flying squirrel may be considered the greatest viability concern among the endemic mammals that were specifically considered by the panels, and the northern flying squirrel may be of greatest concern among the widely-distributed mammals. According to Carey (1991), habitat factors important to northern flying squirrels include large, live trees; large snags; fallen trees; multilayered canopies; and connectedness of habitat either through large contiguous areas of habitat or through corridors of suitable habitat. Alternative 11 provided these features through its system of large and medium HCAs interconnected with small reserves and matrix habitats. Each large HCA should have the capability to support 100 or more northern flying squirrels, medium HCAs to support more than 50 squirrels, and small HCAs to support 20 to 40 squirrels. These individual populations should have the capability to persist over short to intermediate periods of time. Interactions among these populations through the matrix would allow them to function as a metapopulation conferring high probability of long-term persistence. Dispersal through the matrix was facilitated by the beach fringe and riparian habitat management areas, by the overall amount of old forest remaining in the matrix, and by additional measures prescribed under Alternative 11 to provide for connectivity. These additional measures could include relocating small reserves to better serve a role as connectors, thus providing for small squirrel populations at locations intermediate between the larger populations.

These same components of Alternative 11 also reduced risks to the endemic species and the Prince of Wales flying squirrel. In addition, the 200,000-acre reserve designated on Prince of Wales Island, by itself, was expected to support a moderately large population of squirrels. Another feature of Alternative 11 that was to further reduce risk to Prince of Wales flying squirrels was the requirement to survey for endemic mammals on islands of 50,000 acres or less, or in other areas where there is a high likelihood of species presence. Application of this measure to Prince of Wales Island was expected to result in additional project-specific measures reducing risk to the squirrels. Finally, implementation of mitigation measures for goshawk and marten on Prince of Wales Island was expected to result in the retention of structural features important to flying squirrels such as snags, logs, and large live trees.

Implementation of the survey requirement was expected to substantially reduce risks to other endemic species. This requirement, in combination with the ongoing research on endemic taxa, is responsive to Kiester and Eckhardt's (1994) recommendation to conduct a biological survey on the Tongass.

3.3.6. Marbled Murrelet

3.3.6.1. General Observations on the Marbled Murrelet Panel

Only one panel was conducted for the marbled murrelet (Smith 1996). The panel noted the lack of distributional and ecological information about marbled murrelets, especially in Southeast Alaska. They appeared to make the following general assumptions about harvest practices and other components of the alternatives relative to marbled murrelets and in particular to nesting habitat.

1. The best or most important habitat is found within large contiguous blocks of high-volume, low-elevation old-growth forest. In Yakutat and Glacier Bay this may include stands of large mature Sitka spruce.

2. The main concern with fragmenting or reducing such habitat is an increase in predation rates (more edge and less interior).
3. Canopy cover above the nest (highest in the high-volume stands) is another critical factor in keeping predation rates lower.
4. The maintenance of old-growth forest reserves, and extended rotations, are both seen as ways to retain suitable nesting habitat. Large reserves, and rotations greater than 200 years, are favored; an alternative that would provide both Forest-wide would be ideal (assuming timber harvesting is to continue). Rotations averaging 100 years are not long enough to provide suitable habitat.
5. Riparian and beach fringe old growth, due to its linear nature (more edge, less interior), is considered less suitable nesting habitat than interior old growth. Alternatives with higher amounts of riparian and beach fringe protection may work against murrelets by pushing harvest into critical nesting habitat. Conversely, higher riparian protection could lead to improved habitats overall through a synergistic effect resulting from more interconnectivity.
6. The retention of spatially-explicit small OGRs (as in the one/watershed in Alternatives 3) is favored over the "33 percent residual" concept of Alternatives 5 and 6.

3.3.6.2. Marbled Murrelet Panel Results

Average panel ratings are shown in Table D-15. Based on these ratings, the nine alternatives rated fell roughly into four groups. Alternative 1 was by itself with all of its outcome points assigned to Outcomes I or II. The very low level of timber harvest, all of it under a 200-year rotation, resulted in a rating considerably higher (in terms of ensuring viability) than the other alternatives. The assignment of points to Outcome II was primarily a result of the amount of low-elevation, high-volume old growth already harvested.

Alternatives 3, 4 and 5 all rated fairly high, with at least 74 percent of the points in Outcomes I or II. Alternative 5, offering extended rotations and reserves in critical areas, had the highest viability scores of this group, although the panel would have preferred spatially-identified small reserves rather than the 33 percent residual old growth concept. The full reserve system and greater riparian protection, combined with two-aged management, of Alternative 3 was favored somewhat over the Forest-wide uneven-aged management, but no reserves, of Alternative 4.

Alternatives 2, 6, and 9 each had most of their points (67-74 percent) assigned to Outcomes II or III, and except for Alternative 9 have over 90 percent in Outcomes I-III, providing moderate to high viability ratings (although not all panelists felt Outcome III would meet viability requirements). The rationale for these scores varied by alternative. Alternatives 6 rated highest of this group due largely to their reserve systems, two-aged rather than even-aged timber harvesting, and watershed-specific residual old growth requirements. The 100-year rotations in each were a drawback. Alternatives 2 and 9 rated somewhat lower than Alternatives 6, neither of the former having a reserve system and both using even-aged harvest with 100-year rotations.

Finally, Alternative 7, similar to Alternatives 2 and 9 and with a higher timber harvest level, had the lowest viability rating, assigning 2/3 of its points to Outcomes III or IV.

Table D-15.
Marbled Murrelet Panel Results[1]

	1997 Forest Plan Revision FEIS Alternatives												
Outcomes	**Pre 1954**	**1**	**5**	**11**	**4**	**10**	**3**	**6**	**8**	**2**	**9**	**9'**	**7**
1997 Panel													
I													
II													
III													
IV													
V													
Potential POG Harvest (1,000s of acres)	- 414	0	463	475	495	670	571	732	--	853	1,042	1,403	1,200
1995 Panel													
I		85	45		36		41	26	25	18		16	10
II		15	46		38		40	33	38	34		29	20
III		0	6		24		19	36	31	40		38	45
IV		0	3		3		0	5	6	9		18	23
V		0	0		0		0	0	0	0		0	3
Potential POG Harvest (1,000s of acres)	--	0	572	--	618	--	736	954	955	1,107	--	1,403	1,557
Range Between Outcomes I + II and I + II + III													
1997 Panel	--	--	--	--	--	--	--	--	--	--	--	--	--
1995 Panel	--	100	91-97	--	74-97	--	81-100	59-95	63-94	52-91	--	45-83	30-75

[1] Mean likelihood outcome scores by evaluators in 1997 are shown at the top of the table. Scores from the 1995 panel are shown in the middle of the table. Scores were assigned by both panels for Alternatives 1, 2, 5, and 9'. Alternatives 1 and 9' are identical between panels in both features and acres of POG harvested. Alternatives 2 and 5 are identical in features but with fewer acres of POG harvested in 1997 relative to 1995. A range for all alternatives is shown at the bottom of the table for the likelihood of maintaining habitat to support viable and well distributed goshawk populations. Only 'after' scores are shown. The - 414,000 value for POG harvest under Historic represents the acreage harvested since 1954.

Marbled murrelet likelihood outcome ratings were also highly correlated (0.98) with acres of POG planned for harvest over a 100 year rotation. Alternative 10 was very similar in design to Alternative 3, but did not have the extended beach nor option 1 and 2 riparian buffers, both features considered important by panelists, thus presented greater relative risks than Alternative 3. The system of large and medium and unmapped small old-growth habitat reserves in Alternative 10 was also an important feature, thus superior in design with lower relative risk that Alternative 2.

Alternative 11 harvested almost the lowest amount of old growth (Table D-15), had the most extensive forest-wide reserve system with very large reserves in heavily harvested provinces, and had an extended beach and significant riparian protection. The only possible drawback of Alternative 11 was the 100-year timber harvest rotation in the matrix, viewed as unfavorable by panelists. However, an average of nearly 57 percent of the original 1954 POG would remain in all watersheds under timber management contributing to a diversity of stands and habitat mosaics, clearly superior to extensive even-aged stands. Thus, Alternatives 1 and 11 were believed likely offer the highest likelihood of maintaining well distributed viable murrelet populations.

Commentary on the Panel Ratings. The marbled murrelet is second only to the Other Terrestrial Mammals panel with respect to the lack of local information available to assess long-term viability. Viability concerns for the marbled murrelet in southeast Alaska intensified due to listing of this species as threatened under ESA in California, Oregon, and Washington and the very close habitat affinity with coastal old growth forests (Ralph et al. 1995). Information to substantiate this concern in southeast Alaska is only indirect relative to the loss of nearly one million acres of POG coastal temperate rainforests throughout southeast Alaska (including all ownerships). These are generally the more productive sites at low elevation, presumably some of the best murrelet nesting habitat (DeGange 1996). However the strength of the association between murrelet nesting habitat and highly POG forest has not been established; indeed two of the six nests located in Southeast Alaska to date have been on the ground.

Short term (10-15 years) risks to murrelet viability are difficult to assess but are likely minor especially given the magnitude of recent conservative population estimates of over 365,000 marbled murrelets in southeast Alaska (DeGange 1996). Further, murrelets appear to be highly mobile traveling up to 50-60 miles per day on foraging flights (DeGange 1996) suggesting at least the possibility of relatively high population interaction throughout southeast Alaska. Short term risks are likely proportional to the amount of additional old growth planned for harvest among alternatives (1, 11, 5, 4, 3, 10, 6, 2, 9 and 7 in order of increasing risk) within the planning period covered by the Forest Plan Revision. While large block reserves in general may be a preferable conservation strategy, the small (1,600 acre) block reserves (Alternatives 3, 10, 11 and parts of 5 and 6) in each watershed may significantly contribute to maintenance of nesting habitat and well distributed populations in the absence of additional information on nesting habitat relationships. Forest-wide Standards and Guidelines protect nesting habitat around any identified murrelet nests. However, only six murrelet nests have been found so this standard is not considered as a viable conservation strategy in itself. Rather it serves to protect habitat surrounding the few nests that may be located for long term monitoring and studies to understand murrelet habitat relationships.

Under the assumption that POG habitat is the preferred murrelet nesting habitat, then the loss of an additional 1.5 million acres in some alternatives, in addition to the million acres already lost, could contribute to a long-term viability concern. This concern may become greater if future research reveals a significant murrelet selection for high volume low elevation forests that are sought for timber production, similar to the situation documented in the Pacific Northwest (Ralph et al. 1995). DeGange (1996) suggested that long rotations may be beneficial components to a murrelet conservation strategy, he concluded that a reserve system was more likely to present a viable conservation strategy for murrelets given significant unknowns about this elusive specie; protecting intact landscapes/ecosystems is a better hedge against uncertainty.

The significant reserve system in Alternative 11, especially in at-risk landscapes with significant past timber harvest (reserves partially discussed under Wolf) may make this alternative superior to all others (except Alternative 1). The reserve system in additional to significant matrix protection should provide a

reasonably high likelihood of sustaining well-distributed viable murrelet populations throughout southeast Alaska.

Even over long time periods, there is less relative concern for the marbled murrelet compared to other old growth associated vertebrates assessed by panels. Average murrelet scores for Outcome I and II rated higher than all other species in all alternatives except for the wolf in Alternatives 2 and 3.

3.4. New Science Relevant to Wildlife Viability Assessment Since 1997

The process of assessing wildlife risk through a structured panel assessment process is one of a variety of methods for conducting a viability assessment. Beissinger and McCullough (2002) compiled a reference which consists of a set of review papers on population viability analysis. This section presents a summary of the science that is relevant to wildlife viability assessment since 1997. It is largely based on a review of recent science relative to population and species viability assessment conducted by Haufler (2006).

Numerous factors influence the viability of any species. However, habitat is the greatest overall factor affecting viability of a species (Wilcove et al. 1998). Reed et al. (2006) identified four broad classes of factors influencing viability of a species; population size and structure, habitat, demography, and relationships between demographic rates and habitat and between demographic rates and population size. In addition, many other minor factors can play a role. Given this myriad of potential influences on the viability of a species, it is not surprising that quantification of species viability has been a difficult task. Consequently, most assessments of species viability in a planning or impact assessment context have been conducted qualitatively, usually with the use of expert opinion in relation to projected future conditions.

Species viability assessment based on habitat has ranged from expert assessments of future population status based on projected habitat conditions to more complex analyses of individual home ranges and their contributions to species persistence in spatially-explicit individually-based population viability models (Noon et al. 1999). Individually-based spatially explicit models may be the most realistic (Breininger et al. 2002), but these approaches also require many model parameters that may not be known with any accuracy, and include various assumptions that may be difficult to test. The spatial description of habitat quality produced from this approach can be used for a variety of habitat-based population viability assessments (Akcakaya and Atwood 1997, Akcakaya 2000). Lawler and Schumaker (2004) evaluated habitat surrogates for population parameters of red-shouldered hawks and goshawks, and found poor relationships between predicted habitat quality and observed habitat quality.

Various models for population viability assessment (PVA) have been proposed and developed (see review by Akcakaya and Sjogren-Gulve 2000), most involving theoretical relationships of demographic data. The idea behind PVA has been to determine an estimate of the extinction risk to a species based on current demographic conditions and alternative future conditions. Given the complexities of species viability described above, it is not surprising that sufficient data generally do not exist to conduct a thorough population viability analysis. For example, Green and Hirons (1991) reported that data suitable for population modeling were available for only 2 percent of threatened bird species, taxa about which we know the greatest amount, while Samson (2002) reported that suitable data existed to conduct a PVA for only 3 of 119 species at risk in the Northern Great Plains. Beissinger and Westphall (1998) discussed use of PVAs in endangered species management. They suggested caution in use of predictions produced from such analyses because of the unreliability of data available for such models as well as the lack of understanding of both periodic fluctuations and density dependent factors, and varying model assumptions that can cause changes in results. They suggested that PVAs consider relative rather than absolute rates of extinction, be limited to short projections, and use models compatible with the available data.

A number of different demographic-based approaches have been proposed for assessing species viability. As with habitat-based approaches, these range from relatively simple approaches to much more complex approaches (Haufler 2006). Incidence function models are relatively simple models designed to

provide an estimate of the risk of extinction (Hanski 1999). This approach requires the presence or absence of species of interest to be determined for various habitat patches in a landscape over a time. Appropriate time frames are difficult to estimate, as different populations have different generation times and vulnerability to extinction events. This approach assumes relatively static habitat conditions (Ralls et al. 2002), an unlikely condition for management planning or impact assessments.

A second demographic-based approach is the use of population trend information (Morris et al. 1999). This approach requires the population of a species to be consistently monitored over time to determine any changes in the population size. Morris et al. (1999) recommended a minimum of 7 years of trend data for accurate analysis. Even with this information, the population trend applies only to that time interval and landscape studied.

A number of population simulation models have been developed that address questions of productivity and survival rates of a population (Haufler 2006). These models require detailed information on the demographics of the population under evaluation, data that are seldom available (Bessinger and Westphal 1998).

Certain populations may be limited by the spatial distribution of their habitat, where dispersal among patches is a relatively rare event, so that population demographics within a patch are largely independent of other habitat patches within the landscape. When this arrangement occurs, it is known as a metapopulation (McCullough 1996, Hanski and Gilpin 1997). A number of metapopulation models have been developed that attempt to address population persistence in patches as balanced by dispersal rates among patches. Such models, to be accurate, require information on the status of a population within a habitat patch, including the habitat quality, population size, and internal-patch demographic parameters. In addition, the distribution, and size of other patches in the landscape and rates of successful dispersal among the patches must be known. Dispersal data are one of the least known and most difficult parameters to assess for a population, and small errors in assessment of dispersal can cause large errors in projections of metapopulation models (Reed et al. 2002). In addition, even if these population parameters are collected, as with other demographic parameters, they are usually not transferable to other conditions than those in which they were collected.

Concerns over habitat fragmentation have led many to assume that populations are regularly being converted to metapopulations, and to view any system with a patchy distribution as a metapopulation (Hanski and Simberloff 1997, Harrison and Taylor 1997). However, this is generally not correct, as actual metapopulations are rare (Harrison and Taylor 1997). Hanski (1999) discussed the basic parameters that need to be considered to conduct a metapopulation analysis.

Smith and Zollner (2005) argue that using the most vulnerable species, or evaluating single species without reference to others, to assess impacts of land management likely underestimates the probability of extinction of wildlife species across the planning area because the risk of local extirpation increases with the number of extinction prone species considered. Additionally, the management alternative that poses the greatest risk to the most vulnerable wildlife species may not pose the greatest risk to the wildlife community as a whole (Smith and Zollner 2005). The authors present an alternative method for assessing risk to wildlife viability that considers the risk of “any” extinction among species at risk in the planning area. To accomplish this, an equation is used which calculates the joint probability of at least one extinction among the set of selected species (derived from panel assessment ratings or population viability analysis), which can then be used to conduct a relative comparison of alternatives. That is, it takes into account the marginal, or individual, extinction probability of each species. This approach is used here as an alternate method for comparing the effects of the alternatives on wildlife viability (see Section 3.6 and the *Wildlife* section of Chapter 3 for further discussion).

Global climate change has been a subject of increasing interest and focus in the past 10 years. A number of publications have discussed biodiversity conservation in the face of global warming. Saxon (2003) presented a good discussion of this topic. He recommended that conservation planning occur across ecoregions, and that these ecoregions be identified based on abiotic factors including climate, but also based on other abiotic factors than climate as this factor is likely to change. With climate change expected to have a greater effect on more polar regions, incorporating the potential consequences of global warming relative to conservation planning in Alaska is warranted.

3.5. Application of Panel Assessments to the 2008 FEIS Alternatives

The 1997 Forest Plan Revision Final EIS wildlife analysis relied in part on the expert panel evaluations of alternatives in terms of the estimated relative risks to a species or habitat of concern, as described in Sections 3.2 and 3.3. The 2008 Forest Plan Amendment FEIS also relies in part on these panel evaluations. Of the seven alternatives analyzed in the 2008 FEIS, four of them are very similar to or based on alternatives analyzed during the panel assessments. In addition, the harvest levels of all 2008 alternatives are within the range of the 1997 alternative harvest levels, given that a no-harvest alternative was analyzed in 1997. As described in Section 3.1, there was a strong correlation between the acres of POG scheduled for harvest in an alternative and the mean outcome scores for that alternative resulting from the panel assessments (Section 3.3). As the number of acres harvested increased among alternatives, the mean outcome scores also increased, resulting in greater risk that habitat may not be sufficient to maintain viable and well distributed populations. Therefore, the panel evaluations can be used to make inferences about the 2008 alternatives.

The accuracy of this approach was tested in 1997 (Section 3.1). The 1997 FEIS, which was developed prior to the 1997 panel assessments, evaluated two alternatives, which had not been assessed by the panels, by making inferences based on harvest acres; these inferences and the resulting alternative evaluations were generally confirmed based on the 1997 panel assessments (see Appendix N to the 1997 FEIS).

The relationship between the 2008 alternatives and the 1997 alternatives in terms of equivalency of features, land base, and acreage of POG potentially harvested is summarized in Table D-16, for use in rating the 2008 alternatives in terms of the panel assessments.

Based on the equivalencies given in Table D-16 and supplemental information, viability ratings for the 2008 alternatives were developed and are summarized in Table D-17. The ratings were based on the midpoint of the range between the sum of Outcomes I+II and the sum of Outcomes I+II+III for each alternative. The midpoint of the range between these sums was used as the index of viability because viability was generally assumed by panelists to lie between the sum of Outcomes I+II and the sum of Outcomes I+II+III (USDA Forest Service 1997(Appendix N, p.N-3). The 2008 alternatives were evaluated by applying the equivalencies or rankings in Table D-17 to the panel assessment midpoint values as shown in the tables in Section 3.3. The midpoint values were then transferred to ratings using the key provided in the footnote to Table D-17. Further explanation for these ratings is provided in the following subsections.

3.5.1. Northern Goshawk

Alternatives 1, 2, and 3 in 2008 would both have midpoint values above 91, based on applying Table D-16 equivalencies and rankings to Table D-9. Therefore, they are expected to have very high viability ratings for goshawks. Alternatives 5 and 6 in 2008 are both similar to 1997 Alternative 11, which had a midpoint value of 84. In addition, 2008 Alternatives 5 and 6 both include supplemental measures, which may have a positive effect on viability; 2008 Alternative 5 includes the goshawk and marten standards and guidelines and 2008 Alternative 6 includes the legacy forest structure standards and guidelines. Neither of these measures were evaluated by either of the panels, so their value for goshawks was not considered. As a result of this and the 84 midpoint value for 1997 Alternative 11, 2008 Alternatives 5 and 6 are rated in the high category for goshawks. Alternative 4 in 2008 is rated as moderately high, because the midpoint value for 1997 Alternatives 10, 3, and 6, ranges from 66.5 to 74. Alternative 7 in 2008 is equivalent to 1997 Alternative 2, which had a midpoint value of 40.5. This value falls within the moderate range.

Table D-16.
Relationship of 2008 Alternatives to 1997 Alternatives for Use in Rating 2008 Alternatives in Terms of Panel Assessments

2008 Alternatives	Equivalency or Ranking in terms of 1997 Alternatives*
Alternative 1 84,000 acres of potential POG harvest	2008 Alternative 1 has a lower POG harvest than any of the 1997 alternatives with POG harvest. Ratings for this alternative should be between 1997 Alternative 1 with 0 harvest and 1997 Alternative 5 (with 463,000 acres of harvest) or 1997 Alternative 11 (with 475,000 acres of harvest). Based on the low POG harvest levels, ratings would be closest to (but greater than) Alternative 1.
Alternative 2 223,000 acres of potential POG harvest	2008 Alternative 2 has a lower POG harvest than any of the 1997 alternatives with POG harvest. Ratings for this alternative should be between 1997 Alternative 1 with 0 harvest and 1997 Alternative 5 (with 463,000 acres of harvest) or 1997 Alternative 11 (with 475,000 acres of harvest). Based on harvest levels, ratings would be in the middle of the range between Alternative 1 and Alternatives 5 or 11.
Alternative 3 325,000 acres of potential POG harvest	2008 Alternative 3 has a lower POG harvest than any of the 1997 alternatives with POG harvest. Ratings for this alternative should be between 1997 Alternative 1 with 0 harvest and 1997 Alternative 5 (with 463,000 acres of harvest) or 1997 Alternative 11 (with 475,000 acres of harvest). Based on harvest levels, ratings would be closer to (but less than) Alternatives 5 or 11.
Alternative 4 644,000 acres of potential POG harvest	2008 Alternative 4 is similar to 1997 Alternative 6 in terms of features and land base. The acres of POG harvest are lower for the 2008 Alternative 4 at 644,000 compared with the 1997 Alternative 6 at 732,000. However, only the 1995 version of Alternative 6 was evaluated by the viability panels, and the acres of POG harvest are considerably lower in 2008 vs. 1995 (644,000 vs. 954,000, respectively). The alternative that was reviewed by the viability panels and is the closest to the 2008 Alternative 4 is the 1997 Alternative 10 (670,000 acres of harvest). So ratings for 2008 Alternative 4 are expected to be between 1995 Alternative 6 and 1997 Alternative 10; being closer to the latter alternative.
Alternative 5 479,000 acres of potential POG harvest	2008 Alternative 5 is similar to 1997 Alternative 11 in terms of features, land base, and POG harvest (481,000 vs. 463,000 acres of harvest, respectively). Therefore, the ratings for this alternative would be similar to the ratings for 1997 Alternative 11.
Alternative 6 472,000 acres of potential POG harvest	2008 Alternative 6 is similar to 1997 Alternative 11 in terms of features, land base, and POG harvest (472,000 vs. 463,000 acres of harvest, respectively). Therefore, the ratings for this alternative would be similar to the ratings for 1997 Alternative 11.
Alternative 7 826,000 acres of potential POG harvest	2008 Alternative 7 is similar to 1997 Alternative 2 in terms of features, land base, and POG harvest (826,000 vs. 853,000 acres of harvest, respectively). Therefore, the ratings for this alternative would be similar to the ratings for 1997 Alternative 2.

* POG harvest levels in 1997 are based on values given to the panels, which were different, in some cases from the final scheduled acres given in the 1997 FEIS.

Table D-17.
Viability Ratings (likelihood of maintaining habitat to support viable and well distributed populations) assigned to the 2008 Alternatives based on the Equivalent Panel Assessment Ratings from the 1995/1997 Panel Assessments

Species	Alternatives						
	1	2	3	4	5	6	7
Goshawk	Very High	Very High	Very High	Moderately High	High	High	Moderate
Marten	Very High	High	High	Moderate	Moderate	Moderate	Moderate
Wolf	Very High	Very High	High	High	High	High	Moderately High
Brown Bear	Very High	High	High	Moderately High	High	High	Moderately High
Widely Distributed Mammals	High	Moderately High	Moderately High	Moderate	Moderate	Moderate	Moderately Low
Endemic Mammals	Moderate	Moderate	Moderate	Moderately Low	Moderate	Moderate	Very Low
Marbled Murrelet	Very High	Very High	Very High	High	Very High	Very High	Moderately High

[1] Ratings were based on the midpoint of the range between Outcomes I+II and Outcomes I+II+III for each alternative, as determined by applying the equivalencies or rankings in Table D-17 to the panel assessment results tables in Section 3.3. The midpoint values were then transferred to ratings using the following key:
Very High: 91-100, High: 81-90, Moderately High: 66-80, Moderate: 35-65, Moderately Low: 20-34, Low: 10-19, Very Low: 0-9.

In addition, these ratings may be conservatively low. Information from recent studies indicates that goshawks may make more use of second growth and other forest types than was assumed during the panel assessments (Bosakowski et al. 1999; McClaren 2003, 2004; Boyce et al. 2006, Reynolds et al. 2006). As noted in Section 3.3.1.1, the primary factor used by panelists in their ratings was the proportion of POG that would be harvested in 100 years. The panels assumed a strong selection by goshawks for POG and the avoidance of all other habitat types. In addition, the level of old-growth harvest that was envisioned by the panels over the past 10 years has not materialized. As a result, nearly the same amount of old growth still exists on the Tongass and the large quantities of older second growth are now 10 years closer to becoming useful goshawk habitat. Therefore, if the panels were repeated today, the ratings could be slightly higher.

Given these factors, the rankings of the 2008 alternatives relative to the 1997 selected alternative (Alternative 11) would be as follows: Alternatives 4 and 7 in 2008 would have lower viability ratings than 1997 Alternative 11, and 2008 Alternatives 1, 2, 3, 5, and 6 would have higher ratings. These higher ratings are because of a smaller managed land base, the addition of goshawk/marten (in the case of 2008 Alternative 5) or legacy (in the case of 2008 Alternatives 1, 2, 3, and 6) standards and guidelines, and new science about goshawk habitat use in Southeast Alaska. The slight change in the goshawk nest standard and guideline (see Section XX), is not expected to affect viability.

The same relative ratings are also expected to hold for the 1997 Forest Plan versus the 2008 alternatives (i.e., 2008 Alternatives 4 and 7 would have lower viability ratings and 2008 Alternatives 1, 2, 3, 5, and 6 would have higher viability ratings than the 1997 Forest Plan). These conclusions follow the same reasoning as given in the above paragraph for most of the alternatives. Table D-18 summarizes this reasoning.

Table D-18.
Goshawk Viability Ratings for the 2008 Alternatives Relative to the 2007 Forest Plan[1/]

Alternatives	Comparison with 2007 Forest Plan1/	Viability for Alternative relative to 2007 Forest Plan1/
Alternative 1	Acreage in protected POG is considerably higher in Alt 1 due to expanded OGRs (i.e., more acreage in Old Growth Habitat, Special Interest Areas, Semi-Remote Recreation, and other non-development LUDs). 2007 Forest Plan has goshawk S&G, marten S&G, and unmodified goshawk nest S&G, while Alt 1 has legacy S&G.	Alt. 1 has higher viability rating
Alternative 2	Acreage in protected POG is considerably higher in Alt 2 due to expanded OGRs (i.e., more acreage in Old Growth Habitat, Special Interest Areas, Semi-Remote Recreation, and other non-development LUDs). 2007 Forest Plan has goshawk S&G, marten S&G, and unmodified goshawk nest S&G, while Alt 2 has legacy S&G.	Alt. 2 has higher viability rating
Alternative 3	Acreage in protected POG is considerably higher in Alt 3 due to expanded OGRs (i.e., more acreage in Old Growth Habitat, Special Interest Areas, Semi-Remote Recreation, and other non-development LUDs). 2007 Forest Plan has goshawk S&G, marten S&G, and unmodified goshawk nest S&G, while Alt 3 has legacy S&G.	Alt. 3 has higher viability rating
Alternative 4	Acreage in protected POG is considerably lower in Alt 4 due to OGRs in only four provinces and less acreage in non-development LUDs in general. 2007 Forest Plan has goshawk S&G, marten S&G, and unmodified goshawk nest S&G, while Alt 4 does not have goshawk/marten S&Gs or legacy S&Gs.	Alt 4 has lower viability rating
Alternative 5	Same as the 2007 Forest Plan	Alt 5 has the same viability rating
Alternative 6	Acreage in protected POG is higher in Alt 6 due to expanded OGRs (i.e., more acreage in Old Growth Habitat, Special Interest Areas, and Semi-Remote Recreation). 2007 Forest Plan has goshawk S&G, marten S&G, and unmodified goshawk nest S&G, while Alt 6 has legacy S&G.	Alt. 6 has a similar viability rating
Alternative 7	Acreage in protected POG is considerably lower in Alt 7 due to OGRs in only four provinces and less acreage in non-development LUDs in general. 2007 Forest Plan has goshawk S&G, marten S&G, and unmodified goshawk nest S&G, while Alt 7 does not have goshawk/marten S&Gs or legacy S&Gs.	Alt 7 has substantially lower viability rating

1/ The 2007 Forest Plan is defined as the 1997 Forest Plan, as amended through 2007. It is represented by Alternative 5.

3.5.2. American Marten

Alternative 1 in 2008 would have a midpoint value suggesting a very high viability rating for marten, based on applying Table D-16 equivalencies and rankings to Table D-10. Based on the level of POG harvest, 2008 Alternatives 2 and 3 are expected to have a high rating. Alternatives 5 and 6 in 2008 are both similar to 1997 Alternative 11, which had a midpoint value of 64. In addition, 2008 Alternatives 5 and 6 both include supplemental measures, which were not considered in the panel assessments and these measures may have a positive effect on viability; 2008 Alternative 5 includes the goshawk and marten standards and guidelines and 2008 Alternative 6 includes the legacy forest structure standards and guidelines. As a result of this and the 64 midpoint value for 1997 Alternative 11, 2008 Alternatives 5 and 6 are rated at the upper end of the moderate category for marten. Alternative 4 in 2008 is also rated as

moderate, because the midpoint value for 1997 Alternatives 10, 3, and 6, ranges from 49 to 64.5. Alternative 7 in 2008 is equivalent to 1997 Alternative 2 with a midpoint value of 51, which is also in the moderate range.

Information from recent studies indicates that the marten in Southeast Alaska may represent two species, or at least, two different genetic lineages of one species. If there are actually two species, it could indicate a greater viability concern for some islands on the Tongass (e.g., Kuiu - the endemic lineage of marten is currently only documented on Kuiu and Admiralty Islands). However, there is no information indicating that there are ecologically meaningful differences (e.g., differences in habitat use) between the two lineages.

Given these factors, the rankings of the 2008 alternatives relative to the 1997 selected alternative (Alternative 11) would be as follows: Alternatives 4 and 7 in 2008 would have lower viability ratings than 1997 Alternative 11, and 2008 Alternatives 1, 2, 3, 5, and 6 would have higher ratings. These higher ratings are because of a smaller managed land base, the addition of goshawk/marten (in the case of 2008 Alternative 5) or legacy (in the case of 2008 Alternatives 1, 2, 3, and 6) standards and guidelines.

The same relative ratings are also expected to hold for the 2007 Forest Plan versus the 2008 alternatives (i.e., 2008 Alternatives 4 and 7 would have lower viability ratings and 2008 Alternatives 1, 2, 3, 5, and 6 would have higher viability ratings than the 2007 Forest Plan). The moderate viability rating for marten in the 2007 Forest Plan was based on the 1997 plan without the additional conservation measures for marten added in the Decision. With those additional measures, the likelihood of maintaining habitat for viable populations of marten was strengthened. Similarly, Alternative 6 strengthens this likelihood by retaining the additional measures that were added for the 1997 Decision except for the replacement of the Legacy standard for one of the marten measures. This, plus the other additions described in Chapter 2, is why both Alternatives 5 and 6 would have higher viability ratings than the 1997 Forest Plan These conclusions follow the same reasoning as given in the above paragraph for most of the alternatives and are similar to those given in Table D-18 for goshawks.

3.5.3. Alexander Archipelago Wolf

Alternatives 1 and 2 in 2008 would have midpoint values suggesting a very high viability rating for the wolf and Alternative 3 would have a high rating, based on applying Table D-16 equivalencies and rankings to Table D-11. Alternatives 5 and 6 in 2008 are both similar to 1997 Alternative 11, which had a midpoint value of 90. As a result, 2008 Alternatives 5 and 6 are rated at the high end of the high category. Alternative 4 in 2008 is also rated as high, because the midpoint value for 1997 Alternatives 10, 3, and 6, ranges from 79.5 to 91. Alternative 7 in 2008 is equivalent to 1997 Alternative 2 with a midpoint value of 80, which is in the moderately high range.

Given these factors, the rankings of the 2008 alternatives relative to the 1997 selected alternative (Alternative 11) would be as follows: Alternatives 4 and 7 in 2008 would have lower viability ratings than 1997 Alternative 11, and 2008 Alternatives 1, 2, and 3 would have higher ratings. Alternatives 5 and 6 in 2008 would have similar ratings, albeit slightly higher. The same relative ratings are also expected to hold for the 2007 Forest Plan versus the 2008 alternatives (i.e., 2008 Alternatives 4 and 7 would have lower viability ratings and 2008 Alternatives 1, 2, 3, 5, and 6 would have higher viability ratings than the 2007 Forest Plan).

3.5.4. Brown Bear

Alternative 1 in 2008 would have a midpoint value suggesting a very high viability rating for the brown bear, based on applying Table D-16 equivalencies and rankings to Table D-12. Based on the level of POG harvest, 2008 Alternatives 2, 3, 5, and 6 are expected to have high ratings. Alternative 4 in 2008 would be rated as moderately high, because the midpoint value for 1997 Alternatives 10, 3, and 6, ranges from 70 to 78 and averages below 76. Alternative 7 in 2008 is equivalent to 1997 Alternative 2 with a midpoint value of 69.5, which is also in the moderately high range.

Given these factors, the rankings of the 2008 alternatives relative to the 1997 selected alternative (Alternative 11) would be as follows: Alternatives 4 and 7 in 2008 would have lower viability ratings than

1997 Alternative 11, and 2008 Alternatives 1, 2, and 3 would have higher ratings. Alternatives 5 and 6 in 2008 would have similar ratings, albeit slightly higher. The same relative ratings are also expected to hold for the 2007 Forest Plan versus the 2008 alternatives (i.e., 2008 Alternatives 4 and 7 would have lower viability ratings and 2008 Alternatives 1, 2, 3, 5, and 6 would have higher viability ratings than the 2007 Forest Plan).

3.5.5. Other Terrestrial Mammals

Alternative 1 in 2008 would have a midpoint value suggesting a high viability rating for widely distributed mammals and a moderate rating for endemic mammals, based on applying Table D-16 equivalencies and rankings to Tables D-13 and D-14. Based on the level of POG harvest, 2008 Alternatives 2 and 3 are expected to have moderately high ratings for widely distributed mammals and moderate ratings for endemic mammals, respectively. Alternatives 5 and 6 in 2008 are both similar to 1997 Alternative 11, which had a midpoint value of 60 for the widely distributed group and 37 for the endemic group. In addition, 2008 Alternatives 5 and 6 both include supplemental measures (see Section 3.3.2.3), which were not considered in the panel assessments and these measures may have a positive effect on viability; these measures include the survey requirement, connectivity guideline, and goshawk and marten standards and guidelines for 2008 Alternative 5 and the survey requirement, connectivity guideline, and legacy standards and guidelines for 2008 Alternative 6. As a result of this and the midpoint values for 1997 Alternative 11, 2008 Alternatives 5 and 6 are rated at the high end of the moderate category for the widely distributed group and at the low end of the moderate category for endemics. Alternative 4 in 2008 is also rated as moderate for the widely distributed group because the midpoint value for 1997 Alternatives 10, 3, and 6, ranges from 36.5 to 54. This alternative is rated as moderately low for endemics (midpoint ranges from 31 to 35). Alternative 7 in 2008 is equivalent to 1997 Alternative 2 with midpoint values of 10.5 and 4 for the widely distributed and endemic groups, respectively. This places it in the moderately low and very low categories for the widely distributed and the endemic groups, respectively.

Given these factors, the rankings of the 2008 alternatives relative to the 1997 selected alternative (Alternative 11) would be as follows: Alternatives 4 and 7 in 2008 would have lower viability ratings than 1997 Alternative 11, and 2008 Alternatives 1, 2, 3, 5, and 6 would have higher ratings. The same relative ratings are also expected to hold for the 2007 Forest Plan versus the 2008 alternatives (i.e., 2008 Alternatives 4 and 7 would have lower viability ratings and 2008 Alternatives 1, 2, 3, 5, and 6 would have higher viability ratings than the 1997 Forest Plan).

3.5.6. Marbled Murrelet

Alternatives 1, 2, and 3 in 2008 would have midpoint values suggesting a very high viability rating for the marbled murrelet, based on applying Table D-16 equivalencies and rankings to Table D-15. Alternatives 5 and 6 in 2008 are both similar to 1997 Alternative 11, which was not rated by the panel; however, based on the values assigned to the 1995 versions of Alternatives 3, 4, and 5, the 2008 Alternatives 5 and 6 would also fall into the very high viability category. Alternative 4 in 2008 is rated as high, because the midpoint value for the 1995 versions of Alternatives 3 and 6 range from 77 to 90.5. Alternative 7 in 2008 is equivalent to the 1995 version of Alternative 2, but with less harvest. It is given a moderately high viability rating for the marbled murrelet because the midpoint value for the 1995 version of Alternative 2 was 71.5.

Given these factors, the rankings of the 2008 alternatives relative to the 1997 selected alternative (Alternative 11) would be as follows: Alternatives 4 and 7 in 2008 would have lower viability ratings than 1997 Alternative 11, and 2008 Alternatives 1, 2, and 3 would have higher ratings. Alternatives 5 and 6 in 2008 would have similar ratings, albeit slightly higher. The same relative ratings are also expected to hold for the 2007 Forest Plan versus the 2008 alternatives (i.e., 2008 Alternatives 4 and 7 would have lower viability ratings and 2008 Alternatives 1, 2, 3, 5, and 6 would have higher viability ratings than the 2007 Forest Plan).

3.6. Alternative Approach to Viability Evaluation for Alternative Comparison

To determine whether the alternatives provided sufficient habitat to sustain all indigenous wildlife across the planning area, and as a means to compare the alternatives, the 1997 Forest Plan FEIS relied, in part, on the findings of structured panel assessments. As described above, these panel assessments provided estimates of the relative risk, in the form likelihood points or scores for a certain outcome. Results from this assignment of likelihood points do not represent probabilities in the classic sense of frequencies; rather, they represent degrees of belief in future outcomes that are based on reasoned professional judgment and expressed in a probability-like scale (Shaw 1999). Scores from individual panel members were averaged to produce a likelihood score for five possible outcomes related to population distribution for each species: occupancy of historic range (Outcome I), temporary gaps in distribution (Outcome II), permanent gaps in distribution (Outcome III), existence in refugia (Outcome IV), and extirpation from Federal lands (Outcome V).

Other considerations to assess viability were presented in Section 3.4. In order to increase the confidence in our viability assessment, an alternate method for alternative comparisons to address viability was used, The tool with the most applicability to the Tongass, given the lack of level of information required for most other tools, is the analysis presented by Smith and Zollner (2005). They argued that using the most vulnerable species to assess impacts of land management likely underestimates the probability of extinction of wildlife species across the planning area because the risk of local extirpation increases with the number of extinction prone species considered. Since the Tongass is an island archipelago with natural inherent risks of species extripation, this method presents a conservative method to further assess viability risks. The authors present an alternative method for assessing risk to wildlife viability that considers the risk of “any” extinction among species at risk in the planning area. To accomplish this, an equation is used which calculates the joint probability of at least one extinction among the set of selected species. That is, it takes into account the marginal, or individual, extinction probability of each species, as determined by population viability analysis or panel assessment, to compare the relative, rather than absolute, risk of extinction among land management alternatives (see Smith and Zollner (2005) for the equation and for statistical details).

This method was used to rank the 2008 FEIS alternatives in terms of relative level of risk of any of the evaluated species existing in refugia or being extirpated using the 1997 FEIS panel assessment ratings. It is important to note that, since the panel scores for outcomes do not represent probabilities, this approach simply produces risk indices. Two risk indices were calculated: one is based on the likelihood that any species will exist in refugia or be extirpated after 100 years of Forest Plan implementation and the other is based on the likelihood that any species will be extirpated.

This method (which applies the binomial theorem) requires that responses of species at risk to management alternatives be independent (i.e., they cannot respond identically to the management scenario or be ecologically dependent on each other as in predator/prey interactions; Smith and Zollner 2005). The individual species and groups selected for risk assessment panel evaluation were chosen because their ecologies likely incorporate the breadth of forest habitat features and other attributes of environmental variation represented across the Forest (Shaw 1999) and are, therefore, assumed to be independent for this analysis; however, it is recognized that some degree of correlation between components is inherent in all ecological communities.

Table D-19 presents the risk indices for 2008 Alternatives 4, 5/6, and 7, which are equivalent or similar to 1997 Forest Plan FEIS Alternatives 6, 11, and 2 (which were evaluated by the panels), respectively. Applying this risk assessment method indicates that, when all evaluated species are considered jointly, Alternatives 4 and 7 would have the greatest risks. This difference is driven primarily by potential risks to the endemic and widely distributed mammals groups, which have the highest risks of any species or group evaluated (Table D-19). The risk index for extirpation was near 40 percent for both Alternatives 4 and 7, but only 8 percent for Alternatives 5 and 6. The risk index for any species existing in refugia or

Table D-19.
Risk Indices associated with the joint probability that any (i.e., at least one) wildlife species among those evaluated would become restricted to refugia or be extirpated

Species	Risk Index for	Outcome Scores and Risk Index[1/]		
		Alt 4*	Alt 5 or 6	Alt 7
Goshawk	Species existence in refugia or extirpation	17	3	21
	Species extirpation from NFS lands	0	0	5
Marten	Species existence in refugia or extirpation	30	9	18
	Species extirpation from NFS lands	0	0	0
Wolf	Species existence in refugia or extirpation	5	4	4
	Species extirpation from NFS lands	1	1	1
Brown bear	Species existence in refugia or extirpation	11	8	10
	Species extirpation from NFS lands	0	0	0
Murrelet***	Species existence in refugia or extirpation	5	1	9
	Species extirpation from NFS lands	0	0	0
Endemics[2/, 3/]	Species existence in refugia or extirpation	58	45	93
	Species extirpation from NFS lands	30	4	23
Widely distributed[2/, 3/.]	Species existence in refugia or extirpation	51	19	83
	Species extirpation from NFS lands	15	3	15
Combined Risk Index for a Species Being Restricted to Refugia or Being Extirpated [2/]		90	66	>99
Combined Risk Index for a Species Being Extirpated[2/]		41	8	38

[1/] Derived from the 1995 (Alternative 4) and 1997 (Alternatives 7 and 11) panel assessment ratings for Outcomes IV and V; Alternatives 4, 5, and 7 are equivalent to the 1997 Forest Plan FEIS Alternatives 6, 11, and 2, respectively. See Smith and Zollner (2005) for equation and further statistical discussion. Values are relative.

[2.] Endemic group includes small mammals whose known distribution in southeast Alaska (beaver, ermine, voles, etc); wide ranging group includes

[3/] Within each guild, evaluators selected what they considered to be the most sensitive species or group of species to evaluate the effect of each alternative on the guild, sometimes consisting of a few or even one species, depending on geographic distribution of species or management actions (Shaw 1999). For the risk assessment these groups were treated similarly to the single species panels.

being extirpated was greater than 99 percent for Alternative 7, 90 percent for Alternative 4, and 66 percent for Alternatives 5 or 6. Again, it is important to understand that these numbers represent an index of relative risk that any species may exist in refugia or be extripated after 100 years of maximum levels of timber harvest allowed in each Alternative. This relative risk is used to compare alternatives and therefore, it is not accurate to consider these as absolute indicators of a degree of risk.

Because 2008 Alternatives 1, 2, and 3 would harvest less timber than Alternative 5 or 6, but maintain equivalent or more protective conservation measures, it can be assumed that their risk indices would be lower than the corresponding indices for Alternatives 5 and 6. The lowest risk indices would be associated with Alternative 1.

The fact that Alternative 4 had an overall probability of extirpation that was slightly higher than Alternative 7, despite proposing less harvest, is likely due to the fact that risk assessment panels convened twice, once in 1995 and once in 1997, evaluating different alternatives each time. The 1997 FEIS Alternative 2 (equivalent to the 2008 Alternative 7) was assessed both times, whereas 1997 FEIS Alternative 6 (equivalent to the 2008 Alternative 4) was only assessed in 1995. In 1997, there was a consistent shift in outcome ratings for Outcome V, or local extirpation (points shifted to higher outcomes, generally IV), across all alternatives due to a clarification of the interpretation of extirpation within the 100-year evaluation period (Iverson 1997). Also, the acreage potentially harvested under the version of Alternative 6 reviewed by the 1995 panel was higher than the level of harvest for the 1997 Alternative 6 and for the 2008 Alternative 4. Thus, it is likely that if the 1995 version of Alternative 6 had been reevaluated in 1997, its score for Outcome V would also have shifted down, lower than the 1997 version of Alternative 2 (re-ordering the results to show that Alternative 7 considered here would in fact pose the greatest risk to the ecological community). Taking this factor into account, the overall outcomes confirm the relative rankings of the alternatives based on other comparisons.

4. CONCLUSIONS REGARDING THE 2008 FOREST PLAN AMENDMENT

4.1. Introduction

The conservation strategy provides the scientific basis for an ecological approach to the Tongass Forest Plan. The strategy consists of a system of OGRs and matrix lands that are a mix of retention and active forest management. The Forest-wide reserve network provided by the non-development LUDs provides the backbone framework to ensure maintenance of habitat for species viability while the matrix provides a variety of functions and activities. Both are critical for the conservation strategy and to ensure species viability; however, they have different functions.

The reserve network protects the integrity of the old-growth forest ecosystem by protecting the largest blocks of contiguous old growth, as well medium and smaller-sized blocks. These reserves are distributed across the Forest and serve as core areas for functioning old-growth ecological communities.

The forests in the matrix provide a variety of functions, including connectivity between old growth in reserve areas and providing habitat for a variety of organisms associated with forests of a variety of successional stages, including old growth. Standards and guidelines within the matrix are designed to provide for important ecological functions such as dispersal of organisms, carryover of some species from one stand to the next and maintenance of ecologically valuable structural components such as down logs, snags and large trees. The expected condition for the matrix over time, given all Forest Plan expectations, is a mosaic of successional stages – from early seral to second growth forests to old-growth forests. The suite of ecological functions provided by the matrix, including connectivity and old-growth representation, is achieved through the combination of old growth retention in beach fringe, riparian and floodplain buffers, karst, soil, other no-harvest areas; aging young-growth stands; uneven-aged managed stands; and patches of forest left in managed stands. Matrix functions are enhanced, both in the short term and as the stand ages, by leaving individual reserve trees, snags and clumps of reserve trees within harvested units.

4.2. Forest-wide Reserve Changes

Changes to the conservation strategy under the alternatives fall into two broad categories (as described in Sections 2.5.1 and 2.5.2): changes to the Forest-wide reserve network and changes to standards and guidelines that affect management of the matrix. The overall effects of these changes need to be examined in combination to determine the net effects of the changes relative to the 2007 Forest Plan (modeled by Alternative 5). This section summarizes these overall effects.

As noted in Section 2.5.1, the Forest-wide reserve network was modified in two ways: changes were made to the areas identified as Old-Growth Habitat LUDs and changes were made to other non-development LUDs. Under Alternatives 1, 2, 3, and 6, the boundaries of a large portion of the Old-Growth Habitat LUDs that represent the small OGRs were modified using a process that started with an interagency biological proposal and ended with a refinement of that proposal in consideration of multiple-use objectives. The net result of these modifications was an increase in OGR acres by 39,000 relative to Alternative 5 (the 2007 Forest Plan). In contrast, Alternative 4 reduces the acreage in Old-Growth Habitat LUDs by 789,000 or 67 percent and Alterative 7 totally eliminates the Old-Growth Habitat LUD.

The second way that the Forest-wide reserve network was modified was through the modification of other non-development LUDs, which also represent an important part of the network. Overall, the acreage in these other non-development LUDs was also enlarged under Alternatives 1, 2, 3, and 6 relative to Alternative 5, and reduced under Alternatives 4 and 7.

Table D-5 provides a summary of these changes in reserve area relative to Alternative 5. This table demonstrates that the land area in reserves under Alternative 6 (proposed action) has increased by 149,000 acres relative to Alternative 5. This represents an increase of approximately 1 percent of the Forest land area (i.e., reserve acreage represents 79.4 percent of the Forest under Alternative 6 and 78.5

percent under Alternative 5). An increasingly greater percentage of the Forest would be in reserves under Alternatives 3, 2, and 1 (83.3, 88.5, 95.0 percent, respectively). Under Alternatives 4 and 7, the acreage in reserves would be reduced to 71.8 and 69.9 percent of the Forest, respectively.

Table D-6 summarizes these changes relative to POG. Under Alternative 6, the acreage of POG in reserves would be 45,000 acres greater than under Alternative 5, while the acreage of POG that is protected in the matrix would be 28,000 acres less than under Alternative 5, resulting in a net increase of 17,000 acres. In addition, the percentage of high-volume and large-tree POG that is protected in reserves would increase under Alternative 6, relative to Alternative 5, primarily because of the changes made to OGRs and other LUDs; these changes resulted in a greater portion of the forest types consisting of larger trees being included within reserves. Under Alternative 6, for example, 72.6 percent of the high-volume POG and 69.9 percent of the large-tree POG would be included within reserves compared with 71.3 and 67.8 percent under Alternative 5, respectively. Overall, 90.1 percent of the existing high-volume POG and 89.0 percent of the large-tree POG would not be harvested under Alternative 6, compared with 88.9 and 88.6 percent under Alternative 5. Again, an increasingly greater percentage of total POG and the larger tree POG types would be protected in reserves and in overall under Alternatives 3, 2, and 1, in that order. In contrast, a significantly smaller percentage of total POG and the larger tree POG types would be protected in reserves and overall in Alternatives 4 and 7, in decreasing order.

4.3. Standards and Guidelines Changes

The other major factors to be considered in comparing the overall effects of changes to the conservation strategy are the changes to standards and guidelines. Most changes to the standards and guidelines under Alternatives 1, 2, 3, and 6 are minor and it was concluded in the previous subsections that they would not affect the strategy. The one change to the standards and guidelines that is more far-reaching and needs to be considered in combination with the LUD changes is the replacement of the goshawk and marten standards and guidelines with the legacy standard and guideline. The legacy standard provides an alternative, more ecological approach to conserving wildlife habitat at the project scale as compared to the more species-specific marten and goshawk standards. This approach simplifies the standard, allows equal to greater flexibility, and leaves representative components of old growth in high risk VCUs outside of the biogeographic provinces covered by the marten and goshawk standards.

For marten, ADF&G harvest reports continue to indicate stable or increasing marten populations across the Tongass and trapping continues to occur across the entire Tongass under both State regulations and federal subsistence regulations. While there is increased knowledge regarding the distribution of two marten lineages (*caurina* and *americana*), there is no indication of differential life history requirements or habitat use between lineages. Therefore, maintaining one set of marten standards is still appropriate. The legacy standard would continue to retain additional forest structure in VCUs with the highest level of harvest in high risk marten provinces and this is still valid, based on concerns about the ability of marten to travel through landscapes that have large openings due to past timber harvest.

No barriers to movement other than open salt water have been identified and marten travel through a variety of habitats including clearcuts, muskeg openings and roads. Marten will continue to move through the matrix using riparian and beach buffer routes, as well as crossing the mix of natural and human-caused openings. Since trapping access and trapping success can increase where there are roads, the standard requiring road management considerations is maintained, where marten mortality is directly attributed to road access.

Considering the combination of the OGR network, non-development LUDs and retention of old growth via various standards and guidelines, there is significantly more high value marten habitat retained than just in OGRs. Recent studies indicating that OGRs may not be of sufficient sizes to maintain marten do not adequately take into account the amount of other old growth retained in the Forest Plan and, thus, do not reflect how much actual marten habitat would remain. Slightly more than two-thirds (68 percent) of all existing old growth within the matrix would remain unharvested after 100 years of Forest Plan implementation (at the maximum allowable harvest rate) under either Alternative 5 or Alternative 6. Thus, lands outside of the reserves will provide more than just connectivity for marten. Given timber harvest trends (smaller-sized openings coupled with decreased harvest levels), the continued succession of

young growth to mature forest, and the value and amount of old growth retained outside of OGRs, it appears that the assumptions of these studies were very conservative and do not reflect available marten habitat under actual Forest Plan implementation. Based upon this analysis, implementation of Alternatives 1, 2, 3, or 6 with the legacy standard would not reduce the likelihood of maintaining habitat that supports well-distributed marten populations, relative to Alternative 5. Based on the viability panel analysis (Section 3), there is at least a moderate likelihood that sufficient habitat would be maintained to support a viable and well distributed marten populations across the Tongass under these alternatives. While it is anticipated that there could be gaps in this distribution, there is a low likelihood that there would be significant isolation among marten populations resulting from implementation of the amended Forest Plan.

For goshawks, based upon these analyses, Alternatives 1, 2, 3, and 6 would provide a sufficient amount and distribution of habitat to maintain viable and well distributed populations across the Tongass after 100 years of Forest Plan implementation. The legacy standard and guideline would continue to retain additional forest structure in harvest units greater than 20 acres in all VCUs on Prince of Wales Island that were identified as concerns for goshawk, and this is still valid, based on concerns about goshawks specific to this island. In addition, the legacy standard would also retain forest structure in other VCUs forest-wide, which provides an additional measure of protection for goshawk habitat outside of Prince of Wales Island.

These analyses assumed maximum allowable timber harvest every decade for 100 years of implementation of the Forest Plan. The interagency assessment called *The Conservation Assessment for the Northern Goshawk in Southeast Alaska* (Iverson et al. 1996) defined three categories of VCU harvest and related those categories to the likelihood of the VCU continuing to support goshawks. These categories were based on the concept of a 300-year ecological rotation. The three categories were: 1) <33 percent POG harvest = high likelihood that VCU supports goshawks; 2) 33-47 percent POG harvest = slightly increased risk that VCU will not support goshawks; and 3) >47 percent = increased risk that VCU will not support goshawks.

The proportion of the Tongass acreage that falls into these categories was estimated for those VCUs that originally contained a significant amount of goshawk habitat (defined as a minimum of 2,300 acres of POG). For this appendix, the three categories were applied to Alternative 6 and the results are summarized below:

- An estimated 95 percent of the goshawk range on the Tongass currently has a high likelihood of sustaining goshawk habitat (< 33 percent of old-growth harvested).
- An estimated 95 percent of the goshawk range on the Tongass would have 47 percent or less of the POG harvested after 100 years of Forest Plan implementation, and would maintain a relatively high likelihood of sustaining goshawks.
- An estimated 12 percent of the goshawk range on the Tongass would have a slightly elevated risk of not sustaining goshawks, with between 33 and 47 percent of the old growth harvested after 100 years.
- Most elevated risk landscapes (> 47 percent harvested) would be aggregated on North and Central Prince of Wales Island. This province only represents 9 percent of the acreage comprising goshawk range on the Tongass.
- Where risks would be elevated by matrix management intensity, remaining very high quality goshawk habitats would be protected by forest-wide standards and guidelines

These results, together with the viability panel analysis described in Section 3 and the other related analyses presented in Section 2.5, lead to the conclusion that implementation of Alternatives 1, 2, 3, or 6 with the legacy standard would not reduce the likelihood of maintaining habitat that supports viable and well-distributed goshawk populations relative to Alternative 5. Based on the viability panel analysis (Section 3) there is at least a high likelihood that sufficient habitat would be maintained to support viable and well distributed goshawk populations across the Tongass under these alternatives.

In contrast, the modifications to the standards and guidelines under Alternatives 4 and 7 (e.g., no legacy or goshawk/marten standards and guidelines under either alternative and reduced beach fringe and elimination of Class III stream buffers under Alternative 7), coupled with their significantly lower acreages of protected POG, particularly in reserves, leads to the conclusion that the likelihood of maintaining habitat that supports well-distributed marten and goshawk populations could be compromised. The potential effect would be substantially greater under Alternative 7. However, based on the viability panel analysis (Section 3) there is a moderate likelihood for marten and a moderate to moderately high likelihood for goshawks, that sufficient habitat would be maintained to support viable and well distributed populations across the Tongass under these alternatives. In addition, even under Alternative 4 or 7, the potential effect would not be realized unless harvest levels occurred and were maintained at a much higher rate than has occurred in the past 10 years. Given this, and given the 10 to 15-year timeframe until the Forest Plan is revised again, it is highly unlikely that these levels of harvest would occur before the next Forest Plan revision.

4.4. Summary and Conclusions

In summary, the numbers reviewed in Section 2.5 reflect the changes in reserves as well as the changes in standards and guidelines (including the replacement of the goshawk and marten standards and guidelines with the legacy standard and guideline). Although there is some shift of POG from the matrix to POG in reserves, the net effect of all LUD and standard and guideline changes is an increase in protected POG (including the larger tree POG types) under Alternatives 1, 2, 3, and 6, relative to Alternative 5. The 1997 Forest Plan FEIS analysis of Alternative 11 (without consideration of specific additional goshawk and marten standards and guidelines) stated that the 1997 Alternative 11 was explicitly designed to address issues related to wildlife viability conservation planning. It was projected to have a moderately high likelihood of maintaining viable, well distributed populations of old-growth associated species across the Tongass National Forest (USDA Forest Service 1997c). Alternatives 1, 2, 3, and 6 of the 2008 Forest Plan Amendment FEIS do not negatively affect the conservation strategy that this conclusion was based on; in fact, the acreage in reserves and the acreage of old growth in reserves would be higher and the total protected POG would be slightly higher. These positive effects would occur under Alternatives 6, 3, 2, and 1, in increasing order. Alternatives 4 and 7, on the other hand, would negatively affect the conservation strategy and would reduce the likelihood of maintaining viable, well-distributed populations. Alternative 7 would have the greatest potential to negatively affect the strategy. Under any alternative, however, the maximum effects that these conclusions are based on depend on actual harvest levels occurring at a rate significantly higher than under the recent past.

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APPENDIX E
CATALOGUE OF PAST HARVEST

Appendix E

Catalogue of Past Harvest

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Appendix E
Catalogue of Past Harvest

Introduction

This appendix presents a catalogue of past harvest for Southeast Alaska. It is based on updated and extensive mapping of past harvest based on the Tongass GIS library, GIS data layers provided by Sealaska Regional Native Corporation, the State of Alaska, and Audubon Alaska/The Nature Conservancy, as well as supplemental interpretation of orthophotography and other aerial photography. It is also based on tabular information collected from the State of Alaska, Department of Natural Resources regarding state harvests and harvests under the Alaska Forest Resources and Practices Act. Appendix B provides more detailed information on the inventory methodology.

Part I of this appendix provides a tabular catalogue of harvest acreage by ownership category, landowner, and biogeographic province. An approximate harvest period is listed by decade as well. Part II presents a tabular summary of information provided by the State of Alaska Department of Natural Resources, Division of Forestry.

Part I – Acreage of Past Harvest by Ownership Category, by Landowner, by Biogeographic Province, by Approximate Decade

Ownership Category	Landowner	Est. Approx. Harvest Decade	Acres Harvested
Yakutat Forelands Biogeographic Province			
Tongass National Forest	Tongass National Forest	1950s	28
	Tongass National Forest	1970s	553
	Tongass National Forest	1980s	1,812
	Tongass National Forest	1990s	229
	Tongass National Forest	2000s	987
	Tongass National Forest	--	18
	Total NFS Lands		**3,627**
State of Alaska	State of Alaska	1970s–1990s	1,315
	Total State Lands		**1,315**
Private & Other Lands	Yak-tat Kwaan Village Corporation	1980s	12,541
	Other	--	134
	Total Private/Other Lands		**12,675**
	TOTAL PROVINCE HARVEST		**17,618**

Ownership Category	Landowner	Est. Approx. Harvest Decade	Acres Harvested
Yakutat Uplands Biogeographic Province			
Tongass National Forest	Tongass National Forest	1980s	665
	Tongass National Forest	1990s	173
	Tongass National Forest	2000s	552
	Tongass National Forest	--	21
	Total NFS Lands		**1,411**
State of Alaska	**Total State Lands**		0
Private & Other Lands	**Total Private/Other Lands**		0
	TOTAL PROVINCE HARVEST		**1,411**
East Chichagof Island Biogeographic Province			
Tongass National Forest	Tongass National Forest	<1950	1,016
	Tongass National Forest	1950s	1,527
	Tongass National Forest	1960s	6,053
	Tongass National Forest	1970s	13,232
	Tongass National Forest	1980s	10,501
	Tongass National Forest	1990s	11,713
	Tongass National Forest	2000s	60
	Tongass National Forest	--	105
	Total NFS Lands		**44,207**
State of Alaska	State of Alaska	1980s	200
	State of Alaska	1990s	227
	State of Alaska	2000s	70
	Total State Lands		**497**
Private & Other Lands	Hoonah	--	252
	Huna Totem Village Corporation	--	11,449
	Sealaska Regional Corporation	1970s	1,352
	Sealaska Regional Corporation	1980s	7,670
	Sealaska Regional Corporation	1990s	6,400
	Sealaska Regional Corporation	2000s	6,825
	Other Private Owners	--	81
	Total Private/Other Lands		**37,007**
	TOTAL PROVINCE HARVEST		**81,711**

Ownership Category	Landowner	Est. Approx. Harvest Decade	Acres Harvested
West Chichagof Island Biogeographic Province			
Tongass National Forest	**Total NFS Lands**		**0**
State of Alaska	**Total State Lands**		**0**
Private & Other Lands	**Total Private/Other Lands**		**0**
	TOTAL PROVINCE HARVEST		**0**
East Baranof Island Biogeographic Province			
Tongass National Forest	Tongass National Forest	<1950	197
	Tongass National Forest	1950s	223
	Tongass National Forest	1960s	8,158
	Tongass National Forest	1970s	2,725
	Tongass National Forest	1990s	2,227
	Total NFS Lands		**13,530**
State of Alaska	**Total State Lands**		**0**
Private & Other Lands	Other Private Land Owners	--	2
	Total Private/Other Lands		**2**
	TOTAL PROVINCE HARVEST		**13,532**
West Baranof Island Biogeographic Province			
Tongass National Forest	Tongass National Forest	<1950	516
	Tongass National Forest	1950s	1,085
	Tongass National Forest	1960s	9,812
	Tongass National Forest	1970s	5,556
	Tongass National Forest	1980s	10
	Total NFS Lands		**16,978**
State of Alaska	State of Alaska	1980s	696
	State of Alaska	1990s	204
	Total State Lands		**900**

Ownership Category	Landowner	Est. Approx. Harvest Decade	Acres Harvested
Private & Other Lands	Shee Atika Village Corporation Other Private Owners **Total Private/Other Lands**	1980s -- 	1,184 271 **1,455**
	TOTAL PROVINCE HARVEST		**19,332**
Admiralty Island Biogeographic Province			
Tongass National Forest	Tongass National Forest Tongass National Forest Tongass National Forest Tongass National Forest Tongass National Forest Tongass National Forest Tongass National Forest **Total NFS Lands**	Prior to 1950 1950s 1960s 1970s 1990s 2000s -- 	3,202 771 3,305 1,108 17 105 88 **8,595**
State of Alaska	**Total State Lands**		**0**
Private & Other Lands	Shee Atika Village Corporation Other Private Owners **Total Private/Other Lands**	1980s–1990s -- 	20,080 110 **20,190**
	TOTAL PROVINCE HARVEST		**28,785**
Lynn Canal Biogeographic Province			
Tongass National Forest	Tongass National Forest Tongass National Forest Tongass National Forest Tongass National Forest **Total NFS Lands**	1960s 1970s 1980s 1990s 	2,129 1,177 545 1,527 **5,377**
State of Alaska	State of Alaska **Total State Lands**	1980s 	214 **214**
Private & Other Lands	Other Private Owners **Total Private/Other Lands**	1990s 	335 **335**
	TOTAL PROVINCE HARVEST		**5,926**

Ownership Category	Landowner	Est. Approx. Harvest Decade	Acres Harvested
North Coast Range Biogeographic Province			
Tongass National Forest	Tongass National Forest	1950s	221
	Total NFS Lands		**221**
State of Alaska	State of Alaska	--	24
	Total State Lands		**24**
Private & Other Lands	Goldbelt Village Corporation	1980s	20,389
	City and Borough of Juneau	--	1
	Other Land Owners	--	147
	Total Private/Other Lands		**20,537**
	TOTAL PROVINCE HARVEST		**20,782**
Kupreanof/Mitkof Biogeographic Province			
Tongass National Forest	Tongass National Forest	<1950	1,573
	Tongass National Forest	1950s	1,096
	Tongass National Forest	1960s	6,781
	Tongass National Forest	1970s	10,183
	Tongass National Forest	1980s	8,335
	Tongass National Forest	1990s	5,539
	Tongass National Forest	2000s	2,234
	Total NFS Lands		**35,742**
State of Alaska	State of Alaska	1980s	3,648
	State of Alaska	1990s	884
	State of Alaska	2000s	54
	Total State Lands		**4,587**
Private & Other Lands	Kake	--	126
	Petersburg	--	484
	Kake Village Corporation	1970s–1990s	17,471
	Sealaska Regional Corporation	<1980	3,755
	Sealaska Regional Corporation	1980s	1,831
	Sealaska Regional Corporation	1990s	551
	Sealaska Regional Corporation	2000s	6,009
	Other Private Owners	--	823
	Total Private/Other Lands		**31,050**
	TOTAL PROVINCE HARVEST		**71,379**

Ownership Category	Landowner	Est. Approx. Harvest Decade	Acres Harvested
Kuiu Island Biogeographic Province			
Tongass National Forest	Tongass National Forest	<1950	2,570
	Tongass National Forest	1950s	344
	Tongass National Forest	1960s	3,428
	Tongass National Forest	1970s	8,989
	Tongass National Forest	1980s	7,852
	Tongass National Forest	1990s	4,644
	Tongass National Forest	2000s	667
	Total NFS Lands		**28,494**
State of Alaska	State of Alaska	--	9
	Total State Lands		**9**
Private & Other Lands	Sealaska Regional Corporation	<1980	22
	Other Private Owners	--	113
	Total Private/Other Lands		**135**
	TOTAL PROVINCE HARVEST		**28,638**
Central Coast Range Biogeographic Province			
Tongass National Forest	Tongass National Forest	<1950	159
	Tongass National Forest	1950s	910
	Tongass National Forest	1960s	3,574
	Tongass National Forest	1970s	1,087
	Tongass National Forest	1980s	164
	Tongass National Forest	1990s	586
	Total NFS Lands		**6,479**
State of Alaska	State of Alaska	1970s–1980s	1,421
	Total State Lands		**1,421**
Private & Other Lands	Other Land Owners	--	13
	Total Private/Other Lands		**13**
	TOTAL PROVINCE HARVEST		**7,913**

Ownership Category	Landowner	Est. Approx. Harvest Decade	Acres Harvested
Etolin Island and Vicinity Biogeographic Province			
Tongass National Forest	Tongass National Forest	<1950	2,565
	Tongass National Forest	1950s	1,728
	Tongass National Forest	1960s	2,593
	Tongass National Forest	1970s	12,666
	Tongass National Forest	1980s	8,964
	Tongass National Forest	1990s	6,532
	Tongass National Forest	2000s	1,016
	Tongass National Forest	--	4
	Total NFS Lands		**36,066**
State of Alaska	State of Alaska		3,764
	Total State Lands		**3,764**
Private & Other Lands	Wrangell		643
	Other Land Owners		68
	Total Private/Other Lands		**712**
	TOTAL PROVINCE HARVEST		**40,542**
North Central Prince of Wales Island Biogeographic Province			
Tongass National Forest	Tongass National Forest	<1950	1,772
	Tongass National Forest	1950s	11,460
	Tongass National Forest	1960s	50,216
	Tongass National Forest	1970s	47,190
	Tongass National Forest	1980s	35,623
	Tongass National Forest	1990s	33,507
	Tongass National Forest	2000s	4,343
	Tongass National Forest	--	15
	Total NFS Lands		**184,125**
State of Alaska	State of Alaska	--	15,384
	Total State Lands		**15,384**
Private & Other Lands	Hydaburg	--	48
	Kasaan	--	16
	Thorne Bay	--	180
	Haida Village Corporation	1980s–1990s	2,465
	Kavilco Village Corporation	1990s	11,811
	Klawock-Heenya Village Corporation	1980s–1990s	12,073
	Sealaska Regional Corporation	<1980	3,240
	Sealaska Regional Corporation	1980s	32,741
	Sealaska Regional Corporation	1990s	24,452
	Sealaska Regional Corporation	2000s	22,835
	Shaan Seet Village Corporation	1980s–1990s	6,858

Ownership Category	Landowner	Est. Approx. Harvest Decade	Acres Harvested
	Other Private Land Owners	--	3,304
	Total Private/Other Lands		**120,022**
	TOTAL PROVINCE HARVEST		**319,531**
Revilla Island/Cleveland Peninsula Biogeographic Province			
Tongass National Forest	Tongass National Forest	<1950	2,181
	Tongass National Forest	1950s	6,812
	Tongass National Forest	1960s	6,389
	Tongass National Forest	1970s	8,443
	Tongass National Forest	1980s	5,827
	Tongass National Forest	1990s	11,477
	Tongass National Forest	2000s	4,470
	Tongass National Forest	--	60
	Total NFS Lands		**45,658**
State of Alaska	State of Alaska		4,043
	Total State Lands		**4,043**
Private & Other Lands	Ketchikan	--	39
	Sealaska Regional Corporation	<1980	151
	Cape Fox Village Corporation	1980s–1990s	13,266
	Other Land Owners	1980s–1990s	7,406
	Total Private/Other Lands		**20,862**
	TOTAL PROVINCE HARVEST		**70,563**
Southern Outer Islands Biogeographic Province			
Tongass National Forest	Tongass National Forest	1950s	569
	Tongass National Forest	1960s	3,737
	Tongass National Forest	1970s	3,058
	Tongass National Forest	1980s	5,737
	Tongass National Forest	1990s	1,683
	Tongass National Forest	2000s	354
	Total NFS Lands		**15,138**
State of Alaska	State of Alaska	1990s	2,102
	Total State Lands		**2,102**
Private & Other Lands	Haida Village Corporation	--	4
	Klawock-Heenga Village Corporation	--	366
	Sealaska Regional Corporation	2000s	31
	Shaan Seat Village Corporation	1980s–1990s	3,324
	Total Private/Other Lands		**3,725**

Ownership Category	Landowner	Est. Approx. Harvest Decade	Acres Harvested
	TOTAL PROVINCE HARVEST		**20,965**
Dall Island and Vicinity Biogeographic Province			
Tongass National Forest	Tongass National Forest	<1950	77
	Tongass National Forest	1950s	79
	Tongass National Forest	1960s	213
	Total NFS Lands		**369**
State of Alaska	**Total State Lands**		**0**
Private & Other Lands	Haida Village Corporation	1980s–1990s	365
	Klukwan Villa Village Corporation	1980s–1990s	17,265
	Sealaska Regional Corporation	<1980	630
	Sealaska Regional Corporation	1980s	4,549
	Sealaska Regional Corporation	1990s	1,831
	Sealaska Regional Corporation	2000s	8,011
	Other Land Owners	--	265
	Total Private/Other Lands		**32,916**
	TOTAL PROVINCE HARVEST		**33,285**
South Prince of Wales Island Biogeographic Province			
Tongass National Forest	Tongass National Forest	<1950	410
	Tongass National Forest	1950s	60
	Tongass National Forest	1960s	467
	Tongass National Forest	1970s	368
	Tongass National Forest	1980s	276
	Tongass National Forest	1990s	994
	Tongass National Forest	2000s	716
	Tongass National Forest	--	1
	Total NFS Lands		**3,292**
State of Alaska	State of Alaska	--	351
	Total State Lands		**351**
Private & Other Lands	Sealaska Regional Corporation	<1980	79
	Sealaska Regional Corporation	2000s	79
	Haida Village Corporation	1980s–1990s	589
	Kootznoowoo Village Corporation	1980s–1990s	13,491
	Other Land Owners	--	25
	Total Private/Other Lands		**14,184**
	TOTAL PROVINCE HARVEST		**17,827**

Ownership Category	Landowner	Est. Approx. Harvest Decade	Acres Harvested
North Misty Fiords Biogeographic Province			
Tongass National Forest	Tongass National Forest	1950s	81
	Tongass National Forest	1960s	960
	Tongass National Forest	1980s	68
	Tongass National Forest	--	260
	Total NFS Lands		**1,370**
State of Alaska	State of Alaska	--	818
	Total State Lands		**818**
Private & Other Lands	Sealaska Regional Corporation	1980s	16
	Sealaska Regional Corporation	2000s	8
	Total Private/Other Lands		**23**
	TOTAL PROVINCE HARVEST		**2,211**
South Misty Fiords Biogeographic Province			
Tongass National Forest	**Total NFS Lands**		**0**
State of Alaska	**Total State Lands**		**0**
Private & Other Lands	**Total Private/Other Lands**		**0**
	TOTAL PROVINCE HARVEST		**0**
Ice Fields Biogeographic Province			
Tongass National Forest	Tongass National Forest	1960s	1,732
	Tongass National Forest	1970s	1,311
	Tongass National Forest	1980s	996
	Tongass National Forest	2000s	5
	Total NFS Lands		**4,044**
State of Alaska	**Total State Lands**		**0**
Private & Other Lands	**Total Private/Other Lands**		**0**
	TOTAL PROVINCE HARVEST		**4,044**

Ownership Category	Landowner	Est. Approx. Harvest Decade	Acres Harvested
Glacier Bay/Fairweather Range Biogeographic Province			
Tongass National Forest	**Total NFS Lands**		**0**
State of Alaska	**Total State Lands**		**0**
Private & Other Lands	Glacier Bay N.P. **Total Private/Other Lands**	--	200 **200**
	TOTAL PROVINCE HARVEST		**200**
Chilkat River Complex Biogeographic Province			
Tongass National Forest	**Total NFS Lands**		**0**
State of Alaska	State of Alaska **Total State Lands**	1980s–2000s	17,069 **17,069**
Private & Other Lands	BLM Glacier Bay N.P. Private/Other **Total Private/Other Lands**	-- -- --	136 568 2,864 **3,568**
	TOTAL PROVINCE HARVEST		**20,637**

Part II – Statistics on the Alaska Forest Resources and Practices Act Implementation and State Timber Sales in Southeast Alaska

Part II presents a tabular summary of information provided by the State of Alaska Department of Natural Resources, Division of Forestry. Statistical information is not available for harvests prior to the Alaska Forest Resources and Practices Act (AFRPA), nor for some years since the Act. Tables E-1 through E-5 provide statistics regarding the AFRPA, as it has been applied to private and other lands in Southeast Alaska. Tables E-6 through E-17 provide information on State timber sales in Southeast Alaska.

Table E-1
Forest Practices Act – Summary Statistics for Southeast Alaska, 1991-1998

	1991	1992	1993	1994	1995	1996	1997	1998
New Notifications								
SSE	103	117	145	124	131	146	123	87
NSE	2	0	8	0	3	1	0	0
TOTAL	105	117	153	124	134	147	123	87
Harvest Acreage in New Notifications Received								
SSE	21016	37971	28769	33038	22745	30509	26034	16291
NSE	110	0	824	100	227	80	0	0
TOTAL	21126	37971	29593	33138	22972	30589	26034	16291
# Inspections								
SSE	146	134	98	119	93	90	42	56
NSE	2	0	8	1	5	0	0	0
TOTAL	148	134	106	120	98	90	42	56
# Variation Trees Reviewed (=approved, denied, and other (e.g., withdrawn)								
SSE	350	1344	3581	1660	1054	1116	2571	4113
NSE	83	0	0	0	0	0	0	0
TOTAL	433	1344	3581	1660	1054	1116	2571	4113

Table E-2
Forest Practices Act – Summary Statistics for Southeast Alaska, 1999-2006

	1999	2000	2001	2002	2003	2004	2005	2006
New Notifications								
SSE	79	104	36	43	51	47	43	51
NSE	0	0	19	10	6	6	5	3
TOTAL	79	104	55	53	57	53	48	54
Harvest Acreage in New Notifications Received								
SSE	11705	20542	5599	7667	12197	30488	27733	37313
NSE	0	3779	9619	5839	1780	1969	344.3	413
TOTAL	11705.3	24321	15217.8	13505.5	13977	32457	28077.3	37726
# Inspections								
SSE	32	89	44	43	58	35	59	20
NSE	0	0	25	24	11	9	13	9
TOTAL	32	89	69	67	69	44	72	29
# Variation Trees Reviewed (=approved, denied, and other (e.g., withdrawn)								
SSE	1522	330	103	58	336	948	411	0
NSE	0	0	144	20	199	17	0	0
TOTAL	1522	330	247	78.4	535	965	411	0

Table E-3
Forest Practices Act – Road Miles Summary for State of Alaska, 1997 - 2006

Road Miles Notified	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
SSE	156	104	101	130	39	58	71	69	34.1	25
NSE	0	0	0	0	104	20	10	3	4	3
Mat-Su/SW	13	3	28	0	0	3	5	13	12	46
Kenai-Kodiak	195	50	146	44	65	146	96	57	25	11
COASTAL	364	157	275	174	208	227	182	142	75	85
Fairbanks	1	0	0	3	0	1	7	3	0	0
Delta	0	0	0	0	0	0	0	0	4	0
Tok	3	0	0	0	0	0	0	60	57.75	0
Copper R.	7	5	0	0	0	0	0	46	0	0
NORTHERN	11	5	0	3	0	1	7	109	61.75	0
TOTAL	**375**	**162**	**275**	**177**	**208**	**228**	**189**	**251**	**136**	**85**

Table E-4
Southern Southeast Alaska, Forest Practices Act – Detail Statistics

Yr Notified	Geographical Area	Acre Notified*	Road Notified	Renew Ac	Renew Rd	New PCT Ac	Rnwl PCT Ac
Private Land							
2000	Dall Island					2160.0	
2000	Kupreanof Kake Area	1381.0	14.0	430.0	4.0		629.0
2000	Long Island					1958.7	
2000	POW Big Salt					505.0	179.0
2000	POW Craig Rd Area	25.0		110.0			
2000	POW Hetta Inlet	766.0	8.1	710.0	7.6		
2000	POW Kasaan Peninsula	2091.1	10.5	487.5	1.0		
2000	POW Klawock Rd Area	831.0	3.5	179.5	0.2		
2000	POW Natzuhini Bay	89.0	0.7			113.0	58.0
2000	POW s/sw side Kasaan Bay	1140.0	18.9	354.0	2.1		
2000	POW Soda Bay	807.2	4.1				
2000	POW Trocadero Bay	2267.0	18.2	223.0	0.0	0.0	222.0
2000	Revilla Ketchikan Rd Area	522.0	10.0	54.0	1.5		
2000	Revillagigedo Island	10543.0					
2001	Dall Island	1978.0	20.6	230.3			
2001	Kupreanof Kake Area	316.0	3.0	49.0	0.2		610
2001	Long Island					808.0	
2001	POW Big Salt						216.0
2001	POW Hetta Inlet	1856.8	6.0	237.0			
2001	POW Kasaan Peninsula	27.0	0.8	449.5			
2001	POW Klawock Rd Area			55.0	0.4		
2001	POW Natzuhini Bay						208.0
2001	POW s/sw side Kasaan Bay	430.6	3.0				
2001	POW Soda Bay	991.0	8.5				
2001	POW Trocadero Bay						280.0

Table E-4
Southern Southeast Alaska, Forest Practices Act – Detail Statistics

Yr Notified	Geographical Area	Acre Notified*	Road Notified	Renew Ac	Renew Rd	New PCT Ac	Rnwl PCT Ac
2002	Dall Island	3835.0	10.4	363.0	2.1	280.0	
2002	Kupreanof Kake Area	1033.7	15.7	549.3	2.3	0.0	610.0
2002	Long Island					699.4	
2002	POW Big Salt					207.0	173
2002	POW Craig Rd Area	23.0		17.0			
2002	POW Hetta Inlet	254.0		164.0			
2002	POW Kasaan Peninsula	969.0	19.2	328.0	1.8		
2002	POW Natzuhini Bay	331.0	3.2			52.0	76.0
2002	POW s/sw side Kasaan Bay	306.0					
2002	POW Soda Bay	671.8	7.4	255.0	1.5		222.0
2002	Revilla Ketchikan Rd Area	244.0	2.3	103.0	1.9		
2003	Dall Island	2637.0	15.4	1029.0	5.0	460.0	
2003	Kupreanof Kake Area	3710.3	9.7	297.0	2.4	835.0	
2003	Long Island					360.5	
2003	POW Big Salt					695.0	
2003	POW Craig Rd Area	28.0					
2003	POW Hetta Inlet					602.0	
2003	POW Kasaan Peninsula	1252.5	11.5		0.2	38.0	
2003	POW Klawock Rd Area	2216.0	2.8				
2003	POW Natzuhini Bay	952.0	10.8	264.0	2.2	113.0	
2003	POW Soda Bay	1137.0	15.7	214.0	2.1		
2003	Revilla Ketchikan Rd Area	94.0	0.7		1.5		
2004	Dall Island	5189.3	31.7	100.0		119.0	
2004	Kosciusko Island	15.0	0.2				
2004	Kupreanof Kake Area	5056.0	9.5	72.5		1463.0	159.0
2004	Long Island					245.0	
2004	POW Big Salt					601.0	33.0
2004	POW Hetta Inlet					167.0	42.0
2004	POW Kasaan Peninsula	63.0		650.0		38.0	
2004	POW Klawock Rd Area	1082.0	0.4				
2004	POW Natzuhini Bay	3879.0	5.8	402.0	3.4	306.0	
2004	POW Nutkwa Inlet	1571.5					
2004	POW s/sw side Kasaan Bay	1326.0				1605.0	
2004	POW Soda Bay	5020.4	2.1	21.0			134.0
2004	POW Trocadero Bay	2388.0	15.8	542			
2004	Revilla Ketchikan Rd Area	4562.0	1.6	16.0			
2004	Wrangell Island Wrg Rd Area	336.0	2.3				
2005	Dall Island	751.0	9.9	658	0.9		
2005	Kupreanof Kake Area	4209.0		4710.5	5.0	216.0	110.0
2005	Long Island					366.0	
2005	POW Big Salt					271	80.0
2005	POW Hetta Inlet					95.0	
2005	POW Kasaan Peninsula	5398.0	1.5	1326			
2005	POW Klawock Rd Area	10.0					

Table E-4
Southern Southeast Alaska, Forest Practices Act – Detail Statistics

Yr Notified	Geographical Area	Acre Notified*	Road Notified	Renew Ac	Renew Rd	New PCT Ac	Rnwl PCT Ac
2005	POW Natzuhini Bay	2209.0		1807	0.6	369	
2005	POW Nutkwa Inlet	785.0		1571.5			
2005	POW s/sw side Kasaan Bay	4936.4	0.5			600.0	
2005	POW Soda Bay			1604.0			69.0
2005	POW Trocadero Bay	8473.2	7.1	638	5.1		
2005	Revilla Ketchikan Rd Area		1.3	2814			
2005	Revillagigedo Island	712.0	10.9				
2005	Wrangell Island Wrg Rd Area	250.0	2.5	332.0	2.3		
2006	Dall Island	12890.1	5	725.0	5.9		
2006	Kupreanof Kake Area	7761.2		5486	5.2	501.0	
2006	Long Island					377.5	
2006	Mitkof Petersburg Rd Area	2267.0	2.1				
2006	POW Big Salt	30.0				1563.0	
2006	POW Hetta Inlet	3473.0				1916	
2006	POW Kasaan Peninsula					178.0	
2006	POW Klawock Rd Area	16.0					
2006	POW Natzuhini Bay					694.0	
2006	POW Nutkwa Inlet	400.4	3.7				
2006	POW s/sw side Kasaan Bay					286.0	
2006	POW Trocadero Bay	2422.2		2545.4	2.1		
2006	Revilla Ketchikan Rd Area	2050.0	0.6				
2006	Revillagigedo Island	1025.0	10.1	859	4.8		
2006	Wrangell Island Wrg Rd Area			100.0	0.2		
2007	Dall Island	7988.1	7.6	2402.0	3.8		
2007	Kupreanof Kake Area					171.0	191.0
2007	Long Island	853.0	4.3			296.0	
2007	POW Big Salt	106.0				865	
2007	POW Craig Rd Area					39.0	
2007	POW Hetta Inlet					1109	320.0
2007	POW Kasaan Peninsula					362.0	174.0
2007	POW Klawock Rd Area					64.0	
2007	POW Natzuhini Bay					152.0	
2007	POW Nutkwa Inlet			400.4	3.7		
2007	POW Trocadero Bay	292.4	4.1	3039.4			
2007	Revilla Ketchikan Rd Area	14.0	0.5	1000	0.4		
2007	Revillagigedo Island	310.0	4.5	1055.0	4.4		
2007	Wrangell Island Wrg Rd Area	199.0	2.1				
Other Public Land (borough, city, university)							
2000	Revilla Ketchikan Rd Area	79.0	0.9	199.0			
2003	POW Thorne Bay Rd Area	58.0	0.8				
2003	Wrangell Island Wrg Rd Area	115.0	0.7				
2004	Wrangell Island Wrg Rd Area			110.0			

* Acres notified includes clearcut, partial cut, and salvage of previously cut cedar

Table E-5
Northern Southeast Alaska, Forest Practices Act – Detail Statistics

DPO ID	Date Received	Land Owner-Operator	Unit Number	Unit Acres	Area Name
NSE-001	1/16/2001	Mental Health	S17A	36	W. Icy Bay
NSE-001		Mental Health	S17B	58	W. Icy Bay
NSE-001	1/16/2001	Mental Health	S18	18	W. Icy Bay
NSE-002	1/12/2001	SOA/University of AK	43	24	W. Icy Bay
NSE-002	1/12/2001	SOA/University of AK	44	22	W. Icy Bay
NSE-002	1/12/2001	SOA/University of AK	45	21	W. Icy Bay
NSE-002	1/12/2001	SOA/University of AK	47	26	W. Icy Bay
NSE-002	1/12/2001	SOA/University of AK	48	21	W. Icy Bay
NSE-003	1/18/2001	SOA/University of AK	8B	9	W. Icy Bay
NSE-005	1/2/2001	Sealaska Timber	60	59	Hoonah-Eastport
NSE-005	1/2/2001	Sealaska Timber	107	13	Hoonah-Eastport
NSE-005	1/2/2001	Sealaska Timber	108	72	Hoonah-Eastport
NSE-005	1/2/2001	Sealaska Timber	110	111	Hoonah-Eastport
NSE-005	1/2/2001	Sealaska Timber	137	122	Hoonah-Eastport
NSE-005	1/2/2001	Sealaska Timber	126	22	Hoonah-Eastport
NSE-005	1/2/2001	Sealaska Timber	127	68	Hoonah-Eastport
NSE-005	1/2/2001	Sealaska Timber	128	45	Hoonah-Eastport
NSE-006	2/15/2001	Sealaska Timber	135	87	Hoonah-Eastport
NSE-007	3/23/2001	Mental Health	S15C	39	W. Icy Bay
NSE-007	3/23/2001	Mental Health	C18A	14	W. Icy Bay
NSE-007	3/23/2001	Mental Health	C18B	11	W. Icy Bay
NSE-007	3/23/2001	Mental Health	C18C	4	W. Icy Bay
NSE-007	3/23/2001	Mental Health	C18D	3	W. Icy Bay
NSE-007	3/23/2001	Mental Health	C18E	4	W. Icy Bay
NSE-007	3/23/2001	Mental Health	C18F	4	W. Icy Bay
NSE-007	3/23/2001	Mental Health	S20	28	W. Icy Bay
nse-009	4/5/2001	Mental Health	C5	66	W. Icy Bay
nse-009	4/5/2001	Mental Health		0	W. Icy Bay
NSE-010	6/8/2001	Mental Health	C11	137	W. Icy Bay
NSE-012	7/1/2001	Mental Health	C21B	16	W. Icy Bay
NSE-012	7/1/2001	Mental Health	S21A	5	W. Icy Bay
NSE-012	7/1/2001	Mental Health	S23A	27	W. Icy Bay
NSE-012	7/1/2001	Mental Health	S23B	25	W. Icy Bay
NSE-012	7/1/2001	Mental Health	S25	18	W. Icy Bay
NSE-014	8/29/2001	Mental Health	C25	8	W. Icy Bay
NSE-014	8/29/2001	Mental Health	S22A	22	W. Icy Bay
NSE-015	11/20/2001	Mental Health	C1A	4	W. Icy Bay
NSE-015	11/20/2001	Mental Health	C1B	12	W. Icy Bay
NSE-015	11/20/2001	Mental Health	C1C	50	W. Icy Bay
NSE-015	11/20/2001	Mental Health	C2	72	W. Icy Bay
NSE-015	11/20/2001	Mental Health	C25A	15	W. Icy Bay
NSE-016	10/30/2001	Mental Health	S3A	25	W. Icy Bay
NSE-016	10/30/2001	Mental Health	S3B	5	W. Icy Bay
NSE-016	10/30/2001	Mental Health	S5B	26	W. Icy Bay
NSE-016	10/30/2001	Mental Health	S12	14	W. Icy Bay

Table E-5
Northern Southeast Alaska, Forest Practices Act – Detail Statistics

DPO ID	Date Received	Land Owner-Operator	Unit Number	Unit Acres	Area Name
NSE-018	3/29/2002	Mental Health	C3	85	W. Icy Bay
NSE-018	3/29/2002	Mental Health	C20A	34	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	48A	22	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	310	86	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	311	105	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	312	145	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	314	125	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	314A	6	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	501	12	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	501A	3	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	502A	4	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	502B	6	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	502C	8	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	503	12	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	507	16	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	507	16	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	507A	12	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	509	69	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	510	51	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	601/602	260	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	603	76	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	604	66	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	605	130	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	606	14	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	607	46	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	608	67	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	609	99	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	701	19	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	702	130	W. Icy Bay
NSE-022	6/25/2001	SOA/University of AK	703	74	W. Icy Bay
NSE-13	7/22/2001	Mental Health	C23	0	W. Icy Bay
NSE-13	7/22/2001	Mental Health	C24	0	W. Icy Bay
NSE-13	7/22/2001	Mental Health	S21	0	W. Icy Bay
NSE-23	1/26/2002	SOA/University of AK	304	2	W. Icy Bay
NSE-23	1/26/2002	SOA/University of AK	305	36	W. Icy Bay
NSE-23	1/26/2002	SOA/University of AK	504	31	W. Icy Bay
NSE-23	1/26/2002	SOA/University of AK	505A	25	W. Icy Bay
NSE-23	1/26/2002	SOA/University of AK	505B	6	W. Icy Bay
NSE-23	1/26/2002	SOA/University of AK	505C	20	W. Icy Bay
NSE-23	1/26/2002	SOA/University of AK	506	6	W. Icy Bay
NSE-23	1/26/2002	SOA/University of AK	508	11	W. Icy Bay
NSE-24	4/5/2002	Sealaska Timber	8A	23	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	15	15	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	16	28	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	17A	31	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	31A	33	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	38A	17	Hoonah-Eastport

Table E-5
Northern Southeast Alaska, Forest Practices Act – Detail Statistics

DPO ID	Date Received	Land Owner-Operator	Unit Number	Unit Acres	Area Name
NSE-24	4/5/2002	Sealaska Timber	128A	33	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	113	103	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	129	26	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	134	69	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	136B	82	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	1	46	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	4	13	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	6	13	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	7B	13	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	8	76	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	10	18	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	10a	13	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	14	34	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	17B	14	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	18	11	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	19	42	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	20C	17	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	20D	13	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	26A	49	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	27	51	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	28	20	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	28A	7	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	29	22	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	31	23	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	33B	19	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	36B	83	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	37	30	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	38	8	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	50	21	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	51	26	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	52A	31	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	53	53	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	59C	32	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	85	42	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	96	11	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	97	32	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	136	48	Hoonah-Eastport
NSE-24	4/5/2002	Sealaska Timber	137	7	Hoonah-Eastport
NSE-25	7/15/2002	Sealaska Timber	8A	23	Hoonah-Eastport
NSE-25	7/15/2002	Sealaska Timber	38A	18	Hoonah-Eastport
NSE-26	9/29/2002	Sealaska Timber	108A	22	Hoonah-Eastport
NSE-26	9/29/2002	Sealaska Timber	109	23	Hoonah-Eastport
NSE-26	9/29/2002	Sealaska Timber	111	29	Hoonah-Eastport
NSE-26	9/29/2002	Sealaska Timber	112	56	Hoonah-Eastport
NSE-27	2/10/2003	Yak-Tat-Kwaan-Aloha	1	24	Yakutat
NSE-27	2/10/2003	Yak-Tat-Kwaan-Aloha	2	64	Yakutat
NSE-27	2/10/2003	Yak-Tat-Kwaan-Aloha	3	91	Yakutat

Table E-5
Northern Southeast Alaska, Forest Practices Act – Detail Statistics

DPO ID	Date Received	Land Owner-Operator	Unit Number	Unit Acres	Area Name
NSE-27	2/10/2003	Yak-Tat-Kwaan-Aloha	4	207	Yakutat
NSE-27	2/10/2003	Yak-Tat-Kwaan-Aloha	5	75	Yakutat
NSE-27	2/10/2003	Yak-Tat-Kwaan-Aloha	6	45	Yakutat
NSE-28	2/22/2003	Sealaska Timber	136B	21	Hoonah-Eastport
NSE-28	2/22/2003	Sealaska Timber	47	120	Hoonah-Eastport
NSE-28	2/22/2003	Sealaska Timber	115	82	Hoonah-Eastport
NSE-28	2/22/2003	Sealaska Timber	134	58	Hoonah-Eastport
NSE-28	2/22/2003	Sealaska Timber	114A	89	Hoonah-Eastport
NSE-28	2/22/2003	Sealaska Timber	36A	26	Hoonah-Eastport
NSE-28	2/22/2003	Sealaska Timber	33A	14	Hoonah-Eastport
NSE-28	2/22/2003	Sealaska Timber	26C	23	Hoonah-Eastport
NSE-28	2/22/2003	Sealaska Timber	114B	22	Hoonah-Eastport
NSE-29	5/8/2003	Sealaska Timber	195C	57	Hoonah-Eastport
NSE-29	5/8/2003	Sealaska Timber	162	60	Hoonah-Eastport
NSE-29	5/8/2003	Sealaska Timber	171	86	Hoonah-Eastport
NSE-29	5/8/2003	Sealaska Timber	169A	48	Hoonah-Eastport
NSE-29	5/8/2003	Sealaska Timber	168	48	Hoonah-Eastport
NSE-29	5/8/2003	Sealaska Timber	167B	89	Hoonah-Eastport
NSE-29	5/8/2003	Sealaska Timber	180	12	Hoonah-Eastport
NSE-29	5/8/2003	Sealaska Timber	180	23	Hoonah-Eastport
NSE-29	5/8/2003	Sealaska Timber	186	101	Hoonah-Eastport
nse-31	6/30/2003	Sealaska Timber	44A	19	Hoonah-Eastport
nse-31	6/30/2003	Sealaska Timber	47	119	Hoonah-Eastport
nse-31	6/30/2003	Sealaska Timber	49	45	Hoonah-Eastport
NSE-32	9/11/2003	Sealaska Timber	43B	22	Hoonah-Eastport
NSE-32	9/11/2003	Sealaska Timber	42A	39	Hoonah-Eastport
NSE-32	9/11/2003	Sealaska Timber	18	12	Hoonah-Eastport
NSE-32	9/11/2003	Sealaska Timber	17B	15	Hoonah-Eastport
NSE-33	3/11/2004	Huna Totem	EPSH 400	1752	Hoonah-Eastport
NSE-34	8/10/2004	Sealaska Timber	13	28	Hoonah-Eastport
NSE-34	8/10/2004	Sealaska Timber	131	83	Hoonah-Eastport
NSE-34	8/10/2004	Sealaska Timber	132	61	Hoonah-Eastport
NSE-35	8/10/2004	Huna Totem	172	45	Hoonah-Eastport
NSE-36	4/10/2005	Sealaska Timber	26A	30	Hoonah-Eastport
NSE-36	4/10/2005	Sealaska Timber	101A	17	Hoonah-Eastport
NSE-37	4/22/2005	Huna Totem	175	56	Hoonah-Eastport
NSE-37	4/22/2005	Huna Totem	178	77	Hoonah-Eastport
NSE-38	4/27/2005	Sealaska Timber	10	6	Hoonah-Eastport
NSE-38	4/27/2005	Sealaska Timber	16	18	Hoonah-Eastport
NSE-38	4/27/2005	Sealaska Timber	51A	28	Hoonah-Eastport
NSE-38	4/27/2005	Sealaska Timber	83A	15	Hoonah-Eastport
NSE-38	4/27/2005	Sealaska Timber	400	24	Hoonah-Eastport
NSE-39	8/5/2005	Sealaska Timber	16A	13	Hoonah-Eastport
NSE-40	5/18/2005	SOA/University of AK	704	60	W. Icy Bay
NSE-41	1/17/2007	SOA/University of AK	204	23	W. Icy Bay
NSE-41	1/17/2007	SOA/University of AK	205	17	W. Icy Bay
NSE-41	1/17/2007	SOA/University of AK	207	0	W. Icy Bay

Table E-5
Northern Southeast Alaska, Forest Practices Act – Detail Statistics

DPO ID	Date Received	Land Owner-Operator	Unit Number	Unit Acres	Area Name
NSE-43	8/15/2007	SOA/University of AK	203	33	W. Icy Bay
NSE-44	8/15/2007	Sealaska Timber	802	18	Hoonah-Eastport
NSE-44	8/15/2007	Sealaska Timber	37	5	Hoonah-Eastport
NSE-44	8/15/2007	Sealaska Timber	117A	9	Hoonah-Eastport
NSE-45	10/7/2007	Sealaska Timber	130	6	Hoonah-Eastport
NSE-45	10/7/2007	Sealaska Timber	808	5	Hoonah-Eastport

Table E-6
State timber sales sold

	Volume sold		
Year	North-Central	South-Central	Southeast
1983	5964	51985	54
1984	14735	4445	1907
1985	12182	4698	3298
1986	4450	2587	424
1987	9352	3081	7174
1988	16510	4513	6452
1989	13872.5	1990	5738
1990	14317.9	3398.8	18064.5
1991	9519	565	72.2
1992	20613	3306	186
1993	17208	1020	9065
1994	1569	5564	8903
1995	10752[1]	28332	4455
1996	18213[1]	9368	1109
FY97	15528	129	5942
FY98	13211	17754	14623
FY99	6836	2803	4797
FY00	6637	5774	8365
FY01	6064	1857	954
FY02	4207	1333	11340
FY03	4813	3779	4094
FY04	2708	957	8064
FY05	5594	4934	16003
FY06	12478	6638	10777
FY07	6420	30110	24437

[1] Converted from Mcf.
Note: data collection changed from calendar year (CY) to fiscal year (FY) with some overlap between 1996 and FY97.

Table E-7
FY 97 STATE TIMBER SALES SOLD - SOUTHEAST

AREA	SALE NAME	ACRES	SALE DATE	USE	VOL MBF
Ketchikan	Ronald Brown	6	7/22/1996	local	37
Ketchikan	Pat Richter	4	8/21/1996	local	43
Ketchikan	Ernie Eads	9	8/22/1996	local	34
Ketchikan	Last Chance Enterprises	5	1/13/1997	local	55
Ketchikan	Ernie Eads	1	2/3/1997	local	8
Ketchikan	Pat Richter	1	3/3/1997	local	4
Ketchikan	Warren Jones	2	3/7/1997	local	46
Ketchikan	Norman Canaday	5	3/18/1997	local	14
Ketchikan	Ralph Porter	1	5/26/1997	local	34
Ketchikan	Daryl Tinkness	1	6/16/1997	local	19
Ketchikan	Ernie Eads	9	6/9/1997	local	228
Ketchikan	Pete Smit	8	5/30/1997	local	54
SUBTOTAL	**12**	**52**			**576**
Haines	Pond View	22	10/14/1996	local	249
SUBTOTAL	**1**	**22**			**249**
Juneau	Shadow	45	7/26/1996	Export	1,455
Juneau	Corner	12	9/30/1996	local	141
Juneau	Blackheart	14	11/7/1996	local	425
Juneau	Nufie	79	2/11/1997	local	1,700
Juneau	Thumb Nail	45	2/11/1997	local	802
Juneau	Pt. Frederick #6	9	3/7/1997	Export	446
Juneau	Silas Triangle	6	6/30/1997	mixed	106
Juneau	Magazine Road	3	6/30/1997	Export	42
SUBTOTAL	**8**	**213**			**5,117**

Table E-8
STATE TIMBER SALES SOLD- FY 98 - SOUTHEAST

AREA	SALE NAME	ACRES	SALE DATE	USE	VOL MBF
KETCHIKAN	FLEENOR	5	7/25/1997	**local**	178
KETCHIKAN	SNEATHER	0	10/21/1997	**local**	7
KETCHIKAN	WHALE PASS ASSOC. I	0	11/3/1997	**local**	55
KETCHIKAN	WHALE PASS ASSOC. II	0	2/26/1998	**local**	67
KETCHIKAN	TINKESS	1	11/14/1997	**local**	5
KETCHIKAN	TRUMBLE	1	11/24/1997	**local**	1
KETCHIKAN	FLEENOR #2	8	3/6/1998	**local**	147
KETCHIKAN	GRAY	1	12/8/1997	**local**	2
KETCHIKAN	SMITH	3	PENDING	**local**	16
KETCHIKAN	EADS	2	5/12/1998	**local**	44
KETCHIKAN	HAMMAR	3	5/12/1998	**local**	21
KETCHIKAN	HOLLIS COMM. COUNCIL	0	5/12/1998	**local**	74
KETCHIKAN	KITKUN	160	6/29/1998	**local**	4,300
SUBTOTAL	**13**	**184**			**4,917**
NSE	THUNDER CREEK	565	7/15/1997	export	4,331
NSE	BUSTER BENSON	7	8/18/1997	**local**	80

Table E-8
STATE TIMBER SALES SOLD- FY 98 - SOUTHEAST

AREA	SALE NAME	ACRES	SALE DATE	USE	VOL MBF
NSE	HIGHLINE	8	9/2/1997	**local**	244
NSE	ALASKA POWER & TELE.	0	9/18/1997	**local**	6
NSE	FRED STRONG	4	10/9/1997	**local**	32
NSE	SCOTT ROSSMAN	5	5/8/1998	**local**	23
NSE	SCOTT ROSSMAN #2	2	5/28/1998	**local**	12
NSE	SCOTT ROSSMAN #3	2	6/15/1998	**local**	58
NSE	BANANA PT. SALVAGE	2	7/9/1997	**local**	40
NSE	ROY'S BREAKDOWN	41	7/23/1997	**local**	1,339
NSE	SILAS	14	7/23/1997	**local**	466
NSE	ROY SOKOL SALVAGE	1	7/29/1997	**local**	9
NSE	THUMBNAIL UNIT 3	2	9/12/1997	**local**	229
NSE	THUMBNAIL II	29	9/15/1997	**local**	607
NSE	MITKOF HWY ROW	1	11/21/1997	**local**	16
NSE	HEMLOCK SALVAGE	0	11/21/1997	**local**	9
NSE	SHADOW SALVAGE	0	11/24/1997	export	120
NSE	HERMIT CREEK	4	12/22/1997	**local**	102
NSE	PT. FREDERICK #6	0	*6/5/1998*	**local**	58
NSE	EASTERN PASSAGE I	83	2/23/1998	**local**	1,681
NSE	NUFIE II	19	6/9/1998	**local**	244
SUBTOTAL	**21**	**788**			**9,706**

Table E-9
STATE TIMBER SALES SOLD -- FY 99 COASTAL REGION

AREA	SALE NAME	ACRES	SALE DATE	MBF	USE
		SALES SOLD			
KETCHIKAN	Fleenor No. 3	6	07/27/98	125	Local
KETCHIKAN	Small #2	4	08/17/98	123	Local
KETCHIKAN	Small #3	3	09/28/98	68	Local
KETCHIKAN	Small #4	6	11/30/98	382	Local
KETCHIKAN	Small #5	4	11/30/98	308	Local
KETCHIKAN	Small #6	1	11/24/98	18	Local
KETCHIKAN	Small #7	3	12/11/98	80	Local
KETCHIKAN	Small #8	3	12/24/98	67.7	Local
KETCHIKAN	Small #9	0.1	03/26/99	10	Local
KETCHIKAN	Small #10	9.9	05/19/99	357	Local
KETCHIKAN	Small #11	4.7	06/01/99	150	Local
Subtotal	**11**	**44.7**		**1,688.7**	
NSE	Thumbnail III	74	09/21/98	1,613	Local
NSE	Eastern Passage I	52	06/01/99	1,429	Local
NSE	McCormack Creek Rd. Project ROW	0	08/03/98	37.25	Local
NSE	Del Mikkelsen	5	12/03/98	29	Local
Subtotal	**5**	**131**		**3,108**	

Table E-10
STATE TIMBER SALES SOLD -- FY 00 -- SOUTHEAST

AREA	SALE NAME	ACRES	SALE DATE	MBF	MCF	USE
KETCHIKAN	SE-959K	1	07/13/99	3		Local
KETCHIKAN	Coffman Cove	214	07/27/99	5,515		Local
KETCHIKAN	SE-960K	1	09/21/99	14		Local
KETCHIKAN	SE-962K	5	09/21/99	117		Local
KETCHIKAN	SE-1019K	1	03/13/00	12		Local
KETCHIKAN	SE-1021K	5	04/07/00	491		Local
KETCHIKAN	SE-970K	2	05/22/00	27		Local
KETCHIKAN	SE-971K	1	06/08/00	8		Local
KETCHIKAN	SE-1020K	1		34		Local
KETCHIKAN	SE-972K	5		468		Local
KETCHIKAN	SE-973K	8		257		Local
Subtotal	**11**	**244**		**6,945.9**		
NSE	Small #1, SE-474J	3	07/19/99	139		Local
NSE	Eastern Passage I, Unit 4	24	12/30/99	656		Local
NSE	Devils Elbow	2	07/19/99	24		Local
NSE	Porcupine Snow		12/22/99	41		Local
NSE	High Extension	8	02/01/00	49		Local
NSE	Porcupine Wings	24	03/28/00	419		Any
NSE	Porcupine Heights	5	04/05/00	38		Local
NSE	Roy's Favorite	3	06/02/00	53		Local
Subtotal	**8**	**69**		**1,419**		

Table E-II
STATE TIMBER SALES SOLD -- FY 01 SOUTHEAST

AREA	SALE NAME	ACRES	SALE DATE	MBF	PURCHASER	USE
SSE	SE-979-K	1	01/12/01	20	Jack Dupertuis	local
SSE	SE-983-K	2	03/14/01	28	Sealaska	export
SSE	SE-1020-K	2	10/16/00	34	Naukati Adventures	local
SSE	SE-976-K	7	10/03/00	391	Pat Richter	local
SSE	SE-980-K	0	12/08/00	10	Evergreen Timber	export
SSE	SE-981-K	2	12/08/00	30	Hummer Enterprises	local
SSE	SE-982-K	4	05/16/01	80	B&W Lumber	local
SSE	SE-984-K	0	05/17/01	10	Hummer Enterprises	local
Subtotal	**8**	**17**		**603**	**0**	**0**
NSE	Ski Hill	5	07/29/00	34	The Stump Co.	local
NSE	37Mile	6	04/10/01	104	The Stump Co.	local
NSE	Chilkat Lake	2	04/10/01	19	Bob Jensen	local
NSE	Knob 4	2	04/10/01	28	Tophat Logging	local
NSE	Birch Hill	1	04/30/01	9	Eager Beaver	local
NSE	Knob Extension	1	06/18/01	1	Sage Thomas	local
NSE	Knobs Backside	5	06/25/01	24	Carl Smith	local
NSE	Half Load	1	01/18/01	11	Hidden Valley	local
NSE	Knob 3 Extension	2	02/05/01	16	Green Diamond	local
NSE	Daisy	3	02/23/01	65	Hidden Valley	local
NSE	SE-741	1	02/26/01	11	Don Peterson	local
NSE	Three Peaks	2	03/12/01	20	Green Diamond	local
NSE	Knob ABC	2	03/21/01	9	Green Diamond	local
Subtotal	**13**	**33**		**351**	**0**	**0**

Table E-12
STATE TIMBER SALES -- FY 02 -- SOUTHEAST

AREA	SALE NAME	ACRES	SALE DATE	MBF	USE
SSE	Naukati West	70	04/29/02	2,685	V-A
SSE	East Pass #5	50	04/01/02	1,110	V-A
SSE	Tuxecan	134	04/15/02	4,018	V-A
SSE	Richter #2	4	07/09/01	187	V-A
SSE	Richter #3	3	02/08/02	90	V-A
SSE	Jones 1	0	09/18/01	13	V-A
SSE	Sunde 1	0	05/30/02	7	V-A
SSE	Clark Bay Group	3	11/02/01	26	V-A
SSE	Gildersleeve1	1	09/17/01	24	V-A
SSE	Thorne Bay #1	80	09/14/01	2,539	V-A
Subtotal	**10**	**345**		**10,699**	**0**
NSE	37.5 Mile Fall	4	10/25/01	51	V-A
NSE	37-Mile Addition	4	07/24/01	28	V-A
NSE	Daisy Salvage	1	10/16/01	31	V-A
NSE	Birch Road A	2	07/13/01	17	V-A
NSE	Birch Pole	1	01/08/02	3	V-A
NSE	Backside 2	3	07/10/01	19	V-A
NSE	Daisy 2	7	05/24/02	117	V-A
NSE	Birch road	2	07/06/01	10	V-A
NSE	Daisy Dead	2	06/06/02	9	V-A
NSE	LS Mountain	10	07/09/01	357	V-A
Subtotal	**10**	**36**		**641**	

Table E-13
STATE TIMBER SALES SOLD -- FY 03 -- SOUTHEAST

AREA	SALE NAME	ACRES	SALE DATE	MBF	USE
SSE	Yatuk Creek #1	4	10/15/02	179	VA
SSE	Yatuk Creek #2	5	10/15/02	228	VA
SSE	Yatuk Creek #3	2	10/15/02	80	VA
SSE	Yatuk Creek #4	4	10/15/02	41	VA
SSE	Yatuk Creek #5	6	10/15/02	205	VA
SSE	Yatuk Creek #6	4	10/15/02	112	VA
SSE	Yatuk Creek #7	4	10/15/02	308	VA
SSE	Yatuk Creek #8	3	10/15/02	151	VA
SSE	Yatuk Creek #9	64	01/06/03	2,064	VA
SSE	Frederick Rd. #1	4	10/14/02	125	VA
SSE	Thorne Bay Burn #4	2	11/01/02	53	VA
SSE	Thorne Bay Burn #5	2	11/01/02	40	VA
SSE	Sandy Road #1	6	11/01/02	87	VA
SSE	Sunde #2	<1	05/06/03	10	VA
Subtotal	**14**	**110**		**3,683**	
NSE	Starigavin ROW NSE-1026	1	09/27/02	6	VA
NSE	Tidy Stump SE-759	1	08/23/02	25	VA
NSE	Farm Wood	3	01/17/03	50	VA
NSE	Jensen Skid Road	3	02/18/03	19	VA
NSE	Hemlock Switch	5	02/10/03	67	VA
NSE	Spruce Addition	1	02/04/03	10	VA
NSE	20 Mile Xing	2	02/26/03	13	VA
NSE	Half Dozen	1	02/28/03	4	VA

Table E-13
STATE TIMBER SALES SOLD -- FY 03 -- SOUTHEAST

NSE	Wolf Pack	1	03/10/03	13	VA
NSE	Chilkat Lake Road	2	03/27/03	5	VA
NSE	Spruce Log	2	01/03/03	10	VA
NSE	Hemlock Home	1	01/13/00	13	VA
NSE	Porcupine Clean	1	11/04/02	11	VA
NSE	Farm Birch	2	12/17/02	6	VA
NSE	Wolf Skid	2	04/04/03	4	VA
NSE	Spruce Tap	2	05/05/03	7	VA
NSE	Hemlock Corner	2	05/05/03	41	VA
NSE	37 Mile Patch	1	05/19/03	10	VA
NSE	38 Mile Draw	9	05/21/03	84	VA
NSE	Daisy Cleanup	3	06/13/03	64	VA
Subtotal	**20**	**45**		**462**	

Table E-14
STATE TIMBER SALES SOLD -- FY 04 -- SOUTHEAST

AREA	SALE NAME	ACRES	SALE DATE	MBF	USE
SSE	Boy Scout	19	08/21/03	990.18	local
SSE	Intertie ROW	n/a	07/21/03	172.00	local
SSE	Coffman Cove R	1	08/18/03	40.40	local
SSE	Kasaan 1	149	10/21/03	3,238.00	local
SSE	East Naukati	135	05/06/04	3,164.00	local
SSE	Thorne Bay ROW	1	12/12/03	42.43	export
Subtotal	**6**	**305**		**7,647.01**	
NSE	Deats 1-N. Douglas	1	03/14/04	1.00	local
NSE	Little Salmon Mt.	8	10/03/03	357.00	local
NSE	38-mile Draw 5	1	10/02/03	10.00	local
NSE	Spruce Rose	1	07/08/04	11.00	local
NSE	Big Hemlock	2	07/23/03	34.00	local
NSE	Boulder Spruce	3	08/10/03	52.00	local
NSE	Boulder Spruce 2	10	10/30/03	24.00	local
NSE	38 Mile Pocket	1	11/25/03	33.00	local
NSE	Stretch Time	2	12/10/03	29.00	local
NSE	Ice Road	2	02/06/04	28.00	local
NSE	Boulder 6 x 6	1	05/03/04	21.00	local
NSE	Stretch Melt	2	06/10/04	31.00	local
NSE	Nataga Skid	3	06/10/04	5.24	local
NSE	Stretch	6	11/28/03	53.00	local
NSE	38 Mile Extension	1	12/09/03	22.00	local
Subtotal	**15**	**44**		**711.24**	

Table E-15
STATE TIMBER SALES SOLD -- FY 05 -- SOUTHEAST

AREA	SALE NAME	ACRES	SALE DATE	MBF	USE
SSE	2058 Road 1/Jones #2	3	07/09/04	36	local
SSE	2058 Road 2/Jones #3	2	07/09/04	28	local
SSE	2058 Road 4/Jones #1	2	07/09/04	19	local
SSE	2058 Road 5/Thorne Bay WP	6	07/27/04	107	local
SSE	2058 Road 6/Thorne Bay WP	3	07/21/04	65	local
SSE	Sandy Road 2	20	08/20/04	419	local
SSE	Coffman Cove ROW #2	1	08/23/04	8	local
SSE	Thorne Bay 2	130	10/30/04	4130	local
SSE	Control Lake 1-mid	112	11/15/04	3627	local
SSE	Shady Tie-in	40	11/29/2004	987	local
SSE	Kasaan 6	6	11/17/04	179	local
SSE	Control Lake 2	5	12/03/04	121	local
SSE	Control L. 3	8	12/03/04	189	local
SSE	Control L. 4	17	12/09/04	491	local
SSE	Kasaan 2	108	12/17/04	4028	local
SSE	Mt. Point #1	3	05/12/05	149	export
SSE	Choker Setter Cir.	1	06/28/05	23	local
Subtotal	**17**	**466**		**14,606**	
NSE	Boulder Load	1	7/6/2004	8	local
NSE	Boulder Six X Six 2	1	7/12/2004	8	local
NSE	Alder Rerun	2	7/23/2004	27	local
NSE	Alder Rerun 2	2	9/1/2004	41	local
NSE	Nataga Skid 2	1	8/12/2004	17	local
NSE	Alder III	2	9/17/2004	59	local
NSE	Porcupine Mining	1	9/10/2004	20	local
NSE	Porcupine Mining II	1	9/10/2004	23	local
NSE	Klehini U14 Corner	2	12/11/2004	32	local
NSE	Porcupine Mining III	1	10/15/2004	13	local
NSE	Takshanuk Trail	3	11/7/2004	14	local
NSE	37 Mile Ridge	2	11/11/2004	15	local
NSE	Porcupine Low Road	1	11/12/2004	10	local
NSE	Battleship Island	1	12/12/04	2	local
NSE	West Herman 2	9	1/3/2005	185	local
NSE	37 Mile Bowl	2	1/4/2005	27	local
NSE	37 Mile Bowl 2	1	1/24/2005	38	local
NSE	Purlin	1	02/16/05	1	local
NSE	Pondside	2	02/28/05	31	local
NSE	West Draw	2	03/14/05	21	local
NSE	West Herman 1	23	03/01/05	594	local
NSE	West Draw #2	1	04/01/05	21	local
NSE	Knobs Rerun	2	05/21/05	49	local
NSE	Fabrizio Mining	6	05/27/05	82	local
NSE	Birch Reload	1	05/18/05	6	local
NSE	Nataga Sky	1	06/10/05	22	local
NSE	Dunit Bench	2	06/20/05	31	local
Subtotal	**27**	**74**		**1,397**	

Table E-16
STATE TIMBER SALES SOLD -- FY 06 -- SOUTHEAST

AREA	SALE NAME	ACRES	SALE DATE	MBF	USE
SSE	2058 Rd 8 small/Gutchi Creek #2	5	08/02/05	108	local
SSE	SSE 1230/2058 Rd 8 mid	18	10/01/05	588	local
SSE	Eastern Passage units 6-12	395	11/01/05	9110	local
SSE	Steep Drive	1	10/19/05	20	local
SSE	South Thorne Arm #1	0	10/01/05	2	local
SSE	Leask Lake Sort Yard	5	09/22/05	60	export
SSE	Kasaan 6	6	3/28/2006	179	local
Subtotal	**7**	**430**		**10,067**	
NSE	Tatshunak Trail	1	8/2/2005	5	local
NSE	Knobs B-C Timber	1	7/25/2005	16	local
NSE	Nataga Stretch	18	7/25/2005	173	local
NSE	Glacier Salvage	10	10/1/2005	100	local
NSE	Spruce Corner	1	10/3/2005	27	local
NSE	KB West Spur 1	10	10/10/2005	144	local
NSE	1424 Hemlock Ridge	1	12/29/2005	46	local
NSE	1425 Porcupine Salvage	3	1/6/2006	25	local
NSE	1426 Billy Goat	3	1/6/2006	24	local
NSE	1427 Farm Special	5	2/1/2006	38	local
NSE	1428 Farm Spur 2	3	03/15/06	37	local
NSE	1429 Billy Goat 2	3	04/11/06	55	local
NSE	Boulder Firewood	1	04/11/06	10	local
NSE	Porcupine Firewood	2	06/26/06	10	local
Subtotal	**14**	**62**		**710**	

Table E-17
STATE TIMBER SALES SOLD -- FY 07 -- SOUTHEAST

AREA	SALE NAME	ACRES	SALE DATE	MBF	USE
SSE	Bostwick #1	362	11/29/06	12687	local
SSE	2058 Road Small	6	07/10/06	182	local
SSE	2058 Road Small	4	07/10/06	98	local
SSE	Control Lake Fir	1	08/25/06	0	local
SSE	Leask Lake Aide	1	08/25/06	19	research
SSE	South Thorne Bay	128	07/02/06	3330	local
SSE	D-1 #1	1	04/02/07	7	export
SSE	20 Road	26	05/29/07	5145	local
SSE	Whipple Creek	26	04/02/07	2334	export
SSE	Bostwick Trail Lo	0	6/20/2007	13	local
Subtotal	**10**	**555**		**23,815**	
NSE	KB2	1	7/28/2006	17	local
NSE	Cabin Log	4	8/10/2006	41	local
NSE	Spur Road	1	8/10/2006	12	local
NSE	West Herman 3	4	8/25/2006	105	local
NSE	Porcupine Spruce	3	9/12/2006	132	local
NSE	Hemlock Spruce	3	9/12/2006	55	local
NSE	KB3	6	10/26/2006	42	local
NSE	Winds	2	11/2/2006	119	local
NSE	Porucpine Road	1	11/7/2006	5	local
NSE	Warm Springs	5	10/01/06	1	local
NSE	Hidden	2	01/03/07	16	local
NSE	35 Mile Snow Co	10	04/09/07	9	local
NSE	Sunlight Salvage	2	05/11/07	45	local
NSE	Ski Hill	3	06/05/07	23	local
Subtotal	**14**	**47**		**621.9**	

APPENDIX F
BIOLOGICAL ASSESSMENT

Appendix F

Biological Assessment

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Appendix F
Biological Assessment

Introduction

Under Section 7 of the Endangered Species Act (ESA), federal agencies are required to ensure that actions are not likely to jeopardize the continued existence of a listed species. This is done in a report called a "Biological Assessment." The effects analysis for threatened and endangered (T&E) species is required to address the direct and indirect effects of the action(s) on T&E species and their critical habitat (50 Code of Federal Regulations [CFR] 402.02). This documentation complies with Section 7 of the ESA which requires all federal agencies, in consultation with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS), to ensure that their actions are not likely to jeopardize the continued existence of T&E species or adversely modify their habitat. It updates previous Biological Assessments for the Tongass Plan Revision dated October 1996 (previous versions were also completed in August 1990 and April 1992).

This biological assessment complies with the Forest Service Manual (FSM) 2672.4 and documents the potential direct and indirect effects of the proposed alternatives (including the Proposed Action) and the cumulative effects of past, present, and reasonably foreseeable actions within the project area or adjacent lands on the critical habitats and viability of any federally listed or USDA Forest Service sensitive listed species. Species considered in this assessment include any species listed as threatened, endangered, proposed, or candidate by USFWS or NMFS.

Six wildlife species and one plant species under the jurisdiction of USFWS are found (or were once found) in Alaska: Kittlitz's murrelet (*Brachyramphus brevirostris*), the recently listed northern sea otter (*Enhydra lutris kenyoni*), short-tailed albatross (*Phoebastria albatrus*), Eskimo curlew (*Numenius borealis*), spectacled eider (*Somateria fischeri*), Alaska breeding population of Steller's eider (*Polysticta stelleri*), and Aleutian shield fern (*Polystichum aleuticum*). Except for the Kittlitz's murrelet, which is a candidate for listing under ESA, none of these species is found in Southeast Alaska, and will not be discussed further in this biological assessment.

Additionally, a number of marine threatened and endangered species fall under the jurisdiction of NMFS. These species are at least occasionally, or historically have been, found in Southeast Alaska. They include the leatherback sea turtle (*Dermochelys coriacea*), eastern population of Steller sea lion (*Eumetopias jubatus*), small numbers of the western population of Steller sea lion (*E. jubatus*), fin whale (*Balaenoptera physalus*), northern right whale (*Eubalaena japonica*), blue whale (*B. musculus*), and humpback whale (*Megaptera novaeangliae*). In addition to the above listed species, the Cook Inlet beluga whale Distinct Population Segment (DPS) has been proposed for listing as endangered. Furthermore, one sockeye salmon (*Onchorynchus nerka*), six chinook salmon (*O. tshawytscha*), one chum salmon (*O. keta*), and six steelhead trout (*O. mykiss*) evolutionarily significant units (ESUs)/DPSs are currently listed under ESA and are known to seasonally inhabit the marine waters of Southeast Alaska (Table F-1). However, of all these species, the Steller sea lion and humpback whale are known to occur in Southeast Alaska, while 14 of the 28 listed salmon and steelhead trout stocks shown in Table F-1 occur in Southeast Alaska's marine waters.

This combined assessment addresses 12 threatened species, 5 endangered species, and 1 candidate (Table F-1)[1]. These are the only T&E listed species addressed further in this assessment. The listed species covered are divided into two sections: those under the jurisdiction of USFWS (Kittlitz's murrelet), and those under the jurisdiction of NMFS (the remaining 17 species).

[1] Note that the eastern stock of the Steller sea lion is listed as threatened, and the western stock is listed as endangered. As a result, Steller sea lion is included in this count as a threatened species and an endangered species.

Table F-1
Threatened and Endangered Species Listed as occurring on or adjacent to the Tongass National Forest from USFWS and NMFS.

Species/Stock	ESU/DPS Designation [1/]	ESA Status	Likely Ranging into Alaskan Waters? [2/]
Under Jurisdiction of FWS			
Birds			
Kittlitz's murrelet *Brachyramphus brevirostris*	N/A	***Candidate***	Yes
Under Jurisdiction of NMFS			
Marine Mammals			
Humpback whale (*Megaptera novaeangliae)*	N/A	***Endangered***	Yes
Steller sea lion (*Eumetopias jubatus)*	N/A	***Threatened/ Endangered*** [3/]	Yes
Fish			
Sockeye Salmon (*Oncorhynchus nerka*)	Snake River	***Endangered***	Yes
	Ozette Lake	***Threatened***	No
Chinook Salmon (*O. tshawytscha*)	Sacramento River Winter-run	***Endangered***	No
	Upper Columbia River Spring-run	***Endangered***	Yes
	Snake River Spring/Summer-run	***Threatened***	Yes
	Snake River Fall-run	***Threatened***	Yes
	Puget Sound	***Threatened***	Yes
	Lower Columbia River	***Threatened***	Yes
	Upper Willamette River	***Threatened***	Yes
	Central Valley Spring-run	***Threatened***	No
	California Coastal	***Threatened***	No
Coho Salmon (*O. kisutch*)	Central California Coast	***Endangered***	No
	Southern Oregon/Northern California	***Threatened***	No
	Lower Columbia River	***Threatened***	No
Chum Salmon (*O. keta*)	Hood Canal Summer-run	***Threatened***	No
	Columbia River	***Threatened***	Yes
Steelhead (*O. mykiss*	Southern California	***Endangered***	No
	Central California Coast	***Endangered***	No
	South Central California Coast	***Threatened***	No
	Snake River Basin	***Threatened***	Yes
	Lower Columbia River	***Threatened***	Yes
	Upper Columbia River	***Endangered***	Yes
	California Central Valley	***Threatened***	No
	Upper Willamette River	***Threatened***	Yes
	Middle Columbia River	***Threatened***	Yes
	Northern California	***Threatened***	No[4/]
	Oregon Coast	***Threatened***	No[4/]
	Puget Sound	***Threatened***	Yes[4/]

1/ NMFS defines "species" under the ESA to include evolutionarily significant units (ESUs) for salmon and distinct population segments (DPSs) for steelhead.
2/ Distribution from NMFS 2003.
3/ The eastern stock of the Steller sea lion is listed as threatened, and the western stock is listed as endangered.
4/ DPS that were listed since 2004. Alaska distribution assumed.

Section 1. Biological Assessment for Kittlitz's murrelet for the Tongass Forest Plan Adjustment

November 2007

This section addresses the potential direct and indirect effects of the proposed alternatives on threatened, endangered, proposed, or candidate species managed by the USFWS pursuant to Section 7 consultation requirements of the ESA. This Biological Assessment updates a previous Biological Assessment for the Tongass Plan Revision (dated October 1996). This update includes these changes to the previous Biological Assessment:

- The USFWS published a final rule in the Federal Register (USFWS, 1999) delisting the Peregrine Falcon from the Threatened species list. This species is listed as Forest Service Sensitive.
- The Kittlitz's murrelet was officially designated a candidate species (warranted, but precluded) on May 4, 2004.

I. Identification of Endangered, Threatened and Candidate Species and/or Critical Habitats for Such Species within the Project Area.

On May 9, 2001, the Secretary of the Interior was petitioned to list the Kittlitz's murrelet (*Brachyramphus brevirostris*) as endangered with concurrent designation of critical habitat under the ESA. Petitioners cited dramatic reductions in population size over the past decade and declining habitat quality as reasons for the requested listing. On May 4, 2004, the Kittlitz's murrelet was designated a candidate species.

Common Name	Scientific Name	ESA Status
Kittlitz's murrelet	*Brachyramphus brevirostris*	Candidate

II. Overview of Species Distributions, Populations and Habitats.

The Kittlitz's murrelet is closely associated with glacial habitats along the Alaska mainland coast. Breeding sites are usually chosen in the vicinity of glaciers and cirques in high elevation alpine areas, with little or no vegetative cover (Van Vliet 1993). When present, vegetation is primarily composed of lichens and mosses (Day et al. 1983). The species nests a short distance below the peak or ridge on coastal cliffs, barren ground, rock ledges, and talus above timberline in coastal mountains, generally near glaciers 0.2 to 47 miles inland (Day et al. 1983). The remote and solitary nesting habits lead to extreme difficulty in finding nests. Non-breeding or off-duty breeders spend the summer in inshore areas, especially along glaciated coasts.

The Kittlitz's murrelet is one of the rarest seabirds in North America. The only American population occurs in Alaskan waters from Point Lay south to northern Southeast Alaska (Endicott and Tracey Arm). The largest breeding populations are believed to be in Glacier Bay National Park and Preserve, Prince William Sound, Kenai Fjords, and Icy Bay (Kendall and Agler 1998). According to the petition, the southern boundary of the breeding range is LeConte Bay on the Tongass National Forest. Latest worldwide population estimates range from 9,500 to 26,500 birds. The best information available from the USFWS indicates that Prince William Sound populations have declined by 84 percent since 1984, Kenai Fjords area by 83 percent since 1976, Malaspina Forelands by 38 percent and perhaps as much as 75 percent between 1992 and 2002, and Glacier Bay by 60 percent between 1990 and 1999. Speculated causes for decline include oil pollution, glacial recession, gill-net mortality, and availability of preferred forage fish (Kuletz et al. 2003, Piatt and Anderson 1996, van Vliet and McAllister 1994). Effects

of these factors include increased adult and juvenile mortality and low recruitment. Human-caused mortality includes gillnet fisheries and oil spills like that from the Exxon Valdez or smaller tourism and fishing boats. Increased disturbance from helicopter tours and cruise ships may also be a factor.

III. Assessment of Effects on the Populations or Habitats of the Species In Relation to Proposed Actions of the Tongass Forest Plan Adjustment.

Due to the Kittlitz's murrelet's association with glacial habitat, this species occupies areas outside of where timber harvest and associated activities have occurred or are likely to occur. Major threats to this species are global warming, which is correlated with a loss of suitable habitat (glacial melt) and reduction in prey availability due to warming sea temperatures. Human activity in the marine environment, particularly vessel traffic and fishing operations, are additional threats to this species. There is no indication that any Forest Service management activity is affecting the Kittlitz's murrelet (USDA Forest Service 2004). Consequently, implementing any of the alternatives will not directly or indirectly affect the Kittlitz's murrelet.

Forest-wide standards and guidelines have been developed for protecting seabird rookeries and waterfowl concentration areas (Attachment 1). Adverse effects on Kittlitz's murrelet populations or their habitats are not anticipated with any Forest management activities.

Relationship with other Agencies and Plans

The USFWS has responsibility for the Kittlitz's murrelet. Recovery Plans have not been developed for this species. No critical habitat has been designated in Southeast Alaska to date.

Determination for Kittlitz's Murrelet

Based upon this analysis, the Adjustment of the Tongass National Forest Land Management Plan *will not likely jeopardize the continued existence of Kittlitz's murrelet, or adversely modify proposed critical habitat (if it were to be proposed).*

In addition, formal and informal consultation procedures (as directed by the ESA, as amended, and 50 CFR 17.7, and FSM 2670) are used with the USFWS on all projects within areas that may be used by Kittlitz's murrelet. Forest-wide standards and guidelines for threatened and endangered species (Chapter 4 - Wildlife) direct all projects to follow requirements of the ESA and Forest Service Policy (FSM 2670).

Documentation of Correspondence with other Agencies

Consultation with USFWS occurred throughout the 1997 Forest Plan Revision process and was initiated by the Forest Service in September 1987 with written letters requesting a list of threatened, endangered, proposed, and candidate wildlife species for the Tongass National Forest. At that time, the determination was that the American peregrine falcon was the only listed species that could occur on the Tongass and the evaluation of effects in the Biological Assessment indicated that populations of peregrine falcons would not likely be adversely affected as a result of implementation of the decision. The USFWS concurred with this determination in October 1996. The peregrine falcon was delisted in 1999 and, therefore, not assessed further in this updated Biological Assessment.

For the preparation of this update to the Biological Assessment, current species lists were obtained on the USFWS website accessed most recently in November 2007. The Kittlitz's murrelet was officially designated a candidate species (warranted, but precluded) on May 4, 2004 and therefore is automatically listed as Forest Service Sensitive. In April 2006, the Forest Service hosted an interagency Conservation Strategy Review workshop in Ketchikan, Alaska, which brought together scientists, technical experts, and land managers with expertise in conservation biology and natural resource management from the USFWS, the Alaska Department of Fish and Game (ADF&G), and the Pacific Northwest and Pacific Southwest Research Stations. The workshop provided a forum for the presentation and discussion of relevant scientific information gained since 1997 to be used to inform forest planning decisions. This information has been incorporated into the Forest Plan Amendment EIS and this biological assessment.

Informal consultation was initiated by the Forest Service with the USFWS through a phone conversation on November 21, 2007 (log number 71440-2008-SL-0010) regarding Kittlitz's murrelet. The USFWS concurred that formal consultation was not required.

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Section 2. Biological Assessment for the Endangered Humpback Whale, Endangered Western and Threatened Eastern Steller Sea Lion Populations, and Listed Pacific Salmon and Steelhead for the Tongass National Forest Plan Adjustment

November 2007

This section addresses the potential direct and indirect effects of the proposed alternatives on federally-listed species managed by NMFS. This Biological Assessment updates a previous Biological Assessment (dated October 1996,) that was prepared for endangered whales and the threatened Steller sea lion for the Tongass Forest Plan Revision process. NMFS concurred with the Forest Service finding in that Biological Assessment that the proposed revised Tongass Land Management Plan was not likely to adversely affect listed species under the jurisdiction of NMFS. This update includes the following changes:

- Consideration of the endangered western population of Steller sea lion as likely to occur within the coastal waters possibly affected by the proposed action;
- Consideration of 11 additional species of Pacific salmon that were listed since the previous update and may occur within the project area.

I. Identification of Endangered and Threatened Species and/or Critical Habitats for Such Species Within the Project Area.

The following marine mammals and salmon or steelhead stocks under the jurisdiction of NMFS have been identified as possibly occurring within the affected project area and are considered in this assessment.

Marine Mammals
Humpback whale—Endangered
Steller Sea Lion—Threatened: eastern population, Endangered: western population

Fish
Snake River Sockeye salmon—Endangered
Snake River Spring/Summer-run Chinook salmon—Threatened
Snake River Fall-run Chinook salmon—Threatened
Upper Columbia River Spring-run Chinook salmon—Endangered
Lower Columbia River Chinook salmon—Threatened
Upper Willamette River Chinook salmon—Threatened
Puget Sound-run Chinook salmon—Threatened
Columbia River Chum salmon—Threatened
Snake River Basin Steelhead—Threatened
Lower Columbia River Steelhead—Threatened
Middle Columbia River Steelhead—Threatened
Upper Columbia River Steelhead—Endangered
Upper Willamette River Steelhead—Threatened
Puget Sound Steelhead—Threatened

NMFS completed a final recovery plan for the humpback whale in 1991 and for the Steller sea lion in 1992.

There has been no critical habitat officially designated for the whales at this time in Southeast Alaska.

Critical habitat was designated for the Steller sea lion by NMFS in 1993 and represents areas considered essential for the continued survival and recovery of this species (NMFS 1993). The eastern population of Steller sea lion was listed as threatened on November 26, 1990 (55 CFR 40204) and the western population was listed as Endangered on May 5, 1997 (62 CFR 30772). Adult Steller sea lions congregate at rookeries for breeding and pupping. Rookeries are generally located on relatively remote islands, often in exposed areas that are not easily accessed by humans or mammalian predators. These rookeries, as well as haul-outs, have been officially designated as critical habitat in Southeast Alaska (NMFS 2001). NMFS' definition of critical habitat for Southeast Alaska includes a "terrestrial zone, aquatic zone, and an air zone, that extend 3,000 feet landward, seaward, and above, respectively, for each major rookery and major haul-out in Southeast Alaska." Critical habitat provides notice to federal agencies that a listed species is dependent on these areas for its continued existence and that any federal action that may affect these areas is subject to the consultation requirements of Section 7 of the ESA. To date, 3 major rookeries and 11 major haul-outs have been identified in Southeast Alaska (Table F-2).

Table F-2
Major Steller Sea Lion Rookery and Haul-out Habitats in Southeast Alaska

Name	Rookery	Haul-out
Forester Island	X	
Hazy Island	X	
White Sisters	X	
Benjamin Island		X
Biali Rock	X	X
Biorka Rock		X
Cape Addington		X
Cape Cross		X
Cape Ommaney		X
Coronation Island		X
Gran Point		X
Lull Point		X
Sunset Island		X
Timbered Island		X

Source: 50 CFR 226.202, pages 183, 200-203

No ESA-listed stocks of salmon or steelhead originate in Alaskan streams. However many species and stocks are listed that originated from freshwater habitats in Washington, Idaho, Oregon and California (Table F-1). Some of these listed species migrate into marine waters off the coast of Alaska. While distribution of these stocks is primarily in outer coastal waters some are occasionally present in the inner waters of Southeast Alaska and they may feed on prey resources originating within marine and estuarine waters of the Tongass National Forest.

II. Overview of Species Distributions and Populations.

The following summaries for humpback whale, Steller sea lion, and salmonids were abstracted and compiled from information found in the Alaska Marine Mammal Stock Assessments, 2006 (Angliss and Lodge 2007), Glacier Bay Biological Opinion (NMFS 2003a), published scientific literature, and unpublished reports.

Humpback whales were listed as endangered under the ESA in 1973 due to reduced population size that resulted from significant commercial whaling harvest. Currently, no critical habitat has been designated for the humpback whale.

Due to dramatic declines in total population numbers over approximately a 30 year period, the Steller sea lion was listed as threatened under the ESA (55 CFR 40204). In 1997, the Steller sea lion population

was split into two separate populations (western and eastern populations) based on demographic and genetic differences (Bickham et al. 1996, 62 CFR 307772).

A total of 28 listed ESU/DPSs of salmon and steelhead occur in the Northeast Pacific (Table F-1). Alhough none of the listed stocks originate from Alaskan streams, 14 could potentially be present in Alaskan waters during some period of their marine life stage.

Humpback Whale

Humpback whales (*Megaptera novaeangliae*) are currently listed as endangered under the ESA, and have been protected since 1965. From the late 1800s through the early 1900s, they were extensively commercially hunted, and their current worldwide population is estimated to be only 8 percent of their historical numbers. Recent population estimates, however, show signs of recovery (Calambokidis et al. 1997, NMFS 2002a).

Humpback whales generally migrate between temperate and tropical waters in the winter and spring where they mate and calve, and cooler northern coastal waters where they feed. Feeding occurs near the highly productive fjords of the Southeastern Alaskan panhandle and Prince William Sound, from approximately May through December, although some individuals can be seen every month of the year (Calkins 1986). Peak numbers of whales are usually found in nearshore waters during late August and September, but substantial numbers usually remain until early winter. Humpbacks summering in Southeast Alaska have been linked to three wintering areas: the coastal waters along Baja California and mainland Mexico, the main islands of Hawaii, and the islands south of Japan (NMFS 1991). Those whales that feed in Southeast Alaska and migrate to Hawaii are referred to as the Central North Pacific stock (NMFS 2002a).

The local distribution of humpbacks in Southeastern Alaska appears to be correlated with the density and seasonal availability of prey, particularly herring (*Clupea harengus*) and euphausiids, and adults consume up to 3,000 pounds a day outside the breeding season. Important feeding areas include Glacier Bay and adjacent portions of Icy Strait, Stephens Passage/Frederick Sound, Seymour Canal and Sitka Sound. Glacier Bay and Icy Strait appear to be an important feeding area early in the season, when whales prey heavily on herring and other small, schooling fishes. Frederick Sound is important later in summer, when whales feed on swarming euphausiids. During autumn and early winter, humpbacks move out of the Sound to areas where herring are abundant, particularly Seymour Canal. Other areas of Southeastern Alaska may also be important for humpbacks and need to be evaluated. These include Cape Fairweather, Lynn Canal, Sumner Strait, Dixon Entrance, the west coast of Prince of Wales Island, and offshore banks such as the Fairweather Grounds.

The Central North Pacific stock of humpback whales was estimated to number 4,005 in 1993 (+/- 746, 95 percent confidence interval) (Calambokidis et al. 1997). A 1997 Forest Service estimate of the Southeast Alaska humpback whale feeding aggregation was 300 to 500 animals (USDA Forest Service 1997) during summer and fall, although a more recent estimate is 961 animals (+/- 226, 95 percent confidence interval) (Straley et al. 2002). The population rate of increase was estimated at 7 percent for Pacific humpback whales during 1993–2000 (Mobley et al. 2001), which may be near the species maximum. They are regularly sighted in the Inside Passage and coastal waters of the Southeastern Alaska panhandle from Yakutat Bay south to Queen Charlotte Sound (USDA Forest Service 1997).

Because the humpback inhabits shallow coastal areas, it is increasingly exposed to human activity. Consequently, these whales may be more susceptible to confrontational disturbance, displacement, and loss of habitat from environmental degradation than some other whale species. Specifically, the greatest threats to humpback whales today are entanglements in fishing gear, ship strikes, and coastal habitat pollution.

Steller Sea Lion

The Steller (northern) sea lion (*Eumetopias jubata*) ranges from Hokkaido, Japan, through the Kuril Islands and Okhotsk Sea, Aleutian Islands and central Bering Sea, Gulf of Alaska, Southeast Alaska, and south to central California (Calkins 1986, National Marine Mammal Laboratory [NMML] 2003). The centers of abundance and distribution are the Gulf of Alaska and Aleutian Islands, respectively.

The Steller sea lion was originally listed under the ESA in 1990 as threatened. At that time, Steller sea lion numbers were declining sharply throughout their range and particularly in Alaska. Populations are estimated to have declined between the 1950s and 1990 by 78 percent (NMFS 1992). In certain parts of Alaska, declines of greater than 80 percent have occurred since 1985. The number of sea lions observed on certain rookeries from Kenai Peninsula to Kiska Island declined by 63 percent since 1985 and by 82 percent since 1960. Critical habitat for Steller sea lions was designated in 1993 (NMFS 1993). Specific causes of the population decline are unknown, although population modeling has suggested that decreased juvenile survival is a likely driver. The declines are spreading to previously stable areas and are accelerating. Significant declines have also occurred on the Kuril Islands.

In 1997, NMFS classified the Steller sea lion as two distinct population segments, the eastern stock (ES) and western stock (WS), and re-evaluated their status. The stock differentiation is based primarily on differences in mitochondrial DNA, but also on population trends in the two regions. Steller sea lions occurring west of 144°W longitude were reclassified as endangered. The eastern Pacific population, still listed as threatened, includes Southeast Alaska and the Tongass National Forest. ES populations are increasing in the northern part of the range (Southeast Alaska and British Columbia) and declining in the southern end of its range (Oregon, Washington, and California). In this region, habitat concerns include reduced prey availability, contaminants, and disease (Sydeman and Allen 1997). Both WS and ES stocks are designated as “depleted” and “strategic” under the Marine Mammal Protection Act (MMPA). Although ES stock size has increased in recent years, its status relative to its optimum sustainable population size is still unknown.

There is some limited interchange between the WS and ES populations. Raum-Suryan et al. (2002, 2004) branded 8,596 sea lion pups from 1975 to 2001, and found that a few juveniles from the WS moved to the ES region. Resightings of branded Steller sea lions showed wide dispersal from natal rookeries, particularly among juveniles, which occasionally traveled over 1,500 km to other rookeries and haul-outs and crossing stock boundaries. However, individuals consistently returned to breed, and no adult Steller sea lions were observed breeding with the opposite stock (Raum-Suryan et al. 2002). A more recent study used satellite transmitters to track distribution and movement patterns of pup and juvenile Steller sea lions from both stocks. Overall, movement of individuals between the WS and ES populations were documented only in very low numbers, and only among males (Raum-Suryan et al. 2004). Although some WS individuals have been observed foraging in Southeast Alaska, the WS Steller sea lion population will not be discussed in greater detail in this assessment because of the extremely low number of sightings and because the existing Standard and Guidelines are not specific to the ES Steller sea lion stock and would therefore protect both populations.

The total estimated population of the ES Steller sea lions is 48,519 or 54,989 in 2002–2005, depending on which assumptions are used to calculate the pup multiplier (see Calkins and Pitcher 1982, Trites and Larkin 1996). The number of ES pups produced has nearly doubled since 1978, with an annual rate of increase of 5.9 percent from 1979 to 1998, although the rate of increase between 1989 and 1997 was only 1.7 percent (Calkins et al. 1999). Sease and Gudmundson (2002) estimated a 1.8 percent annual increase in non-pup sea lions between 1991 and 2002. In the Southeast Alaska portion of the ES, non-pup counts on trend sites have increased 29.3 percent since 1990 (Sease et al. 2001). The estimated abundance of the ES population of Steller sea lions throughout its range is 31,028 animals (NMFS 2002b). Calkins et al. (1999) suggested that there are probably more sea lions at present than at any time in recorded history. The minimum population estimate for Steller sea lions in Southeast Alaska in 2005 was 20,793 (15,283 non-pups, 5,510 pups). Current population trends in Southeast Alaska are moving up, with non-pups at trend sites increasing 56 percent from 1979 to 2002, and pups increasing 148 percent (Merrick et al. 1992, Sease et al. 2001, NMFS 2006).

Steller sea lions are opportunistic predators, feeding primarily on a wide variety of fishes and cephalopods. Prey varies geographically and seasonally. Some of the more important prey species in Alaska are walleye pollock (*Theragra chalcogramma*), Atka mackerel (*Pleurogrammus monopteryguis*), Pacific herring (*Clupea harengus*), capelin (*Mallotus villosus*), Pacific sand lance (*Ammodytes hexapterus*), Pacific cod (*Gadus macrocephalus*), salmon (*Oncorhynchus* spp.), and, locally, eulachon (*Thaleichthys pacificus*).

Listed Salmon and Steelhead

Although none of the listed stocks originate from Alaskan streams, 14 of the 28 listed ESU/DPSs of salmon and steelhead could potentially be present in Alaskan waters during some period of their marine life stage (Table F-1). All of these originate from the Columbia River system or Puget Sound. Juveniles from these ESUs/DPSs move varying distances north from Washington after leaving their natal streams to rear in the rich north Pacific waters before returning to their home streams as adults (Groot and Margolis 1991, McNeil and Himsworth 1980). They may feed on prey resources originating from marine and estuarine waters of the Tongass National Forest, and could occasionally be present in inner waters of Southeast Alaska. Overall, listed stocks make up a small portion of total salmon and steelhead in waters off the coast of Alaska (NMFS 2003b). Snake River sockeye do not occur within the marine waters bounded by the Tongass National Forest in the Inside Passage, but may occur in adjacent waters near the western boundaries of the Forest. British Columbia and Washington sockeye stocks normally occur south of the Southeast Alaska sockeye stocks below the latitude of 46°N (Burgner 1991).

Any of the six listed chinook ESUs could potentially be present in marine Alaskan waters, off the outside coast to the west of the Tongass National Forest, and some may rarely be present in the marine waters of the Tongass National Forest. Columbia River chum and all ESUs of steelhead are likely present in Southeast Alaska waters only rarely (Salo 1991, NMFS 2003b). Southerly stocks of chum tend to move offshore early in their northern migration (Salo 1991). Chinook and steelhead may use nearshore marine and estuarine resources, such as prey fish, which are dependent on the Tongass National Forest.

III. Assessment of Effects on the Populations or Habitats of the Species in Relation to Proposed Actions of the Tongass Forest Plan Adjustment.

Humpback Whale

The NMFS recovery plan for the humpback whale identified six known or potential categories of human impacts to these species: hunting, entrapment and entanglement in fishing gear, collisions with ships, acoustic disturbance, habitat degradation, and competition for resources with humans. The majority (74 percent) of human-related mortalities and injuries to humpback whales investigated involved commercial fishing gear, and 38 percent of these were serious injuries or mortalities. These data were gathered from reports submitted to NMFS, Alaska Region, 2001–2005 (NMFS 2007). The estimated minimum mortality and serious injury rate incidental to U.S. commercial fisheries in Southeast Alaska is 1.4 humpback whales per year (NMFS 2007). Mortality and serious injury caused by ship strikes in Southeast Alaska occurred 1.4 times/year between 2001 and 2005.

National Forest management activities which may have an effect on whale habitats or populations generally fall into the categories of acoustic disturbance and habitat degradation. These management activities include: the development and use of log transfer facilities (LTF's) and their associated camps, the movement of log rafts from log transfer facilities to mills, and the potential development of other docks and associated facilities for mining, recreation, and other forest uses and activities. Generally, with the development and use of LTF's and other docking facilities for projects, there is an associated increase in recreational boating in the immediate vicinity during the construction and use of the facilities. Risks from hunting, entrapment and entanglement in fishing gear, ship strikes, and competition for resources with humans associated with LTF’s are generally negligible. This is due to the slow speed of watercraft associated with the log transfer activity, and the lack of association between LTF’s and the other risks.

Construction and operation of LTF's and other docking facilities are restricted to small, very localized areas of the marine environment. There are 116 LTF's currently on the Tongass National Forest and there is an estimated 232 acres of marine benthic disturbance associated with these existing LTF's (2 acres per LTF). However, not all LTF's are active at the same time and, in recent years, the number that are active is a small minority of the total existing. Based on the 2007 logging system and transportation analysis and modeling conducted for the 2008 Final EIS, it is estimated that a maximum of 115 new LTFs would be needed under the highest harvest alternative (Alternative 7), resulting in an estimated maximum of 230 additional acres of benthic habitat disturbance. The 2 acres of disturbance per LTF figure, assumes that logs would be placed into the water and rafted, rather than loaded onto barges as is

currently required on many sales. Therefore, it is likely that future effects at each LTF would be even less than in the past.

Generally there is no reasonable potential to directly affect whales with these facilities. During the summer of 1989, there was a report of a humpback whale entangled in some cables from an inactive LTF site on the Stikine Area. To our knowledge, this is the only direct effect incident related to LTF's.

Two potential indirect effects of LTF's and other docking facilities and associated activities have been identified: 1) effects on whale prey species, and 2) disturbances of whales by boat traffic associated with LTF's.

Effects on Prey. Nemoto (1970) noted that euphausiids and gregarious fish are the primary prey of humpbacks. Thirteen species of fish and 57 species of invertebrates were identified as humpback whale prey in Southeast Alaska. Humpbacks studied in Glacier Bay and Stephens Passage-Frederick Sound were found most frequently in areas of high prey density (Wing and Krieger 1983).

Construction and operation of all LTF's and similar facilities require U.S. Army Corps of Engineers and U.S. Environmental Protection Agency permits, and State of Alaska Tidelands permits. The permitting process provides that construction and operation maintain water quality in the specific facility locations, and that marine circulation and flushing are maintained. All facilities must be in conformance with permit standards. No impacts to the marine environment which would affect whale prey species are anticipated.

Effects from Disturbance. Humpback whale response to nearby boating activity varies from no apparent response to pod dispersal, sounding, breaching, evasive underwater maneuvers, and maintaining distance (Baker and Herman 1983, Baker et. al. 1982). Disturbance by boat activity has been suggested as one of the possible causes of observed changes in whale distribution in Southeast Alaska. Direct pursuit of whales by boats, and frequent changes in boat speed and direction appear to elicit avoidance behaviors more frequently than other types of boat traffic. However, whales may readily habituate to constant and familiar noise (Norris and Reeves 1978). Whales can be commonly found in some areas of Southeast Alaska which have considerable boat traffic; however, whether they are habituated to boat traffic has not been documented, as far as we know. Adverse effects from current levels of boat traffic have not been documented, as far as we know.

Two basic types of boat activity would be associated with LTF's: log raft towing and recreational boating by workers. Log raft towing frequency would vary between camps, seasons, and years; a general average may be about once a week during the working season (U.S. Forest Service, 1989-94 Operating Period for the Ketchikan Pulp Company Long-term Sale Area). Tugs would maintain relatively constant speeds and directions during raft towing. Constant speed and direction elicit less avoidance behavior from whales than other types of boating activity. Log raft towing routes are generally well established, and adverse effects from log raft towing have not been documented.

Recreational boating activity would vary between seasons, years, and camps of different sizes. This activity would be concentrated near LTF sites, other docking facilities and camps. It is estimated that most recreational boating would occur within a few miles of the site, few trips would be made over 10 miles, and activity greater than 30 miles from a site would be negligible. This boating would involve frequent changes in speed and direction and may include some small amount of whale pursuit, if the whales are within sight of the camp or an occupied boat. The effect of such recreational activity on whales would depend on many factors such as size of the bay, depth of the waters in the bay, number of boats, individual behavior responses of the whales, etc. At the present time, there is not a quantifiable way to estimate these possible effects.

Attachment 2 outlines forest-wide standards and guidelines that have been developed for application on all Forest Service permitted or approved activities to minimize or eliminate any adverse impacts on humpback whales.

The amount of human activity in the marine environment associated with Forest management activities is only a fraction of the total amount of human activity occurring in the marine environment. Some of the other activities include: commercial fishing, sport fishing, hunting, subsistence, tourism, and mariculture.

Many of these activities are not regulated by the Forest Service. NMFS is currently proposing regulations for how close humans can approach whales. The purpose of these regulations is to reduce disturbance to whales from activities such as whale pursuing. Such regulations would reduce the indirect disturbance effects discussed above.

Steller Sea Lion

NMFS provides a summary of factors affecting the Steller sea lion populations, including:.reductions in the availability of food resources - especially pollock which is the most important prey species for sea lions; commercial harvests of sea lion pups; subsistence harvests of sea lions; harvests for public display and scientific research purposes; predation by sharks, killer whales and brown bear; disease; the inadequacy of existing regulatory mechanisms re quotas on the incidental harvesting of sea lions during commercial fishing operations; and other natural or manmade factors such as incidences of fishermen shooting adult sea lions at rookeries, haul out sites, and in the water near boats (NMFS 1990, 1993). None of these factors are regulated or fall within the jurisdiction of the Forest Service.

A primary human-caused injury and mortality factor is incidental take during commercial fisheries, though mortality by this cause is low (0.8 mortality rate for 2001–2003, or about 1/year for Pacific whiting component groundfish trawl) (NMFS 2007). Subsistence harvest is likewise low (mean annual take 2001–2005: 9), though it is aimed at both the ES and WS stocks of Steller sea lions (NMFS 2007). Illegal shooting, entanglement in non-fishery-related manmade material, and research activities also account for an additional small amount of annual mortality. The sum of these manmade mortality factors does not exceed annual potential biological removal as defined by NMFS for the ES Steller sea lions, and these can therefore be considered insignificant.

Southeast Alaska populations have not declined to the extent that other populations have. Harassment or displacement of sea lions from preferred habitats by human activities such as boating, recreation, aircraft, LTF's, log raft towing, etc., is a concern with regard to long term conservation of the sea lion in Southeast Alaska. Forest-wide standards and guidelines direct the Forest Service to prevent and/or reduce potential harassment of sea lions and other marine mammals due to activities carried out by or under the jurisdiction of the Forest Service. These Forest-wide standards and guidelines are listed in Attachment 2.

Salmon

The USDA Forest Service has no authority over the direct taking of salmon. This responsibility rests with the State of Alaska, Board of Fisheries, and ADF&G. As a land management agency, the Forest Service may indirectly influence the take of fish, both on and adjacent to the National Forest. Indirect take may occur as a result of modification of habitat or improving the opportunity to harvest salmon. Examples of the latter include the development of roads, boat launches, saltwater anchorages, or cabins; and special use permits for lodges, guides and outfitters. The following analysis considers the potential opportunity for indirect taking of the listed Snake River Sockeye, six Chinook salmon ESUs, Columbia River Chum salmon, and five steelhead DPSs believed to potentially occur in Alaskan waters (Table F-1).

Snake River Sockeye. Due to both the lack of suitable sockeye habitat in the Tongass National Forest, little or no use of prey resources potentially affected in the nearshore environment, and the lack of availability to sport and subsistence fisheries accessed through the Forest, amendment of the Tongass National Forest Land Management will not likely adversely affect the Snake River sockeye salmon.

The management of the Tongass National Forest has no direct or indirect effect on the take of the Snake River sockeye salmon. There is only a very limited relationship between the life history of these salmon and management of terrestrial habitats of the Tongass.

Snake River Chinook (All Stocks). Among the listed fish species evaluated, the six Chinook salmon ESUs are generally most likely to be found in inner waters of Southeast Alaska. Because chinook salmon are piscivores they may feed on fish which are dependent on the waters of Tongass National Forest during some stage of their lives, or these prey species may be affected by management actions. Additionally, chinook salmon are harvested in the sport and subsistence fisheries which may utilize the Tongass for saltwater access. Aquatic habitat protection measures have been designed to provide a

natural range of habitat conditions in the waters of the Tongass National Forest (Riparian Forest-wide Standards and Guidelines) and have been developed to reduce or eliminate the likelihood of contribution to the degradation of freshwater habitats. Chinook prey species, such as members of the Pacific smelt family, Pacific herring, and other Pacific salmon, are not anticipated to be negatively impacted by the Tongass Forest Plan Adjustment.

The Tongass Forest Plan does not schedule any developments which measurably increase the access or opportunity to harvest Snake River chinook salmon by sport or subsistence fisheries. Additionally, it is likely that such projects that could be developed in the future, such as roads; boat launches; saltwater anchorages, cabins, special use permits for lodges, guides and outfitters,and logging camp development for the purpose of timber harvest, would have no measurable effect on the listed chinook salmon.

Columbia River Chum Salmon. Like sockeye, the effects of Tongass National Forest actions on land or in nearshore environments are not likely to affect this stock because of their rare presence in the inner marine waters of this region and small magnitude of any affects to the marine environment from any future actions.

Steelhead (All five DPSs). The nearshore resources utilized by steelhead could be affected in small regions. Again because of low probability of any of these fish being present in the inner waters, and the low chance of any adverse effects to prey resources, changes to the Tongass Forest Plan are unlikely to cause adverse effects to any of the listed steelhead DPSs. Additionally, as noted above, none of the considered actions result in any ground or nearshore marine water disturbance so the considered action will have no direct effect on these steelhead DPSs. Specific ground disturbing actions, considered in this respect, would be addressed in through agency consultation, as needed, during project specific actions.

Determination for Marine Mammals and Listed Pacific Salmon/Steelhead

Based on the analysis above, which takes into account current protection measures required by the Marine Mammal Protection Act (MMPA), ESA, and implementation of the Forest-Wide Standards and Guidelines (Attachments 2 and 3), the National Forest management activities will not likely adversely affect the humpback whale, Steller sea lion, or of the any of the ESUs or DPSs of salmonids or their habitats addressed above and listed in Table F-1.

Since the currently evaluated actions do not permit any ground disturbing activity none of the considered actions will have any direct adverse effects to any of the listed species addressed in this section. Any proposed actions indirectly resulting from the considered alternatives will be evaluated on case specific bases as to their affect to listed species and may include formal or informal consultation with NMFS at the time of project evaluation.

In addition, formal and informal consultation procedures (as directed by the ESA, as amended in 50 CFR 17.7, and FSM 2670) are used with the NMFS on all site specific projects that implement the Forest Plan. Forest-wide standards and guidelines for threatened and endangered species (Attachments 2 and 3) also direct that all projects will comply with requirements of the ESA and Forest Service Policy (FSM 2670).

Documentation of Correspondence with Other Agencies

Consultation with NMFS occurred throughout the 1997 Forest Plan Revision process and was initiated by the Forest Service in September 1987 with written letters requesting a list of threatened and endangered marine mammal and anadromous fish species for the Tongass National Forest. The evaluation of effects in the Biological Assessment indicated that populations of species under the jurisdiction of NFMS would not likely be adversely affected as a result of implementation of the decision. NMFS concurred with this determination in November 1996. They concluded Section 7 consultation by stating that consultation should be reinitiated if project plans change or new information becomes available that would change the basis of this determination,

Concurrence findings from the 1997 Forest Plan Revision are still valid for this amendment. Extensive consultation occurred throughout past revision processes of the Forest Plan; the proposed new Forest Plan is an amendment; and the above analysis and determination is consistent with the approach and findings of the 1996 Biological Assessment. The Forest Service will continue to adhere to the Forest-wide Standards and Guidelines for Threatened, Endangered, and Sensitive species, which was the basis

for concurrence in the November 21, 1996 letter. Consultation will occur when site specific activities are proposed that may affect a listed species.

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Attachment 1

Forest-wide standards and guidelines in the Tongass Land Management Plan for the conservation of threatened, endangered, and proposed species (portions excerpted relevant to the Kittlitz's murrelet).

Wildlife Habitat Planning: WILD1

I. Coordination/cooperation with other Agencies, Institutions and Partners

A. Coordinate with the Alaska Department of Fish and Game, other state agencies, NMFS, the U.S. Fish and Wildlife Service, tribal governments, and other cooperators and partners during the planning of activities that may affect wildlife.
   1. The Forest should meet at least annually with state and Federal wildlife agencies to review resource activities, present progress reports on implementation of past cooperative work or agreements, and-schedule cooperative work.
   2. Seek to maintain memoranda of understanding with appropriate state, Federal, and local agencies and associations.

B. Emphasize management for indigenous wildlife species and natural habitat except in cases where the Forest Service, in cooperation with the Alaska Department of Fish and Game and U.S. Fish and Wildlife Service, find desirable alternatives. Special consideration should be given to the possible adverse impacts on habitat of sensitive, threatened, and endangered species.

C. Coordinate wildlife habitat surveys, studies, plans and improvement projects with the Alaska Department of Fish and Game, U.S. Fish and Wildlife Service, NMFS, and other appropriate state, Federal, tribal, local and private agencies. Use the Sikes Act authorities for cooperative work with the state. Use agreements and other partnerships to cooperate with other partners.

D. Coordinate with the Alaska Department of Fish and Game in development of state strategic plans and population goals and objectives for wildlife species and attempt to incorporate wildlife goals and objectives into forest management.

E. Provide habitat information to the Alaska Department of Fish and Game to assist in correlating hunting seasons, permits, and bag limits to on-the-ground habitat conditions so that population and habitat objectives can be achieved.

II. General Habitat Planning/Coordination

A. Recognize as wildlife habitat, areas of land and water which can contribute to achieving wildlife objectives for consumptive and non-consumptive uses.

B. Provide the abundance and distribution of habitat necessary to maintain viable populations of existing native and desirable introduced species well-distributed in the planning area, i.e., the Tongass National Forest. (Consult 36 CFR 219.19 and 36 CFR 219.27.)

C. Cooperate with the State and, as appropriate, the U.S. Fish and Wildlife Service in managing vehicle, boat, and other human use (e.g. hunting and fishing seasons and bag limits) as necessary to achieve wildlife objectives, recognizing the access provisions of ANILCA. Emphasize management to reduce human disturbance in high value habitat areas and during critical periods of wildlife use.

D. Maintain a Forest program schedule which includes anticipated wildlife habitat and population inventory needs, monitoring requirements and proposed habitat improvement and maintenance projects.

E. Use forest plan management indicator species to evaluate the potential effects of proposed management activities affecting wildlife habitat (Consult Forest Service Manual 2620).

F. Develop interagency habitat capability models for any or all of the management indicators to systematically assess the impacts of proposed projects during project level analysis. Periodically review and update models to reflect the most current habitat relationships and habitat modeling technology.

G. Cooperate with the Alaska Department of Fish and Game to seek to prevent existing populations of invasive species from dispersing into Wilderness areas. Address issues regarding management, introduction, and re-introduction of wildlife species consistent with National and Regional Policy.

H. When population or habitat declines for a plant or animal species or subspecies indicates that long-term persistence is at risk, evaluate the particular species for designation as a Regional

Sensitive Species by the Regional Forester. (Consult FSM 2670 and R10 supplemental directions for Threatened, Endangered, and Sensitive Species.)

III. Seabird Rookeries

A. Provide for the protection and maintenance of seabird (marine bird) rookeries.
   1. Locate facilities and concentrated human activities requiring Forest Service approval as far from known seabird colonies as feasible consistent with the Migratory Bird Treaty Act. The following distances are provided as general guidelines for maintaining habitats and reducing human disturbance:
      a) For aircraft flights on Forest Service permitted or approved activities, when weather ceilings permit, maintain a constant flight direction and airspeed and a minimum flight elevation of 1,500 feet (458 meters) for helicopters and fixed-winged aircraft. If at all possible, avoid flying over seabird colonies.
      b) Regulate human use to maintain a 250 meter no-disturbance distance from seabird colonies on upland habitats.
   2. The availability of garbage to gulls should be eliminated by requiring Special Use Permittees to collect and dispose of garbage from their Special Use Authorizations.
   3. Cooperate with state and other Federal agencies to develop sites and opportunities for the safe public viewing of these species. Maintain a public education program explaining forest management activities related to these species in cooperation with state and other Federal agencies.

IV. Waterfowl and Shorebird Habitats

A. Maintain or enhance wetland habitats which receive significant use by waterfowl and shorebirds. (The Tongass National Forest is a “Priority Forest’ in the national TAKING WING Strategic Plan.) “Significant” is relative, but generally relates to use of a specific area by tens or hundreds of individuals of one or more species.
   1. Support the international significance of wetland habitats on the Tongass National Forest by participating in partnerships such as the North American Waterfowl Management Plan and the Western Hemisphere Shorebird Reserve Network.
   2. Identify during project analysis, in cooperation with the Alaska Department of Fish and Game and the U.S. Fish and Wildlife Service, wetlands which receive significant waterfowl or shorebird use during fall/winter/spring concentrations or nesting, brood rearing or molting habitats.
   3. Locate facilities and concentrated human activities requiring Forest Service approval as far from known waterfowl or shorebird concentration and nesting areas as feasible. Minimize disturbance of waterfowl by restricting, when feasible, development activities to periods when waterfowl are absent from the area.
   4. During project analysis, consider the need to rehabilitate waterfowl habitat following development activities if there is no feasible alternative to the habitat disturbance. (Also see the Wetlands Forest-wide Standards & Guidelines.)
   5. Maintain habitat capability in coastal wetlands and intertidal areas that are important migratory staging areas and fall/winter/spring concentration areas, and wetlands that are important nesting and brood-rearing habitats, by avoiding, where feasible, all development activities which could fill wetlands, drain wetlands, or alter water levels resulting in loss of desirable vegetation, or direct loss of habitat. (Consult the Migratory Bird Treaty Act.)
   6. Minimize human disturbance of habitats during important periods of the year (nesting and brood-rearing, molting, and winter) by managing human use (such as trails, Off-Highway Vehicle use) in significant wetland areas. The following distances are provided as guidelines for reducing human disturbance:
      a) Provide a minimum distance of 330 feet (100 meters) between human activities on the ground and significant areas being used by other waterfowl.
   7. Develop waterfowl habitat improvement projects in cooperation with appropriate state, Federal and local agencies, partner organizations, and individuals.
   8. For Special Use Administration (non-recreational), issue only authorizations which meet the objectives of Executive Order 11990 (Protection of Wetlands). Issue permits which

serve to preserve, enhance, or aid in the management of the natural and beneficial values of wetlands.

9. Perform integrated logging system and transportation analysis to determine if other feasible routes avoiding areas where significant waterfowl use exists.
10. If the need to restrict road access is identified during project interdisciplinary review, roads will be closed either seasonally or yearlong to minimize adverse effects on waterfowl.
11. Cooperate with state and other Federal agencies to develop sites for safe-public viewing opportunities that do not adversely disturb wildlife. Maintain a public education program explaining forest management activities related to these species in cooperation with state and other Federal agencies.

B. Conduct activities to avoid or minimize disturbance to habitats within the forest, riparian, and estuarine areas which are important nesting, brooding, rearing, and molting areas, for Vancouver Canada geese, sandhill cranes, or trumpeter swans.

Threatened, Endangered, and Sensitive Wildlife Species: WILD4

Consult FSM 2670 and R10 supplemental directions for Threatened, Endangered, and Sensitive Species.

I. Threatened or Endangered Species

A. Kittlitz's Murrelet

1. Provide for the protection and maintenance of known Kittlitz's Murrelet nesting habitats.

Attachment 2

Wildlife Forest-wide Standards and Guidelines in the Tongass National Forest (portions excerpted pertaining to the conservation of marine mammals and their habitats).

WILDLIFE
Forest-wide Standards & Guidelines

Wildlife Habitat Planning: WILD1

I. Coordination/Cooperation with Other Agencies, Institutions, and Partners

C. Coordinate with the Alaska Department of Fish and Game, other state agencies, NMFS, the U.S. Fish and Wildlife Service, tribal governments, and other cooperators and partners during the planning of activities that may affect wildlife.
   1. The Forest should meet at least annually with state and federal wildlife agencies to review resource activities, present progress reports on implementation of past cooperative work or agreements, and-schedule cooperative work.
   2. Seek to maintain memoranda of understanding with appropriate state, Federal, and local agencies and associations.

D. Emphasize management for indigenous wildlife species and natural habitat except in cases where the Forest Service, in cooperation with the Alaska Department of Fish and Game and U.S. Fish and Wildlife Service, find desirable alternatives. Special consideration should be given to the possible adverse impacts on habitat of sensitive, threatened, and endangered species.

E. Coordinate wildlife habitat surveys, studies, plans and improvement projects with the Alaska Department of Fish and Game, U.S. Fish and Wildlife Service, NMFS, and other appropriate state, federal, tribal, local and private agencies. Use the Sikes Act authorities for cooperative work with the state. Use agreements and other partnerships to cooperate with other partners.

F. Coordinate with the Alaska Department of Fish and Game in development of state strategic plans and population goals and objectives for wildlife species and attempt to incorporate wildlife goals and objectives into forest management.

G. Provide habitat information to the Alaska Department of Fish and Game to assist in correlating hunting seasons, permits, and bag limits to on-the-ground habitat conditions so that population and habitat objectives can be achieved.

II. General Habitat Planning/Coordination

A. Recognize as wildlife habitat, areas of land and water that can contribute to achieving wildlife objectives for consumptive and non-consumptive uses.

B. Provide the abundance and distribution of habitat necessary to maintain viable populations of existing native and desirable introduced species well-distributed in the planning area, i.e., the Tongass National Forest. (Consult 36 CFR 219.19 and 36 CFR 219.27.)

C. Cooperate with the State and, as appropriate, the U.S. Fish and Wildlife Service in managing vehicle, boat, and other human use (e.g. hunting and fishing seasons and bag limits) as necessary to achieve wildlife objectives, recognizing the access provisions of ANILCA. Emphasize management to reduce human disturbance in high value habitat areas and during critical periods of wildlife use.

D. Maintain a Forest program schedule that includes anticipated wildlife habitat and population inventory needs, monitoring requirements and proposed habitat improvement and maintenance projects.

E. Use forest plan management indicator species to evaluate the potential effects of proposed management activities affecting wildlife habitat. (Consult Forest Service Manual 2620.)

F. Develop interagency habitat capability models for any or all of the management indicators to systematically assess the impacts of proposed projects during project level analysis. Periodically review and update models to reflect the most current habitat relationships and habitat modeling technology.

G. Cooperate with the Alaska Department of Fish and Game to seek to prevent existing populations of invasive species from dispersing into Wilderness areas. Address issues

regarding management, introduction, and re-introduction of wildlife species consistent with National and Regional Policy.

H. When population or habitat declines for a plant or animal species or subspecies indicates that long-term persistence is at risk, evaluate the particular species for designation as a Regional Sensitive Species by the Regional Forester. (Consult FSM 2670 and R10 supplemental directions for Threatened, Endangered, and Sensitive Species.)

III. Marine Mammal Habitats

H. Provide for the protection and maintenance of harbor seal, Steller sea lion and sea otter habitats.

1. Ensure that Forest Service permitted or approved activities are conducted in a manner consistent with the MMPA, the ESA, and NMFS guidelines for approaching seals and sea lions. Consult with the appropriate agency for identification of critical timing events, such as molting, parturition, etc., and recommended distances to avoid disturbances. "Taking" of marine mammals is prohibited; "taking" includes harassment (adverse disturbance), pursuit, or attempting any such activity.
2. Locate Forest Service authorized and approved facilities and concentrated human activities as far from known marine mammal haul outs, rookeries and known concentration areas as feasible to meet the Alaska Coastal Management Program (ACMP) consistency requirements and MMPA**.** The following distances are provided as general guidelines for maintaining habitats and reducing human disturbance:
   a) Locate camps, Log Transfer Facilities, campgrounds and other developments (where allowed by the Land Use Designation) 1 mile from known haul outs, and farther if the development is large.
   b) Forest Service permitted or approved activities will not intentionally approach within 100 yards, or otherwise intentionally disturb or displace any hauled-out marine mammal.
   c) Dispose of waste oil and fuels off-site as regulated by the Alaska Department of Environmental Conservation.
3. Cooperate with the state and other federal agencies to develop sites and opportunities for the safe viewing and observation of marine mammals by the public. Maintain a public education program explaining forest management activities related to marine mammals in cooperation with state and other Federal agencies.

Threatened, Endangered, and Sensitive Wildlife Species: WILD4

Consult FSM 2670 and R10 supplemental directions for Threatened, Endangered, and Sensitive Species.

I. Threatened or Endangered Species

A. Steller Sea Lion

1. Protect Steller sea lion habitats.
2. Ensure that Forest Service funded, permitted or authorized activities are conducted in a manner consistent with the requirements, consultations, or advice received from the appropriate regulatory agencies for the MMPA, the ESA, and NMFS guidelines for approaching seals and sea lions. "Taking" of sea lions is prohibited; "taking" includes harassing or pursuing or attempting any such activity.
3. Locate facilities, camps, Log Transfer Facilities, campgrounds and other developments 1 mile from known haulouts, and, farther away, if the development is large.
4. Cooperate with state and other federal agencies to develop sites and opportunities for the safe viewing and observation of sea lions by the public. Maintain a public education program explaining forest management activities related to sea lions in cooperation with state and other federal agencies.

B. Humpback Whale

1. Provide for the protection and maintenance of whale habitats.
2. Ensure that Forest Service permitted or approved activities are conducted in a manner consistent with the MMPA, the ESA, and NMFS regulations for approaching whales, dolphins, and porpoise. "Taking" of whales is prohibited; "taking" includes harassing or pursuing or attempting any such activity.

Attachment 3

Forest-wide standards and guidelines in the Tongass Forest Plan for the conservation of threatened, endangered, and proposed fish species. These conservation measures serve to protect important habitat that may be used for listed Pacific salmon and steelhead.

FISH
Forest-wide Standards & Guidelines

Fish Habitat Inventory and Monitoring: FISH1

I. Fish Habitat Inventory

A. Maintain the channel type and stream class (see Glossary) based inventory of all Forest streams.
   1. Maintain and update the stream inventory (and GIS mapping) during site-specific project planning and analysis.
      a) Consult publication *R10-TP-26, A Channel type Users Guide for the Tongass National Forest, Southeast Alaska* (as revised), for descriptions of the channel types.
      b) Consult the Aquatic Habitat Management Handbook FSH 2090.21 for descriptions of Region 10, stream survey methodologies.

B. Maintain the inventory of Forest streams and watersheds for fish enhancement opportunities.

C. Maintain, and further develop as necessary, the fish-habitat-objectives database used to measure changes in the natural range and frequency of aquatic habitat conditions. (See FISH 112,IV(B) and Appendix B.)

Fish Habitat Planning: FISH2

I. Fish Habitat and Channel Processes

A. Recognize watershed function and channel processes when planning for the protection, restoration or enhancement of fish habitat. (Consult Riparian Forest-wide Standards and Guidelines RIP2 and Soil and Water Forest-wide Standards and Guidelines S&W112.)
   1. Consider the effects of upstream and upslope activities during site-specific planning.
   2. Consider the condition of upstream and upslope areas during site-specific planning.
   3. Consider topics such as erosion processes, watershed hydrology, vegetation, stream channel morphology, water quality, wilderness designation, recommendations for inclusion into the Wild and Scenic River System, species and habitats, and human uses, during analyses.

II. Channel Classification and Process Groups

A. Use channel type inventories to categorize stream reaches into channel process groups. Use channel types and process groups to plan management activities affecting fish and fish habitat along all lakes and streams. Process groups and the channel types included in each process group are shown in Appendix D, and in publication R10-TP-26, A Channel type Users Guide for the Tongass National Forest, Southeast Alaska. These groups may be redefined as more information about channel types becomes available.
   1. Map and field-verify streams, lakes and estuaries by channel type and stream class for project planning and implementation.

III. Fish Stream Classification ***(reference FSH 2090.21 (2001) Chapter 10, Section 12)***

A. Determine fish/water quality value class of all streams in the affected area prior to or during site-specific project planning (also see Riparian Standards and Guidelines).

B. Use the following classification system across the Forest.
   1. **Class I:** Streams and lakes with anadromous or adfluvial fish or fish habitat; or high quality resident fish waters or habitat above fish migration barriers known to provide reasonable enhancement opportunities for anadromous fish.
   2. **Class II:** Streams and lakes with resident fish or fish habitat—generally steep channels 6 to 25 percent or higher gradient—where no anadromous fish occur, and otherwise do not meet Class I criteria.
   3. **Class III**: Perennial and intermittent streams with no fish populations but which have sufficient flow, or transport sufficient sediment and debris, to have an immediate influence

on downstream water quality or fish habitat capability. For streams less than 30 percent gradient special care is needed to determine if resident fish are present.

A stream segment is designated Class III if the following conditions are met **for the majority of its length:** Bankfull stream width greater than 1.5 meters (5 feet) **and** channel incision (or entrenchment) greater than 5 meters (15 feet).

Streams that do not meet both the width and incision criteria may be classified as class III streams based on a professional interpretation of stream characteristics for the stream segment being assessed. The following characteristics **could** indicate a class III stream:

a. Steep side-slopes containing mobile fine sediments, sand deposits, or deep soils that can provide an abundant source area for sedimentation.

b. Very steep gradient channels (greater than 35 percent slope).

c. Recently transported bedload or woody debris wedges (especially if deposited outside high water mark).

d. High water indicators (scour lines, drift lines etc) that greatly exceed observed wetted stream width.

e. Large sediment deposits stored amongst debris that could be readily transported if debris shifts.

4. **Class IV**: Other intermittent, ephemeral, and small perennial channels with insufficient flow or sediment transport capacity to directly influence downstream water quality or fish habitat capability. Class IV streams **do not** meet the criteria used to define Class I, II or III streams. Class IV streams must have bankfull width of at least 0.3 meters (1 foot) over the majority of the stream segment. For perennial streams, with average channel gradients less than 30 percent, special care is needed to determine if resident fish are present (resident fish presence dictates a Class II designation).

5. **Non-streams**: Rills and other watercourses, generally intermittent and less than 1 foot in width, little or no incision into the surrounding hillslope, and with little or no evidence of channel scour (Note: these micro-drainage features are not mapped in GIS hydrography layers).

IV. Objectives/Guidelines for Management Affecting Fish Habitat

A. Maintain or restore the natural range and frequency of aquatic habitat conditions on the Tongass National Forest to sustain the diversity and production of fish and other freshwater organisms.

B. Use (and update) baseline fish habitat objectives as a reference to evaluate the relative health or condition of riparian and aquatic habitat. Use baseline fish habitat objectives, listed below (and others as developed), (AFHA, 1995, Bryant et. al. 2004, Woodsmith et. al. 2005) to characterize the natural range of habitat conditions by channel types and process groups. Specific measurement protocols are described in the Alaska Region Aquatic Management Handbook (FSH 2090.21 – 2001-1)

1. Width-to-depth ratio. Relationship between bankfull width and average bankfull depth, expressed as average bankfull width / average bankfull depth.
2. Large woody debris. Frequency of qualifying large wood pieces per kilometer of stream.
3. Total key pieces of large woody debris. The frequency of large, structurally integral pieces of wood scaled to channel size per kilometer of stream.
4. Pools per Kilometer. Frequency of qualifying pools per kilometer of stream.
5. Pool spacing. Frequency of qualifying pools per unit area of channel, length of channel surveyed / average channel bed width / number of pools.

6. Residual pool depth per channel bed width. Residual pool depth scaled to channel size, residual pool depth / average channel bed-width.
7. Median particle size.
8. Pool length per meter. Total qualifying pool length divided by length of survey.
9. Pool size (relative depth). Average residual pool depth / average bankfull depth.
10. Relative submergence. Expressed as average bankfull depth.

C. Maintain or restore stream banks and stream channel processes.
   1. Stream Class I, and Class II streams that flow directly into Class I streams. Maintain, restore or improve anadromous, adfluvial, and high value resident fish habitat capability by providing natural or improved cover/pool ratio, pool-riffle sequences, and habitat features, such as stable large woody debris. Design management activities to maintain stream bank, channel and flood plain integrity.
   2. Other Stream Class II: Maintain or restore habitat capability for resident fish populations by providing natural or improved cover/pool ratio, pool-riffle sequences, and habitat features, such as stable Large Woody Debris. Design management activities to maintain stream bank, channel, and flood plain integrity. Avoid impacts to downstream Class I streams.
   3. Stream Class III: Design management activities to maintain or restore stream bank, channel, and flood plain integrity. Avoid impacts to downstream Class I and Class II streams.

D. Maintain or restore natural and beneficial quantities of Large Woody Debris (LWD) over the short and long-term.
   1. Stream Class I, and Class II streams that flow directly into Class I streams. Maintain or restore anadromous, adfluvial, and high value resident fish habitat capability by providing for natural and beneficial volumes of LWD for rearing, stream energy dissipation, and sources of organic matter to the stream ecosystem. Use biological and physical characteristics of the stream to determine size classes and distribution of LWD. Limit navigational clearing of large wood to the minimum necessary for safety.
   2. Other Stream Class II: Maintain or restore habitat capability for resident fish populations by providing LWD, and by designing for future sources of LWD at volumes determined by channel type biological and physical characteristics.
   3. Stream Class III: Maintain or restore LWD in channels and banks to prevent changes in natural stream bank and stream channel processes.

E. Maintain or restore water quality to provide for fish production.
   1. *Stream Classes I, II, and III*: Prevent adverse effects to rearing and spawning habitat. Maintain or restore anadromous, adfluvial, and high value resident fish habitat capability. Maintain or restore capability for other resident fish populations to the extent feasible. Assure no chronic sediment input following soil-disturbing activities. Prevent adverse impacts to fish habitat downstream by minimizing siltation.
   2. Implement applicable Best Management Practices. (FHS 2509.22).

F. Maintain or restore optimum water temperatures for salmonids, considering both winter and summer habitat requirements, climate, and natural watershed characteristics.
   1. Stream Class I, and Class II streams that flow directly into Class I streams. Maintain or restore optimum salmonid summer stream temperatures at between 50 and 68°F or at natural levels.
   2. Other Stream Class II: Maintain water temperatures below 68°F, or at natural levels, to maintain or restore habitat capability for resident fish populations. Manage watersheds and riparian streamsides to maintain water temperature standards and guidelines for downstream Class I streams.
   3. Stream Class III: Manage watersheds and riparian streamsides to maintain water temperature standards and guidelines for downstream Class I and II streams.

G. Maintain, restore or improve, where feasible (see glossary), stream conditions that support the migration or other movement of aquatic organisms inhabiting a waterbody.
   1. If a stream crossing cannot be avoided then the best solution for aquatic organism passage is generally to maintain the natural stream form and processes from the inlet, through the crossing, and into the downstream channel. Bridges, open bottom culverts and stream simulated culverts designed and installed to applicable BMPs (Soil and Water

Conservation Handbook , FSH 2509.22) and design standards (Aquatic Habitat Management Handbook, FSH 2090.21) to best meet this objective.

2. Some stream conditions, engineering constraints or cost may make it desirable to install culverts that use a variety of weir/baffles or roughened channel to provide for passage. These hydraulically designed culverts rely on matching culvert hydraulic conditions at a specified design flow to the swimming performance of a specified design fish (Aquatic Habitat Management Handbook, FSH 2090.21).
3. Stream crossing structures requiring aquatic organism passage will be designed to current standards by qualified professionals.
4. Consult applicable Best Management Practices (see FSH 2509.22).
5. Consult and improve the inventory of identified fish stream crossings.
6. As per Memoranda of Understanding between the Forest Service and the Alaska Department of Natural Resources (ADNR, 2004), and the Alaska Department of Environmental Conservation (ADEC, 1992), culvert installation, stream alignment or diversions; dams; low-water crossings; and construction, placement, deposition, or removal of any material or structure below ordinary high water all require State concurrence.
7. Overall, the intent is to not disrupt the migration or movement of aquatic organisms, but occasionally it is not feasible to protect some sections of habitat and movement will be restricted. In determining feasibility consider the following:
   a) Presence of known sensitive, isolated or unique fish populations.
   b) Extent and quality of available habitat and how it is affected by the location of the stream crossing.
   c) The cumulative impacts of restricting fish passage at multiple sites in the same watershed.
   d) The upstream and downstream linkages between the anadromous and resident life strategies of the same species.
   e) Advice from the Alaska Department of Fish and Game and the Alaska Department of Natural Resources.
   f) The length of time that a stream structure will restrict movement.
   g) The cost of providing ideal passage conditions compared to less than ideal conditions.
   h) Availability of suitable, cost effective compensatory mitigation projects.
8. The discharge of dredge or fill material from normal silviculture activities such as timber harvest is exempt from Clean Water Act Section 404 permitting requirements in waters of the United States (404(f)(1)(A). Forest roads qualify for this exemption only if they are constructed and maintained in accordance with BMP's specified in 33CFR 323.4(a). These BMPs have been incorporated into BMP 12.5 in the Alaska Region's BMP Handbook (FSH 2509.22)

V. Management Indicators

A. Use forest plan management indicators to evaluate the potential effects of proposed project management activities affecting fish habitat.

VI. Management Activities

A. Maintain a fish program schedule which includes anticipated inventory needs, proposed habitat improvement and maintenance projects, and monitoring requirements.

VII. Coordination

A. Coordinate activities that affect fish resources with other Forest disciplines through the Interdisciplinary Team process, and with state, other Federal, and local agencies and groups.
   1. Develop and maintain Memoranda of Understanding/Agreements with appropriate state, Federal, and local agencies and aquaculture associations.
   2. Coordinate with the state and federal agencies, and the Pacific Northwest Research Station, to maintain a continuous program for research, monitoring, and assessment of impacts of land-use activities on fish habitat.

B. Consider the influence of proposed management activities on fishing use patterns.

C. Consider effects of Off-Highway Vehicle (OHV) travel and road closures on fish habitat and populations.

VIII. Projects

A. Use the following priority for fish habitat project work: mitigation for unplanned impacts, rehabilitation/restoration, enhancement. For both mitigation and rehabilitation, consider alternatives for cost efficiency of performing off-site enhancement (enhancement of a different area than where the impact actually occurs).
   1. Location of off-site enhancement shall be governed by the following priorities:
      a) First priority: same stream reach (same species)
      b) Second priority: same stream (same species)
      c) Third priority: same watershed (same species)
      d) Fourth priority: same anadromous fish harvest area (same species)
      e) Fifth priority: differing species, using above priority order

B. Enhance fish habitat to meet the objectives identified in this plan. Opportunities may include, but are not limited to: instream enhancement, lake fertilization, cooperative bio-enhancement (e.g., stocking), incubation boxes, and fishway construction.
   1. Use the Cooperative Fisheries Planning process (Consult ANILCA Section 507) and/or other cooperative agreements for developing priorities for the enhancement of fish resources.
   2. Determine habitat capability on streams and lakes identified for enhancement in the Cooperative Fisheries Planning process prior to construction of fish projects.
   3. Update the fish habitat enhancement list (Cooperative Fisheries Planning process) periodically.

C. Recognize bio-enhancement (e.g., stocking of juveniles, use of egg incubation boxes, transferring of adult fish to seed stream systems) as part of the fish improvement project costs when appropriate. Cooperate/coordinate with fish agencies and aquaculture associations to facilitate bio-enhancement.

D. Fishpass projects abide by the standards and best practices for colonization projects included in the Comprehensive Salmon Enhancement Plan for Southeast Alaska, Phase III.

E. Coordinate new projects to enhance the use of National Forest System lands with the recreation program managers.

Fish Habitat Improvement: FISH3

I. Planning

A. Improve or restore fish habitat to work toward the habitat objectives of the Forest Plan.

B. Construct projects using the most cost-efficient methods, while achieving desired results consistent with the Land Use Designation.

C. During project planning consider the need to monitor the accomplishment of project objectives. Need shall be governed by the type of project, with high interest/high investment projects being monitored more intensively.
   1. Where needed, develop cooperative agreements with fish/aquaculture agencies and other groups to assess the effectiveness of Forest Service habitat improvement.

II. Construction Coordination

A. Coordinate all fish habitat improvement using an interdisciplinary process.

B. Coordinate habitat improvement projects with the Alaska Department of Fish and Game and other appropriate agencies and groups.

III. Monitoring

A. Conduct monitoring of fish improvement projects to insure their continued function at the design level of operation.

B. Monitor fish production on a representative sample of improvement projects to evaluate effectiveness of individual projects, categories of similar projects, and the effectiveness of the overall improvement program.

Fish Habitat Maintenance: FISH4

I. Maintenance

A. Provide for the maintenance of fish habitat enhancements.
   1. Fund maintenance of existing projects prior to the construction of new ones.
   2. Include funding for maintenance in the planning and budgeting for all projects.

3. Maintain improvements to assure that investment objectives are met.
4. When maintenance and operation of an improvement become inefficient , reconstruct or remove the improvement.
5. If an improvement becomes inoperable, reconstruct or remove the improvement.

B. Develop a written maintenance responsibilities agreement with project cooperators prior to project construction.

Threatened, Endangered, and Sensitive Fish Species: FISH5

Consult FSM 2670 and R10 supplemental directions for Threatened, Endangered, and Sensitive Species.

I. Threatened or Endangered Species

A. There are currently no Threatened or Endangered fish species on the Tongass National Forest.

II. Sensitive Fish Species

A. Island King Salmon
1. Provide for the protection and maintenance of runs of king salmon that naturally occur on islands including the runs in King Salmon and Wheeler creeks on Admiralty Island.
2. Coordinate with the Alaska Department of Fish and Game and NMFS on commercial, sport and subsistence fish use, hatchery egg take programs, and other activities affecting the viability of king salmon runs in order to conserve these unique populations.
3. Avoid the placement of facilities or issuing permits for activities near these streams that would increase harvest pressure on these king salmon runs.

B. Northern Pike
1. Provide for the protection and maintenance of northern pike found in the Pike Lakes on the Yakutat Forelands. This population of northern pike is unique to Southeast Alaska.
2. Avoid the placement of facilities near the Pike Lakes which would increase harvest pressure to the point where the viability of these species is affected.
3. Coordinate with the Alaska Department of Fish and Game on any activities that would affect the viability of the northern pike.

C. Fish Creek Chum Salmon
1. Provide for the protection and maintenance of chum salmon in Fish Creek near Hyder. This population of chum salmon is characterized by their extraordinary large size.
2. Coordinate with the Alaska Department of Fish and Game and NMFS on commercial, sport and subsistence fish use, hatchery egg take programs, and other activities affecting the viability of the chum salmon runs in Fish Creek in order to preserve these populations.
3. Provide for habitat improvement and maintenance to maintain the viability of this run of salmon, as necessary.

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APPENDIX G
TIMBER DEMAND AND SUPPLY

Appendix G

Timber Demand and Supply

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Appendix G

Timber Demand and Supply on the Tongass National Forest

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December 7, 2007

Summary

Since 1990, when the Tongass Timber Reform Act (P.L. 101-626) required the Tongass National Forest to take economics into account in planning timber sale programs, a number of demand studies have been published by the US Forest Service Pacific Northwest Research Station, assessing derived demand for Alaska wood products. Information from these demand assessments is incorporated into short-term timber sale planning through a supply model, and into long-term planning through the Forest Plan process. This appendix supports text in the Forest Plan amendment EIS, provides additional information about the Brackley et al. (2006a) demand estimates, and outlines how the Brackley et al. demand projections are incorporated into annual timber sale offer target calculations on the Tongass National Forest.

Introduction

Section 101 of the 1990 Tongass Timber Reform Act (TTRA) states that:

> Subject to appropriations, other applicable law, and the requirements of the National Forest Management Act (P.L. 94-588); except as provided in subsection 9d) of this section, the Secretary shall, to the extent consistent with providing for the multiple use and sustained yield of all renewable forest resources, seek to provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from such forest and (2) meets the market demand from such forest for each planning cycle.

The 1997 Record of Decision for the Tongass Land and Resources Management Plan Revision committed the US Forest Service to develop procedures to insure that annual timber sale offerings would be consistent with implementing the “seek to meet market demand” language of the TTRA. Those procedures were completed in 2000, and have become known as the “Morse methodology” after their author. These procedures are based on the premise that:

- Forest products markets are volatile, especially in the short run.
- Timber purchasers in Southeast Alaska have few alternative suppliers of timber if they cannot obtain it from the Tongass National Forest. Oversupplying this market has relatively few adverse economic effects; undersupplying it can have much greater negative economic consequences.
- It takes years to prepare national forest timber for sale, including completion of environmental impact statements.
- It is difficult to estimate demand for timber from the Tongass, even a year or two in advance.
- Industry must be able to respond to rapidly changing market conditions in order to remain competitive.

Accordingly, the Morse methodology establishes a system that seeks to build and maintain sufficient volume of timber under contract (timber purchased but not yet harvested, the primary indicator of timber

inventory available to the industry) to allow the industry to react promptly to market fluctuations. Industry actions such as annual harvest levels are monitored and timber program targets are developed by estimating the amount of timber needed to replace volume harvested from year to year. The Morse methodology is self-correcting, because if harvest levels drop below expectations, future timber sale offerings will also be reduced to levels needed to maintain the target level of volume under contract. Conversely, if harvest levels rise unexpectedly, future timber sale targets will also increase sufficiently to ensure that the inventory of volume under contract is not exhausted. By dealing with uncertainty in a flexible, science-based fashion, the Morse methodology is an example of adaptive management. The Forest Service intended the Morse methodology to be the means by which the agency complies year-by-year with the annual demand portion of the TTRA "seek to meet" requirement. Similarly, the agency intended to comply with the requirement to seek to meet demand "for each planning cycle" through a series of annual applications of the Morse methodology.

The US Forest Service Pacific Northwest Research Station has published several studies conducted in support of Tongass Land Management planning that estimate derived demand for timber in Southeast Alaska, including Brooks and Haynes (1997) and Brackley et al. (2006a). The procedures developed by Morse (2000) to estimate the timber offer target (supply) incorporate the demand numbers from the PNW studies as an input into a spreadsheet. The PNW derived demand projections are trend projections and should be interpreted as five-year averages. The Morse methodology relates these derived demand projections into an annual calculation of timber sale offer levels.

The procedures developed by Morse (2000) to estimate the annual sale offering targets from the Tongass National Forest address the uncertainty associated with forecasting market conditions, considering the continuing transformation of the timber industry and the inability of the Forest Service to respond quickly to market fluctuations due to the time it takes to prepare timber for sale. The basic approach developed is to allow the industry to accumulate an adequate volume under contract (a measure of inventory), then monitor industry behavior and adjust timber program levels to keep pace with the harvest activity. Key economic indicators and stumpage market conditions are monitored. The method underwent rigorous technical and public review before it was implemented. Since the method was initially developed by Morse (2000), inputs to the model have been adjusted to reflect new understandings and information, such as share of raw material provided by the Tongass National Forest to local processors, the amount of time between purchase and harvest of a timber sale, and mill capacity. In this way, the approach has allowed for adaptations to current situations.

Morse (2000) outlined monitoring goals, with some specific criteria for action. An update of the timber demand assessment by Brooks and Haynes (1997) was requested from the US Forest Service Pacific Northwest Research Station, because sales to domestic markets now account for more than 35 percent of lumber products in Southeast Alaska. The PNW Research Station published new demand projections (Brackley et al. 2006a) with some changes in how alternative scenarios were presented and how timber volume was characterized. The new projections contain four scenarios, as opposed to the three in Brooks and Haynes (1997), and the timber volume in the Brackley et al. (2006a) demand projections is demand for decked logs (stacked logs at processing facilities) plus a portion of cedar log shipments out of Alaska.in scenarios 1 and 2. The authors acknowledge that pulpwood grade material may be left in the woods, but they do not include that volume in these two projections. In the case of scenario 3 and 4, the derived demand estimates include pulpwood quality material that is assumed to be left in the woods under scenarios 1 and 2, decked logs at processing facilities, and cedar log shipments out of Alaska. The new projections do not require a change in the basic methodology for timber offer calculations in the procedure outlined in Morse (2000).

During the 1990s, competition with production in other regions and market conditions led to the closure of Southeast Alaska's two pulp mills and numerous closures of sawmill facilities. The twelve remaining active mills operated at about 13 percent of their estimated capacity in 2005. The Tongass National Forest contributed about 65 percent of wood sawn by local mills from 2002 to 2006 (Kilborn et al. 2004; Brackley et al. 2006b; data from mill surveys conducted by Dan Parrent of Juneau Economic Development and on file with the Regional Economist, US Forest Service Alaska Region). Although about one-third of sawn wood has come from State of Alaska lands, State lands comprise a relatively small percentage of Southeast Alaska forest lands, and State lands cannot indefinitely supply such a high

proportion of the needs of remaining Southeast Alaska sawmills. A very small proportion (less than one percent) has come from private lands in the past five years. The primary destination for material sawn in Southeast Alaska is currently other states within the U.S. Brackley and Haynes (in press) conclude that many of the lumber and wood products markets Alaska mils compete in are higher-end markets in which foreign and domestic prices have become fairly similar, through market arbitrage. Haynes at al. (2007) found that since 1994, the value of U.S. forest product exports has been in gradual decline while the value of imports has steadily increased. Hansen (2006) states that U.S. companies have historically jumped into the export market when the domestic market is down, and shifted back to the U.S. market when the domestic market improves. In recent years, the U.S. domestic market has been very attractive with high housing starts and strong prices in many forest product categories. Haynes et al. (2007) state that U.S. demand for forest products is varied and large, averaging 71.4 cubic feet per person per year. This per capita consumption of wood products in the U.S. has been relatively constant for 50 years. Total U.S. forest products consumption is projected to continue to rise. U.S. imports of wood products are projected to rise at a somewhat faster rate than domestic wood supply. U.S. import dependence is projected to reach more than one-quarter of the total of all wood products consumed and exported in the US by 2010. Economic globalization throughout wood products manufacturing is contributing to a global realignment of growth in raw material demands. In addition to this realignment of where manufacturing takes place, sheer population growth will drive increases in wood products demand both in the US and world-wide. Ince et al. (in press) state that countries such as China are emerging in the 21st century as growth leaders in wood raw material and industrial wood product demand.

Brackley and Haynes (in press) examined trade information and literature on Chinese wood products markets, and concluded that one of the most significant events of the 21st century has been the emergence of China and other Asian nations into world markets. Although China and other undeveloped Asian nations will probably have a minor impact on demand for softwood products produced in southeast Alaska in the next 5 years, in the longer term there will be direct and indirect impacts “that will provide markets for any level of production the forest products industry in southeast Alaska may attain” (Brackley and Haynes, in press; 26).

In 2007, the US Forest Service in Alaska approved a new policy under which timber purchasers may ship to the lower 48 states unprocessed certain small-diameter and low-quality logs harvested from the Tongass, up to 50 percent of the volume harvested on each sale. This interstate shipments policy places purchasers of Tongass National Forest timber in a similar position as their counterparts in the Lower 48, where there is no restriction on interstate shipments of timber harvested from National Forest System lands. While it is still early in the implementation of the new policy, full implementation of it over the next year or two could make Alaska forest products producers more competitive with their counterparts in the Lower 48 States. That may allow Alaska producers to increase their share of domestic forest products markets, which would stimulate demand for timber from the Tongass without the construction of new processing facilities in Southeast Alaska. In addition, a new veneer mill has opened in Ketchikan that uses low-grade sawtimber.

On the supply side, the cost of preparing stumpage for sale and delivering it to mills has increased, due to decreased size of sales, increased fuel costs, legal and procedural challenges to federal timber sales, and more constraints on harvest activity in the interest of resource protection. The uncertainty surrounding Tongass National Forest sale quantities has increased the risk faced by potential purchasers and investors in local processing capacity.

Demand Estimation

The method to project timber harvests and output in Alaska followed by Brackley et al. (2006a) is essentially the same as that employed in previous estimates of Alaska timber demand by Haynes and Brooks (1990), Brooks and Haynes (1990), Brooks and Haynes (1994), and Brooks and Haynes (1997). Derived demand is determined by converting demand in all markets, foreign and domestic, to the timber volume that is required to produce the defined products utilized by the market. In the model, ratios are used to assign a portion of the total global demand to producing regions. Brackley et al. (2006a) then estimate the Alaska forest products output, by product, required to meet projected demand, and calculate the raw material requirements necessary to support this production, using explicit product recovery and

conversion factors. The total raw material requirement (the total derived demand for timber) is a combined projection of timber harvest from private ownership, from National Forests, and from non-National Forest public owners. The projected National Forest timber demand is the quantity of timber required to satisfy projected derived demand given harvest by other owners, and given explicit assumptions about markets and implicit assumptions about prices (described below). The study analyzes trends over a historical period of about 40 years (1965 to 2004) as a basis for a projection of 20 years (2005 to 2025) in three key parameters:

1. The level of forest products imports in Pacific Rim nations. According to Brackley and Haynes (in press), the PNW demand studies define the Pacific Rim as the major producing areas of the three contiguous Pacific coast states (California, Oregon, and Washington), British Columbia, Alaska, the Russian Far East, and major consuming regions of Japan, Korea, Taiwan, and China (Haynes and Brooks 1990). Based on other research regarding these markets, the Brackley et al. demand study projects that Pacific Rim imports of sawn wood products will increase over the next 20 years.
2. The share of those markets that will be supplied by North American forest products producers, which the study projects will remain constant.
3. The share of North American exports to the Pacific Rim that will come from Alaska. The analysis examines four alternative assumptions regarding future trends of the Alaskan share of North American exports to the Pacific Rim.

Brackley et al. (2006a) assembled historic data that describe relevant components of the Alaska forest sector and calculated possible future wood needs by using an analysis of trends in factors that influence harvests. They also used assessments of current markets from other analysts. Data from the historic period of 1965 to 2004 were used as a basis for the projection of the future (2005 to 2025), to avoid emphasis on short-term cycles. Trends in consumption (for example, of sawn wood in Japan), and trends in production, represented by shipments (for example, of lumber to all destinations) make up the basic structure of the model. The authors recognized that the US is a net importer of timber. A mill in Alaska has the option to ship products to traditional export markets, emerging new markets, or the lower 48 states. Demand for wood products is global in nature and increasing amounts of wood products are being imported into the United States. The primary determinate of where products will be shipped is price. There are many high-value products (such as large timbers for architectural designed buildings, and shop grades of lumber) that are now being shipped to the lower 48 from Alaska.

The demand model calculates the quantity of National Forest timber needed by mills as a residual necessary to balance the model. In other words, Brackley et al. (2006a) estimated the roundwood equivalent of all material used to produce products from Alaska, and subtracted estimated future volume harvested from other landowners to derive National Forest roundwood needs (the “residual”). The results in Brackley et al. (2006a) reflect decked roundwood volume (stacks of unprocessed logs) at processing facilities.

Stumpage price projections in the PNW demand studies are linked to price series used and projected in the Resource Panning Act assessments (such as Haynes et al. 2007). Stumpage prices in Alaska are estimated as a function of prices in western Washington and Oregon. Alaska markets directly interact with producers and consumers in other US regions through this price relationship. Brackley and Haynes (in press) explain that “market arbitrage is used to understand parity among prices in spatially distinct markets where there is the opportunity for open exchange (trade). Market arbitrage is a powerful force that keeps prices of different species, grades, and locations within some fixed proportion to each other. Abstracting from transportation and transactions costs, for example, prices of one species and grade will not exceed prices for other species of a similar grade in the long run because of possibilities of substitution.” Tying price in Alaska to price in the Pacific Northwest is how market arbitrage is included implicitly in the demand assessment. The mix of products that go into end markets from Alaska are, on average, higher quality and more valuable than the average lumber markets in Washington, Oregon, and British Columbia (Brackley and Haynes in press). The type of lumber products in the demand projections reflects this higher value by the type of markets they compete in. Although price is not explicit in the PNW demand studies, it is reflected through this mix of generally higher value products that go into various end markets, and by the assumption that Alaska price is a function of US price.

Alaska is one of the last places in western North America that produces products from slow-grown large old trees. Old-growth trees and some younger trees in Alaska have special high-quality strength and appearance characteristics. Wood products manufactured in Alaska generally go into high-end markets, such as window casings and door moldings. These markets are arbitraged throughout the Pacific Rim, meaning that prices for these products are similar regardless of what market it goes into—domestic or foreign. Brackley and Haynes (in press) illustrate how Alaska producers have shifted in and out of domestic markets. Brackley et al. (2006a) accounted for this market arbitrage by assuming export products would be synonymous with high-value products that could be sold in domestic or foreign markets based on price.

Brackley et al. (2006a) used information about US exports to Japan, and Japanese import data, as a benchmark for the historic data, as such exports represented, until very recently, the vast majority of sawn wood production from Southeast Alaska. Data about domestic end markets for sawn wood production from Southeast Alaska have been available since about 2000. The information on domestic end markets can be difficult to verify. One major question is how much of the product shipped to the Pacific Northwest is trans-shipped Trans-shipments are products that are shipped to foreign markets from a different customs district than the one in which they were manufactured. In the case of Southeast Alaska, lumber manufactured in Alaska is apparently being shipped to foreign markets from the Seattle customs district, making it difficult to track many of the very recent end markets and subsequent demand for manufactured products from Alaska. Other data used in the Brackley et al. (2006a) analysis includes log sources from all ownerships in Southeast Alaska, log and chip shipments out of Alaska to various destinations from all owners, harvest by owner, the Alaska market share for manufactured products in North America, and the North American market share in Japan.

The assumptions used by Brackley et al. (2006a) in their four scenarios are outlined in Table G-1. The Limited Lumber Production and the Expanded Lumber Production scenarios assume the wood processing industry in Southeast Alaska is focused only on processing of sawlogs. The primary difference between these two scenarios is the assumption that Alaska will increase its market share in the North American export market from 0.39 percent to 1.14 percent in the Expanded Lumber scenario, while the Limited Lumber scenario maintains the same market share for Alaska products (0.39 percent) in the North American market as a whole. The North American market share of the entire Pacific Rim market remains at about 50 percent in all scenarios; what changes is the assumption of how much of that larger market will be comprised of wood products from southeast Alaska. In addition, although the market share of North American in the larger Pacific Rim market remains at about 50 percent, the total amount of wood products consumed in that global market is expected to rise by more than 20 percent by 2025, due to increasing populations throughout the Pacific Rim. This projected total increase in consumption is consistent with expected rates of increase in consumption reported in the RPA (Haynes et al. 2007) projections and considerably lower than the rates reported by the United Nations World Trade Organization and Trends Inc, summarized in Brackley et al. (in press).

Basically, the Limited Lumber scenario assumes the market for sawlogs from Alaska will be relatively low and remain so, as the intent of this scenario was to depict the situation the industry has faced over the last several years. The Expanded Lumber scenario assumes there will be some kind of demand stimulus for sawlog material. Such a demand stimulus could come from an industry marketing program, capital investment to make existing sawmills in Alaska more efficient, a change in policy, or some other event that enhances the competitive position of Alaskan producers relative to their competitors in the continental United States, or a combination of such developments. The recent implementation of a limited shipment policy by the US Forest Service in Alaska, in addition to the start-up of a veneer mill in Ketchikan, makes the Expanded Lumber Scenario the most likely scenario representing southeast Alaska's near future (Brackley and Haynes in press).

The Medium Integrated Industry and High Integrated Industry scenarios build on the Expanded Lumber scenario, and in addition, both assume there will be a demand stimulus for low grade and utility logs, which could come about by the construction of one or more chip and utility log processing facilities in Southeast Alaska. These two scenarios assume an increase in markets for Alaska lumber products, but not to the extent assumed in the first two scenarios. These two integrated industry scenarios also assume varying increases in the Alaska share of the North American export market. The Medium

integrated scenario assumes an increase in demand for chippable material equivalent to the construction of one chip/utility processing facility in 2008, while the High integrated scenario assumes there will be two increases in demand for chippable material, equivalent to the construction of two chip/utility processing facilities, one in 2008 and another in 2012. Development of a market for low-quality material is referred to as an integrated industry, because all of the material resulting from timber harvest would be processed into marketable products. This is displayed as the construction of medium-density fiberboard (MDF) plants, but the authors make it clear that an MDF plant is only one way a use for low-quality material could develop. Shipments of low-grade material to markets outside southeast Alaska could also be the demand stimulus modeled in these two scenarios.

Table G-1
Characteristics of scenarios defining demand for Alaska roundwood (adapted from Brackley et al. 2006a)

Characteristic	Scenario			
	Limited lumber production	Expanded lumber production	Medium integrated industry	High Integrated industry
	Million cubic meters			
Pacific Rim lumber imports:				
Starting	8,077	8,077	8,077	8,077
Ending	11,042	11,042	9,099	10,098
	Million board feet lumber tally			
NA share of Pacific Rim market[a]				
Starting	2,146.7	2,146.7	2,146.7	2,146.7
Ending	2,760.5	2,760.5	2,760.5	2,760.5
	Percent			
AK share NA market				
Starting	0.39	0.39	0.39	0.39
Ending	0.39	1.14	1.60	2.34
NA share of Pacific Rim softwood lumber market	49.29	49.29	49.29	49.29
Estimated low-grade material in sawmill log mix[b]	33	33	10	10
Demand stimulation	no	yes	yes	yes
Market for low-grade logs	no	no	yes	yes

a. NA is North America, and AK is Alaska.
b. Estimating amounts of low grade and utility grade logs delivered to sawmills for use as saw logs meeting the definition of a number 2 saw log at least 12 feet long.

The assumptions and structure used in the Brackley et al. (2006a) model affect the results. An example of a structural aspect is the way total demand is allocated among ownerships. Since the trend analysis model used by Brackley et al. (2006a) calculates National Forest wood demand as a residual (i.e., the share of total demand for Alaska wood products not already accounted for by other ownerships), the model will be sensitive to assumptions about production from other ownerships. They assumed state lands in the region will produce 6.8 mmbf annually. Production from state lands will have an inverse relationship to production from Federal lands, all else assumed constant. If nothing else changes in the model, less production from State lands will mean more demand from Federal lands, and vice versa.

The assumptions in the model also affect the results in various ways. The model assumes that low grade and utility material in the two lumber production scenarios may be unused, sent to chippers, or exported. Changes in their assumptions regarding low grade material utilization may affect the volumes of timber actually removed from timber sales. The model also assumes that in the long run, the volume of sawn material shipped to the total Pacific Rim market (both domestic and foreign) from North American will steadily increase. The proportion stays the same, but the total amounts increase, as the model assumes

the entire market is increasing. In the short run this assumption won't affect the results. Over a decade or more, if this assumption proves incorrect, there will be an effect on projected demand. Given population trends in all Pacific Rim market areas, this assumption of increasing demand is very likely. The model also assumes that demand for Alaska manufactured products is directly linked to demand for North American manufactured products through the share calculation. As the North American share of total Pacific Rim markets increases, so will demand for Alaska products, all else constant. In addition, if the proportion of Alaska products in the entire North American market increases, demand for Alaska products will increase, all else constant. These assumptions change from current levels to the levels outlined in Table G-1 gradually throughout the projection period.

Brackley et al. (2006a) list the following issues that will need further research to assist in better predictions in the future. They mention the issue of transshipments. Local sales of lumber within Southeast Alaska are not documented; information is needed as to types of products, prices, and so on. The price differential between foreign and domestic markets for Alaska wood products needs more investigation. Transportation costs are not documented in publicly available databases. The mix of dimension versus shop products is only beginning to be assessed, and conversion factors for these products in Alaska manufacturing are not well developed.

Using Derived Demand Estimates to Estimate Supply

Determining what the demand estimates mean for timber sale offered from National Forest lands in Southeast Alaska involves taking the results from Brackley et al. (2006a) and using them as input to a supply calculation that seeks to meet annual market demand from the forest. The derived demand projections in Brackley et al. (2006a) are one of the inputs to the timber offer calculation developed by Morse (2000). In the original model development (Morse 2000), the derived demand input was total projected harvest volume from the PNW projections developed by Brooks and Haynes (1997). Timber volume in the Brackley et al. (2006a) demand projections in Scenarios 1 (limited lumber) and 2 (expanded lumber) include decked saw logs, cedar log shipments out of Alaska, chip volumes available from sawmill production, and a very small portion of utility or low-grade material that they assumed goes directly to mill chippers. The authors acknowledge that pulpwood grade material may be left in the woods, but they did not include that volume in these two projections. Scenarios 3 (medium integrated) and 4 (high integrated) include decked saw logs, cedar log shipments out of Alaska, chip volumes available from sawmill production., utility, and low-grade material. This is different than previous projections, which projected demand for Tongass timber as volume of timber in timber sales in the forest, and did not disaggregate by species or log grade. The volume reported in Brackley et al (2006a) needs to be adjusted to represent total sale volume needed to meet derived demand estimates for the Limited Lumber and Expanded Lumber scenarios. Table G-2 illustrates the estimated sale volume represented by Brackley et al. (2006a) in their projections.

Table G-2
Tongass National Forest sale volume necessary to supply derived demand for decked log volume and chips reported in Brackley et al. (2006a) (Million Board Feet).

	Projected National Forest Timber Harvest—Alaska (MMBF; includes sawlog, utility, and shipments from Alaska)[a]			
Year	1. Limited lumber	2. Expanded lumber	3. Medium integrated	4. High integrated
2007	49.8	61.9	67	67
2008	49.8	66.4	139	139
2009	51.3	72.4	151	151
2010	52.8	78.5	166	166
2011	52.8	84.5	184	184
2012	54.3	90.5	204	286
2013	55.8	98.1	204	291
2014	57.3	105.6	204	295
2015	58.9	113.2	204	299
2016	58.9	122.2	204	303
2017	60.4	131.3	204	308
2018	61.9	140.3	204	312
2019	63.4	150.1	204	317
2020	64.9	163.0	204	325
2021	66.4	175.0	204	333
2022	67.9	187.1	204	342
2023	69.4	200.7	204	351
2024	70.9	215.8	204	360
2025	72.4	230.9	204	370

a. Annualized calculation to fulfill derived demand scenarios from Brackley et al. (2006a). This table was created using annualized values provide by Dr. Allen Brackley (personal communication, Nov 29 2006) from the model used to develop derived demand estimates in Brackley et al. (2006a). The values reported in this table have been adjusted to include low quality material not included in the demand projections. The Limited and Expanded Lumber scenarios are adjusted from values provided by Dr. Brackley by 33.73 percent to include utility volume (14.56 percent) and grade 3 volume (19.17 percent). The Limited and Expanded Lumber scenarios include saw logs, cedar export, and chip volumes available from sawmill production. Footnote b in Table 2, page 17, Brackley et al. (2006a) states that material delivered to sawmills meets the definition of a number 2 saw log at least 12 feet long , so these calculations are adjusted to account for utility and grade 3 volume. The Medium and High Integrated Scenarios developed by Brackley et al. (2006a) and presented here include saw logs, cedar exports, chip volumes, low-grade material, and utility. These scenarios are not adjusted.

The volume adjustment of wood delivered to sawmills, as in the Limited Lumber and Expanded Lumber scenarios in Brackley et al (2006a), to volume of wood necessary to be offered in a timber sale requires several steps. First is an assessment of the distribution by species in the Tongass National Forest. The net volume, by percent, of growing stock on timberland in Southeast Alaska of commercial softwood species is as follows:

Alaska yellow cedar = 10.02%
Sitka spruce = 26.71%
Western redcedar = 6.18%
Western and Mountain hemlock = 57.09%

The above percentages were calculated from Table 13 in van Hess (2003).

The next step is to assess what percentage of timber is in each grade by species on the ground. The following distribution is calculated using cruise data from thirteen timber sales distributed across the forest. Grades 2 and 6 are combined because some cruises were done before grade 6 (special mill) was implemented.

Western hemlock grade 3:	33.8%
Western hemlock grade 2/6:	55.8%
Western hemlock grade 1:	6.2%
Western hemlock grade 0:	3.2%
Sitka spruce grade 3:	15.5%
Sitka spruce grade 2/6:	64.7%
Sitka spruce grade 1:	13.2%
Sitka spruce grade 0:	6.4%

Utility grade is not part of cruise data. Recent information indicates that 10 percent of all Sitka spruce is utility, and 20 percent of all hemlock is utility. By combining the information about percent of grade by species, the percent of standing timber by species in an average Southeast Alaska stand, and the fact that 10 percent of all Sitka spruce is utility and 20 percent of all hemlock is utility, the following percent of net volume by grade and species for standing timber on the Tongass National Forest was derived.

The following calculation is an example of how percentages of Sitka spruce and hemlock by grade were calculated. The percentage of Sitka spruce in grade 3 (15.5) multiplied by the percentage of Sitka spruce in an average stand (26.71) yields the percentage of Sitka spruce grade 3 in an average stand (4.14 percent). We know that ten percent of this grade 3 Sitka spruce is utility. So, 0.41 percent of Sitka spruce grade 3 is utility and 3.73 percent of Sitka spruce grade 3 remains (see Table G-3). The utility wood from all the grades for Sitka spruce add up to 2.96 percent (Table 3, any errors are due to rounding).

Table G-3
Percent of volume in an average Tongass National Forest stand, by grade and species.

Species and Grade	Percent of Total Volume
Alaska yellow-cedar	10.02
Western red-cedar	6.18
Sitka spruce grade 3	3.73
Sitka spruce grade 2/6	15.55
Sitka spruce grade 1	3.18
Sitka spruce grade 0	1.54
Sitka spruce utility	2.96
Hemlock grade 3	15.44
Hemlock grade 2/6	25.49
Hemlock grade 1	2.84
Hemlock grade 0	1.47
Hemlock utility	11.60

The amount of utility in an average Southeast Alaska timber stand is 14.56 percent. The amount of grade 3 is 19.17 percent. The total amount of low-grade material is 33.73 percent.

The demand numbers reported by Brackley et al. (2006a) are projections of how much wood will be used to meet derived demand projections. Timber sales take years to process, and can be held for several years by the purchaser in anticipation of future needs. Timber sales must be planned and made available in advance of projected needs. The derived demand projections do not include increased timber sale volume in anticipation of increases in wood processing (such as increasing use of existing infrastructure, or construction of new mills). Such timber would need to be sold in preceding years to provide sufficient wood supply.

Demand is an estimate, and translating that demand to on-the-ground sale numbers is also an estimate. The derived demand projections developed by Brackley et al. (2006a) are used to estimate the market demand for the Forest planning cycle. They are also, as noted above, an important input to the model (Morse 2000) that the Forest Service uses to compute the offer target or supply of timber from the Tongass National Forest in a given year. That procedure will be outlined in the next section.

Development of Timber Sale Requirements to Meet Market Demand

The new demand projections in Brackley et al. (2006a) required that the spreadsheet model outlined in Morse (2000) for estimating timber sale goals be modified slightly to reflect the four alternatives in Brackley et al.(2006a). Modification of the spreadsheet model allows continued implementation of Forest Service Sale Preparation Handbook direction (FSH 2409.18, R-10 Supplement 2409.18-2006-5; Ch. 11.4), which basically states that the procedure outlined in Morse (2000) will be followed in developing short-term offer targets.

The general approach of the timber sale offer model (Morse 2000) is to consider the timber requirements of the region's sawmills at different levels of operation and under different assumptions about market conditions and technical processing capacity. These assumptions provide a basis for estimating the volume of timber likely to be processed by the industry as a whole in any given year. The specific steps in the process are outlined below.

Volume of Timber Processed Locally. The first stage in the calculations adjusts mill capacity estimates by the utilization rate assumed for each of the four scenarios, and by the percent of volume expected to come from the Tongass National Forest. This provides an estimate of the volume of logs from the Tongass National Forest likely to be processed into lumber by sawmills in Southeast Alaska under the different scenarios. These figures are then adjusted upward to account for species and grades of timber that are not processed into lumber locally. Given this set of assumptions, the timber supply expected to be consumed in a given fiscal year is then computed.

Inventory requirements. The second stage provides an estimate of the volume of uncut timber inventory to carry under different demand scenarios. As described on pages 19-20 of Morse (2000), target inventory levels depend on the volume expected to be processed each year and the amount of time needed to replenish inventory. The relationship is summarized in Morse (2000; equation 2, page 20) and by the timber inventory requirements in the model itself. Because the volume of timber expected to be processed varies by scenario, timber inventory requirements also vary from one scenario to another.

Harvest Projections. The next step in the process is to incorporate the derived demand estimates developed by Brackley et al. (2006a), adjusted as shown in Table G-2.

Range of Expected Timber Purchases. By subtracting the volume under contract at the beginning of the year from the required inventory , the projected inventory shortfall is calculated. The low range of expected timber purchases is replacement for the volume harvested; the high range is the volume harvested plus the inventory shortfall so that the inventory requirement is met at the end of the year.

The Fiscal Year (FY) 1999 to 2006 Department of the Interior and Related Agencies Appropriations Acts have included appropriations for preparing additional timber for sale to establish a three-year timber supply. In FY 2006, the Act states that:

> That of the funds provided under this heading for Forest Products, $5,000,000 shall be allocated to the Alaska Region, in addition to its normal allocation for the purposes of preparing additional timber for sale, to establish a 3-year timber supply and such funds may be transferred to other appropriations accounts as necessary to maximize this accomplishment.

While the funding level has been different for each fiscal year, the appropriation for preparation of timber sales in order to establish a three year timber supply has remained constant. The reason for establishing a three-year supply is to give timber manufacturers in Southeast Alaska enough volume to maintain a viable inventory for financial integrity and to respond to market changes at their discretion.

Three-year timber supply. The annual timber supply needs from the Tongass National Forest is considered synonymous with the annual timber consumption (i.e., the amount that is expected to be harvested in a given year). To estimate the three-year timber supply, the annual consumption is multiplied by three years.

Timber Pipeline. The Tongass timber pipeline was established as a process to "ramp-up" to the three-year supply over a period of years. It takes about four years to get a project through the analysis and preparation process, to be ready to offer for sale. The additional average annual volume needed to meet the three-year timber supply in a given fiscal year is the three-year timber supply of timber inventory minus timber inventory requirement , spread evenly over a four-year period.

Total Timber Sale Requirement. By taking the median between the low and high range of the volume expected to be purchased, and combining it with the average annual pipeline volume, the total volume anticipated for purchase is estimated.

The measure of meeting the TTRA "seek to meet" and the appropriations bill "three year timber supply" is volume sold from the Tongass National Forest. To meet these objectives, a sufficient amount of volume must be offered to account for any fall-down between the volume offered and the volume sold. The final step in projecting the amount of volume to be purchased is to evaluate the anticipated volume that needs to be offered.

Timber Sale Fall-down. Historically, there has been a difference between the volume offered and the volume sold from National Forest timber sales. The reluctance of purchasers to buy timber sales tends to increase as markets decrease and/or logging costs increase. Mason et al. (2004) examined why some offerings in Southeast Alaska go unsold, and concluded that the probability of a timber sale being successfully sold is tied to downstream markets that are inherently difficult to predict, rather than factors directly controlled by the Forest Service.

Projected Offer Objectives. In an effort to project the amount of volume that needs to be offered for each of the scenarios, the total timber sale projection is increased to account for fall-down and litigation to provide a rough estimate of the volume to be offered for each scenario to meet timber sale objectives.

Conclusion

There have been many changes in the wood manufacturing industry in southeast Alaska in the past decade. Southeast Alaska's two pulp mills and numerous sawmill facilities have closed. Remaining active mills operate at about 13 percent of their estimated capacity, on average. In 2006, the ratio of species sawn in Southeast Alaska mills was about the same as the past six years, with western hemlock in the lead (60 percent of total volume sawn), followed by Sitka spruce (27 percent), western red-cedar (11 percent), and Alaska yellow-cedar (3 percent). Between 2002 and 2006, sources of logs for local mills have been about two-thirds National Forest and one-third State of Alaska, with a very small proportion (less than one percent) from private lands. The destination for material sawn in Southeast Alaska is now primarily other states within the U.S. (Kilborn et al. 2004; Brackley et al. 2006b). Demand for Southeast Alaska wood products in historic export markets, particularly Asia, continues to be low. Hansen (2006) states that U.S. companies have historically jumped into the export market when the domestic market is down, and shifted back to the U.S. market when the domestic market improves. In recent years, the U.S. domestic market has been very attractive with high housing starts and strong prices in many forest product categories. Haynes et al. (2007) state that U.S. demand for forest products is varied and large.

On the supply side, the cost of preparing stumpage for sale and delivering it to mills is generally higher than in Oregon and Washington, due to transportation and labor costs, decreased size of sales, increased fuel costs, legal and procedural challenges to federal timber sales, and more constraints on harvest activity on Federal lands in the interest of resource protection. The uncertainty surrounding Tongass National Forest sale quantities has increased the risk faced by potential purchasers and investors in local processing capacity.

In choosing the offer level, it is important to anticipate the consequences of a "wrong" decision. In terms of short-term economic consequences, over-supplying the market is less damaging than under-supplying it. If more timber is offered than purchased in a given year, the unsold volume is still available for purchasing off-the-shelf or re-offered at a minimal investment. However, a significant shortfall in the supply of timber available for harvest in a given year can be financially devastating to the industry.

Planning the timber program requires more than just pure economic factors. To account for delays in timber sale preparation, administrative appeals, and/or litigation, sufficient contingent volume must be included in the annual timber sale program to account for realistic fall-downs. Budget and organizational constraints limit the extent to which the Forest Service can respond to economic cycles and the associated fluctuations in timber demand. All of these factors must be considered in evaluating the market demand for timber and setting timber offerings. In the final analysis, planning the timber sale program is an exercise in professional judgment. The purpose of this paper is to identify the extent to which economic analysis contributes to this decision-making process.

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APPENDIX H
COMMENTS AND RESPONSES

Appendix H

Comments and Responses

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Attachment A Letters from Agencies, Elected Officials, and Tribal Governments

Appendix H
Comments and Responses

A. Introduction

The Tongass Land and Resource Management Plan Amendment Draft Environmental Impact Statement (EIS) and the Draft Proposed Land and Resource Management Plan were completed and mailed out (beginning January 4, 2007) to the 2,300 organizations and individuals on the Tongass National Forest's mailing list. The document and supporting documents were also posted on the project web site (http://www.tongass-fpadjust.net).

The Notice of Availability for the Draft EIS was announced in the Federal Register on January 12, 2007, initiating the 90-day formal public comment period. The 90-day comment period was subsequently extended from April 12 to April 30, 2007 because severe weather in Southeast Alaska caused some of the public meetings/hearings to be rescheduled and delayed some of the Forest's Tribal consultation activities.

This appendix presents a summary of the comments received during the public comment period and provides the Forest Service's responses to these comments. In addition, Attachment A provides copies of the letters received from government agencies, elected officials, and tribal governments.

Public Meetings

Twenty-five public meetings were held to elicit public comment over this period. These meetings included 23 meetings in communities located throughout Southeast Alaska, a meeting in Anchorage, and an electronic public meeting held on the internet (Table H-1). These meetings included both open houses and hearings. The open houses were informal meetings where participants could review maps and other information, and ask questions or discuss the Draft EIS or Forest Plan with Forest Service representatives. The hearings were formal opportunities for participants to provide oral testimony on the Draft EIS. A total of 204 people provided oral testimony at these hearings, with several people testifying at more than one hearing.

Public Input

The Forest Service received 84,509 separate pieces of input during the public comment period. These pieces of input, referred to here as "comment documents," were provided in a number of different forms, including email, letter, fax, public testimony, and online comment form (http://www.tongass-fpadjust.net). As part of the initial comment evaluation process, comment documents were initially divided into unique comment documents and form comment documents.

A comment document is considered a form document when copies of the same document (letter, email, comment form, etc.) are submitted by five or more people. Form comment documents are typically generated by special interest organizations that encourage their members to write, and provide a written template for them to use. In some cases members are encouraged to add their own personal message to the template.

Table H-1.
Locations and Dates of the Public Meetings

Community	Location	Date
Anchorage	Loussac Library Assembly Chamber	3/30/2007
Angoon	Community Center	4/13/2007
Coffman Cove	City Hall	2/20/2007
Craig	Craig Community Hall	3/1/2007
Edna Bay	Community Building	3/21/2007
Gustavus	School	3/14/2007
Haines	Borough Chambers	3/6/2007
Hoonah	Ranger District	3/7/2007
Hydaburg	City Hall	2/27/2007
Internet Meeting	http://www.tongass-fpadjust.net/	3/22/2007
Juneau	Centennial Hall	2/27/2007
Kake	Community Hall	3/21/2007
Ketchikan	Discovery Center	3/1/2007
Naukati	School Commons	2/21/2007
Petersburg	City Council Chamber Hall	2/22/2007
Point Baker	Community Building	3/12/2007
Port Protection	Community Building	3/22/2007
Saxman	Saxman Community Center	3/13/2007
Sitka	Sheet'ka Kwaan Naa Kahidi (Community House)	2/22/2007
Skagway	City Chambers	3/5/2007
Tenakee Springs	Community Hall	3/14/2007
Thorne Bay	City Hall	2/22/2007
Whale Pass	Library	2/23/2007
Wrangell	Nolan Center	3/20/2007
Yakutat	High School Auditorium	2/28/2007

Unique Comment Documents

Approximately 2.5 percent (2,102) of the comment documents received were classified as unique comment documents. The vast majority of these unique documents (1,898) were received from addresses in the U.S. Eight unique comment documents were received from Canada, with one apiece from Great Britain, France, Switzerland, and Japan. The remaining 192 unique comment documents were received with no address information.

Alaska residents submitted 620 unique comment documents, including 200 comments submitted as testimony at public hearings. These comment documents accounted for approximately 29 percent of the total unique comment documents received. The next three most frequently represented states were Washington (180 comment documents, 8 percent), Florida (130 comment documents, 5 percent), and Oregon and Pennsylvania (105 comment documents each, 5 percent each).

The total number of unique comment documents received in response to this Draft EIS (2,102) is approximately 70 percent of the number (2,983) submitted during the public comment period for the 2002 Draft Supplemental EIS (SEIS) for Wilderness Recommendations on the Tongass (USDA Forest Service 2003).

Form Comment Documents

The vast majority (approximately 97.5 percent) of the comment documents were form responses. Thirteen different form comment documents were identified, with the number of copies ranging from 5 to 43,216.

Approximately 95 percent of the form comment documents received were from addresses in the U.S. Form comment documents were received from all 50 states. Residents of California accounted for

15,600 (19 percent) of the form comment documents sent from within the U.S. The next three most frequently represented states were New York (6,220 comment documents, 8 percent of U.S. form comment documents), Florida (4,330 comment documents, 5 percent), and Illinois (3,430 comment documents, 4 percent). Alaska residents submitted 350 form comment documents, less than 0.5 percent of the total received from U.S. residents.

Form comment documents were also received from 89 other countries. Approximately 15 percent of the form comment documents from other countries were from Canada (600 comment documents). The next three most frequently represented countries were Great Britain (540 comment documents, 13 percent of non-U.S. form comment documents), Australia (280 comment documents, 7 percent), and France (120, 3 percent). In addition, 1,130 form comment documents were submitted without any address information.

The large number of documents and locations involved reflects the importance of the Tongass National Forest at a national and international level. It also reflects the membership and geographic reach of the organizations that prepared the original written templates, as suggested by the concentration of form comment documents from addresses in California and New York.

The total number of form comment documents received in response to this Draft EIS (82,407) is less than half the number of form comment documents (174,000) submitted during the public comment period for the 2002 Draft SEIS (USDA Forest Service 2003).

Comment Document Evaluation

Public comments were submitted to the Forest Service via online comment form, email, U.S. Mail, as testimony at a public hearing (in-person or online), and via hard copy comment form. Approximately 97.5 percent of the total comment documents (82,400) were sent via email. This percentage was higher for the form comment documents with 99.3 percent sent via email. Email accounted for 29 percent (about 600 messages) of the unique comment documents. More than half (59 percent, 1,220 letters) of the unique comment documents were sent via U.S. Mail.

Each comment document was assigned a unique identifier (number) upon receipt and entered into a database. Documents were numbered in the order received by the comment management team. Summary demographic information for each response was entered into a database, including the name and address of the comment author (when provided), the type of comment author (individual, government agency, environmental organization, etc.), and the method of transmittal (online comment form, email, U.S. Mail, public hearing testimony, hard copy comment form).

Members of the comment management team read each comment document and identified the comments within each document. Comments were identified for one copy of each form comment document. Comments were defined for the purposes of this initial identification phase as a coherent segment of text that stood alone as a suggestion, idea, request, or critique. Comments were delineated on a hard copy of the comment document and each comment was assigned a number. The comment number was entered into a database and assigned to a coding category. Up to three key words or terms that further characterized the comment, along with additional notes, were entered in separate fields in the database, as appropriate. The initial coding categories corresponded for the most part with the resource areas addressed in the Draft EIS. A copy of each coded comment document was scanned and saved as a unique PDF file.

Comment Summaries and Responses

The database allowed the comments to be sorted by coding category and key words. Resource specialists and Forest Service managers reviewed all the comments and consolidated the individual comments into logical comment summaries, developed responses to the comment summary, and revised the analysis or text in the Final EIS, as appropriate. The comment summaries and responses are presented in Section B of this appendix. Some comment summaries represent a concern raised once; others represent a concern, opinion, or preference that was repeated in a number of different comments. This is generally indicated at the beginning of each comment summary.

Appendix H

The comment identification process erred on the side of inclusion and more than 5,500 individual comments were identified and coded. Many of the identified comments consisted of statements of opinion or preference, and did not require a factual response. Comment summaries and responses are, however, presented in Section B for a number of these types of comments, primarily to provide information to the public or clarify popular misconceptions.

In accordance with 40 Code of Federal Regulations (CFR) 1503.4, the Forest Service generally considered responding in five basic ways to the substantive public comments identified in the following sections.

1. Modifying alternatives.
2. Developing and analyzing alternatives not given serious consideration in the Draft EIS.
3. Supplementing, improving, or modifying the analysis that the Draft EIS documented.
4. Making factual corrections.
5. Explaining why the comments do not need further Forest Service response.

Review of the public comments resulted in Alternative 1 being modified between the Draft and Final EIS with all Inventoried Roadless Areas being removed from the suitable land base under this alternative. After substantial consideration, it was decided that the range of alternatives was sufficient and captured the effects of all possible new alternatives. The results of the public involvement and comment process did, however, lead to a number of improvements, clarifications, and updates between the Draft and Final EIS. These changes are identified where applicable in the following section (Section B).

The following section presents the comments and responses developed by the resource specialists and Forest Service managers that comprise the Interdisciplinary Team for this project. Copies of the comment documents received during the public comment period from government agencies, elected officials, and tribal governments are presented in Attachment A. All of the responses received are available for review in the project planning record.

B. Comment Summaries and Responses

This section of the Appendix presents a summary of all of the substantive comments, written or oral, received during the public comment period for the Draft EIS and provides Forest Service responses to these comments. The comments and responses are organized and presented in the following categories:

General Comments

- Alternatives
- Cumulative Effects
- Energy
- Forest Plan – General
- Forest Plan Monitoring and Adaptive Management
- General
- Key Issues
- Multiple Use
- Public Involvement
- Restoration
- Schedule
- Standards and Guidelines
- Tribal Consultation

Resource and Issue Comments

- Climate and Air
- Economic and Social Environment
- Fish and Watersheds
- Geology, Soils, Karst and Caves
- Heritage and Sacred Sites
- Lands
- Minerals
- Recreation, Tourism and Scenery
- Roadless Areas and Wilderness
- Subsistence
- Timber
- Transportation and Utilities
- Wetlands
- Wildlife, Biodiversity and Plants

Specific Geographic Area Comments

- Specific Geographic Area Comments and Responses
- Specific Places Identified for Protection

General Comments

The General Comments section is divided into the following subsections:

- Alternatives
- Cumulative Effects
- Energy
- Forest Plan – General
- Forest Plan Monitoring and Adaptive Management
- General
- Key Issues
- Multiple Use
- Public Involvement
- Restoration
- Schedule
- Standards and Guidelines
- Tribal Consultation

Alternatives

Comment: Many comments expressed support or opposition for one or more of the seven alternatives. Support for Alternative 1 which would provide the lowest level of timber harvest and the highest level of roadless area protection was most prevalent. At the other end of the spectrum many respondents expressed support for Alternative 7, which provided the highest level of timber output and would support a fully integrated timber industry.

Response: The seven alternatives evaluated in the Final EIS present a range of reasonable alternatives developed in response to the three significant issues identified for this project. Clearly, people disagree on what the appropriate mix of timber harvest and roadless area protection should be on the Tongass. They also disagree about the risk the different alternatives pose to wildlife viability and other potentially affected resources.

Comment: Some respondents felt that the range of alternatives was inadequate. Some believed that Alternative 1 had too much old growth logging and road building, or that no old-growth should be cut. Others felt that Alternative 7 might not provide an adequate amount of timber to sustain an integrated timber industry in Southeast Alaska and should be modified to eliminate old-growth reserves (OGRs), roadless area protections, beach buffers, and Class III stream riparian buffers. Some respondents were opposed to any timber harvest, while others commented that too much land is being left undeveloped and at least 1.5 million acres were needed for timber production and pointed out that this would still leave over three-quarters of the old-growth forest undeveloped.

Response: Alternative 1 was modified between the Draft and Final EIS to reduce the amount of logging and road building. All Inventoried Roadless Areas were removed from the suitable land base, as were a number of areas of concern, such as Kuiu Island. The Forest has an obligation under the Tongass Timber Reform Act (TTRA) to seek to meet the demand for timber. Alternative 7 has an adequate land base to exceed the highest levels of potential future timber demand as identified by McDowell Group 2004 and Brackley et al. 2006. Alternative 7 does not include OGRs or 1,000-foot beach buffers. Alternative 7 (as modified in the Final EIS) does not include OGRs, 1,000-foot beach buffers, or buffers on Class III streams.

Comment: A number of comments stated that the analysis was too narrowly focused on timber demand resulting in an inadequate range of alternatives. These respondents felt that the Draft EIS should have examined alternate desired conditions for the Forest and a new array of goals and objectives. Other items such as designation of new wilderness areas, road management options, the growth in recreation demand, and other OGR options were cited as examples of topics that should have been considered in more detail. Some felt that a full revision of the Forest Plan was necessary.

Response: This analysis effort is being conducted in response to the August 2005 Ninth Circuit Court of Appeals Court Decision which directed the Forest to take a second look at timber demand, the alternatives considered in response to timber demand, and cumulative effects. To respond to the Court in a timely manner, the decision was made to limit the scope of the analysis and amend the Forest Plan. The suggested topics were covered in the 1997 Plan Revision that this Amendment brings to completion. Chapter 1 of the Final EIS explains the Purpose and Need for the analysis and describes the history of forest planning on the Tongass. Forest planning is a dynamic process with periodic reviews occurring to assess the need for additional changes.

Comment - Concern was expressed that an alternative that maximized timber harvest within the roaded land base was not developed.

Response: Alternative 1 was modified for the Final EIS to remove all Inventoried Roadless Areas from the suitable land base. The timber output level associated with Alternative 1 is intended to represent the level of timber harvest that has occurred over the last several years. While it is true that more timber might be harvested from this land base, it is unclear if it would truly be sustainable. As the land base decreases, standards and guidelines that coincide and other spatial issues become more problematic. While some feel that more intensive management on a smaller land base is appropriate, others have concerns about issues such as wildlife habitat connectivity and water quality. Some analysis has been done regarding the maximum amount of timber that could be harvested from the roaded land base, but a separate alternative was not analyzed in detail.

Comment: Concern was expressed that a preferred alternative was not identified in the Draft EIS.

Response: As noted in the cover letter that accompanied the Draft EIS, the Forest Supervisor for the Tongass National Forest, chose not to identify a preferred alternative for the Draft EIS because he hoped that public input in response to the Draft EIS would help the forest make a more informed decision. The Forest Service wanted to get comments regarding the merits of all the alternatives and ideas about possible combinations of alternatives that would be acceptable. The Forest Supervisor and other members of the planning team felt that identifying one of the alternatives as the preferred in the Draft EIS could be counterproductive and might lead to polarization rather than a collaborative discussion.

Comment: Some felt they could only support an alternative that gave great emphasis to conserving the forest for future generations rather than highly weighting immediate extractive use of the forest.

Response: All the alternatives in the Final EIS are judged to be sustainable and conserve the forest for future generations.

Cumulative Effects

Comment: Several comments urged that the cumulative effects of past logging, particularly on private lands, be taken into account when considering future timber harvest.

Response: Cumulative effects were one of the deficiencies of the 1997 Final EIS identified in the August 2005 decision issued by the U.S. Court of Appeals for the Ninth Circuit. As noted in the cover letter that accompanied the Draft EIS, considerable work was completed for this analysis to acquire information on past timber activities conducted on lands managed by the State of Alaska and Alaska Native Corporations. This information is included in the cumulative effects discussions presented by potentially affected resource in the EIS and supplements the extensive cumulative effects analysis that was completed for the 1997 planning effort.

Energy

Comment: One comment noted that as fuel and other energy costs continue to increase there will be increased interest in wood products and hydroelectric projects on the Tongass. These things, the comment noted, will help reduce the region's dependence on fossil fuels. Another comment expressed support for using wood waste and low value material as fuel and cited the current project in Craig as an example that should be identified in the Final EIS.

Response: Biofuel and hydroelectric projects do have the potential to reduce fossil fuel consumption, as noted in the Final EIS. The wood burning boiler installed by the community of Craig to heat school buildings and a recreation facility is identified in the *Economic and Social Environment* section of the EIS as an example of one of several developments that hold future promise for the timber industry in Southeast Alaska. As noted in the EIS, several other communities have also shown interest in this type of system

Comment: Several comments stated that the site for the airport identified in the Kootznoowoo Wilderness should be on the EIS maps. These maps should also show prospective hydroelectric, wind, tidal, and geothermal energy sites, as well as native allotments.

Response: This Plan Amendment responds to a narrow set of issues defined by the Ninth Circuit Court and to some additional issues identified in the 5-year Plan Review. These maps are not intended to illustrate all aspects of Forest resources. However, the Angoon Hydroelectric Project will be included in the Transportation and Utility Systems LUD on the Forest Plan map.

Forest Plan - General

Comment: Some comments stated that the Tongass National Forest should be divided into sections or different units for various reasons and each area should be managed separately, taking into consideration the uniqueness of each area or applicable laws.

Response: The Land Use Designations (LUDs) identified in the current and proposed Forest Plans consider the uniqueness of areas and allow for the tailoring of management direction to match the characteristics of each area. The LUDs take into account all applicable laws and regulations, including TTRA, the Alaska National Interest Land Conservation Act (ANILCA), and Wilderness designations by Congress.

Comment: One respondent felt the Forest Plan should be specific to each separate island or appropriate island-groupings, with unique management plans and separate standards and guidelines applied to each island or island-grouping.

Response: Forest planning takes place at two levels: 1) programmatic planning, as found at the Forest Plan level, and 2) project-specific planning that addresses particular site-specific projects, such as proposed timber sales or recreation developments. Intermediate planning as proposed in this comment is beyond the scope of this analysis. The Forest Service normally evaluates specific projects at the landscape assessment or site-specific level during Forest Plan implementation. Nothing precludes the Forest Service from applying adaptive management techniques based on appropriate analysis whether at the smaller landscape or project level, or at the level represented by the Forest Plan**.**

Comment: Concern was expressed that the Experimental Forest LUD should not be classified as a Development LUD but instead should be in the Natural Setting LUD group because of the restrictions to development.

Response: Development and Natural Setting are broad categories that are useful for comparing LUD designations in alternatives. The Experimental Forest LUD may be a good example of one that is somewhere in between these two categories.

Comment: Some respondents felt that a separate LUD was needed for customary and traditional uses. Others asked for an economic zone around certain native communities so that their needs would be recognized and have highest priority in those areas.

Response: Traditional and subsistence uses are widespread and often compatible with other uses and, as a result, the current and proposed Forest Plans emphasize the importance of these uses across the Forest on most lands rather than identify certain zones. Maps of community use areas were considered in alternative development and determination of effects (see the *Subregional Overview and Communities* section of the EIS).

Forest Plan Monitoring and Adaptive Management

Comment: Numerous comments were received regarding the use of adaptive management. Most generally accepted or supported adaptive management but advised caution with respect to the potential for misuse. Others expressed concern over the use of adaptive management and assumed that the application of adaptive management techniques would mean less protective measures for a particular resource. Concern was also expressed that there needed to be a monitoring program in place with adequate funding.

Response: Site-specific projects or activities that implement adaptive management are typically applied and reviewed at the project level, though some may be applied Forest-wide. The Forest Plan monitoring program considers adaptive management.

Comment: One comment noted that the information needs for the Conservation Strategy identified in Appendix B to the 1997 Forest Plan were presented as a static list of studies that were priorities in 1997 with no mechanism that allowed this list to evolve over time. The comment noted that funding for research and monitoring is limited and stated that Appendix B to the amended Forest Plan needs to incorporate a "dynamic, well-defined process to identify and prioritize information needs, and compare results against original hypotheses."

Response: Appendix B of the Final Proposed Forest Plan has been updated to better reflect the ongoing nature of pursuing new information and the fact that many agencies, academics, and others are involved in this process. The appendix also acknowledges that coordination between different agencies and researchers is important.

Comment: Many general comments on Forest Plan monitoring were received. Identified concerns included issues related to adaptive management, evaluation needs and working with cooperative agencies. Some comments were concerned about the overall ability of the Forest to fund adequate and appropriate monitoring.

Response: The Monitoring plan for the Final Proposed Forest Plan was extensively edited from the Draft EIS. These changes reflect these issues in light of declining budgets while maintaining a robust monitoring plan that is adaptable and serves the needs of the Forest Plan.

General

Comment: One respondent felt that the Draft EIS failed to adequately scope and analyze the effects of emergencies and natural disasters.

Response: The potential effects of emergencies and natural disasters are beyond the scope of this analysis. It may, however, be noted that the Forest Service has emergency procedures in place to deal with these types of events. These measures include coordination with other state and federal agencies.

Comment: Some respondents felt that the Forest Plan objectives were becoming more general and vague. They suggested that the objectives be rewritten as narrowly defined, precise, and measurable statements. One respondent was particularly concerned about the removal of specific trail construction targets, which are expressed in miles of new trail in the existing Forest Plan.

Response: Some of the objectives were edited for clarity in the Proposed Forest Plan. In the past, objectives were often expressed as targets in discrete, measurable units, such as numbers of acres, structures, or miles. This often resulted in a disconnection between the broader goals the Forest Plan is intended to accomplish and these counts of acres, structures, or miles. These types of objectives also failed to take into account changes in budget from year-to-year.

Comment: Concern was expressed that changes to Research Natural Areas and Experimental Forests might preclude the State from exercising its wildlife management responsibilities. In particular concern was expressed about the required approval of routine activities by the Director of the Forest Service's Pacific Northwest (PNW) Research Station. Reference was made to various Memorandums of Understanding (MOUs) that recognize the State's responsibilities for wildlife management.

Response: The Forest Service recognizes the State's responsibilities for wildlife management. Coordination will be needed between the State, the PNW Research Station, and the affected Ranger Districts to ensure that each can fulfill its responsibilities.

Comment: One respondent wanted the Forest Plan to recognize that commercial ventures for raising forest products are a legitimate and authorized use of the National Forest. They also wanted the Plan to allow for production of traditional and customary food stocks in commercial quantity in wilderness areas.

Response: Commercial ventures such as this can be considered on a case-by-case basis. There are too many variables related to the type of venture and the location to make such a broad statement in the Forest Plan. In general, we do not feel that commercial ventures such as this are appropriate in designated Wilderness though such proposals could be examined through the special use permitting process.

Comment: One comment recommended that the Forest Service prohibit all pesticide use on the Tongass. Another comment expressed opposition to "area pesticide spraying" and stated that herbicide spraying should "not be used in case of human health emergencies." Another comment expressed a general concern about herbicide use.

Response: The Forest Service acknowledges the concerns expressed regarding pesticide use, but we are not willing to ban all use on the Tongass. Pesticide use is a tool that needs to be carefully evaluated on a case-by-case basis with the appropriate site-specific analysis, including public comment.

The Tongass does not use herbicide for Forest management. Although it is possible that it may be needed to control invasive species in the future, there are no plans currently to do so. Any plans for herbicide use would require a separate National Environmental Policy Act (NEPA) analysis.

Comment: A number of comments stated that the Draft EIS was flawed and recommended that a revised or Supplemental Draft EIS be issued. Various reasons were cited including the Forest Service's failure to conduct an Analysis of the Management System (AMS), complete the Conservation Strategy Review process initiated in 2006, disclose and respond to scientific opinion that opposed the proposed action, fully disclose when uncertainty exists, and include important information in the Draft EIS.

Response: Resource-specific and procedure-related concerns are addressed in detail elsewhere in this comment response volume. Specific concerns about the conservation strategy are, for example, addressed under Wildlife and Biodiversity. Detailed critiques of the timber demand projections developed for this Amendment process are disclosed and addressed under Timber Demand in the Economic and Social Environment section. The AMS is addressed in response to the following comment summary.

The Forest Service believes that the Draft EIS fully disclosed and responded to conflicting scientific opinion and identified areas where there is known uncertainty beyond that typically associated with all types of scientific impact analysis. These discussions have been expanded in the Final EIS, where appropriate, and this comment response volume discloses and responds in detail to the opposing scientific and other opinions provided by individuals, organizations, and others in response to the Draft EIS and Proposed Forest Plan.

In addition, we believe that the Draft EIS adequately informed the public about the alternatives considered and the potential effects so that informed comments could be received. The comprehensive Forest Plan Adjustment website established for this project (www.tongass-fpadjust.net) made information available to interested parties as the analysis progressed and provided the opportunity for the public to provide feedback and input throughout the process.

Comment: Some respondents felt that the Forest Plan Amendment process was flawed because no new AMS was prepared. One comment stated that the "primary goal of the AMS is to analyze Forest resource supply and demand and determine whether current management direction should change in response to these conditions." The comment argued that an AMS is necessary to determine which lands are suitable for timber production, considering whether the land has been withdrawn by Congress or administratively, can be reforested within 5 years, and if irreversible resource damage would occur if timber is harvested.

Response: The Forest completed the various steps in an AMS and an updated AMS is in the project planning record. The suitability determination was the most complete analysis done anywhere to our knowledge. Building on past efforts, including the recent SEIS (USDA Forest Service 2003) which completed an AMS for all roadless and wilderness areas, we used GIS data to map all areas withdrawn by Congress or administratively. We then mapped unstable areas, sensitive riparian areas, and areas with soil concerns and removed these areas from the suitable land base. Each remaining area of productive forest land was subsequently divided into logical logging settings and individually evaluated

using existing NEPA analyses, aerial photographs, LiDAR, LANDSAT, GIS data, and local knowledge. Those areas that appeared to have problems were flagged and risk factors were assigned based on the problems that were identified. Areas considered unsuitable were identified. Logging engineers then identified individual logging settings and the type of yarding methods and road access that would be needed to log each unit. They also identified the silvicultural system that would be most likely to be used. This process took several months and resulted in the best estimate of timber supply we have ever had, both for total supply and for that portion of the total supply that will likely be economical to harvest. The demand for Tongass timber was identified in the timber demand analysis prepared by the PNW Research Station (Brackley et al. 2006a).

Comment: A number of comments stated that the Forest Service should use the "best available science" or "sound science" in the EIS analysis. A number of these statements were made with respect to the existing Conservation Strategy Standards and Guidelines, which some argued are not based on sound science. Others stated that the Final EIS should fully incorporate the findings of the 2006 Conservation Strategy Review. Others made general statements that some of the impact analyses presented in the Draft EIS were not based on scientific analysis, but were just speculation or opinions.

Response: Specific concerns about the scientific basis of particular analyses or components of the Forest Plan are addressed in detail elsewhere in this comment response volume. Specific concerns about the existing Conservation Strategy Standards and Guidelines are, for example, addressed under Timber. Concerns about the Conservation Strategy Review are addressed under Wildlife and Biodiversity.

It is not possible to provide a specific response to general assertions that the Draft EIS analysis is speculative or just opinions, but, in general, the Forest Service believes that the Draft EIS employs the best available science, to the extent possible. The Draft EIS was reviewed by scientists at the PNW Research Station and additional analysis, information, and citations were added to the Final EIS based on the results of this review and comments from the public and other agencies.

Comment: One respondent felt that using total development LUD acres in alternative descriptions and effects analyses overstates potential impacts as only a small percentage of the development LUDs would be developed or otherwise impacted.

Response: The distribution of the Forest by LUD group (Intensive Development, Moderate Development, Natural Setting, and Wilderness) provides a general basis for comparison between different alternatives. Other information, such as suitable acres, provides another basis of comparison about the relative impacts of each alternative.

Comment: Many respondents were opposed to road construction, which was often mentioned in connection with clearcutting. Road-related concerns often centered around impacts to wildlife habitat and reductions in roadless character.

Response: The alternatives feature a wide range of road construction levels and potential effects to roadless areas. Alternative 1 was modified for the Final EIS to greatly reduce the road construction miles and eliminate effects to Inventoried Roadless Areas. However, even in this alternative some road construction is needed to access lands suitable for timber harvest.

Comment: Several comments urged that the Tongass Plan Implementation Team papers be reviewed and incorporated in the Final EIS, as necessary.

Response: These papers have been reviewed and incorporated in the Final EIS, as appropriate.

Comment: Some respondents expressed interest in greater protection of the coastline and coastal valleys then occurred in the past.

Response: The 1997 Forest Plan added extensive protection measures such as the adoption of 1,000-foot beach and estuary buffers. All alternatives, with the exceptions of Alternative 7, retain these important features. Alternative 7 has a 1,000-foot estuary buffer and a 500-foot beach buffer.

Comment: One comment expressed concern that the Draft EIS said the 5-Year Forest Plan Review was part of the purpose and need for the Amendment despite the fact that the Forest Supervisor concluded at the end of the 5-Year Review that the plan did not need to be revised at that time.

Response: The 5-year review pointed out many areas that needed updating but that overall there was no reason to begin a full scale revision of the Forest Plan. With the need to respond to the Court order of August 2005, it seemed like an excellent opportunity to address some of those items from the 5-year review at the same time we responded to the Court.

Comment: One comment noted that a reduction in timber harvest in temperate zones results in the transfer of the needed harvest to tropical areas.

Response: It seems reasonable to assume that demand for timber will be met and, provided demand remains constant or increases, a reduction in harvest in one area will likely lead to an increase in harvest somewhere else. The Forest Service is required to seek to provide a supply of timber from the Tongass that meets market demand. The Proposed Forest Plan alternatives address a range of potential demand estimates. None of the proposed alternatives are expected to result in a transfer of harvest that would otherwise occur on the Tongass to other regions of the world.

Comment: One comment requested that the Final EIS explain the relationship between the Amendment and previous planning documents. Concern was also expressed about the statement on page 2-8 of the Draft EIS that: "The individual alternative descriptions on the following pages only identify items that are not consistent with the current Forest Plan or Proposed Forest Plan." Several respondents found this confusing and were concerned that this would result in information not being fully disclosed.

Response: The Final EIS and Record of Decision (ROD) will clarify this relationship. In summary, the amended Forest Plan and ROD will be stand alone documents giving management direction for the Tongass. Previous analyzes, such as the 1997 Final EIS, are tiered to and will continue to be used at the project level.

The alternative descriptions presented in Chapter 2 of the EIS focus on the main changes from the current Forest Plan to the Proposed Forest Plan, as noted in the above quote. The entire Proposed Forest Plan, which includes all the unchanged elements of the current Forest Plan, as well as the proposed changes, was published with the Draft EIS. A revised version of the Proposed Forest Plan has also been published with the Final EIS.

Comment: One respondent felt that the Draft EIS should discuss in more detail the laws related to the management of the Tongass and other national forests. They stated that "these statutes and their current applicability should be more clearly referenced in the (Forest Plan) and the Draft EIS."

Response: The Draft and Final EIS documents discuss and reference the laws that are most directly applicable to this Forest Plan Amendment. These laws include TTRA, the National Forest Management Act, and ANILCA. There are, however, many other laws that have a direct bearing on the management of national forests, as well as implementing regulations and court decisions interpreting these laws. These laws, regulations, and court decisions are not specifically discussed in the EIS, but additional general information is available on the Forest Service's web site (www.fs.fed.us).

Key Issues

Comment: There were several comments regarding the three key issues. Some thought that issues one and three were very much the same. Other comments identified additional issues that the comment authors thought should be identified as separate key issues. Subsistence, salmon conservation, and the social and economic well-being of Southeast Alaska communities were proposed as other key issues.

Response: Key issue one emphasizes the protection of high value roadless areas from development. Key issue three emphasizes the protection of wildlife habitat and biodiversity. While the two issues are certainly linked, they are two different issues. The key issues for the EIS were developed based on a review of the public input received prior to publication of the Draft EIS and are directly related to the purpose and need for the Forest Plan Amendment process. This issue identification process is discussed in the *Public Issues* section of Chapter 1 of the EIS. The other resources and resource uses identified in the above comment summary are also important aspects of the Forest Plan and are addressed in the proposed Forest Plan and the EIS, as appropriate.

Comment: One comment stated that Allowable Sale Quantity (ASQ) was not an indicator of a viable economy. They felt that Southeast Alaska could have a viable economy without timber harvest.

Response: The ASQ is not used in the EIS as an indicator of a viable economy. Rather it is a measure of the maximum potential harvest that could be achieved under each alternative. Definitions of viable vary, but based on recent trends it appears that population and employment in Southeast Alaska has declined slightly and stayed relatively the same, respectively, despite relatively large declines in timber harvest over the past decade and more. Other indicators suggest that some communities have been more negatively affected by this decrease than others (see the *Subregional Overview and Communities* section in the EIS).

Comment: One comment requested that the description of Key Issue 2 be revised as follows (underlined words to be added):

> **The Tongass National Forest needs to provide a sufficient <u>economic</u> timber supply to meet market demand and help maintain a vibrant, <u>diverse</u> economy"**

The comment defined "economic" timber as timber that a purchaser can harvest at a profit.

Response: The description of Key Issue 2 presented in the Draft EIS summarizes the issue adequately and remains unchanged in the Final EIS. Timber demand and concerns regarding timber supply are discussed in more detail under Timber Demand in the Economic and Social Environment section of this appendix.

Multiple Use

Comment: Many respondents talked about the importance of multiple use in guiding future management of the Tongass. A balanced approach to managing the Tongass was a common theme. But there were two distinct perspectives. Some felt that the multiple use concept supports the idea of a large timber industry and higher levels of timber harvest. They often mentioned the relatively small area of the Tongass open to timber harvest and stated that these lands should be managed intensively. Other comments discussed the idea of multiple use in the context of the various other uses found on the Tongass. They felt that timber harvest was emphasized too much and, when done at a large scale, was not compatible with other uses.

Response: Each alternative in the Final EIS represents the concept of multiple use by incorporating the full spectrum of land uses, from designated wilderness to lands emphasizing timber management or mineral extraction. Each alternative balances these uses differently and the range of alternatives covers the various points of view expressed in the comments.

Comment: One comment argued that the "multiple use" concept is: "a fancy way of (bypassing) the trust responsibility of protecting the habitat" and characterized this concept as a "popular political maneuver to try to please everyone a little, and still damage the habitat by allowing tree cutting so roads can be built without taxpayer expense."

Response: Multiple use is required by law (the Multiple Use-Sustained Yield Act of 1960). Changing this policy would require an act of Congress and is beyond the scope of this analysis. The Forest Service disagrees with this characterization of the application of the multiple use process.

Comment: Some felt that this Forest Plan Amendment should not decrease the land area open to commercial uses such as logging and mining. A number of comments cited ANILCA as indicating that no more restrictions would be put into place.

Response: The Final EIS looks at a wide range of alternatives built around the issue of timber harvesting. Three alternatives feature a reduced land base available for logging, two alternatives would increase the lands available, and the remaining two would maintain the current land base. No major changes to mining opportunities are proposed.

Public Involvement

Comment: Some respondents had suggestions for how the public meetings on the Draft EIS could have been conducted differently. For example, one person suggested that a question and answer session be held between the open house and the public hearing.

Response: There are many different ways to conduct a public meeting. The people that attend our meetings often have very different objectives for being there. Some are interested in listening to presentations and learning about the issues and planning process. Others want to ask questions about issues or places of concern to them. Others have formed their opinion and want nothing more than to have a forum to express it. We believe that our meetings, which featured an open house followed by a public hearing, made efficient use of the available time and offered a format that met most peoples' needs.

Comment: Some respondents requested that the Forest Service have public meetings in more small communities. Elfin Cove was one particular community mentioned.

Response: The Forest Service held public meetings in 24 Alaska communities during the comment period for the Draft EIS. We also held an internet public meeting and hearing open to anyone with computer access. In addition, Forest Service staff were available by telephone or email to answer questions, and comments could be submitted via letter, fax, email, or online comment form. We worked hard to get to as many of the smaller communities as possible as evidenced by public meetings in smaller communities such as Whale Pass, Port Protection, and Point Baker. One of the reasons the comment period was extended by 18 days was to reschedule public meetings cancelled by the weather. Unfortunately, we were not able to visit all of the communities in the region.

Comment: Some respondents felt that the 90 day comment period for the Draft EIS was not adequate and that the comment period needed to be extended.

Response: The Forest Service believes that the comment period was adequate. This is especially true given that much of the information in the Draft EIS and Proposed Forest Plan has been on the project website (www. tongass-fpadjust.net) for months. For example, the track changes version of the Forest Plan showing many of our proposed changes was posted during the summer of 2006. The new timber demand study completed by the PNW Research Station was posted in March of 2006. The comment period was extended to April 30, 2007 (108 days total) due to the bad weather in Southeast Alaska, which caused several of the public meetings to be rescheduled.

Comment: Some people felt that a hard copy of the Draft EIS should have been mailed to everyone because not everyone has a computer to get online or view a CD.

Response: Nearly 1,000 copies of the Draft EIS and Proposed Forest Plan were distributed. A hard copy set of documents costs over $140 with postage. Most people found the CD met their needs and distributing CDs rather than hard copies resulted in a significant cost savings to the taxpayer. Anyone who requested a hard copy was mailed one at no charge. Hard copies were also placed in libraries across Southeast Alaska.

Comment: Some readers felt that the Draft EIS was not written very well for the lay person in that it was too long and technical.

Response: The Final EIS has been edited to fix areas that seemed to cause confusion and to be more consistent in use of terminology. Unfortunately the documents remain fairly lengthy and technical due to the complex nature of current science and natural resource management, as well as the need to stand up to intense scrutiny and legal challenge. Summary level information is, however, presented in the Comparison of Alternatives section in Chapter 2.

Comment: One comment requested that the Final EIS include a map that identifies the percent of public hearing participants that want to protect certain areas and present this information by community.

Response: This is an interesting request, but it is not possible to produce this type of map for a number of reasons. These include the fact that many people participating in the public hearings did not identify specific areas. Further, even if the Forest Service had surveyed all meeting participants, which we did not, there is no guarantee that the people who attended the public meetings are representative of their respective communities.

Restoration

Comment: A number of comments expressed support for more habitat restoration to reverse the negative impacts of timber harvest and road building. Many emphasized fixing culverts on salmon streams and deer habitat management in young growth. Many said they wanted their tax dollars spent in that manner instead of on building new roads. Some pointed out that restoration could support good jobs.

One comment stated that a substantive program needs to be put in place to promote, support, and fund a riparian and forest restoration program. The comment also recommended that this program have a dedicated funding source, such as a federal trust fund, to ensure it is actually implemented.

Another Comment recommended that the Forest add an objective for the "speedy replacement or removal" of all culverts that block fish passage to the Transportation System Riparian Standards and Guidelines (RIP2, II, H.1).

Response: The Final EIS and Final Proposed Forest Plan place more emphasis on restoration including management of young growth forest. The Tongass has prioritized the culverts that need to be replaced and many of the high priority ones have been replaced. The rate of future replacement is dependent on funding. Creating a federal trust fund would require an act of Congress and is beyond the scope of this analysis. Although the "speedy replacement or removal" of fish passage blocking culverts has not been added to the Riparian Standards and Guidelines in the Final Proposed Forest Plan, this continues to be a priority on the Tongass, but is, as noted above, dependent on funding.

Comment: One comment suggested that the Forest Plan contract restoration work associated with past practices to companies actively engaged in the forest products industry to enhance the viability of existing Southeast Alaska logging companies.

Another comment requested that the Forest Service incorporate local and Native hire provisions in its hiring practices and reduce the non-resident component of the wood products sector to less than 10 percent on Baranof Island.

Response: Contracts with the Forest Service are awarded on a competitive basis in accordance with federal contracting standards. In general, the Tongass National Forest prefers to contract with local operators, where possible. ANILCA provides for Native Alaskan hiring provisions for federal employment. The hiring practices of private sector companies are outside the scope of this Amendment process.

Schedule

Comment: Concern was expressed that some sort of "timeout" proposal might be advanced which would delay a decision on the Amendment and not really lead to any long-term solution to the issues.

Response: A decision will be made on this proposed Amendment. References to a "timeout" generally refer to how the Forest Plan might be implemented, with the intent to facilitate continued discussions about the issues, rather then delay the decision process.

Standards and Guidelines

Comment: There were many detailed comments on the wording of standards and guidelines and goals and objectives. They ranged from expressions of support or disagreement to detailed edits of the language used.

Response: These comments were carefully evaluated on an individual basis and changes were made to the Forest Plan, as appropriate. Space does not allow for an individual response to each of these detailed comments here.

Comment: One respondent commended the Forest Service for incorporating standards and guidelines that address invasive species and recommended that the new section be expanded to include discussions of Integrated Pest Management and Executive Order 13112 on invasive species.
Response: The 5-year review of the existing Forest Plan highlighted the need to update the Forest Plan to address the threat of invasive species. We believe the direction added provides the appropriate guidance to address future invasive species issues.

Comment: Several respondents discussed the importance of various resource protection standards and guidelines and the need to insure that these are mandatory requirements.

Response: The language in each Standard or Guideline indicates how mandatory the direction is. For example, "Commercial timber harvest is not permitted in this LUD" is a standard. "Salvage may be permitted…" is a guideline. Standards are mandatory while guidelines, as the name implies, provide guidance and are not mandatory. While the Forest Plan provides broad strategic direction that employees must follow, there also has to be flexibility for on the ground managers to tailor actions to meet the needs of specific locations. Managers always have the option, with appropriate documentation, to amend the Forest Plan to meet the needs of specific situations.

Comment: One respondent suggested that the definition of the estuary fringe presented in Chapter 4 of the Proposed Forest Plan include reference to a source, or sources, that identify the location of estuaries on the Tongass.

Response: Estuary is defined in the Forest Plan glossary. This definition clearly identifies where estuaries occur and provides sufficient information for the identification of these areas at the project level.

Comment: Concern was expressed about Wild and Scenic Rivers direction in the Proposed Forest Plan that appeared to restrict temporary improvements such as weirs which are fully compatible with ANILCA.

Response: Direction in the Final Proposed Forest Plan has been revised to address this concern.

Tribal Consultation

Comment: Concern was expressed that tribal governments and tribal corporations were not adequately consulted during this forest planning process.

Response: The record shows that tribal governments and tribal corporations were consulted throughout the process. The District Rangers took the lead in communicating about the Forest Plan Amendment and in organizing meetings with tribal organizations.

Comment: One comment objected to the use of Alternative 5 as a baseline for the other alternatives because they felt that the 1997 Forest Plan did not feature adequate consultation with tribal governments.

Response: Alternative 5 is used as a baseline for comparison for some of the resource analyses because it represents the current Forest Plan and is the no action alternative. The record shows that considerable tribal consultation took place in developing the existing Forest Plan. In addition, the current Amendment featured a new consultation effort to ensure that tribal issues are heard and understood.

Comment: One comment expressed the desire for native communities to build a more collaborative relationship with the Forest Service. The comment author felt that this type of relationship could help these communities be more effective in community development and better understand how to take advantage of economic opportunities. This comment specifically pertained to the city of Hydaburg.

Response: The Forest Services supports continued collaboration between the Forest Service and native communities and encourages interested parties to work with their local District Rangers.

Resource and Issue Comments

The resource and issue comments are divided into the following subsections:

- Climate and Air
- Economic and Social Environment
- Fish and Watersheds
- Geology, Soils, Karst and Caves
- Heritage and Sacred Sites
- Lands
- Minerals
- Recreation, Tourism and Scenery
- Roadless Areas and Wilderness
- Subsistence
- Timber
- Transportation and Utilities
- Wetlands
- Wildlife, Biodiversity and Plants

Climate and Air

Comment: A number of respondents were concerned about how climate change would affect the Tongass. They believe that the results of climate change will be catastrophic for the Tongass and include expansion of new species, increased blowdown, and an increase in forest fires. Several comments stated that the Draft EIS did not address the significance of the Tongass in global carbon storage. Others stated that that global warming will affect Alaska and logging old growth forest would release stored carbon into the air, further aggravating the situation. Several comments stated that there should be no logging on the Tongass until the Forest Service determines how much logging can be done without significant effects on global warming.

Response: The Draft EIS acknowledges that climate change is occurring and that it is affecting the forests of Southeast Alaska; the exact changes likely to occur over the coming decades are not certain but are expected to include warmer winters, continued severe storms, and perhaps drier summers. These factors, in turn, may lead to increased blowdown and increased insect populations, which would adversely affect existing forests and may lead to an increase in fires, although the warming trend has not

resulted in these events to date, as noted in the Draft EIS. Information on the risks and uncertainty related to the effects of climate change has been added to the Final EIS. As the Draft EIS states, models available for estimating climate change are designed to predict changes on a regional level and are not detailed enough to predict changes to the Tongass. Consequently, existing models do not agree on how global warming will affect Southeast Alaska. Additional information has been added to the Final EIS dealing with carbon sequestration and climate change which incorporates recent research.

As noted in the *Climate and Air* section of the EIS, logging old-growth forest can result in additional carbon entering the atmosphere; although not all of the carbon stored on the logged area is lost. Much of the carbon stored in organic matter in the soil, as well as carbon stored in down wood, cull logs, and low-value logs left on the site, remains sequestered. Carbon stored in lumber can also be sequestered for a time, depending on how it is used. Also, even under the alternative with the highest allowed harvest level, more than three-quarters of the existing old-growth forest on the Tongass would be exempt from harvest (nearly 3.8 million acres under Alternative 7 and nearly 4.7 million acres under Alternative 1), as would nearly all non-productive forest (2.4 million acres). No carbon stored in these forests would be lost due to logging.

As the EIS states, cumulative effects on carbon sequestration depend on the amount of forest land harvested; how the harvested wood is used; the management of the non-National Forest System (NFS) land in Southeast Alaska; the amount of carbon released during harvest, processing, and transporting wood products; on-site decomposition; and the length of the rotation (the period between harvests). If the products resulting from harvest are primarily lumber and other building materials, then there is a potential that the carbon in these products would be stored for the life of the buildings, longer if the wood is recycled or placed in landfills. If the wood is used for paper products or fuel, carbon storage would be short term. Any temporary storage of carbon in lumber products may be completely offset by carbon released during and after harvest, transportation, and processing. Whether carbon sequestration would actually increase or decrease under the alternatives considered in this analysis is unknown. However, recent estimates indicate that all the carbon stored in the forests of the Tongass (including carbon stored in its soil) represents approximately one quarter of one percent of the stored carbon in forests worldwide.

Further, carbon stored in all of the world's forests represents only a small portion of the total carbon stored in land vegetation and other terrestrial biomass, in soils, in the oceans, and deep below ground. Therefore, the Final EIS concludes that, while carbon storage on the Tongass is important for many reasons, small changes in carbon sequestration on the Tongass, whether positive or negative, would have only minor effects on atmospheric carbon levels. For comparison, Leighty et al. estimate that between 6.4 and 17.2 million metric tons (0.2 to 0.6 percent) of stored carbon has been lost on the Tongass since timber harvest began in the early part of the 20th century. For comparison, approximately 4.5 million metric tons of carbon was released every day to produce electric power in the United States in 2005 (U.S. Department of Energy 2006).

Comment: Some respondents believe that the protection of old growth forest may offer the best hedge against global warming because old growth forests sequester carbon. Comments also noted that old-growth forests may have value on the carbon trading market.

Response: About 8 percent of the commercial size old growth had been harvested on the Tongass National Forest as of 2005. Leighty et al. (2006) estimate that this represents between 0.2 to 0.6 percent of stored carbon on the Tongass. If the current Forest Plan (Alternative 5) were to be implemented for the next 100 years, which would only occur if new industries and markets developed to process and utilize the wood, 82 percent of the old growth forest would still be present in 100 years time. Approximately 88 percent would remain under Alternative 1, which has the lowest harvest level, and approximately 76 percent would still be present in 100 years under Alternative 7, which has the highest harvest level.

Using the Leighty et al. estimate, this suggests that under 1 percent of the total carbon would be lost under Alterative 1 (cumulatively) and less than 2 percent (cumulatively) under Alternatives 5 and 6.

Based on Leighty et al., approximately 0.6 to 1.8 percent (cumulatively) would be lost under Alternative 7, the alternative with the highest harvest level. This is the equivalent of approximately 17 days carbon emissions from power plants in the United States (refer to the *Climate and Air* section in the Final EIS). These comparisons assume that the projected maximum harvest levels associated with these alternatives would be fully implemented over the next 100 years. However, the proposed Forest Plan Amendment would only cover the next 10 to 15 years and approximately 90 percent of the remaining old growth would still remain under all alternatives when the next Forest Plan is developed. Also, monitoring and adaptive management during the planning period may result in changes to harvest levels prior to developing a new Plan. It is also worth noting that actual harvest is likely to be lower than the projected ASQ under all of the alternatives.

Whatever carbon is lost during old growth harvest would also be partially offset by young stands which accumulate carbon as they grow. Therefore, it is unlikely that preserving all of the remaining old-growth forest on the Tongass would have a much greater effect on atmospheric carbon levels than preserving the majority of it, which would be the case under all of the alternatives. As noted in the Final EIS, all the carbon stored in the Tongass represents a small fraction of the world's stored carbon. Leighty et al. (2006) estimate that all the carbon stored in the forests of the Tongass represents approximately one quarter of one percent of the stored carbon in forests world wide. Carbon stored in the world's forests, including forest soils, represents a small portion of total global carbon storage (terrestrial, ocean, and fossil carbon pools). As noted in the Final EIS, all terrestrial sources (croplands, tundra, grasslands, savannas, etc.) store about one-twentieth of what the oceans store. Therefore, the Final EIS concludes that small changes in carbon sequestration on the Tongass, whether positive or negative, would have a minor effect on atmospheric carbon levels.

The possible future value of old-growth forests in the world carbon trading market is currently unknown and speculative at this point.

Comment: Some respondents felt that the impacts of climate change described on pages 3-98 and 3-99 of the Draft EIS are exaggerated. They believe that it is impossible to predict the effects of climate change over the 10 to 15 year life of the plan. Also, many believe trees absorb carbon as they grow and, therefore, they argue, society should support timber harvest. In addition, they note, young trees consume more carbon dioxide than old trees.

Response: As noted in the preceding comment response, the Draft EIS acknowledges that while climate change is occurring and it is affecting the forests of Southeast Alaska, the exact changes likely to occur over the coming decades are uncertain. As the Draft EIS states, models available for estimating climate change are designed to predict changes on a regional level and are not detailed enough to predict changes to the Tongass. Consequently, existing models do not agree on how global warming will affect Southeast Alaska. Additional information has been added to the Final EIS dealing with carbon sequestration and climate change which incorporates recent research.

While research confirms that young trees accumulate more carbon on a yearly basis than old trees, one must also take into account the amount of carbon already stored in old forests, including above ground vegetation, logs and organic matter on the forest floor, and organic matter in the soil. Some of this is lost when the forest is logged and the site is exposed to the sun, increasing decay rates and releasing carbon into the air. Also, carbon is released as fuel is burned during harvest, processing, and transporting of wood products. As noted in the EIS, carbon can also be stored in lumber and other building materials for the life of the buildings, longer if the wood is recycled or placed in landfills. Whether carbon sequestration would actually increase or decrease under the alternatives considered in this analysis is unknown.

Comment: Some respondents want the Forest Service to consider the impact global warming will have on yellow-cedar and end logging of this species.

Response: The EIS recognizes that the decline and mortality of yellow-cedar is one of the most widespread and important forest health problems in Southeast Alaska (see the *Forest Health* section of the Final EIS). This decline is associated with wet, poorly drained sites, and research suggests that reduced snow pack in low-elevation areas associated with a warming trend that started in the 1800s has exposed fine surface roots to freezing, which in turn kills trees. As the climate continues to warm, yellow-cedar decline is likely to continue to spread, especially in the south and east. Conversely, yellow-cedar appears to be spreading northward as climate warms, into areas that retain snow longer into the spring. Not cutting cedar trees on sites that can no longer support yellow-cedar will not change the fact that these trees are growing in areas that cannot support them. Planting yellow-cedar on suitable sites north of its current range has a reasonable prospect for success and may aid the species natural movement north.

Comment: One comment stated that the EIS should measure air quality impacts in terms of the total carbon footprint associated with cruise ships, float planes, and related commercial uses of the Wilderness. The comment stated that on calm days haze can be seen in Ketchikan, parts of Misty Fjords, and Glacier Bay National Park.

Response: This Amendment responds to the 2005 Court decision which held that the EIS and ROD for the 1997 Forest Plan had errors relating to the use of projected market demand for timber, the range of alternatives relative to market demand calculations, and cumulative effects of timber harvest activities on non-NFS lands. Measuring the total carbon footprint for cruise ships, float planes, and other commercial uses in Southeast Alaska would be difficult and time consuming and is not necessary for the analysis of the issues identified by the court. In addition, all of the action alternatives propose the same standards and guidelines with respect to cruise ships and commercial use in Wilderness. The main variables that could potentially affect the size of the carbon footprint from these activities are the number of visitors to the region and the demand for commercial recreation activities in Wilderness. The *Recreation and Tourism* section in the EIS discusses potential recreation demand, but it is not possible to project how the number of visitors to the region and demand for Wilderness recreation would be affected by each alternative with the type of precision required to estimate differences in the resulting “carbon footprint.”

We were unable to find information on carbon footprint for cruise ships, float planes, or other commercial uses in Southeast Alaska in the literature, but we are aware of studies underway to identify cruise ship emissions. No results for carbon emissions into the atmosphere have been reported to date specific to the cruise ship business in Southeast Alaska to our knowledge. However, we did find a general estimate of CO_2 released per passenger mile (0.43 kg) (http://www.responsibletravel.com/Copy/Copy100858.htm). A rough extrapolation of this, based on the estimated number of cruise ship passengers visiting the Southeast Alaska (948,226 in 2005), results in an estimated total of 78,000 metric tons of carbon released in 2005 (this assumes each cruise was 7 days and ships averaged 100 miles per day travel, including port stays). The portion of this that may have been released in or near wilderness areas is unknown. Please note that this is a very rough estimate. For comparison, as noted in response to one of the preceding comments, approximately 4.5 million metric tons of carbon were released every day to produce electric power in the United States in 2005 (U.S. Department of Energy 2006).

As noted in the Draft EIS, the air quality for all of Southeast Alaska, except for the Juneau area, is rated as good by EPA. Air quality in the Juneau area has improved and has met EPA’s air quality standards in recent years, as noted in the Draft EIS. Also, as noted in the Draft EIS, smoke from fires in western Canada sometimes crosses into the Southeast Alaskan air shed, causing haze.

Comment: Some respondents stated that although climate models predict warmer winter temperatures, they also predict more snow at higher elevations. One comment noted that Juday et al. (1998; 41), for example, state there is a strong possibility of heavy snow at high elevations. They respondents expressed concern that in some years there will also be more snow in low-elevation areas and note that the deer model does not take this into account.

Response: It is certainly possible that there will be heavy snowfall in some winters at low elevation, just as it is possible that, with global warming, there will be less snow in low-elevation areas in most winters. Weather models are not able to accurately predict next year's snowfall, much less snow levels over the next several decades. However, Juday et al (1998) predict ("with some confidence") low snow accumulations in most low-elevation forest in Southeast Alaska. Concerns about the deer model and severe winters are discussed in the Wildlife, Biodiversity and Plants section of this appendix under Deer.

Comment: One comment states that both the HAFCM2SUL and the CGCM1 climate models predict a 30 percent increase in the mean seasonal severity rating for fires in Southeast Alaska by 2060. The comment notes that Dale, Juday, and other scientists predict an increased risk from insects and disease. The comment also states that increased rain will lead to more landslides, adversely affecting water quality and fisheries in Southeast Alaska. The comment notes that Salathe (2006) suggests that a 15 percent increase in precipitation over the whole of Southeast Alaska is indicated and the comment states that the resulting increase in soil moisture would increase likelihoods of windthrow, stem snap, and mass wasting.

Response: Our reading of the HAFCM2SUL and the CGCM1 models indicate that they predict a 10 to 30 percent increase in the fire severity rating, depending on the model. In any case, a 30 percent increase in almost no fires (the current condition) would still result in little damage due to fires. As noted in the Final EIS, Berman et al. (1999) state that it is difficult to predict the magnitude of area likely to be burned in a region with no historic fire record, but they believe that most fires would be small and of low intensity. They suggest a scenario in which 5,000 acres might burn over a period of decades, an average of perhaps 100 acres a year in an ecosystem that includes over 10 million acres of forest. Juday et al. (1998) also suggest that the effects of fires on resources are likely to be low.

There is no evidence that there has been increased damage from windthrow or insects in the last several years, as noted in the Draft EIS. There was a big up-swing in insect damage in the 1990s but this has subsided. We can expect other periods of increased insect activity, as insect population cycles ebb and flow. This is a natural part of the ecosystem. That said, it is likely that there will be some additional risk to forests from both insects and disease as the climate continues to warm. However, there is little evidence of increased insect, disease, or blowdown during this decade even though the climate has warmed considerably and gale-force storms have increased, as discussed in the Draft EIS. Juday et al. (1998), for example, suggest that the increase in gale force winds could result in increased blowdown. However, they also state that this had not occurred as of their study, nor did the 2006 survey report such an increase, despite the large increase in storm events over the last several decades. Periodic catastrophic windthrow has long been a factor in Southeast Alaska and can be expected to continue to be.

The Draft EIS notes that most studies predict wetter weather in Southeast Alaska over the coming decades. As noted in the comment, some researchers believe that increased rain could lead to more landslides. This in turn, could affect water quality and fish habitat. There's quite a lot of research about rain and snowmelt-driven landslide events (particularly in Washington and Oregon). Whether more rain would mean more landslides in Southeast Alaska would depend on local conditions at the time of the event, such as the rain characteristics (intensity, duration), the soil conditions (degree of saturation, pore pressure), the vegetation characteristics (vegetation cover, root strength) all of which could be affected by climate change as well as other factors that might not be so directly affected by climate change (including slope angle and any changes in lateral support, loading, or vibrations). Until climate models at the sub-regional scale include these factors it will be hard to quantify the risk.

The Salathe (2006) paper referenced in the comment finds "greater precipitation over the North Cascades and extending southward along the Cascades. Increases in precipitation are also found for the Idaho Rockies…" We did not see a prediction specific to Southeast Alaska.

Specific concerns regarding the potential effects of climate change on wildlife are addressed in the Wildlife, Biodiversity and Plants section of this appendix

Comment: Some respondents believe that the forests of the future will need to be resilient to novel conditions presented by climate change. They stated that old-growth forests, having survived fires, droughts, and insect and disease outbreaks of the past, have shown themselves to be resilient to change. Once comment cited recent research in California that indicates that old growth is more resilient to fires than plantations and fires are expected to increase in the future climate which is expected to have drier conditions. One comment stated that replacing old growth forest with young stands would expose the forest to increased risk of fire, insects, and disease, and concluded that, therefore, the Forest Service should avoid cutting old growth.

Response: The old-growth trees present today began life in the cooler climate of the little ice age, which began about 700 years ago and ended about 150 years ago. They have not endured fire to any notable extent, nor prolonged drought. Southeast Alaska has a cool, wet climate even in the warmest, driest years. This is a very different situation than in California, where tree species present in old-growth forests have evolved along with fire and drought and have developed coping mechanisms, such as thick bark, as a protection from periodic fires. There is little reason to think that old Sitka spruce or western hemlock trees would be better suited to a warmer climate than young trees of the same species, nor could one make a strong case for the opposite.

If the climate does get warmer and drier (some predict that it will get warmer and wetter) then hemlock and spruce trees would be less well suited to Southeast Alaska than they were during the past cool period. The fact that thick-barked, old-growth pine and Douglas fir trees in California are more resistant to fire than young trees says little about the resilience to fire of thin-barked, old-growth hemlock and spruce trees. Also, as noted in one of the preceding responses, the predicted 10 to 30 percent increase in the fire severity rating would still result in few fires and little resource damage. A more realistic threat to forest health comes from insects. Experience indicates that insect outbreaks have had a greater effect on old forests than on young ones (refer to the *Forest Health* section of the EIS).

Comment: One comment stated that it is important to preserve northern forests, which preserve 50 percent of Earth's carbon, and also noted that cutting trees will lead to more fires.

Response: The great majority of the earth's carbon is in the oceans as discussed in the *Climate and Air* section of the Final EIS. Also, the risk of fire in Southeast Alaska is very small, as discussed in the Final EIS.

Comment: Some respondents believe that the effects of climate change on values/resources should be given the same consideration as timber harvest. They state that just because there is uncertainty that does not mean the EIS does not have to analyze the possible effects, just as it does with timber demand, which is also uncertain. They believe the EIS should analyze the range of possible effects that climate change will have on values and/or resources and on achieving the desired future condition for these resources.

Response: Information that discusses the range of effects that climate change may have on achieving the desired future condition for various resources has been added to the appropriate sections in the Final EIS.

Comment: One comment stated that the Forest Service should lead by example and "enable ecosystems to adapt to climate change" by applying the principles outlined in Forest Service publications. The comment also stated that the Forest Service should analyze 11 studies that were listed in the comment.

Response: The Tongass planning team reviewed the cited studies, as well as many other studies on climate change. Some of the studies recommended in the comment are applicable to Southeast Alaska and the Tongass National Forest (e.g., Berman et al. 1999, Juday et al. 1998) and information from these studies was added to the Final EIS. Others are very broad based, general discussions on what may happen, often in other distant parts of the U.S. (i.e., effects on trout in the southeast U.S., fire risks in the western continental U.S., carbon dioxide [CO_2] effects on growth rates in the continental U.S.). The planning team reviewed this literature, with guidance from scientists at the PNW Research Station, and sought to use the most appropriate studies to show the range of possible outcomes for the Final EIS. We favored local studies where available. Some of the studies referenced in the comment had limited applicability to the Tongass. For example, the comment recommended that we consider Pratsad and Iverson (1999), which considers the effect climate change will have on 80 tree species in Eastern North America as an example of how we should model changes on the Tongass. However, this study deals with trees on a subcontinent-level, and in a less complicated region geographically. By comparison, the Tongass is about the size of West Virginia and is made up of a series of islands and a narrow strip on the mainland bordered by tall mountains and glaciers to the north and east and by the Pacific Ocean to the west. Consequently, it is difficult to predict changes using existing models designed to predict changes on a continent or subcontinent level.

As noted in the Final EIS, models are based on predictions for large regions and do not agree on exactly what is likely to happen in local areas such as the Tongass beyond the likelihood that the climate will be warmer. Researchers have modeled changes in the range of species at the Alaska regional scale. They estimated that the boreal forest will likely move approximately 100 miles north, coniferous and mixed forest would advance into the boreal zone, and the southern coastal forests are likely to expand westward (various studies cited in Parson et al. 2001). Studies also predict that trees in Southeast Alaska will expand their range upward into higher elevations and both yellow-cedar and red cedar will expand their range northward. As one of the papers cited in the comment (Hansen et al. 2001) notes, topographic barriers between Canada and Southeast Alaska are likely to limit the northward expansion of species into Southeast Alaska, therefore we do not anticipate species such as Douglas-fir migrating to the Tongass in the foreseeable future.

The Aber et al. (2001) paper cited in the comment discusses the effects of higher CO_2 on tree growth and illustrates the difficulties involved in trying to estimate the effects of global warming on the Tongass National Forest. While their focus is on the continental United States rather than on Alaska, Aber et al. demonstrate the problem of applying general theory to specific areas. There is research indicating the higher CO_2 levels driving climate change may increase the rate of photosynthesis and therefore tree growth, at least in the short term. However, this and other studies indicate that this would only occur if no other factor is limiting, such as water or nutrients. Whether water will be limiting in Southeast Alaska is unknown. Some models indicate a 10 percent reduction in summer rain across the Tongass but others do not. This leaves us without much certainty as to whether growth rates will increase. All we can really take from this, and similar studies, is a note of caution; therefore, the Final EIS does not predict increased tree growth for the Tongass, though it acknowledges the possibility. Increased tree growth, if it does occur, could increase carbon sequestration and future timber production, which in turn could lead to shorter recovery rates for disturbed habitats.

Comment: Several comments stated that the Forest Service should conduct research on greenhouse gases and carbon dioxide and identify how logging and re-growth change the carbon budget on the Tongass.

Response: Estimates of the amount of carbon stored in existing forests and the amount lost as a result of harvest are included in the Final EIS, as is a discussion of the problems encountered in attempting to

estimate the amount of carbon released due to harvest. The PNW Research Station continues to conduct research on global warming.

Comment: One comment expressed concern that timber harvest results in air pollution which causes asthma and lung problems.

Response: As discussed in the *Climate and Air* Section in the EIS, air quality is good on the Tongass and timber harvest has little effect on air quality in the region. In many other regions, logged areas are broadcast burned following harvest to dispose of logging slash and this can adversely affect air quality. Broadcast burning is not used on the Tongass.

Comment: One comment pointed out that the construction of interconnecting electric power lines would reduce air pollution from diesel generators, and result in a reduction in CO_2 emissions.

Response: Information on this subject has been added to the *Climate and Air* section of the Final EIS. The alternatives would not affect power line construction; all alternatives propose the same Transportation and Utility System LUDs.

Economic and Social Environment

The Economic and Social Environment comment and response subsection is divided into the following categories:

- Timber Demand
- Regional Economy
- Economic Efficiency Analysis
- Tongass National Forest Budget
- Payments to the State
- Communities

Timber Demand

Comment: Some respondents felt that the model used by the PNW Research Station to determine timber demand was obsolete. In particular, they felt that using a model built around exports to the Pacific Rim was a fatal flaw now that domestic markets are the primary destination for Tongass timber. They note that the model does not include a single parameter to account for changes in domestic markets.

Response: Brackley and Haynes (in press) state that "the existing model is a robust system that remains a valid approach to model demand for Tongass timber because of the limited data on lumber shipments and values and production costs." They go on to explain that Alaska producers are sawing lumber products that are, on average, better quality and enter higher priced markets, than lumber manufacturers are producing in the western Pacific states and in Canada. These high quality products have similar prices in domestic and foreign markets. Using historic data with scenario assumptions to model movement of these products in both domestic and foreign markets is a valid approach.

The method to project timber harvests and output in Alaska followed by Brackley et al. (2006a) is essentially the same as that described in publications about previous estimates of Alaska timber demand by Haynes and Brooks (1990), Brooks and Haynes (1990), Brooks and Haynes (1994), and Brooks and Haynes (1997). The method begins by estimating Alaska forest products output, by product, followed by calculating the raw material requirements necessary to support this production, using explicit product recovery and conversion factors. The total raw material requirement (the total derived demand for timber) is a combined projection of timber harvest from private ownership, from National Forests, and from non-

National Forest public owners. The projected National Forest timber demand is the quantity of timber required to satisfy projected derived demand given harvest by other owners, and given explicit assumptions about markets and implicit assumptions about prices.

Brackley et al. (2006a) assembled historic data that describe relevant components of the Alaska forest sector and calculated possible future wood needs by using an analysis of trends in factors that influence harvests. A historic period of about 40 years (1965 to 2004) was used as a basis for a projection of 20 years (2005 to 2025), to avoid emphasis on short-term cycles. They used information about US exports to Japan, and Japanese import data, as a benchmark for the historic data, as such exports represented, until very recently, the vast majority of sawn wood production from Southeast Alaska.

Data about recent domestic end markets for sawn products from Southeast Alaska has been available since about 2000. The data on domestic end markets is difficult to verify. One major question is how much of the product shipped to the Pacific Northwest is trans-shipped. Trans-shipments are products that are shipped into foreign markets from a different customs district than the one in which they were manufactured. In the case of Southeast Alaska, lumber manufactured in Alaska is apparently being shipped to foreign markets from the Seattle customs district, making it difficult to track many of the very recent end markets and subsequent demand for manufactured products from Alaska.

Other data used in the Brackley et al. (2006a) analysis includes log sources from all ownerships in Southeast Alaska, log and chip shipments out of Alaska to various destinations from all owners, harvest by owner, the Alaska market share for manufactured products in North America, and the North American market share in Japan. Brackley et al. (2006a) allocated their projections of total derived demand to foreign export markets (17 percent) and domestic markets (83 percent). They used information from Resource Planning Act (RPA) projections and assessments of future demand to estimate increases in derived demand in the future, allocated between domestic and foreign markets.

Predicting demand for federal timber in the wood products market in Southeast Alaska is difficult, due to the relatively small size of the market, the kinds of data available, and the structure of land ownership in the region. The structure of the model used by Brackley et al (2006a) makes it difficult to assess changes in domestic markets. This will need to be addressed in future demand predictions for Southeast Alaska, but gathering historic data that can be used in such a trend analysis for recent market shifts is problematic. It became clear from data reported by Kilborn et al. (2004) that shipments of manufactured wood products from Alaska were shifting from foreign to domestic destinations by 2000, and the continued significance of the domestic market through 2004 is illustrated by data reported by Brackley et al. (2006b). However, checking this data against data sources for domestic shipments and foreign exports is difficult at present, because of lags in reporting and the issue of transshipments. Data used in the Brackley et al. (2006a) model was cross-checked by the authors to ensure its reliability. It will take more research to assess if the end market information reported by Kilborn et al. (2004) and Brackley et al. (2006b) can be reconciled with other sources of data, such as the Harmonized Trade Code information, so that verifiable domestic shipment data can be used in future Southeast Alaska wood products demand assessments.

Comment: Some respondents felt that the PNW Research Station demand report was overly optimistic and did not accurately account for the challenges faced by producers in Alaska related to the competitive disadvantages of higher harvesting, transportation, and manufacturing costs. They pointed out that in most years the existing industry has been operating at less than 50 percent of the installed mill capacity. They felt that new industry investments, associated with the higher demand scenarios, were unlikely to occur. Some comments stated that the harvest level for the past few years represented the actual demand.

Response: Brackley and Haynes (in press) state that “current production levels and shipment patterns in Southeast Alaska demonstrate how the industry has transitioned to operate in current market opportunities”. They go on by saying that shifts to “higher proportions of shop lumber, larger sizes of

dimension lumber, heavy timbers, and cants should give Alaska producers an opportunity to supply products of relatively higher value to both domestic and export markets."

Brackley et al. (2006a) selected four scenarios they deemed reasonable and possible, given their assumptions. The Limited Lumber Production and the Expanded Lumber Production scenarios assume the wood processing industry in Southeast Alaska is focused only on processing of sawlogs. The primary difference between these two scenarios is the assumption that Alaska will increase its market share in the North American export market from 0.39 percent to 1.14 percent in the Expanded Lumber scenario, while the Limited Lumber scenario maintains the same market share for Alaska products in the North American market as a whole. The Medium Integrated Industry and High Integrated Industry scenarios both assume one or more chip and utility processing facilities will be added to the Southeast wood processing industry. These two scenarios assume an increase in Pacific Rim lumber imports, but not to the extent assumed in the first two scenarios. These two integrated industry scenarios also assume varying increases in the Alaska share of the North American export market. The Medium Integrated scenario assumes markets for chip and/or utility material will increase in 2008, while the High Integrated scenario assumes markets for chips and/or utility material will increase in both 2008 and again in 2012. Although Brackley et al. (2006a) assumed these markets would be the result of processing facilities built in Alaska, any market stimulation that results in higher demand for chip or utility material would have the same result. The recent policy change regarding appraisal of lower grade material for shipment to the lower 48 states could have a similar effect to building a processing facility for lower grade material, in terms of demand stimulation.

Comment: Some respondents felt that demand scenarios should not have been based upon non-existent facilities. They noted that the demand study prepared by Brooks and Haynes (1997) did not count potential demand from proposed facilities.

Response: Brooks and Haynes (1997) had scenarios labeled high, medium, and low. They chose not to go into detail in their discussion about how these demand levels might be achieved, simply leaving the discussion more general. Brackley et al. (2006a) chose to discuss how their scenarios might look "on the ground", to give an idea to the reader how demand might actually be stimulated under their assumptions in their model. The structure of the model itself, however, is simply driven by changes in relative market shares based on a number of assumptions, as discussed in response to the preceding comments in this section. Brackley et al. based this discussion of how changes in demand might take place based on efforts to plan and build various facilities in Southeast Alaska that would utilize lower grade material and have been under discussion for some time. However, as mentioned above, the demand stimulation could also take place as a result of other events, such as policy changes in timber sale appraisals.

Comment: Some respondents questioned why a timber demand scenario was not developed for a declining timber demand. They cite studies that indicate the possibility of the United States playing a smaller role in global wood products markets in the future.

Response: Brackley et al. (2006a) recognized that the US is a net importer of timber. A mill in Alaska has the option to ship products to traditional export markets (Japan), emerging new markets, or the lower 48 states. Demand for wood products is global in nature and increasing amounts of wood products are being imported into the United States. Alaska products constitute a small proportion of the total US market; very small shifts in how much of the US market Alaska supplies can mean a big change in Alaska.

Brackley and Haynes (in press) state that several short and long-term changes point to an increase in demand for wood products from all sources, including Alaska. These changes include a slowing in lumber production in sawmills in western Canada, in addition to longer-term factors, such as increased interest in renewable energy applications and a projected steady increase in US population and a concurrent growth in demand for softwood products. Brackley and Haynes state that the probability of a future decrease in demand for lumber from all Pacific Rim markets is virtually zero. In fact, they argue

that projected consumption in domestic markets alone will increase substantially. Therefore, there was no compelling reason for the Brackley et al. study to include a scenario showing demand falling, which would be contrary to the best scientific information available.

Estimated demand for Alaska sawn products declined considerably between Brooks and Haynes (1997) and Brackley et al. (2006a). The lowest projection of derived demand for sawn products from Alaska in Brooks and Haynes (1997) for the period 2003 to 2007 was 130 million board feet (MMBF). The lowest projection in Brackley et al. (2006a) for the same period was 30 MMBF. These differences were due to changing assumptions from one projection to another, and shifts in the structure of the industry as it adjusted after the end of the long-term contracts. Also see Chapter 2 of the Final EIS, Alternatives Considered but not in Detail.

Comment: Some comments stated that even when supplemented by state and private wood Alternatives 1 through 6 would not produce enough wood to meet market demand. Others argued that Forest Service demand studies have not adequately recognized the value of 100 percent wood utilization and the critical need to restore an integrated wood products industry to Southeast Alaska. Some stated that only Alternative 7 would produce enough timber (360 MMBF per year) to supply a fully integrated timber industry.

Response: The Medium Integrated Industry (Scenario 3) and High Integrated Industry (Scenario 4) scenarios in Brackley et al. (2006a) both assume one or more chip and utility processing facilities would be added to the Southeast wood processing industry, creating an integrated industry. The timber demand analysis presented in the *Economic and Social Environment* section of the Final EIS indicates that both Alternatives 4 and 7 would provide sufficient volume to meet projected demand under Scenario 4 in the second decade following plan implementation.

Comment: Some comments were concerned that as designed none of the alternatives provide enough timber to sustain a fully integrated timber industry (Brackley et al. Scenario 4). Alternative 7 has one-third of its harvest in Scenic Viewshed and Modified Landscape LUDs, which would not result in economic timber sales. Some stated that a total of 1.5 million acres of commercial forest land is required to allow economic timber harvest and provide annual harvest levels of 360 MMBF (or some said 370 MMBF) per year. Others commented that the Forest can harvest 360 MMBF per year using only 25 percent of the forest land.

Response: The range of alternatives evaluated in the EIS provides sufficient volume to meet the four demand scenarios, when timber from state and private land is considered. One assumption is that, if an integrated industry does develop, lower-grade logs from private land would be available for local use, for example, in an MDF plant. These logs are currently exported or shipped to the lower 48 states because there is no local market for them. As noted in the preceding comment response, the timber demand analysis presented in the *Economic and Social Environment* section of the Final EIS indicates that both Alternatives 4 and 7 would provide sufficient volume to meet projected demand under Scenario 4 in the second decade following plan implementation.

Some areas on the Tongass are designated as Scenic Viewshed or Modified Landscape because the Forest Service is required to manage for multiple use. The conservation strategy requires managing some lands outside of the Wilderness for wildlife (e.g., beach fringe, OGRs). Managing scenic areas as Scenic Viewshed protects the scenery resource while making some timber available from these areas. Many other areas are important for recreation and therefore are managed as either Scenic Viewshed or Modified Landscape. This protects these resources while providing some timber. The bulk of the timber harvest under all the alternatives comes from areas classified as Timber Production; these are areas that allow more intensive timber harvest, while still protecting other resources, such as fish and water quality through stream buffers and other standards and guidelines.

Comment: Some respondents felt that the PNW Research Station demand study did not adequately take into account the lack of a reliable and economic supply of timber. They argued that poor timber sale design is a greater problem than poor markets. A number of comments stated that industry would respond to a reliable, economic supply of timber with investments to build a competitive integrated industry.

Response: The PNW Research Station has published several demand studies conducted in support of Tongass Land Management planning efforts (Brooks and Haynes 1990, 1994, 1997; Brackley et al. 2006a). These studies estimate derived demand for timber in Southeast Alaska. They do not address supply issues. The supply of timber from the Tongass National Forest is determined by two main factors. The first is the volume of timber offered for sale by the Forest Service. In April 2000, procedures to determine the estimated supply needed were published in 'Responding to the Market Demand for Tongass Timber' (Morse 2000). These procedures to estimate the timber offer target (supply) incorporate the demand numbers from the PNW Research Station studies as an input into a spreadsheet. The procedures developed by Morse (2000) to estimate the annual sale offering targets from the Tongass National Forest address the uncertainty associated with forecasting market conditions, considering the continuing transformation of the timber industry and the inability of the Forest Service to respond quickly to market fluctuations due to the time it takes to prepare timber for sale.

The second factor affecting timber supply is the cost of harvesting and delivering wood to its respective intermediate markets: mills in the case of locally processed material, and ports in the case of log exports. Although a significant issue, reduced volume offered for sale by the Tongass National Forest is not the sole reason for recent harvest declines. Rather than merely securing volume, the challenge facing Tongass National Forest timber purchasers is being able to make a profit from new sales volume and volumes currently under contract.

Profitability for Tongass National Forest timber can be affected by (1) the combination of valuable materials versus logging costs in a given timber sale, (2) market options for lower grade material coming off the Forest, and (3) prices for Southeast Alaskan premium species and grades. Limited market options for lower grade material is at least partially the result of the closure of the region's two pulp mills in the 1990s, though the removal and sale of low grade and utility logs had been a challenge for independent operators in low markets prior to the closures. Many contracts now allow the option of leaving utility stumpage in the woods, but current market conditions are still challenging profitability.

Planning the timber program requires more than just pure economic factors. To account for delays in timber sale preparation, administrative appeals, and/or litigation, sufficient contingent volume must be included in the annual timber sale program to account for realistic fall-downs. Budget and organizational constraints limit the extent to which the Forest Service can respond to economic cycles and the associated fluctuations in timber demand. All of these factors must be considered in evaluating the market demand for timber and setting timber offerings. In the final analysis, planning the timber sale program is an exercise in professional judgment.

The current status of the timber industry in Southeast Alaska is discussed in the *Economic and Social Environment* section of the EIS and includes the following summary of the difficulties involved in accurately projecting future demand.

> Accurately projecting future demand is difficult and cannot be considered an exact science. Market demand for Southeast Alaska timber and wood products depends upon numerous difficult to predict factors, including changes in technology, growth and exchange rates in key markets, changes in consumer tastes and preferences, as well as developments in other producing regions whose products compete with those of Alaska. While demand is difficult to predict, industry relies on a stable timber supply in order to conduct long-term business planning.

The section also states specifically with respect to Brackley et al.'s Scenario 1 that: "The current status is believed to be largely the result of supply limitations and not necessarily related to market demand."

Comment: One comment stated that the estimate of installed capacity of 261 MMBF identified on page 2-47 of the Draft EIS is low. The manufacturers of the mill equipment estimate that the "active, installed capacity" is 370 MMBF.

Response: The active processing capacity of the timber industry in Southeast Alaska in 2004 and 2005 was 261 MMBF, as stated in the Draft EIS. This estimate is from the detailed mill surveys conducted in those years (Brackley et al. 2006b, Juneau Economic Development Council 2006). This, as stated on page 2-47, was the estimated active installed processing capacity in 2005. Total estimated processing capacity for those years was 376 MMBF. The difference is the capacity of three mills that were installed but not active in 2004 or 2005. These mills were: KPC/Annette Island Hemlock Mill (70 MMBF), Gateway Forest Products Veneer Mill (30 MMBF), and Kasaan Mountain Lumber & Log (15 MMBF). This is noted in Table 3.22-5 in the Draft EIS. It may also be noted that the analysis summarized on page 2-47 uses both the active (261 MMBF) and total (376 MMBF) processing capacities as benchmarks for evaluation.

The mill capacity discussion presented in the Economic and Social Environment section of the Draft and Final EIS documents has been updated in the Final EIS to include the findings of the 2006 mill survey, which was completed following publication of the Draft EIS (Juneau Economic Development Council 2006). There was a net decline of 5.5 MMBF in total and active processing capacity in 2006. Northern Star Cedar in Thorne Bay sold equipment capable of processing 8 MMBF and Icy Straits Lumber in Hoonah added a linebar resaw and 2.5 MMBF of capacity (Juneau Economic Development Council 2007). The installed capacity benchmarks used for evaluation of the alternatives have been updated accordingly in the Final EIS.

Comment: One comment stated that the installed capacity figures used in the Draft EIS appeared to substantially overstate existing mill capacity. The comment noted that the figures for the mills in Hoonah, for example, appeared to be 6 to 10 times their actual processing levels.

Response: The installed capacity figures included in the Draft EIS are from the annual mill surveys conducted in 2004 and 2005 (Table 3.22-5). As explained in the Draft EIS, installed capacity is the volume of material that the mill could process in 500, 8-hour shifts. This is not the necessarily the same as the amount actually processed in any given year. The actual amounts processed in 2004 and 2005 are also shown by facility in Table 3.22-5. Actual utilization (or actual processing levels) for the sawmills in Hoonah were, as noted in the comment, substantially below the installed capacity in 2004 and 2006 (see Table 3.22-5). This table has been updated in the Final EIS to include the results of the 2006 mill survey (Juneau Economic Development Council 2007).

Comment: One comment questioned whether the timber demand projections used in the EIS considered peak oil concepts and the projected increase in oil prices, which will negatively affect the competitiveness of the timber industry in Southeast Alaska.

Response: The methodology used to develop the PNW Research Station demand projections is explained in Brackley et al. (2006a), with additional information provided in an addendum prepared in response to comments on the Draft EIS (Brackley and Haynes, in press).

Comment: One respondent asked if Brackley et al. considered a potential increase in demand from the lower 48 states.

Response: The Brackley et al. (2006) study included the assumption of increasing demand in domestic markets. Brackley and Haynes (in press) add further detail to this assumption. Populations in the US are projected to continue to rise in the future, along with demand.

Comment: One comment stated that there is too much wood fiber on the market from domestic and foreign producers and the glut will continue for decades. They believe that the building industry doesn't need or want additional wood from the Tongass.

Response: Brackley and Haynes (in press) argue that Alaska producers have a unique advantage over all other manufacturers in the Pacific Northwest in their access to high quality wood. Alaska producers compete in different market segments with higher value products, on average, with better visual and strength characteristics. Demand for this high quality wood is strong and consistent.

The Forest Service uses a scientific process, Morse 2000, to determine timber sale offer levels to seek to meet annual demand. Among other things it takes into consideration volume under contract and past harvest to help determine what the current demand is for timber.

Comment: The alternatives in the Draft EIS are based on the same faulty logic as those alternatives evaluated in the 1997 EIS. TTRA requires that the Forest Service seek to meet market demand. Market demand for the past several years has been about 50 MMBF and, therefore, only Alternative 1 is consistent with TTRA and the Court order.

Response: Timber harvest in what economists call an "imperfect market", with one major seller and with supply limitations, does not equal demand. In other words, recent harvest levels on the Tongass National Forest do not equal demand.

The basic approach of all the PNW Research Station demand studies over the last 17 years has been to derive the demand for timber from the Tongass from estimates of demand for the end products manufactured from Tongass timber in the markets in which those products are sold. This approach makes it possible to estimate the demand that would exist in the absence of the considerable constraints currently placed on the supply of timber. Examples of such constraints include appeals and litigation, difficulties in preparing sales with positive appraisals, legislation unique to the Tongass that disallows timber purchasers from requesting sales with negative appraisals be offered, and funding levels. In addition, the limited interstate shipment policy has only recently made it possible for sales to be appraised on the assumption that low-grade and small diameter material will be sold in continental US markets, which is expected to enable more sales to appraise positive, and allow them to be offered, than was the case before the policy was adopted. Finally, the Brackley et al. report mentions other developments such as biofuels that could substantially increase future demand, even if the current model cannot quantify such effects.

For all these reasons, we believe the level of timber harvested on the Tongass in recent years is not a good basis for estimating market demand for the next decade or two.

Comment: One comment stated that the following harvest levels represent important thresholds for the timber industry:

- **83.5 MMBF is the bare minimum needed to keep Southeast Alaska mills in operation over the next one to two years, while the supply of timber from the Tongass is increased. This would allow short-term, single-shift operation of the existing mills.**
- **167.5 MMBF per year is needed to allow existing mills to operate two shifts daily and provide 30 MMBF for development of a new facility that would use low-value timber.**
- **231.7 MMBF is needed for the existing mills to operate at full capacity (three shifts daily) and provide 30 MMBF for a facility that would use low value timber.**

This, they note, needs to be economically feasible timber, not the ASQ, which has historically been much higher than the economically feasible level.

Response: The above volumes are broadly similar to the minimum timber volumes required by various processing facilities that are identified in Table 3.22-17 in the EIS. These volumes are used as one set of benchmarks against which the projected NIC I component of the ASQ available under each alternative is compared.

Comment: One comment stated that the analysis prepared for the Southeast Conference and referenced in the Draft EIS—"Timber Markets Update and Analysis of an Integrated Southeast Alaska Forest Products Industry" (McDowell Group et al. 2004)—has been updated. This updated version should be used in the Final EIS. The Southeast Conference has also commissioned another study—"Level of Harvest Capability Required to Support an Integrated Forest Products Industry in Southeast Alaska" (Cascade Appraisal Services, Inc. 2007). The results of this study should also be included in the Final EIS.

Response: The industry capacity reports referenced in the above comment have been reviewed and the updated McDowell Group study is cited in the Final EIS. These reports both included comments on the Draft EIS. These comments are summarized and responded to in this appendix.

Comment: One comment stated that the analysis should not use market demand or installed capacity to determine how much of the Tongass should be cut. Timber should be harvested on a sustained yield basis.

Response: The EIS used market demand to identify the range of alternatives to be evaluated in the Draft EIS because Key Issue 2 for the EIS responds to the requirement under TTRA that the Forest Service seek to meet market demand for timber in Southeast Alaska. Installed capacity is not used to determine harvest levels, but as one benchmark against which the projected ASQ available under each alternative can be compared. All alternatives propose that timber harvest be conducted on a sustainable basis.

Comment: One comment stated that the Morse method used by the Forest Service to establish annual timber sale objectives and meet demand for Tongass timber on an annual basis has a number of shortcomings including a low mill capacity estimate, a "contrived" capacity utilization rate, and unrealistic estimates of non-federal sources of timber. The same comment author also points out that the Forest Service is not meeting its goal of having an approximate three-year supply of timber under contract. The proposed sales identified in the Forest Service's current 5-year plan added to the existing volume under demand would not provide three years worth of supply for an annual harvest of 150 MMBF, let alone the 350 MMBF industry representatives believe is necessary for an integrated industry.

Response: The Morse methodology is referenced in the Draft EIS, but is not part of the analysis and has no bearing on the decision making process. As a result, questions surrounding this methodology are beyond the scope of this analysis. This methodology is, however, discussed in Appendix G.

The Draft EIS identifies that the goal of the Forest Service is to have an approximate three-year supply of timber under contract, as cited in the above comment. However, in the same paragraph, the text explains that: "(i)n recent years the Forest Service has not been able to achieve a three-year supply under contract, mostly due to litigation and administrative policy changes (i.e., Roadless Area decisions)." This discussion has been expanded in the Final EIS.

Comment: One comment pointed out that the Draft EIS (page 3-424) incorrectly references a Juneau EDC/Tongass Futures Roundtable demand projection of 248 to 268 MMBF. The comment author points out that the Tongass Futures Roundtable has not developed any demand projections.

Response: This discussion has been revised in the Final EIS and the reference to the Tongass Futures Roundtable estimate has been deleted. This projection and the correct source are presented in Table 3.22-17 in the Final EIS. The correct source is as follows: Estimates developed by the Forest Service based on McDowell Group et al (2004), Brackley et al. (2006b), and the Juneau Economic Development Council (2006) with updates by Southeast Alaska sawmills.

Comment: One comment stated that the mill capacities presented in Table 3.22-17 in the Draft EIS are incorrect and represent "some very temporary, rough estimates of how much timber the currently operating mills needed to survive one year." The comment then refers the Forest Service to the 2005 Mill Capacity and Utilization Study for actual capacity information.

Response: The estimates presented in Table 3.22-17 in the Draft EIS are, as stated in the title to the table, the minimum timber volumes required by various processing facilities. The capacities identified in the 2005 Mill Capacity and Utilization Study are presented in Table 3.22-5 in the Draft EIS. A 2006 Mill Capacity and Utilization Study was completed between the publication of the Draft and Final EIS documents. The results of the 2006 study have been incorporated in the Final EIS (Juneau Economic Development Council 2007).

Comment: One comment stated that the minimum volumes identified in Table 3.22-17 are not "additive." An MDF facility needs 80 to 100 MBF to operate but this volume needs to be utility logs and sawmill chips only. If an MDF facility had to rely on higher priced sawlogs for its supply it could not be competitive with MDF facilities located elsewhere. The comment author, therefore, concludes that a harvest level of approximately 360 MMBF would be required to supply an MDF facility. Further, different facilities require different types of logs.

Response: Table 3.22-17 in the Draft EIS identifies the minimum volumes required by various processing facilities. These volumes are used in the following analysis by alternative. The analysis does not simply assume that total demand is 248 to 268 MMBF, although this is one measure that could be employed. Rather, the analysis evaluates whether each alternative would meet all or part of the estimated minimum requirements and discusses ways in which these estimated demand levels could be met based on the average timber harvest composition. The average timber harvest composition used in this analysis is estimated based on the average composition of recent sales on the Tongass (see Table 3.22-18 in the Final EIS).

This alternative-by-alternative analysis also uses the maximum annual average harvest levels (NIC I component of the ASQ) with respect to the active and total installed processing capacity and the potential planning cycle demand estimate of 360 MMBF.

Comment: One comment stated that the: "Figure 3.13-11 on page 3-261 (of the Draft EIS) incorrectly depicts the volume that must be harvested to supply a veneer plant and an MDF plant. The 80 to 100 MMBF of utility logs and chips required by an MDF facility cannot realistically be produced from 250 MMBF of timber harvest."

Response: This comment is not clear. There is no Figure 3.13-11 on this page. It is possible that the comment author actually meant to refer to Table 3.13-11, which is on this page, but the comment does not appear to pertain to this table, which identifies the sawlog and utility volume identified for each alternative and does not identify the volume needed to supply a veneer plant or any other specific facility. The ability of each alternative to supply the minimum volumes required by various processing facilities is evaluated in the timber demand analysis in the *Economic and Social Environment* section of the EIS.

Comment: Many comments disagreed with the estimates of demand presented in the Draft EIS. Some requested that the Final EIS be clear that not everyone agrees with these estimates of demand.

Response: Projected timber demand is discussed in detail in the *Economic and Social Environment* section of the Final EIS. This section presents a range of demand estimates and projections, and discusses uncertainty about future demand, other studies, and differences of opinion.

Comment: One comment pointed out that the likelihood of a third party developing an MDF or veneer plant in Southeast Alaska was very low, even under Alternative 7. The comment author cited the recent closure by Weyerhaeuser of two of their veneer plants in Oregon. Weyerhaeuser reportedly stated that these closures were the result of reduced demand for plywood panels due to the decline in the housing market and the increased availability of competing products. The comment author pointed out that Weyerhaeuser supplied these mills from tree farms adjacent to highways and the facilities themselves were located less than two hours from a major Pacific port.

Response: The derived demand scenarios developed by Brackley et al. (2006a) presented MDF plants as an example of how derived demand for low-grade and utility wood might be stimulated. Other possibilities include development of biofuels markets, bioenergy applications, or shipment to markets and processors elsewhere. Chip prices are volatile and depend on many factors; if chip supplies go down regionally and demand increases, prices will increase to the point that shipments of low-grade material over longer distances will become a viable option. In the case of biofuels or bioenergy, as the prices of substitutes (e.g. oil and gas) increase, the probability of using wood products in these applications will increase. The scenarios presented in Brackley et al. (2006a) are designed to encompass a variety of future possibilities.

Comment: A number of comments stated that it is not the Forest Service's responsibility to develop a wood products industry in Southeast Alaska if that industry cannot be operated in an economically and ecologically sustainable manner. Others felt that the current industry was sustainable.

Response: The Forest Service is required to seek to meet market demand under the terms of TTRA. The existing and proposed Forest Plans are designed to ensure that timber harvest on the forest is conducted in a manner that is ecologically sustainable. The EIS evaluates potential demand using a number of possible future scenarios. The timber industry will not develop in the region if individual facilities are not economically sustainable (i.e., able to operate at a profit).

Comment: One comment stated that given that the Forest Plan is revised every 5 years it is not necessary to project timber demand far into the future and current demand levels should be used as a guideline.

Response: The Forest Plan undergoes a periodic review process every 5 years. The results of the most recent 5-year review are discussed on the Tongass National Forest's 5-year review web site (http://www.tongass-5yearreview.net/). The review process is not, however, the same as revising or preparing a new plan, this occurs every 10 to 15 years.

The Tongass estimates timber demand on an annual basis, but is also required under TTRA to seek to meet demand for each planning cycle. In order to seek to meet this demand, it is necessary to develop projections of demand over the planning cycle and into the future. It is, however, also important to note, as stated in the Draft and Final EIS documents, that the Forest Plan itself does not authorize any timber harvest. Rather, harvest is authorized by site-specific timber sale projects, which implement the plan. In other words, the plan does not directly meet demand for timber; rather it sets the conditions under which

the Forest Service can seek to meet market demand through the cumulative sales of the annual timber sale program over the planning cycle.

Comment: One comment asked whether TTRA requires the Forest to meet global timber demand or only local demand.

Response: The TTRA does not make a distinction between local and global demand. The Tongass seeks to meet annual demand with the timber offer calculation outlined by Morse (2000). The calculation of planning cycle demand by PNW Research Station scientists is derived demand in end markets for Tongass wood products, wherever those end markets may be.

Regional Economy

General

Comment: One comment stated that the McDowell Group's 2007 report to the Southeast Conference shows that population in Southeast Alaska has decreased since 2000, while the total population in Alaska has increased by 6.9 percent over the same period. The comment authors urged that the Forest Service to consider and use this information in the Final EIS.

Response: This information is presented in both the Draft and Final EIS documents. See Table 3.22-33 in the Draft EIS. (Note that according to the U.S. Census Bureau, the population of Alaska grew by 5.9 percent between 2000 and 2005, not 6.9 percent as stated in the comment [Table 3.22-33; U.S. Census Bureau 2007]). Population data for 2006 are now available and have been added to the Final EIS. These data indicate that the population of Southeast Alaska declined from 70,822 in 2005 to 70,053 in 2006 (Alaska DOL 2007a).

Comment: One comment noted that population has increased by 31 percent in Southeast Alaska since closure of the pulp mills and total personal income increased by 14 percent. The comment author noted that if the timber industry really were the "be all and end all" of the Southeast Alaska economy, these numbers would be going down, not up.

Response: Data for key economic indicators for 1995 and 2004 are presented in Table 3.22-1 in the Draft and Final EIS documents. These data do not support the trends identified in the above comment. When adjusted for inflation, total personal income decreased by 4 percent over this period and per capita income decreased by 1 percent. Total population decreased by 4 percent over this period and total employment was approximately the same in 2004, as in 1995. These data provide a useful overview of the Southeast Alaskan economy, but it is important to understand that the costs and benefits of the current transition in the regional economy are not evenly distributed. This is discussed further in the *Subregional Overview and Communities* section of the EIS.

Comment: One comment cautioned the use of regional statistics to evaluate the economy of Southeast Alaska and pointed out that Juneau accounts for 40 percent of the population and more than half of the region's economy, and may mask significant trends in other parts of the local economy.

Response: This concern is specifically addressed in the Draft and Final EIS documents. The section of the EIS that characterizes the Regional and National Economy presents regional data, as noted in the comment, but cautions that the trends exhibited by these data are not evenly distributed throughout the region and refers the reader to the *Subregional Overview and Communities* section of the document. The *Subregional Overview and Communities* section of the EIS addresses this concern directly and provides

and analyses data at the Borough and Census Area level. This is noted on the second page of the *Economic and Social Environment* section of the EIS.

Comment: One comment stated that the 1995 total personal and per capita income figures for Southeast Alaska presented in 2005 dollars in Table 3.22-1 appear to be incorrect.

Response: The 1995 income figures presented in Table 3.22-1 were developed using data from the U.S. Bureau of Economic Analysis (2006a). These data are compiled by Borough and Census Area. The estimates presented in Table 3.22-1 were developed by combining the Bureau of Economic Analysis data for the Boroughs/Census Areas that comprise Southeast Alaska. The resulting estimates were then adjusted for inflation using the Consumer Price Index (All Urban Consumers). A review of these calculations did not identify any errors. Table 3.22-1 has been updated in the Final EIS.

Comment: One comment stated that the data presented in Table 3.22-3, which estimate natural resource-based employment for 1995 and 2004, "significantly understate the magnitude of the decline experienced by the timber products industry following the passage of the Tongass Timber Reform Act in 1990."

Response: Table 3.22-3 is part of the section of the EIS that provides a general overview of natural resource-based industry in Southeast Alaska and is not intended to illustrate the full extent of the reduction in wood products employment that has occurred since employment peaked at 3,543 jobs in 1990. (Note that this table has been updated and revised in the Final EIS). The general overview is followed by sections that discuss specific natural resource-based industries in detail. The section that discusses the wood products industry presents employment data from 1986 to 2005.

Comment: One comment stated that the EIS should explain that the data presented in Table 3.22-2 provide a poor representation of the contribution made by natural resource-based industries to the economy of Southeast Alaska, especially the commercial fishing and recreation and tourism sectors. Another comment noted that this table "inexplicably" lumps together "forestry, fishing, related activities, and other" into one category and fails to distinguish between these important sectors.

Response: The shortcomings of the data presented in Table 3.22-2 are discussed with respect to Recreation and Tourism in the paragraphs immediately following Table 3.22-2. (Note this table has been updated in the Final EIS). The section of the EIS that follows Table 3.22-2 presents estimates of natural resource-based employment by sector and includes estimates of commercial fishing and recreation and tourism-related employment developed from other sources. More detailed employment estimates are provided in the following sections that address each natural resource-based industry in turn.

The data presented in Table 3.22-2 are from datasets compiled by the U.S. Bureau of Economic Analysis. These data are compiled and made available in accordance with the North American Industry Classification System (NAICS), which groups establishments and employees into the categories shown in Table 3.22-2.

Comment: Several comments expressed the concern that the economic analysis in the Draft EIS failed to adequately consider the impacts of logging on other sectors of the economy, and failed to adequately quantify other sectors. One comment noted that the Draft EIS "alternatives fail to consider the economic realities of standing forest and what it represents monetarily via tourism and other recreational and commercial uses beyond timber." One comment recommended that logging be phased out as jobs increase in recreation, tourism, and other sectors. Another comment noted that timber harvest is a single use of the forest that reduces other uses of harvested areas for many decades.

Response: The economic and social analysis presented in the EIS assesses the potential economic impacts of the proposed alternatives on recreation and tourism in terms of the effects that projected timber harvest and associated road building would have on available recreation opportunities on the Forest. The current and proposed Forest Plans include standards and guidelines specifically designed to protect Forest values and resources and the economic activities and values associated with them.

The affected environment portion of the *Economic and Social Environment* section discusses natural resource-based economic sectors of the economy at some length, including wood products, recreation and tourism, commercial fishing, mining, and the economic value of natural amenities and quality of life. The environmental consequences addresses the potential impacts to these resources, as well as other non-use values, including passive use values and ecosystem services.

Comment: A number of comments expressed concern that timber harvest in areas surrounding local communities or areas that are popular for recreation and other uses would have detrimental effects on these areas and the economic activities that depend upon them. The same concern was expressed with respect to fish and the recreational angling and commercial fishing industries that depend on healthy populations of fish.

Others expressed the same general concern, noting that the Tongass National Forest is worth more intact than as harvested timber. Along these lines, many comments stated that the Forest should be managed to support sustainable levels of recreation and tourism, commercial fishing, and subsistence, with timber harvest limited to small sales for local, value-added processing.

Response: Concerns raised with respect to impacts to specific places are addressed in Section C of this appendix. In general, it may be noted that this EIS provides a programmatic forest-wide analysis appropriate for a strategic Forest Plan Amendment. Site-specific projects or activities are best examined locally during the decision making process as appropriate for that action. Specific concerns raised with respect to the potential impacts of the proposed alternatives on the commercial and recreational fishing industries are addressed in the following Commercial Fishing subsection.

The management alternatives presented in the EIS are all designed to support sustainable levels of recreation and tourism, commercial fishing, and subsistence. The areas potentially available for timber harvest would, however, vary by alternative, with projected harvest volumes ranging from approximately 49 MMBF per year under Alternative 1 to 421 MMBF per year under Alternative 7.

Comment: One comment requested that the EIS disclose the opportunities for commercial timber, minerals, and other uses that are foregone in areas allocated to Wilderness, National Monument, OGRs, and other restrictive LUDs. They requested that these foregone opportunities be quantified in acres, volume, value, and improved habitat.

Another comment urged the Forest Service to "conduct a comparative economic analysis of the short and long term economic impacts of leaving unprotected roadless areas as intact wilderness or having these same areas logged." Another comment requested that the environmental and opportunity costs of opening an area to intensive resource development be quantified in the overall feasibility evaluations of opening any new areas to this type of development.

Response: There are trade-offs or opportunity costs associated with all of the alternatives evaluated in the EIS. The decision to allocate an area to one type of use or management often precludes another use, although this isn't always necessarily the case. The EIS analysis evaluates the potential environmental impacts of the proposed alternatives by resource and, as a result, implicitly includes the trade-offs or opportunity costs associated with each alternative. The EIS does not, however, provide a Forest-wide inventory of resources that would be available assuming that existing Congressionally-mandated land designations and other management policies were not in place because these designations and policies

will remain in place regardless of the alternative selected. As a result, this type of inventory would not contribute to the decision making process that the EIS is designed to facilitate.

The alternatives evaluated in the Final EIS examine a broad range of options concerning roadless areas and logging. Although the EIS does not provide a comparative analysis of the economic impacts of preserving existing roadless areas or logging all of these areas, Alternative 1 in the Final EIS protects all roadless areas and may be compared with the other alternatives that each include varying levels of harvest in roadless areas (see the *Economic and Social Environment* section in the Final EIS).

The analysis presented in this EIS is programmatic and provides overall Forest-wide direction. Project-specific analyses are conducted for specific projects, such as a timber sales or recreation developments. Project-level analyses do not typically use the term "opportunity costs", but essentially quantify all the impacts—negative and positive—of a proposed project. Potential impacts may include impacts to subsistence, wildlife, or particular sectors of the economy.

Comment: One comment noted that the data included in the Socioeconomic Setting section on page 3-8 of the Draft EIS were from 1999 and pointed out that these data should be updated in the Final EIS. The comment author stated that the updated data will show that the economy is even worse now then it was in 1999 and will show that it is "crucial that the (Forest Plan) do everything possible to help the economy."

Response: The data identified in this comment have been updated in the Final EIS. These data simply identify total population and the largest economic sectors in the region based on employment. More detailed analysis of economic and social trends is provided in the *Economic and Social Environment* section of the EIS. The *Economic and Social Environment* section in the Draft EIS included the most recent data available when the Draft EIS was prepared, and these data have been updated for the Final EIS, as appropriate.

Comment: One comment requested that the introduction to the Economic and Social Environment section of the EIS (page 3-403 in the Draft EIS) identify "adequate infrastructure" as an essential element of a healthy economic and social environment.

Response: The introduction to the *Economic and Social Environment* section provides a brief overview of the contribution of resources from the Tongass National Forest to local communities and the regional economy. A general statement about infrastructure is not consistent with the intent of this short section. Potential impacts to transportation and utilities are discussed in the Environmental Consequences part of the *Economic and Social Environment* section of the EIS, as well as in the *Transportation and Utilities* section.

Comment: One comment stated that commercial fishing is the largest natural resource industry in Southeast Alaska, not recreation and tourism, as stated in the Draft EIS. The comment also stated that the number of pages spent discussing each natural resource sector in the economic impact analysis reflects the relative level importance assigned by the Forest Service, as well as the level of analysis, with Timber assigned 16 pages and Commercial Fishing less than 1 page.

Response: Natural resource-based industries and their relative contribution to the regional economy of Southeast Alaska are discussed in detail in the subsection titled "Natural Resource-Based Industries" in the *Economic and Social Environment* section of the Draft and Final EIS documents. Based on estimates for 2004 presented in the Draft EIS, the recreation and tourism sector employed more people than the commercial fishing sector (see Table 3.22-3 and Figure 3.22-2 in the Draft EIS). These estimates have been updated in the Final EIS.

The relative number of pages allocated to a subject is not a reliable indicator of the importance assigned to an issue by the Forest Service. However, the commercial fishing section of the economic impact analysis is relatively short because: 1) it is not one of the key issues identified through the 2005 Court ruling or the 5-Year Forest Plan Review (see Chapter 1 of the Draft and Final EIS documents for details); and 2) there are no effects to commercial fishing employment anticipated over the 10 year timeframe of this analysis. This conclusion draws upon the analysis prepared for the 1997 Final EIS, which is incorporated in this EIS by reference.

In contrast, the supply of timber is a major focus of this EIS. Key Issue 2 for the EIS responds to the requirement under TTRA that the Forest Service seek to meet market demand for timber in Southeast Alaska. Estimating market demand is a difficult and contentious task and this is reflected in the Draft and Final EIS documents. The timber section of the economic impact analysis assesses the alternatives with respect to a number of different demand indicators and other measures of demand and supply.

Comment: A number of comments emphasized that the timber industry provides relatively highly paid jobs that last all year round. This type of comment often involved a comparison with recreation and tourism-related employment, which was typically characterized as relatively low paid and seasonal. One comment also argued that employment in the timber industry is more stable than that in other natural resource sectors.

Response: Wood products jobs do tend to be relatively high paid, with recreation and tourism-related employment often relatively low paid and seasonal, but this is not necessarily always the case. The Final EIS looks at a wide range of alternatives built around the issue of timber harvesting. Three alternatives feature a reduced land base available for logging while two alternatives increase the lands available.

Multipliers

Comment: **One comment stated that the economic impact analysis presented in the Draft EIS is "fatally flawed" because it uses economic multipliers, derived from the IMPLAN economic model, to estimate indirect and induced employment and income impacts. They cite several studies, both empirical and theoretical, to support their claim that impact multipliers in general, and input-output models in particular, do not provide accurate estimates of total economic impact. The comment also argued that IMPLAN does not provide comparable details for all resource-based sectors of the economy and is biased toward timber. The comment author sees evidence of this bias in the structure of the model data, which provides data for the lumber and wood products sector, but does not identify a recreation sector.**

Response: Some professional economists disagree on the utility of static impact multipliers of the type produced by IMPLAN and similar input-output models. These models are, however, a standard tool for a broad range of regional analyses conducted by government agencies, academics, and other entities interested in estimating the economic impacts of different policy options. IMPLAN in particular has been used in numerous and various policy analyses and research settings. The economic impact analysis presented in the EIS follows standard analysis procedures by using the IMPLAN model. The analysis in the EIS is accompanied by an explicit caveat recognizing that some economists may have reservations about the validity of this methodology. As noted in the Draft EIS (pg. 3-410):

> "Concerns have been raised with respect to the ability of IMPLAN and similar input-output models to accurately predict indirect and induced effects. Alternate techniques for estimating these effects are, however, subject to the same, or similar, criticisms and more accurate estimates are not readily available for this analysis. While the multipliers presented here should be viewed with caution, the resulting estimates of indirect and induced employment provide a basis for comparison between alternatives."

In addition, the EIS is careful to distinguish between direct effects on one hand and indirect and induced effects on the other.

The multipliers used to assess timber impacts are easier to derive from the IMPLAN model than those used to assess recreation and tourism, as noted in the comment. As noted in the same comment document, "recreation is scattered among a variety of industries generally classified in services and retail, with some in transportation." The IMPLAN model uses data compiled from standard economic sources and it is more likely that the absence of a single recreation sector in the model reflects the form of the source data, rather than a deliberate bias toward timber.

Comment: Another comment also urged caution in the use of IMPLAN data noting that employment and income multipliers for Southeast Alaska can be highly variable from year-to-year and provided examples of employment multipliers based on 2004 IMPLAN data: logging (2.18), sawmills (2.1), gold/silver mining (1.92), commercial fishing (1.22), and seafood processing (1.94). The same comment also provided examples of income multipliers.

Response: As noted in the above comment and on page 3-410 of the Draft EIS, the actual magnitude of the estimated multipliers should be viewed with caution.

The numbers provided in the above comment are different from those used in the EIS, which are based on IMPLAN data from 1998. The differences are less than 0.5 in all cases, except sawmill income where the difference is 0.78. The use of different multiplier coefficients would affect the total employment estimates across all alternatives, but would not affect the relative ranking of the alternatives. Using the employment coefficients for timber (sawmills and logging) provided in the comment instead of those used in the EIS would, for example, increase the total employment estimate for each alternative by about 8 percent. As noted in response to the preceding comment: the EIS is careful to distinguish between direct effects on one hand and indirect and induced effects on the other.

The main purpose of using multipliers in this analysis is to acknowledge that economic activity in one sector has impacts elsewhere in the economy and these potential impacts should be taken into account when considering the employment impacts of the alternatives.

Comment: One comment noted that a study of the multiplier effect in Southeast Alaska found that the multiplier effect with respect to jobs in Southeast Alaska was effectively zero. Another comment noted that: "IMPLAN, while useful for appraising the total economic impacts of a Forest Plan is insufficient for evaluating impacts on communities."

Response: The Forest Service is not aware of a study with the finding that the multiplier effect in Southeast Alaska is effectively zero. Research conducted in Southeast Alaska communities did, however, find that indirect employment coefficients while applicable at large scales, such as large regional or statewide assessments, are not useful at small local scales and may be misleading (Robertson 2003). This may be the study that the comment author is referring to.

The multipliers derived from IMPLAN are used in the EIS analysis to assess the total economic impacts of the Forest Plan (as recommended in the comment) at the regional level (Southeast Alaska as whole). They are not used to evaluate impacts at the community level.

Comment: One comment noted that inadequate supplies of timber not only affect loggers and mills, but also specialized support businesses and other elements of the timber industry infrastructure. The comment notes that if these people leave the industry will fail.

Response: The economic impact analysis presented in the EIS uses economic multipliers to account for potential indirect and induced employment and income impacts. The indirect component for the timber industry includes employment and income in industries that provide specialized support and other inputs for the timber industry. This type of analysis does not establish levels of economic activity necessary to

sustain particular industries or support services, but it seems reasonable to assume that the size of an industry or business is directly related to its market.

Timber

Comment: The statement on page 3-415 of the Draft EIS that the overall patterns of harvest levels shown in Figure 3.22-5 generally reflects broader trends in the wood products market oversimplifies the situation. Market trends were just one of many factors influencing harvest levels, equally important were reductions in timber supply from the Tongass.

Response: The comment takes the cited statement out of context. The EIS acknowledges that timber demand and harvest has been influenced by a number of factors. The overall trend shown in Figure 3.22-5 does, however, mirror broader trends in the wood products market, as discussed in the Draft and Final EIS documents.

Comment: Table 3.22-8 in the Draft EIS compares the ASQ on the Tongass from 1994 to 2005 with actual harvest levels. One comment observed that the Ketchikan Pulp Corporation would have logged "a lot more in the 1990s" if the volume had been available and noted that "1995 was the highest market of all time."

Response: The table referenced in the comment compares actual harvest levels from 1994 through 2005 with the ASQ for those years. Harvest volumes from 1986 to 2005 are shown graphically in Figure 3.22-5 in the Draft EIS. (Note: this table and figure have been updated in the Final EIS). These data are provided to illustrate the discrepancy between ASQ levels and actual harvest and display trends over time. As noted in response to the preceding comment, the EIS acknowledges that timber demand and harvest have been influenced by a number of factors.

Comment: The wood products employment projections in the EIS assume a linear relationship between harvest and employment levels, with a one percent change in harvest resulting in a one percent change in employment. One comment was concerned that given current trends in automation, there is no direct linear relationship between harvest and employment and the use of this assumption may lead to an overestimate of timber employment under the higher volume alternatives.

Response: As noted in the Draft and Final EIS documents, the linear relationship between harvest and employment is an approximation assumed for the purposes of analysis to allow a comparison between alternatives. The relationship between harvest and jobs expressed in the Final EIS as jobs/MMBF is based on data collected from 2000 to 2005 (Alexander 2007). The logging and sawmill jobs/MMBF coefficients were revised between the Draft and Final EIS documents. These coefficients are believed to be representative of current conditions and are suitable for a comparison of alternatives.

While the resulting projections are suitable for a comparison of alternatives, the absolute values should be treated with caution, especially those for the higher volume alternatives. The main reason for this caution pertains to the jobs/MMBF coefficients, rather than the idea that ongoing automation could sever the relationship between harvest volume and related employment. The existing job/MMBF coefficients are based on the current industry structure. The higher volume alternatives assume that a veneer mill and some other form of "demand stimulation", such as an MDF plant, will also be in operation. The jobs/MMBF coefficients associated with these facilities are likely different than those associated with the sawmills that comprised the industry from 2000 to 2005. Other changes in industry structure or outputs, such as an increase in value added products oriented toward local markets, could also result in different coefficients.

Comment: One comment noted that many logging jobs go to people from out of state and do not contribute to the local economy. This, they stated, is probably not considered in the Draft EIS analysis.

Response: As noted in the Draft and Final EIS documents, nonresidents account for approximately 35 percent of the employment in the logging industry. This is not accounted for in the direct employment estimates, but the total employment estimates are based on region-specific multipliers that take into account the fact that some of the income generated through logging employment is spent outside the region. Non-resident participation is high for all resource-based employment in Southeast Alaska (see Figure 3.22-2 in the Final EIS).

Recreation and Tourism

Comment: One comment stated that the Draft EIS incorrectly used studies by McDowell Group (1999) and Global Insight (2004) to estimate the economic activity associated with the recreation and tourism sector in Southeast Alaska. The comment notes that both studies include resident and non-resident business travel, as well as vacation travelers and, therefore, estimates developed using these studies overestimate recreation and tourism-related economic activity.

Response: The basic approach and estimated coefficients from the 1999 McDowell Group study were used to develop estimates of recreation and tourism-related economic activity for 1999 and 2001 in the Draft and Final Tongass SEIS documents, respectively. The findings of this study were used indirectly in the Draft EIS to help estimate the current contribution of recreation and tourism to the regional economy. The McDowell Group study addressed vacationers, business travelers, and those combining business and pleasure, as noted in the comment. However, the study identified the relative share of the total visitor impacts associated with what they termed the "vacation/pleasure visitor component" and this ratio was used to adjust the data used in the Draft EIS analysis. The resulting estimates were, as a result, broadly representative of recreation and tourism (or vacation/pleasure visitors), and not all visitors. This estimate and discussion has been substantially revised in the Final EIS, which presents employment data for the Leisure and Hospitality sector as a proxy for recreation and tourism.

Comment: One comment stated that the Draft EIS does not account for the differences in the value of different types of recreational experiences. The comment cited a recent study that compared sportfishing expenditures in unroaded areas around Bristol Bay with those in road-accessible areas on the Kenai Peninsula and found that expenditures in the unroaded areas were 38 times higher than those in road-accessible areas.

Response: As discussed in the Draft EIS (page 3-429), the recreation and tourism economic analysis is based on a number of simplifying assumptions, including the following:

> "This approach assumes that the average amount of employment generated by a single RVD is constant over time and that this number is the same for both Tongass-related recreation and the region as a whole, as well as for different types of recreation on the Tongass."

The Draft and Final EIS documents explain that: "While these assumptions may not accurately reflect underlying realities, they are necessary to produce a quantified estimate of the relation between recreation activity and employment."

Comment: One respondent presented the following comments. The analysis assumes that the projected reduction in the supply of primitive and semi-primitive recreation opportunities would not be severe enough to limit consumption because it assumes that demand would only increase by 18 percent over the 2005 to 2010 period. Evidence from California suggests that the demand for wilderness hiking and camping by residents increased by 42 percent between 1990 and 1998

(Outdoor Industry Foundation n.d.). The EIS should at a minimum include a sensitivity analysis that assesses the relative impacts of different projected consumption growth rates.

In addition, given the long-term impacts of timber harvest and other development activities, the recreation component of the economic impact analysis should extend beyond 2010. Even at the low growth rates assumed by the analysis, projected demand would begin to exceed supply in 2017 under Alternative 7 and 2019 under Alternative 1.

Response: The recreation and tourism component of the economic impact analysis presented in the EIS is based on projected future demand and changes to Recreation Opportunity Spectrum (ROS) settings in recreation places by alternative. The key assumptions used in this analysis include the use of a linear projection based on 1984 to 1995 data collected for recreation places to project future demand (see Figures 3.22-7 and 3.22-8 in the EIS) and a series of assumptions about the effects that timber harvest would have on ROS settings to estimate the effects of the alternatives on recreation supply.

The demand projection used for the analysis in the EIS relies upon a number of simplifying assumptions (as noted in response to the preceding comment and in the Draft and Final EIS documents), but is based on Tongass-specific data and is the best currently available information for the Tongass. The analysis in the Final EIS has been adjusted and compares projected changes in ROS supply for the first decade following implementation (presented as annual average estimates by alternative) with projected demand for 2015.

The demand projection used in this model assumes that overall recreation demand would increase by 36 percent from 2005 to 2015. This analysis suggests that demand for ROS1 opportunities would begin to exceed supply in 2020 under Alternative 7 and in 2022 under Alternative 1. Increasing the expected growth rate in ROS1 demand, as suggested in the comment, results in demand for these opportunities exceeding projected supply sooner under all alternatives, but does not increase the differences between the alternatives. Projected ROS1 supply under all alternatives would be exceeded within a two to three year period and, therefore, the overall effects would remain similar.

It is also important to recognize that, as explained in the Draft and Final EIS documents, the purpose of this analysis is to allow a quantitative comparison between alternatives. The likelihood of demand for primitive and semi-primitive recreation opportunities exceeding supply on the 16.9 million acre Tongass National Forest in the foreseeable future is low for at least two reasons. First, the analysis discussed in the comment is for identified recreation places only (see the *Recreation and Tourism* section of the EIS for details), not the entire forest. In other words, ROS1 supply is assumed to be limited to just 2.2 million acres from the total of 13.4 million acres of ROS1 available on the Forest (see Table 3.15-3 in the *Recreation and Tourism* section of the EIS), which viewed in RVDs (using the same assumptions as the model) is seven times the projected demand in 2015.

Second, in order to emphasize the differences between the alternatives, the analysis assumes that 25 percent of the change in ROS settings projected to occur over a 160 year analysis period would happen in the first decade following implementation (by 2015 in the Final EIS). This would not happen, but without this assumption there is very little difference between alternatives.

This analysis is designed to assess the programmatic effects of the alternatives and the finding that there is little difference between the alternatives is consistent with this scale of analysis, with standards and guidelines expected to minimize potential impacts on cruise ship routes and popular activities and reduce the potential for overcrowding in wilderness areas under all alternatives. There could, however, be important differences between alternatives on a project-by-project basis, with the alternatives that permit more intensive timber harvest potentially impacting existing or potential outfitter/guide use areas and other nature-based activities. These potential impacts are identified with respect to important recreation places in the *Recreation and Tourism* section of the EIS.

Commercial Fishing

Comment: Several comments questioned the finding that there would be no impact to the commercial fishing industry.

One comment referenced a recent study prepared for Trout Unlimited (Curley and Bristol 2006), which suggests that the majority of salmon originate on the Tongass and depend on roadless watersheds. This study, they argue, suggests that timber harvest and road building in roadless watersheds would have negative impacts on fish and the commercial fishing industry. The comment also pointed out that the fact that much of the future of the fishing industry in Alaska is expected to be dependent on factors outside of the Tongass National Forest is beside the point. The EIS, they argue, needs to evaluate the potential impacts of the alternatives with all other things assumed to be equal.

Another comment stated that the conclusion that there would be no impact to the commercial fishing industry under any of the alternatives ignores a number of issues, including harvest on steep slopes with unstable soils and problems with road maintenance and culverts, among others.

Response: The economic impact analysis presented in the Draft and Final EIS documents does discuss broader trends that are likely to affect commercial fishing in the future, but also states: "There is not expected to be any significant effect to the commercial fishing or fish processing industries over the next decade as a result of National Forest activities" (Draft EIS, page 3-457). This, as explained in the Draft and Final EIS documents, is because the projected levels of timber harvest represent a relatively small proportion of the remaining productive old growth (POG) on the Tongass and an even smaller proportion of the entire Forest. In addition, the Riparian Management Standards and Guidelines established in the current Forest Plan and included in the Final Proposed Forest Plan are designed to protect salmon habitat and prevent impacts to salmon and other aquatic species.

Risks to aquatic resources would increase with more harvest (see the *Fish* section in the Draft and Final EIS documents). Site-specific evaluations would occur with each timber sale to evaluate potential adverse impacts to aquatic resources and identify mitigation measures to reduce any potential impacts. One of the goals of project-specific NEPA documents is to ensure that project actions do not result in significant adverse impacts to important resources. The potential impacts of the alternatives on fish are discussed in more detail in the *Fish* section of the Draft and Final EIS documents. The study referenced in this comment is discussed in the Fish section of this comment response appendix.

The potential impacts of the past practices and related management actions identified in the last part of the comment are part of the baseline for all of the alternatives and would not vary by alternative. These potential impacts are discussed in the Fish section of this comment response appendix and the *Fish* section of the EIS.

Comment: One comment stated that in addition to direct timber harvest-related impacts to fish, the commercial fishing industry would also be severely impacted if any species of concern, such as the marbled murrelet, were listed as endangered under the Endangered Species Act (ESA) as a result of timber harvest practices.

Response: As discussed in response to comments on the *Wildlife* section of the EIS, the potential effects of timber harvest on old-growth habitat are discussed under the marbled murrelet subsection of the wildlife analysis, and tables indicating the distribution and protected status of this habitat are provided in the *Biodiversity* section. The potential effects of the proposed alternatives on other species of concern are also addressed in the *Wildlife* section of the EIS. None of the alternatives are expected to result in fish or wildlife species on the Tongass being listed as endangered under ESA.

Comment: One comment questioned why the discussion of the commercial fishing and seafood processing industries in the Draft EIS focuses on salmon, even though the text acknowledges that other species comprise about one-quarter of the region's total catch on a total value basis. The comment also expressed concern that the Draft EIS uses data from 1994 to discuss salmon's share of the commercial fishing industry and requested that this information be updated in the Final EIS.

Response: The rationale for this decision on page 3-431 of the Draft EIS (and cited by the above comment author) is as follows:

> "While commercial salmon fishing comprises the bulk of Southeast Alaska's fishing industry, halibut, crab and herring fishing combined makes up a substantial proportion of the region's total catch (approximately 24 percent in 1994 on a value basis). There is an important connection between salmon and other wildlife and fish species on the Tongass. Crab, halibut, herring, bears, eagles, and other species depend on the annual return of millions of salmon and on the juvenile salmon produced in the Tongass streams and lakes. As a result, management decisions that affect salmon indirectly affect other species that are commercially fished. These relationships are, however, poorly understood and difficult to quantify. The commercial fishing discussion presented in this section, therefore, focuses on the salmon fishery. Data available for the seafood processing industry, however, do not allow for an easy distinction between salmon processors and other firms. Data presented for the seafood processing sector, therefore, include the entire seafood processing industry."

This statement is also included in the Final EIS. This is consistent with the analysis presented in the 1997 Final EIS and the 2003 SEIS.

Salmon comprised approximately 42 percent of the commercial fishing industry in 2005 based on ex-vessel value. Halibut, crab, and herring combined, comprised 30.7 percent of the industry in 2005, 6.7 percent more than in 1994 (Alaska DOL 2007e). From 2000 to 2006, salmon harvesting ranged from 41 percent to 48 percent of total fish harvesting employment in Southeast Alaska, comprising 47 percent of the total in 2006 (Alaska DOL 2007d). This information has been added to the Final EIS. Employment data have also been added for the non-salmon components of the commercial fishing industry. However, as noted above, the focus of the commercial fishing impact discussion remains on the salmon fishery.

Comment: One comment was concerned that self-employed commercial fishermen were not included in Tables 3.22-1, 3.22-3, and 3.22-4 in the Draft EIS. The comment asked: "how is it … that whole fisheries and their self-employed participants have … 'disappeared' from the … employment estimates presented in the Draft EIS?" The comment author states that the analysis is "hopelessly flawed and patently dishonest" because it fails to include these numbers.

Response: As stated in the Draft EIS and contrary to the concern raised in the comment, self-employed salmon fishermen <u>are</u> included in the salmon harvesting employment estimates (see, for example, page 3-410, final paragraph or page 3-432, footnote 3). These totals were calculated using data from the Alaska Commercial Fisheries Entry Commission and the methodology employed in the 1997 Forest Plan Revision Final EIS analysis (see, for example, Table 3.22-3 in the Draft EIS, note 4).

Employment data were presented in the Draft EIS for the salmon component of the commercial fishing industry only. Employment data associated with other components of fishing industry were not included in these totals. Salmon harvesting continues to be the focus of the commercial fishing discussions in the Final EIS. Employment data are, however, provided for the entire commercial fishing sector in Southeast Alaska in the Natural Resource-Based Industries overview presented in the Final EIS.

The following paragraphs address the specific tables referenced in the comment.

Table 3.22-1: This table provides an overview of the Southeast Alaska economy and does not present data by industry. The average annual employment data presented for Southeast Alaska are from data compiled by the U.S. Bureau of Economic Analysis (BEA) and include self-employed workers.

Table 3.22-2: The data presented in this table were also compiled by BEA. These data are compiled and made available in accordance with the North American Industry Classification System (NAICS), which groups the industries, as shown. Self-employed workers are included in the "proprietors employment" category. This information is not available by industrial sector at the borough/census area level.

Table 3.22-4: This table presents employment and income multipliers for various natural resource sectors in Southeast Alaska, including the salmon harvesting and seafood processing sectors. It does not present employment estimates.

Natural Amenities and Quality of Life

Comment: One comment states that while the Draft EIS acknowledges that natural amenities and quality of life are important for attracting and retaining residents, it does not quantify this impact in the economic impact analysis because the Forest Service essentially claims it would be too hard to do so. The Draft EIS does not provide any data, studies, or explanation that supports the contention that the proposed alternatives would have no significant effect on the economic activity that these amenities are believed to generate.

Further, the comment continues, the Draft EIS "seems to have made up its own science in support of the sophism that protecting natural amenities will somehow degrade quality of life" by stating that: "changes in the local economy such as a shift to tourism may impact local atmosphere and amenities… These impacts are largely assumed to be negative as tourism leads to crowding and the loss of traditional charm, but this need not always be the case" (Draft EIS, page 3-437).

Response: The Draft EIS concludes that in most cases and localities the effects of the action alternatives relative to the no action alternative are not expected to be significant enough in of themselves to result in measurable changes to amenity-driven economic activity. This conclusion is based on the standards and guidelines that are designed to protect and/or mitigate negative effects to natural resources on the Tongass, as well as the relatively small proportion of the Forest that would be disturbed under any of the proposed alternatives.

The importance of the standards and guidelines are discussed with respect to quality of life and other difficult to quantify values in the *Economic and Social Environment* section of the EIS (under Ecosystem Services).

Potential harvest activities under the proposed alternatives would affect a relatively small proportion of the Tongass and would be unlikely to affect the predominantly wild and undeveloped nature of the region and the role it presently plays in attracting visitors and residents. The EIS notes that this is likely to be the case in most cases and localities, but it is possible that this type of impact could potentially occur at a local level, if timber harvest were to occur in a presently undeveloped location that is used and valued by local residents. This type of impact would be more likely to occur under Alternatives 4 and 7, which include more timber harvest, but quantifying the possible extent of this effect would require site-specific analysis that is beyond the scope of this programmatic EIS.

In addition, it should be noted that the existing literature does not provide much direction with respect to this type of analysis. Studies to date have tended to focus on a comparison between rural counties that include designated Wilderness, and those that do not (see, for example, the literature reviews included in Rudzitus and Johnson 2000, Colt 2001, and Sonoran Institute 2006). These broad macro-scale analyses have important implications, as discussed in the EIS. However, even proponents of this relationship caution that while data suggest that rural counties with Wilderness outperform those without, "a

correlation does not imply a cause and effect relationship" or "guarantee that economic prosperity ... (in a county) … will automatically rise following the designation of Wilderness" (Sonoran Institute 2006; 28).

Indeed, the same comment author who submitted this comment also provided a copy of a paper prepared on their behalf, *Greater than Zero: Toward the Total Economic Value of Alaska's National Forest Wildlands*, in which the authors (Phillips and Silverman 2007, 20) explain that they do not attempt to estimate these types of values because Alaska presents a "particular econometric problem" in this regard, with the uniform and high presence of "wildlands" across the region preventing a "comparison of communities with and without nearby wildlands, because almost all communities fall into the category 'with nearby wildlands'."

The Draft EIS (page 3-437) states:

> "Although it is difficult to directly measure the importance of natural amenities in attracting and keeping residents, proximity to natural environments and the recreational activities they support are undeniably a benefit enjoyed by residents, especially in the more rural communities of Southeast Alaska."

The paragraph continues to explain that changes in traditional economies may not always be perceived as positive and uses the example of tourism, which can lead to overcrowding and a loss of traditional charm. The discussion also notes that some aspects of tourism development such as restaurants, meeting centers, or entertainment facilities that are also used by local residents may have positive effects on local residents. It is not clear why the comment author believes this discussion is the result of made-up science and it is not the intent of the EIS authors to convey that "protecting natural amenities will somehow degrade quality of life." The statement quoted in the comment has been revised in the Final EIS to discourage this misinterpretation.

Comment: One respondent noted that the Draft EIS discusses the role of natural amenities and quality of life factors attracting new residents to the region. Anecdotal evidence suggests that this has happened in Southeast Alaska. The comment notes that this has had positive impacts, as suggested in the EIS (e.g., local purchases, human capital), but there is another side to this issue with impacts to life-long residents, who may experience increases in home and property values and property taxes, as well as a change in collective attitudes, with new residents favoring policies that do not necessarily reflect the positions of long-time residents who may make their living from the surrounding Forests. The comment states that if this issue is "really relevant to Tongass management issues it ought to be addressed in appropriate detail rather than speculatively."

Response: The issue of natural amenities and quality of life is relevant to the Forest Plan to the extent that proposed management decisions may impact these values and affect local residents and communities. There are potential downsides associated with retirees and others moving to small communities, including those noted in the comment. The discussion presented in the EIS is intended to provide a balanced perspective on this issue, but the main point is to assess the potential effects of the proposed alternatives on the economic aspects of this issue. As noted in the EIS, local amenities and quality of life do not provide employment or generate income in the same way as a sawmill or a tourist lodge, but they can serve to attract and keep residents. The EIS concludes that the effects of the action alternatives relative to the no action alternative are not expected to be significant enough in of themselves to result in measurable changes to amenity-driven economic activity. This is discussed further in response to the preceding comment.

Economic Efficiency Analysis

General

Comment: One comment noted that the calculation of net public benefits is missing or has been conflated with the economic efficiency analysis summarized in Table 3.22-29. The comment author observed that "(i)n order to accurately represent the PNV (Present Net Value) of alternatives it must include all Forest Service costs for all program areas, not just variable costs of timber." Another comment noted that the analysis should include the costs, as well as the benefits of non-timber programs, such as recreation and commercial fishing.

Response: The net public benefit analysis conducted for the EIS is presented in the Economic Efficiency portion of the *Economic and Social Environment* section of the EIS. The introduction to this section has been revised to explain the relationship between net public benefits and the economic efficiency analysis. The economic efficiency analysis has been expanded in the Final EIS to include program costs for: Inventory and Monitoring; Minerals and Geology; Recreation, Heritage, and Wilderness Management; Land Management Planning and Land Ownership Management; Vegetation and Watershed Management; and Wildlife and Fisheries Habitat Management, in addition to variable timber costs. The costs assigned to these categories are estimated based on the average 2005/2006 costs for these cost categories and are assumed to remain constant across all alternatives.

Comment: One comment stated that recent District Court decisions indicate that it is "erroneous to presume that monetary values need to be assigned to non-timber resources as you have attempted to do in the Draft EIS" and the presentation of this "flawed and misleading" information "permeates the Draft EIS and will unduly influence the ultimate outcome without basis in law or fact." The comment further stated with reference to Table 3.22-29 in the Draft EIS that the "assumptions, conclusions and management directions based on this table are problematic throughout the plan."

Response: The economic efficiency analysis summarized in Table 3.22-29 assigned monetary values to those goods and services where they could be reasonably assigned in accordance with the 1982 Forest Planning rules (36 CFR 219). These resources and the associated potential impacts were important factors in formulating the alternatives evaluated in the Draft EIS, but the difference in estimated values between timber and recreation and tourism, as shown in Table 3.22-29, did not have an undue bearing on this process. As noted in response to the preceding comment, the economic efficiency analysis has been expanded in the Final EIS.

Comment: A number of comments were concerned that the economic efficiency analysis presented in the Draft EIS is misleading and represents an "apples and oranges" comparison, with actual projected timber receipts and costs compared to hypothetical willingness-to-pay values for recreation that are based on outdated survey data from 1988. Comments disagreed on how this was misleading. Some felt that the analysis incorrectly suggests that "non-timber uses of the Tongass are grossly more beneficial than timber uses from an economic standpoint." Others felt that the comparison overvalues timber harvest relative to other non-timber uses not included in the table.

One comment stated that the following statement on page 3-461 of the Draft EIS was particularly misleading: "Recreation and tourism estimates range from approximately 76 times (Alternative 7) to 380 times (Alternative 1) higher than those for timber, indicating the importance of the Tongass National Forest as a recreation resource for both local residents and outside visitors."

Response: The economic efficiency analysis has been revised in the Final EIS. The analysis includes the consumer surplus (willingness-to-pay) estimates for recreation and tourism, but also includes receipts to the Forest from recreation activities as a separate category, as well as recreation program costs. Program costs are also included for: Inventory and Monitoring; Minerals and Geology; Heritage and

Wilderness Management (this category also includes recreation costs); Land Management Planning and Land Ownership Management; Vegetation and Watershed Management; and Wildlife and Fisheries Habitat Management.

The high consumer surplus values estimated for recreation and tourism on the Tongass are believed to reflect the importance of these activities to local visitors and outside residents. There is, however, little variation in these estimated values by alternative, as discussed in the Draft EIS. The text in the Final EIS has been revised to further emphasize this point.

Comment: One comment noted that Table 3.22-29 suggests that recreation and tourism revenues are a reflection of the amount of timber harvest and also suggests that rather than being a broad-based plan that seeks to balance multiple uses this plan is an analysis of the effects of timber harvest on other uses. The comment further noted that the table also suggests that other program costs are not expected to vary by alternative. Another comment stated that the summary in Table 3.22-29 "denies the multiple use concept" by suggesting that recreation and tourism and the timber industry cannot work side-by-side without impacting one another. In addition, the comment author felt that the values in this table indicate that the "non-use" values of nonresidents are given priority over employment opportunities for state residents.

Response: The analysis summarized in Table 3.22-29 in the Draft EIS has been expanded in the Final EIS, as discussed in response to preceding comments on this issue. The revised table provides estimated costs and revenues for other Tongass program elements, as well as timber and recreation and tourism. While it is likely that program costs would vary by alternative, it is not possible to project these variations at this time.

The table presented in the Draft EIS was not intended to convey that recreation and tourism and timber cannot co-exist. However, higher timber harvest levels, especially those projected under Alternatives 4 and 7, would affect recreation and tourism over the 160 year planning horizon considered in the economic efficiency analysis. Timber harvest and road building in unroaded areas would result in an increase in Roaded Modified (RM) recreation opportunities, and a corresponding decrease in the availability of unroaded recreation opportunities. This is discussed in the Environmental Consequences part of the *Recreation and Tourism* section of the Draft and Final EIS documents under Recreation Opportunity Spectrum.

Comment: One comment stated that the economic efficiency analysis incorrectly suggests that the Tongass National Forest should be managed to achieve maximum economic return. The Forest Service is required to manage NFS lands for multiple uses, but not necessarily the combination of multiple uses that returns the greatest dollar returns or unit outputs.
Response: The economic efficiency analysis is not intended to suggest that the Tongass National Forest should be managed to achieve maximum economic return. More discussion regarding the purpose of and requirement for the economic efficiency analysis has been added to the introduction to the Economic Efficiency section in the Final EIS.

Timber

Comment: Several comments noted that the net timber benefits shown in the economic efficiency analysis only include direct sale revenues paid to the government and do not capture the full benefits of the Tongass timber program. One comment stated that the timber benefit estimate should also include the impacts of the money spent harvesting and manufacturing the timber, which the comment author estimated as approximately $600 to $700 per MBF. Another comment suggested that the benefit estimate should include federal payroll taxes and associated corporate income taxes.

Response: The economic efficiency analysis has been revised in the Final EIS. The timber portion of the analysis has been adjusted and revenues to the federal government are now estimated using base rate values by species and the average species composition of timber on the Tongass. The base rate is the minimum value that must be bid for timber to be sold or cut. This rate is lower than the average value per MBF harvested in 2005/2006 that was used in the Draft EIS ($7.12/MBF versus $11.69/MBF).

The regional economic impact benefits of the various alternatives are evaluated in the economic impact analysis presented in the Draft and Final EIS documents. This analysis includes the jobs and income generated by the money spent to harvest and manufacture the projected timber sale volumes under each alternative. As noted in the timber part of the Economic Efficiency section in the Draft and Final EIS documents, industry revenues are omitted from the timber benefit calculation "because efficiency analysis commonly assumes perfect competition in the private sector. This implies, in turn, that competing purchasers of federal timber will bid up the price of stumpage to the point where all economic profits (i.e., profits over and above a competitive rate of return to capital) are dissipated." Federal payroll taxes and corporate income taxes are associated with all economic activities supported by Tongass resources. No attempt is made to estimate these tax revenues in the Draft or Final EIS documents.

Comment: Other factors than just stumpage values need to be included in timber appraisals. These factors include direct and indirect jobs in the timber industry, as well as other multiplier effects. When the value of recreation, tourism, and fishing are estimated these factors are always included, but the costs of these other uses versus the user fees are never shown.

Response: The procedures used for timber appraisals are outside the scope of this Forest Plan Amendment. With respect to the Forest Plan Amendment and this EIS, potential timber-industry related impacts are discussed in two sections, along with impacts to other resources (recreation and tourism, commercial fishing, etc.). These sections are the Economic Impact Analysis and Economic Efficiency Analysis parts of the *Economic and Social Environment* section of the EIS. The economic efficiency analysis has been expanded in the Final EIS and includes the costs of administering other programs on the Tongass. The economic impacts of the alternatives are evaluated in terms of jobs and income (including multiplier effects) in the economic impact analysis.

Comment: One comment stated that the cost of future remediation for roads and logging should be factored in and borne by those who profit from the logging and road building.

Response: The costs associated with planning, implementing, and administrating timber sales, as well as associated mitigation activities, are included in the projected costs used in the economic efficiency analysis presented in the EIS. These costs include sale preparation, environmental assessments, and cultural resource surveys, among others. A second group of costs related to the actual harvest of the timber are included in the purchaser's contract requirements and are reflected in the stumpage value received. These costs include the costs of reforestation, road obliteration, and culvert removal among others. A third group of costs are largely fixed costs associated with long-term forest management and Forest Plan implementation and monitoring, and are not expected to vary significantly by alternative.

Comment: One comment stated that the Draft EIS fails to identify the true costs of the Tongass timber program because it does not disclose the costs of building roads that are necessary for a timber sale to go forward ("pre-roading"). Pre-roading contracts are let in advance of timber sales and nearly all large sales, especially those in roadless areas, are dependent on this practice. Other sales are dependent on advance road improvements to existing logging roads that are contracted under maintenance contracts, although this maintenance has no purpose other than to facilitate future timber sales. The comment states that these costs need to be disclosed in the Draft EIS.

Response: Pre-roading is a process whereby roads are constructed into a NEPA cleared project area prior to and separate from a timber sale or other resource activity. The intent of pre-roading is to develop or expand the transportation network without requiring one resource to carry the entire burden of road construction costs. Pre-roading is an administrative decision that requires funding from Congress and is subject to the same environmental laws and regulations (NEPA, NFMA, etc.) as other federal actions. This practice is best addressed at the project level and is outside the scope of this programmatic EIS.

Comment: One comment stated that the Draft EIS failed to accurately account for the costs associated with the proposed levels of harvest. They argue that the $101/MBF figure used to estimate timber costs in the economic efficiency analysis is based on an undocumented estimate, which "any examination of expenditures in relation to outputs over the last decade" shows to be an underestimate. In addition, this cost per MBF derived from budget allocations assumes that all planned sales are actually sold, which is not the case. The Forest Service plans for more volume than is actually cut and even projects that make it through the planning phase may not necessarily be sold, as was the case with 30 percent of the sales offered between 1998 and 2003.

Response: The economic efficiency analysis presented in the EIS uses the $101/MBF figure cited in the comment to estimate the timber sale costs for each alternative and assumes for the purposes of analysis that all sales offered are sold. This estimate is based on historic timber sale preparation costs and includes costs for NEPA preparation, sale preparation, sale administration, and engineering support. The Forest Service uses the $101/MBF figure to estimate costs as part of its timber sale planning process at the individual timber sale level. The use of this figure in this EIS to assess potential costs is consistent with these practices and provides an adequate basis to allow a comparison between alternatives, recognizing that economic efficiency analyses conducted at the Forest Plan level project outcomes and assign approximate valuations to costs and benefits more than 100 years into the future and require numerous simplifying assumptions.

The timber component of the economic efficiency analysis has been revised in the Final EIS. This revised version uses the base rates—the minimum value that must be bid for timber to be sold or cut—to estimate timber revenues. The average base rate value per MBF used in the Final EIS ($7.12/MBF) was estimated using 2006 base rates by species and the average timber sale composition. The benefits estimated in the economic efficiency analysis using this value are the absolute minimum that must be bid for a timber sale to go forward. These estimated cost and benefit figures indicate that viewed in terms of direct costs and revenues to the Forest Service, timber harvest results in a net loss per MBF. These flat rates are used to evaluate the alternatives and result in the total projected net loss increasing as the projected harvest volume increases.

Comment: One comment pointed out that a large component of the costs that make logging uneconomical on the Tongass are the costs associated with court litigation brought by opposition groups.

Response: These costs are not directly factored into the average timber sale costs used in the economic efficiency analysis presented in the EIS. However, litigation has increased the timber sale preparation costs incurred by the government and has also had the effect of interrupting the supply of timber to local mills.

Comment: One comment stated that the Draft EIS failed to consider that the effects of non-competitive bidding reduce estimates of timber revenues. The comment also pointed out that almost 50 percent of new sales offered between 1998 and 2005 did not sell and that 20 of the sales that did sell were returned to the Forest Service.

Response: The economic efficiency analysis in the Draft EIS implicitly considered the effects of non-competitive bidding in the Draft EIS by using the average stumpage value ($11.69/MBF) from actual sales

to estimate revenues. This portion of the economic efficiency analysis has been adjusted in the Final EIS and revenues to the federal government are now estimated using base rate values by species and the average species composition of timber on the Tongass. The base rate is the minimum value that must be bid for timber to be sold or cut. This rate is lower than the average value per MBF harvested in 2005/2006 that was used in the Draft EIS ($7.12/MBF versus $11.69/MBF).

Comment: One comment stated that the timber industry has manipulated stumpage prices in the past and that this could happen again. They recommended that the Forest Service look into this practice.

Response: Analyzing stumpage prices is beyond the scope of this analysis. The economic efficiency analysis presented in the Final EIS has been revised to use base rate values to estimate potential revenues to the Federal government.

Recreation

Comment: One comment identified the following specific concerns with the "contingent valuation" methodology used to estimate the net benefit of recreation/tourism activity:

- **The estimated sport fishing "willingness-to-pay" value of $1,025.27 (1988 survey data adjusted to 2005 dollars) per Recreation Visitor Day (RVD) "defies reason" because it is "highly unlikely" that guided and unguided fishing operators would so "vastly under-price their product."**
- **Willingness-to-pay methodologies employ survey research to place hypothetical dollar values on non-market goods. Use of these values in economic analysis is contentious because this type of analysis produces hypothetical, unverifiable values and research has found that stated willingness-to-pay is often very different to actual willingness-to-pay.**
- **If tourists were willing to pay additional money to visit the Tongass the tourism businesses would already be charging them that money**.

Response: There is an extensive academic literature that addresses contingent valuation with respect to outdoor recreation and benefit cost analysis, and a number of methodological concerns have been identified, including those identified in the above comment. There is, however, broad consensus surrounding the use of willingness-to-pay measures with respect to recreation in the academic literature and various Federal agency planning regulations and guidance documents, including the Forest Service Handbook (FSH 1909.17, Chapter 10).

The analysis presented in the EIS uses the average net willingness-to-pay value used in the 1997 Final EIS (USDA Forest Service 1997a) adjusted for inflation. This value was originally developed based on survey research conducted at the national level and then adapted for the Tongass. This is the best information currently available for the Tongass. While the estimated sport fishing value is high, as noted in the comment, the analysis uses an aggregated figure of $69.13 per RVD.
The analysis presented in the Draft and Final EIS documents illustrates that there is little difference between estimated recreation consumer surplus values by alternative. The overall intent of this analysis is to compare alternatives and, while different levels of timber harvest affect the types of recreation that may be available in the future, the analysis is not intended to compare the relative values of different resources.

Non-Market Values and Ecosystem Services

Comment: A number of comments expressed concern that the Draft EIS did not adequately address non-market values, which they thought should be assigned monetary values and treated on a par with market timber values. Several comments provided lists of "important net benefits" that the comment authors felt had been incorrectly excluded from the Draft EIS analysis. The most detailed list identified the following "unpriced benefits" that the comment author felt the Draft EIS "largely overlooked":

> **"biological diversity; cultural connection to the land such as subsistence; quality of life; endangered/threatened species protection; water quality; special non-timber forest products; passive use values such as bequest, option, and existence values; educational and scientific values; unearned income; ecological services such as carbon sequestration; hydrological services; irreversible consequences and lack of substitutes; property values and offsite benefits; and visual amenities"**

Response: The items listed in the above comment are all discussed and evaluated in the Draft and Final EIS documents and will be considered in the overall decision-making process, as appropriate. The fact that these items are not assigned monetary values and quantified in the economic efficiency analysis does not lessen their importance to the overall process. This is discussed further in the Economic Efficiency section of the Final EIS.

While the EIS does not attempt to assign monetary values to the non-use values potentially associated with each alternative, the text does acknowledges that the non-use values associated with the Tongass are likely to be high, especially given the national importance of this issue. The fact that no monetary value is attached to non-use values does not lessen their importance in the decision making process; decision-makers routinely choose alternatives that do not maximize PNV. Many forest benefits are incorporated into forest planning decisions in a qualitative fashion. Also, a large proportion of the Draft and Final EIS documents are devoted to revealing impacts to the forest resource that cannot be readily expressed in monetary terms. The Forest Service Manual states that decision makers must "[c]onsider economic efficiency, *along with other factors* (emphasis added), in making decisions and in implementing and reviewing projects, programs, and budgets" (FSM 1970.3(3)).

Comment: Several comments stated that the Forest Service is required by the 1982 planning regulations to assign monetary values to non-market goods and services. Two comments supported this contention by quoting the following definition of net public benefits from 36 CFR 219.3:

> **"An expression used to signify the overall long-term value to the nation of all outputs and positive effects (benefits) less all associated inputs and negative effects (costs) whether they can be quantitatively valued or not"**

One comment supported this position with the following:

> **"Economists have made great advances in developing methods to estimate the economic benefits generated from the production and conservation of non-commodity resources. Therefore, in addition to qualitative descriptions of all non-commodity benefits and costs the decision documents must quantitatively estimate the benefits (costs) of conserving (damaging) non-market resources."**

Response: The introduction to the Economic Efficiency Analysis subsection has been revised in the Final EIS and highlights the 1982 planning regulations and their relationship to this analysis. The revised section explains that the approach taken in the EIS is consistent with the 1982 planning regulations, which state that "quantitative and qualitative criteria" may be used to evaluate alternative outputs "when monetary values may not be reasonably assigned" (36 CFR 219.12(g)(3)(ii)). This approach is also consistent with the definition of net public benefits cited in the above comment, which allows that not all

effects can be "quantitatively valued" (36 CFR 219.3). As noted in the response to the preceding question, the economic efficiency analysis is one piece of information for the decision maker to consider, but is by no means the only one and a large portion of the EIS is spent evaluating potential effects that cannot be reasonably assigned a monetary value at this time.

Comment: One comment submitted an unpublished draft report that presented the commenting organization's own assessment of non-market values on the Tongass and Chugach National Forests (*Greater than Zero: Toward the Total Economic Value of Alaska's National Forest Wildlands*, Phillips and Silverman 2007). The comment stated that this report estimates that the value of wildlands on the Tongass ranges from $1.5 billion to $1.8 billion per year and provided a summary of the results (adapted from the Phillips and Silverman draft report). The comment expressed surprise that the Forest Service had not included similar estimates in the Draft EIS and argued that not including these types of monetary estimates in the Final EIS would "constitute a violation of NEPA for failing to disclose significant effects."

Response: The analysis prepared by Phillips and Silverman (2007, 3) takes a benefit-transfer approach and applies values developed elsewhere and broad macro-scale dollar figures to, in their own words, estimate "the total benefits of the wildlands on the Tongass and Chugach National Forests" at "an admittedly coarse scale—a first approximation." In some cases, they note that they were unable to provide separate estimates for each forest, instead providing one estimate that covers both forests. This analysis provides a rough approximation of total economic values for various "benefit categories" (e.g., subsistence, passive use, ecosystem services not otherwise counted, etc.) that are included in the Final EIS as illustrations of one set of possible total economic values, where appropriate. The Phillips and Silverman analysis also illustrates the difficulties in developing accurate estimates suitable for policy analyses that require data at a finer resolution than this type of "coarse scale" approach and, in effect, supports the Forest Service's decision to use these types of estimates to support a qualitative discussion of potential impacts to these resources, rather than use these very general values to attempt to quantify differences between alternatives in monetary terms.

In addition to the problems with the total value estimates, Phillips and Silverman (2007) do not address or even mention one of the main challenges in implementing this type of analysis in a policy or management context, namely, identifying the impacts of the proposed alternatives in units or outputs that can be accurately measured in sufficient detail to allow meaningful comparison between alternatives. The ecological impact assessments presented in the Draft and Final EIS documents follow standard scientific approaches to these types of analysis and typically assess impacts in terms of probability and risk, not in numbers of affected deer or salmon, etc. The difficulties associated with identifying production relationships and the corresponding units of measurement is generally considered one of the main challenges currently facing ecosystem services analyses (Kline 2006).

Interest in ecosystem services has increased in recent years and, as noted in the preceding comment summary, economists have made useful progress in developing and improving methods and techniques that can be used to value non-market ecosystem services. Recognizing the potential utility of the ecosystem services concept, the Forest Service recently proposed that ecosystem services be used as a framework for describing and evaluating the many benefits associated with NFS lands and established an Ecosystem Services web site (http://www.fs.fed.us/ecosystemservices/) that provides detailed information and resources, identifies and discusses Forest Service efforts in this area, and issues a regular Ecosystem Services newsletter. In addition, the PNW Research Station recently issued a technical report that attempts to define an economics research program to describe and evaluate ecosystem services (Kline 2006). One of the long-term goals of this type of agenda is to allow these types of non-market ecosystem services values to be incorporated into management decisions in the future. We are just not there yet.

With respect to the Tongass National Forest, scientists from the PNW Research Station in Juneau have recently initiated an ecosystem services research program that is aimed at using the Tongass as a case study of the impacts of forest management on the long-term provision of ecosystem services and goods.

The initial phase of this program has involved working with the MIMES (Multiscale Integrated Models of Ecosystem Services) model developed by leading ecosystem services researchers at the University of Vermont. Initial work has focused on developing a simplified, dynamic model of forests and ecosystem services and goods. Future research plans involve adapting MIMES to model the impacts of management decisions on the flow of ecosystem services and goods.

Tongass National Forest Budget

Comment: One comment stated that the Final EIS should disclose the detailed budget (by EBLI) and staffing projections needed for each alternative. At least one alternative, they argue, should have a smaller budget and ASQ than Alternative 5 (No Action) and mirror more closely what will be possible in the future with reduced budgets. The comment notes that: "The plan alternatives are all built on a budget and staffing level that will expand to meet potential accomplishments; this is unrealistic."

Response: The Draft and Final EIS documents evaluate three alternatives (Alternatives 1 though 3) with an ASQ that would be lower than is currently the case.

As discussed in the Draft and Final EIS documents, the Forest Service budget is appropriated through Congress on an annual basis. National Forest budget requests are considered as part of total budget requests submitted to the United States Congress by the executive branch each year, with Congress having final say. The overall forest budget would be affected by variations in the projected level of timber harvest, with timber-related budget requirements likely higher under Alternatives 4, 5, 6, and 7, and Alternative 1 requiring the lowest level of funding. Budget shortfalls are likely in the future, especially for the more timber-intensive alternatives.

The information presented in the Draft and Final EIS documents is sufficient to allow a comparison between alternatives. Detailed budget estimates will continue to be developed on an annual basis following the selection of a preferred alternative.

Comment: Several comments stated that the Forest Service should use the funds presently spent managing the timber program to fund programs that manage recreation and tourism. These funds should also be used to repair damage from past logging practices and sustain wild salmon runs.

Response: As noted in response to the preceding comment, the Forest Service budget is appropriated through Congress on an annual basis. Funds provided in the budget are allocated for specific purposes. Funds allocated to the timber program, for example, are used for that program and the Tongass does not have budget authority to reallocate these funds to other uses. Other Tongass programs address recreation and tourism, restoration, and salmon, and are also funded by Congress.

Payments to the State

Comment: One comment stated that the 2000 Secure Rural Schools Act provided a safety net for communities that have historically depended on revenue from timber sale receipts. This legislation expired in 2006 and unless the act is reauthorized, Southeast Alaska communities will experience a loss of revenues, which at current harvest levels would be approximately $9 million annually. This would include about $400,000 the Ketchikan Gateway Borough uses to fund its school system.

Response: The 2000 Secure Rural Schools Act has been extended to 2007, as noted in the Final EIS. Future government funding or legislation will be decided in Congress and is beyond the scope of this EIS. This Act has provided funds to counties hard hit by reductions in timber harvest throughout the Pacific Northwest and other regions, as well as Southeast Alaska.

Communities

Comment: One comment stated that the "community use areas" used to assess potential effects to Sitka and Kake do not appear to adequately represent what these communities consider their use areas.

Response: The community use areas identified in the Draft EIS were originally identified for the 1997 Forest Plan Revision EIS. These areas are intended to generally represent the areas commonly used or related to by community residents in their local, day-to-day work, recreation, and subsistence activities. The community use areas are used to provide a more localized representation of data provided elsewhere in the Draft EIS. These identified areas may not fully encompass all areas used by local residents, but they provide a useful overview of LUD designations and suitable acres within the immediate vicinity of each community. Local residents concerned about potential impacts in areas outside the identified community use areas can find comparable information for these areas elsewhere in the EIS.

Comment: One comment expressed concern that the Communities subsection of the Draft EIS fails to adequately assess the economic effects of the alternatives on each community. The comment stated that the "section is focused subsistence use of deer and contradictory and not substantiated." Another comment stated that the Draft EIS does "little to nothing to show the effects of each alternative on individual Southeast Alaska communities."

Response: The comment does not identify what type of analysis the author thinks would be appropriate at the community scale, and does not provide any specific comments that can be addressed or examples of how the sections might be considered contradictory. As a result it is not possible to provide a specific response. The introduction to the Communities subsection in the Draft and Final EIS documents identifies some of the difficulties involved in trying to predict the effects of forest-wide management alternatives on community economies and explains that the community analyses do not attempt to quantify economic impacts in absolute terms because this is simply not possible (see the subsection titled: Analyzing Impacts to Communities).

The community analyses presented in the Draft and Final EIS documents do, however, provide a considerable amount of information about each community and illustrate how each community might be affected by the various alternatives. This analysis is consistent with those presented in the 1997 Forest Plan EIS and the 2003 SEIS.

Comment: A number of comments stated that the existing sawmills in Southeast Alaska require an economically viable wood supply from the Tongass to operate at full capacity and provide jobs in local communities. One comment also stated that the EIS analysis needs to evaluate impacts on a community-by-community basis and must not: "claim that the benefits from a growing community that does not depend on the timber industry somehow offset the negative impacts on communities that depend on the timber industry."

Response: The Draft and Final EIS documents evaluate the potential impacts of the proposed alternatives on a community-by-community basis in the Communities subsection of the *Subregional Overview and Communities* section. The EIS analysis is programmatic and not site-specific, which limits the ability of the analysis to project impacts at the community level. This is discussed further in the Communities subsection of the EIS (see the subsection titled: "Analyzing Impacts to Communities"). The EIS does not make any "claims" that suggest that benefits to one community outweigh negative effects to another. The positive impacts of Forest-wide planning decisions may not, however, be distributed evenly across the Forest, with some communities, those in the south, for example, bearing a larger share of the negative impacts associated with timber harvest than those to the north.

Comment: One comment pointed out that the discussion of the Silver Bay sawmill in Wrangell in the Communities subsection of the Draft EIS needs to be updated. Silver Bay came out of bankruptcy in 2004 and has stated that the mill would like to operate at capacity (65 MMBF annually).

Response: This section has been updated in the Final EIS and now states that Silver Bay continues to operate. The updated section also provides summary data based on the 2006 mill survey, which included the Silver Bay mill. The facility processed an estimated 6 MMBF in 2006 and employed 30 people (Juneau Economic Development Council 2007).

Comment: One comment noted that the discussion of Hoonah in the Communities subsection of the Draft EIS did not mention the Icy Straits Lumber Company mill and its role in the economy of Hoonah, and requested that this be added to the Final EIS.

Response: The Icy Straits mill and its location in Hoonah are discussed elsewhere in the Draft EIS (see Table 3.22-5, for example), but the mill was not specifically identified in the general discussion of Hoonah's economy presented in the Communities subsection. This information has been added to this discussion in the Final EIS.

Comment: The Draft EIS states that: "Tenakee Springs residents have been vocal in their opposition to tourism development." One comment noted that small-scale, locally-owned businesses catering to independent travelers are a large part of the Tenakee Springs economy. Local residents opposed cruise ship development, not all tourism development. This should be clarified in the Final EIS.

Response: The cited statement is attributed to Dugan et al. (2006) in the Draft EIS and is taken directly from their report: *Nature-Based Tourism in Southeast Alaska: Results from 2005 and 2006 Field Study*. The report presented the results of interviews with nature-based tourism businesses in Southeast Alaska communities, including Tenakee Springs. A note of clarification citing the comment author (Chichagof Conservation Council) has been added to this statement in the Final EIS.

Comment: One comment requested a balanced Forest Plan that provides employment opportunities in local communities. The comment author noted that people are moving from villages to larger urban areas for work and cited the examples of people moving from Hydaburg, Craig, and Klawock to Ketchikan, and people moving from Hoonah, Angoon, Kake, and Yakutat to Juneau.

Response: Population data are presented by community in the Communities subsection of the Draft and Final EIS. These data indicate that all of the communities referenced in the comment, with the exception of Juneau and Hoonah, experienced a net loss in population from 2000 to 2005. Ketchikan also lost population over this period. The seven alternatives presented in the Draft and Final EIS documents each provide a balance between different land uses on the Tongass, but the balance is weighted differently under the different alternatives.

Comment: Several comments stated that the data provided in the *Subregional Overview and Communities* and Environmental Justice sections of the Draft EIS indicate that Southeast Alaska is "in dire economic straits and fully justifies that the … (Forest Service) … should do everything possible to improve the viability of the forestry and mineral industries."

Response: This represents one perspective. Others providing comments believe that the future health of Southeast Alaska's economy is predicated on recreation and tourism and commercial fishing. These

comments argue that continued large-scale logging and mineral exploration seriously jeopardize this future. These represent contrasting visions for the future of the region. The Forest Service has proposed a range of alternatives that try to balance these competing visions.

Comment: Many general comments were received expressing concern about the economic plight of small isolated communities that have few well paying year-round jobs. One respondent focused especially on the community of Hyder in this respect and had a number of requests that might improve the situation such as designating a minerals development overlay LUD for the historic mining area near Hyder.

Response: As noted in response to the preceding comment, there are a number of competing visions for the future of the region. The EIS evaluates a range of alternatives that try to balance these competing visions. A minerals overlay has been added to the Hyder area under all of the action alternatives in the Final EIS.

Comment: One organization providing comments included several lists of "core principles" the authors believed the Forest Plan should address and implement with respect to community use. These lists included the following:

- **"Establish a shared and balanced vision of the values and uses of the Tongass National Forest**
- **Protect customary and traditional uses of the forest**
- **Protect key community use areas which Southeast Alaskans cherish and benefit from economically, socially, and culturally**
- **Provide a long-term management vision of the forest which ends the unsustainable practice of logging Inventoried Roadless Areas and seeks to meet the needs and benefit all who care about the forest, including residents, visitors, and other stakeholders."**

Response: The proposed Forest Plan alternatives evaluated in this EIS are designed to meet the goals identified in the above comment, to the extent possible, recognizing that the Forest Service is required to manage the Tongass for multiple uses and also seek to meet demand for timber under TTRA. The alternatives considered in this EIS range from Alternative 1, which involves the lowest projected levels of timber harvest and would not involve logging in roadless areas, to Alternative 7, which involves the highest projected levels of timber harvest and includes logging in roadless areas. The potential impacts of the proposed alternatives on customary and traditional uses of the forest and community use areas are assessed in the *Subsistence* and *Communities* sections of the EIS.

Fish and Watersheds

The Fish and Watersheds comment and response subsection is divided into the following categories:

- General
- Buffers
- Culverts and Roads
- Watersheds
- Forest Plan and EIS Revisions

General

Comment: Some comments disagreed with the assessment that none of the alternatives would result in significant declines of major fish and marine resources. Concern was expressed that none of the alternatives adequately protect fish and their habitat because all alternatives include some development LUDs in primary fish producing watersheds. Further, one comment stated that under all of the alternatives there would be large changes in temperature, sediment, and physical conditions in watersheds that supply important habitat for rearing fish.

Response: The suite of Forest-wide and LUD-specific standards and guidelines that have been in place since 1997 have proven through monitoring and research to be effective in protecting fish habitat and fish populations. These protections and monitoring efforts will continue under all alternatives. The Final Proposed Forest Plan does, however, include a number of changes to the standards and guidelines for riparian areas and for fish management, based on information developed in the 5-Year Forest Plan Review.

The EIS acknowledges that risks to aquatic resources would increase with more harvest and would vary by alternative (see the *Fish* section). Site-specific evaluations, and, if needed based on standard and guidelines, watershed analysis would be conducted for all timber sale proposals to evaluate if specific adverse affects would occur and identify how best to modify the actions to minimize these specific effects. One of the goals of the site-specific timber sale NEPA assessments is to ensure that significant adverse effects do not occur to important resources as a result of the timber sale.

Comment: One comment stated that the Draft EIS overstated possible impacts to fish passage and karst (page 2-53, Table 2-18) given the protective measures found in the Forest Plan.

Response: Table 2-18 (Summary of Effects Matrix) in the Draft EIS displays the effects of the seven alternatives on all potentially affected resources, including Karst and Fish, in a consistent manner to aid in comparison of the alternatives. Forest Plan standards and guidelines are implemented to protect or minimize the potential effects at the project level. Specific comments with respect to fish passage are addressed elsewhere in this section. Specific comments about karst are addressed in the Geology, Soils, Karst, and Caves section of this comment and response appendix. Table 2-18 has been updated in the Final EIS to reflect changes made between the Draft and Final EIS and for the Final Proposed Forest Plan.

Comment: One comment requested that additional discussion of the potential effects of the alternatives on fish populations and fisheries be provided. Another comment requested additional discussion of the potential effects of the alternatives on stream flow, temperature, transport of nutrients and feed from headwaters to fish rearing habitat, and the influence of large woody debris and beaver dams on fish productivity. One comment also questioned whether there really has been no effect on fish or fish populations from past harvest over the last 30 years.

Response: A general discussion of the types of effects that occur from timber harvest has been added to the *Fish* section of the Final EIS. This discussion includes potential impacts to many of these factors (e.g. temperature, nutrients, large woody debris). The effects of the alternatives on these factors are addressed indirectly by quantifying the relative difference in risk factors that influence these parameters. These factors include acres of harvest and miles of roads, which may, for example, influence temperature and large woody debris in streams. The likely effects at specific sites would be addressed through the project-specific NEPA process for any future timber sale or other development projects.

Additional discussion has been added to the Final EIS concerning the effects of past timber harvest practices on fish or fish populations. (Also see the cumulative effects subsection of the *Fish* section in the Final EIS for overall factors, including past, present, and reasonably foreseeable future actions that could affect fish). Effects to fish populations from future actions cannot be directly quantified given the number

of outside variables, such as ocean conditions and population fluctuations. However, past, present and future actions are discussed by quantifying factors known to have increased risk to fish habitat. It should be noted that all of the proposed alternatives have a substantial number of measures that would be implemented during timber harvest to protect fish habitat, many of which were not in place during most of the past timber harvest.

Comment: One comment requested that the EIS acknowledge the importance of salmon and their carcasses as input to the ecosystem of the forest and streams. The comment also stated that indirect and cumulative effects to salmon should be considered as part of the EIS analysis.

Response: Additional information has been added to the Final EIS discussing how salmon carcasses contribute to production in forest and stream ecosystems. Some general discussion of local effects to some anadromous and resident fish populations from older harvest methods has also been added. Cumulative effects are addressed relative to the effects of overall timber harvest-related actions with respect to risks to fish habitat. Overall effects to fish populations and returning salmon to streams cannot be directly determined from this analysis, but the relative direction of effects among the alternatives can be inferred.

Comment: Several comments raised the concern that timber harvest would adversely affect spawning fish in upper Tenakee Inlet, noting that this appeared to have occurred in other local streams. One comment suggested that the success of salmon production in Tenakee Inlet is due to the pristine conditions and noted that cool water is essential for salmon spawning.

Response: The amount of timber harvest in the Tenakee Inlet area varies by alternative (as shown in the alternative maps that accompany the Final EIS). Forest Plan standards and guidelines are intended to minimize or eliminate adverse effects to important aquatic resources. Further, specific effects to these resources would be evaluated during the project-specific NEPA process for timber sales and other projects.

Comment: One comment stated that the claim that logging harms fishing is contradicted by harvest data, which indicates that catch was much higher after most of the heavy harvest occurred then it was before.

Response: Some information has been added to the text in the *Fish* section discussing likely effects of past logging actions on fish numbers. Information is supplied that indicates there have been adverse effects from old logging practices on numbers of fish at specific sites. However, changes in the number of returning salmon are the result of many factors, including climate and ocean conditions, which play a large role and can change returns dramatically. Also there has been dramatic increase in hatchery fish production in recent years, affecting overall harvest. Additionally, the total amount of area directly affected by timber harvest, relative to the entire Tongass National Forest, is small so that any local changes in salmon runs would likely not be apparent in total harvest numbers from Southeast Alaska. These concepts are discussed in a number of the references cited in the Final EIS.

Comment: One comment recommended that the information used to summarize sport fishing effort and demand in the introduction to the Fish section in the Draft EIS be updated using the Alaska Department of Fish and Game (ADF&G) Statewide Harvest Survey. The comment also requested that Dolly Varden and cutthroat trout be added to Table 3.5-1, which lists commonly harvested sport, subsistence, and commercial fish.

Response: This information has been added to the Final EIS.

Comment: One respondent wanted to know when and how known problems with siltation from forest roads and deposits of detritus from log transfer facilities would be remedied.

Response: Potential siltation from forest roads would be addressed on a site-specific basis during the NEPA process for specific timber sales. Siltation would be controlled using Best Management Practices (BMPs) for roads, with these practices applied on a site-specific basis. This would also be the case for log transfer facilities. Additional information has been added to the text in the *Fish* section in the Final EIS. (See also the *Transportation and Utilities* section for more detail on potential log transfer facility effects.)

Comment: One comment noted that the latest definition of Essential Fish Habitat in Alaska should be used in the text. Another comment clarified how Essential Fish Habitat and the Magnuson-Stevens Act applies to this Forest Plan Amendment.

Response: The current definition of Essential Fish Habitat is included in the Final EIS**.** The Final EIS also discusses the Magnuson-Stevens Act and how it applies to the Forest Plan Amendment.

Comment: One comment provided a citation they believed was important relative to addressing fish die offs in Southeast Alaska streams. The paper noted that adult returning salmon mortalities were from natural conditions and not directly related to past harvest conditions.

Response: This information has been added to the *Fish* section of the Final EIS under the Important Components of Fish Habitat subsection.

Comment: One comment recommended that the Forest Service, in consultation with the State, develop objective criteria and protocols to use for stream classification, and train Forest Service staff in the application of these protocols. The comment also urged the Forest Service to maintain existing flexibility in the Class III guidelines to protect water quality and downstream fish habitat in a manner that is practical for timber harvesting.

Response: The Final Proposed Forest Plan includes objective criteria and protocols for stream classification. The Forest Service agrees that taking measures to promote consistent interpretation and application is important. A Forest Plan implementation training program will be developed and used to promote consistency after the Amendment is completed. That effort will be done collaboratively with the State and others.

Comment: One comment expressed concern over adequate funding for the maintenance of BMPs designed to protect fish. The comment author also felt that more protection, beyond BMPs, is needed on smaller streams, and pointed out that even non-fish streams have valuable riparian functions and also contribute wildlife habitat.

Response: Overall Forest Service funding is declining but implementation of standards and guidelines is not funding-dependent. Protection of fisheries is a high priority and adherence to standards and guidelines and monitoring of results will continue. Monitoring has not identified a problem with the current level of protection.

Comment: One respondent was concerned that hatchery fish would compete with wild fish to the detriment of wild fish. The comment stated that the Forest Service is standing by and allowing hatcheries to destroy the integrity of the wild habitat.

Response: The Forest Service manages habitat for wild fish (and other wildlife) within the Tongass National Forest. It does not manage hatcheries. This is a state issue and beyond the scope of this analysis.

Comment: Several comments wanted the Forest Service to reprioritize activities to make maintaining and enhancing salmon runs a top priority.

Response: The Forest Service in the Final EIS and Final Proposed Forest Plan is placing more emphasis on habitat restoration, including that relating to salmon habitat. This also includes prioritizing culvert replacement for areas that have the greatest need. Funding for this activity is dependent on Congress and Forest Service Management decisions. The Final Proposed Forest Plan includes standards and guidelines that are intended to protect aquatic resources and prevent effects that would inhibit maintaining fish runs.

Buffers

Comment: Some respondents felt that global warming may raise stream temperatures and could harm anadromous fish. One comment recommended that stream buffers be expanded to ensure waters stay cool and fish die offs are not caused by forest practices.

Response: Generally, stream temperatures on the Tongass are well below the point where fish would be affected. Some streams do have periods when they exceed optimal temperatures and the warming trend could compound this problem. The stream buffers required by the Final Proposed Forest Plan would provide shade which would help keep temperatures cool. Conversely, some streams in Southeast Alaska are colder than optimum, and the warming trend may improve conditions for salmon in these streams.

Past fish die offs have been documented in both harvested and unharvested watersheds and were reported to be primarily the result of flow conditions, air temperature, and the density of fish, not specifically the lack of shade or other harvest-related conditions. Future harvest practices are likely to have little direct effect on the occurrence of fish die offs during spawning. The current buffering system will supply abundant shade along fish streams under all alternatives and widening the buffers would not substantially change the shading. The one exception is Alternative 7, which would not require buffers on Class III streams, which may affect temperature.

Comment: One comment stated with respect to the importance of cool water temperatures for fish that there is an optimum temperature within which temperature changes are not harmful and may even be beneficial.

Response: The text in the *Water* section of the Final EIS was modified to discuss the importance of optimum temperatures**.**

Comment: Some comments stated that where logging occurs there should be wide stream buffers and units should be no larger than 20 to 30 acres.

Response: Current standards and guidelines require large wind firm buffers on streams. These are included in all alternatives. The average opening size is approximately 11 acres currently, primarily due to stream buffers.

Comment: Several comments noted the importance of headwater streams to the whole system. One comment supported including buffers on all Class III streams as recent evaluations and literature suggest that these streams require wood to properly function and Class III streams are important to the whole system by supplying fish food downstream, and are important to water quality.

Response: All the alternatives except Alternative 7 retain buffers on Class III streams. The effects of not having Class III stream buffers on sediment, water quality, and fish food supply are noted in the EIS.

Comment: A number of comments wanted the plan to ensure that buffer areas were present along streams and that roads were not allowed along river banks to ensure good quality habitat and prevent water heating and pollution.

Response: The current Forest Plan provides adequate buffers to ensure temperature is not changed as a result of logging. Trees in buffers are only removed where roads cross streams, and guidelines ensure that long lengths of stream buffer are not removed for road placement.

Comment: Several comments requested that riparian and beach buffers recommended in the Draft EIS be developed in consultation with the Alaska Department of Natural Resources to ensure that they are consistent with Alaska Forest Resources and Practices Act when implemented adjacent to non-federal lands.

Response: The process of establishing riparian buffers and beach and estuary buffers included addressing the concerns of State of Alaska relative to this issue. The establishment of buffer sizes considered many factors including the benefits and deficits of various buffers widths. These buffers were primarily established to protect natural resources, including fish and wildlife. With the exception of Alternative 7, the buffer widths proposed in this Amendment are the same as those under the current Forest Plan and monitoring has shown these buffers to be effective. Reducing buffers adjacent to non-federal lands to make them consistent with State requirements would not provide the level of protection needed to meet the objectives of the Forest conservation strategy.

Comment: One comment stated that no harvest should be allowed along streams or along the beach. Another comment requested that the Forest Service increase stream buffers from 200 to 500 feet depending on the stream channel.

Response: All alternatives except Alternative 7 provide no-harvest buffers along Class I, II, and many III streams and a 1,000-foot, no-harvest buffer along the beach. Alternative 7 provides no-harvest buffers along Class I and II streams and a 500-foot no-harvest buffer along the beach. Stream buffers vary in width, depending on site-specific conditions, including stream class, channel type, and the risk of windthrow. See Appendix D of the Final Proposed Forest Plan.

Comment: One comment questioned whether a 100-foot buffer on Class III streams was needed. The comment noted that studies suggest that 90 percent of sediment runoff was successfully filtered with a 10-foot buffer, and thought a 60-foot buffer would be more than sufficient to filter out contaminants.

Response: There are multiple reasons for buffers on Class III stream, not just for filtering. The Final EIS notes some of the purposes. A recent review by the Forest Service (Paustian et al. 2006) evaluated the appropriateness and need for buffers on Class III streams and the importance of Class IV streams. One of the items noted was that large wood was needed in Class III streams for them to properly function. Wood from adjacent riparian areas enters these streams in many ways, but requires a riparian source.

Typical mature tree height is often in the range of 100 feet, so reducing the buffer width has the potential to reduce wood supply. Some wood from Class III streams, depending on valley morphology, enters fish streams and contributes to habitat in those areas as well. The wood in Class III streams also controls rates of sediment entry into fish streams. Additionally, more than 50 percent of the water in a basin originates in Class III and IV streams. So effects such as changes in water temperature, possibly from small buffers, have potential to affect downstream temperature. Much of the food supply in fish streams originates from Class III streams and a significant portion of that food source is terrestrial, entering from riparian vegetation. A substantial reduction in riparian trees could affect this supply. Alternative 7, however, does not require buffers on Class III streams. This alternative would likely have additional adverse effects to fish resources not common to the other alternatives.

Culverts and Roads

Comment: Several comments were received concerning culverts that block fish passage. A concern was expressed that funds for the replacement of past passage problems at existing culverts have decreased. Some comments requested that the Forest Service commit to replacing existing culverts that currently block fish passage and fund maintenance of existing roads before constructing new roads; others suggested that restoring passage at culverts not currently meeting fish passage criteria should be a high priority for the Forest and that plans to repair passage problems in future timber sales should be included in the Proposed Forest Plan. Some respondents requested that an analysis identifying how culverts influence cumulative effects to fish resources be included in the Final EIS.

One comment requested that a recently developed model for determining the biological significance of not meeting passage at individual culverts be included in the EIS analysis, as well as the cost of fixing past culvert passage problems. The comment also requested that specific citations concerning road and culvert effects on fish be noted in the EIS text.

Response: The Forest Service considers fish passage to be an important priority and has an ongoing program to eliminate or replace culverts that do not provide passage. The Forest Service plans to continue to address past culvert problems as funding is available. The budget for this work is appropriated through Congress on an annual basis. National Forest budget requests are considered as part of total budget requests submitted to the U.S. Congress by the executive branch each year, with Congress determining the annual appropriation. Determining funding levels is outside the scope of this Forest Plan Amendment EIS. Current standards and guidelines for culvert installation have requirements to ensure fish passage is provided when fish are present at the crossing areas. These guidelines differ from the guidelines that were in place when most of culverts that have fish passage problems were installed. As a result, fish passage problems from future installations are expected to be comparatively rare.

Additional information on the status of the current culvert inventory relative to fish passage has been added to the *Fish* section of the Final EIS. The number of potential stream crossings identified in the EIS provides a relative approximation of the potential number of culverts by alternative; an exact number of future culverts cannot be determined prior to site-specific analyses. The exact number of culverts would be determined for each specific timber sale or other project and the potential effects would be addressed as part of the project-specific NEPA analysis at that time. The Forest has a substantial database that identifies the status of nearly all existing culverts and includes fish passage information. Two citations were added to the *Fish* section in the Final EIS, as requested; however, some of the other citations were not added because the issues they addressed had already been discussed in the analysis, and the information these documents provided on the number and status of culverts on the Tongass was less exact and older than the specific data reported in the Final EIS.

Comment: One comment questioned the use of the term "restored" for improving fish passage for culvert replacement. The comment stated that in a substantial number of cases passage conditions before culvert replacement would have allowed most fish to pass most of the year, and replacement in many of these cases was intended only to ensure passage at infrequently occurring flow conditions.

Response: The discussion of culvert replacement presented in the *Fish* section under Fish Habitat Enhancement has been expanded in the Final EIS to provide additional information with respect to culvert replacement.

Comment: One comment stated that the characterization of road effects on stream sedimentation in the *Fish* section under General Effects, Roads, was exaggerated. The comment included a document containing data from some specific sediment studies. Additionally, the comment noted that the Draft EIS statement that roads could contribute to overharvest of fish should be excluded because fish harvest is a fish management issue and not a direct result of road development.

Response: The text does not specifically quantify the magnitude of road effects on sediment and, therefore, the EIS does not exaggerate the effects. Potential sediment effects are evaluated on a site-specific basis during the NEPA evaluation of timber sales. The general statements on road/sediment effects and the effects to fish harvest in the Draft EIS were retained in the Final EIS. Fish harvest is a management issue, but increased access can lead to overharvest in the absence of harvest management actions and it cannot necessarily be assumed that ADF&G harvest management would change fishing regulations in areas where new roads are built. Again, site-specific effects would be evaluated through the NEPA process for each timber sale.

Comment: One comment stated that using the number of road crossings and road miles by alternative as an index of sediment input and fish passage problems was not justified. The comment stated that new culvert designs ensure fish passage and road management would ensure sediment runoff meets standards.

Response: The standards and guidelines in the Final Proposed Forest Plan are intended to achieve these goals. However, even with the best practices not all goals are completely achieved. For example, the EIS notes that culverts installed under the new guidelines are very good at achieving the passage guidelines, with 93 percent meeting current passage criteria. Therefore, if the percent not meeting the criteria (e.g., 7 percent) remains the same the greater the number of culverts installed, the greater the number of potential fish passage problems. Also, monitoring indicates that even under new standards for road construction some short term increases in turbidity occur. Therefore, as with culverts, the greater the number of road miles, the greater the likelihood of exceeding the sediment (turbidity) standards. Thus, the comparison is a reasonable way to assess the alternatives on a forest wide basis. Site-specific evaluations of potential passage and sediment problems would be made for any future timber sale through the NEPA process and more specific information would be used at that time to evaluate potential effects.

Comment: One comment noted that there are always impacts to water from road construction or presence and that the EIS should display a habitat reduction factor for every mile of road constructed.

Response: The EIS acknowledges the risks of roads to fish habitat and states the greater the number of road miles the greater the risk. But with new guidelines for construction, the plan is to keep these risks to low levels with measures such as avoiding steep unstable slopes, taking roads out of use after harvest is complete, including removal or bypassing culverts, and ensuring new culverts meet more stringent fish passage criteria. Therefore it is not reasonable or possible to develop a reduction of habitat amount based on the number of road miles. The specific effects of proposed road systems will be evaluated

during the NEPA process for timber sales and other projects, and as needed adjustments will be made to the individual plan to reduce the risks and ultimately the effects of roads to fish habitat.

Watersheds

Comment: Several comments wanted the Forest Plan to prevent all road building and logging in primary salmon producing watersheds as identified by ADF&G and specify that watershed analyses be completed prior to any timber sale. Some comments noted that entire watersheds need to be protected from development to ensure the protection of anadromous fish resources. Some comments recommended that additional protections should be applied to 23 specific watersheds. The suggested protections primarily relate to new roads .

Many respondents asked that watersheds be protected. Some mentioned high value watersheds while others discussed the importance of protecting "intact" watersheds—those that have all their ecological parts and functions—from timber harvest and road construction. One comment included a summary of the findings of the 1997 Panel that evaluated potential harvest alternative guidelines and the potential concerns for these actions, and also cited a document by Bryant and Everest (1998) that discusses the likely effects of past and future harvest on fish stocks in Southeast Alaska.

Response: The Forest Service does not dispute that watersheds without disturbance have a greater chance of having consistent runs of salmonid stocks than those that are highly disturbed. However, current standards and guidelines for timber harvest and road construction are greatly improved over past methods, and comparing past impacts to salmon stocks from old harvesting methods to current ones is not an appropriate comparison. While there is a legacy of some problems from past actions, future conditions in newly harvested watersheds would not have marked impacts. The EIS acknowledges the potential problems, concerns, and risks identified by the 1997 panel and many of the panel recommendations for protecting fish resources and watersheds were included in the alternatives.

Comparisons provided by Bryant and Everest (1998) consider the effects of past harvest practices, as well as those that were implemented at that time (1998). They note the importance of maintaining pristine watersheds, but they also indicated that 75 percent of the Tongass National Forest is in relatively protective LUDs. Current analysis based on road miles indicates that 70 percent of all Tongass National Forest Value Comparison Units (VCUs) have no roads, and are, therefore, undeveloped. The alternatives considered in this EIS could reduce this percent over a 100 year period to between 51 and 68 percent, depending on the alternative. This would only occur if the alternative is fully implemented and it may be noted that harvest over the last decade has been much less than predicted in the current plan. In any case, the majority of the Tongass would remain pristine under any alternative.

As noted in the EIS, the National Marine Fisheries Service (1996) considers most watersheds with less than 2 miles of road per square mile to be "properly functioning" with respect to ESA-listed salmon and steelhead. Currently, less than 3 percent of the VCUs on the Tongass National Forest exceed this road density. Under the alternatives considered in this EIS, this percent could increase to about 6 to 10 percent over a 100 year harvest period if site-specific NEPA analysis indicated that exceeding this road level would not significantly affect the watershed. It is likely that over 90 percent of watersheds within the Tongass would still be considered "properly functioning" 100 years from now even under Alternative 7.

ADF&G (1998) developed a list of VCUs that met certain requirements relative to importance for fisheries, wildlife, and other community factors. They identified about 26 percent of all VCUs in Southeast Alaska as "Primary Salmon Producing Watersheds." The state used this document to provide a request to the Forest Service for revisions to the 1997 Forest Plan. The Forest Service considered the request by the State, which made the following recommendation:

> "work with communities to determine which of these areas should have appropriate management prescriptions that protect community use and fish and wildlife values. Avoiding or minimizing timber

harvest in areas of high community use will increase predictability and reliability of the timber supply and ensure the viability of all forest uses."

The watersheds referred to include the primary salmon-producing watersheds. The quote above indicates there was not a specific request to prevent all harvest and road building in all of the primary salmon producing watersheds, but to work with communities in development of specific harvest plans. The Forest Service has done this in the past and will work with communities in the future. As illustrated by the preceding quote, it is apparent from the ADF&G (1998) document that total elimination of harvest in all these watersheds was not the intent of the evaluation or recommendations at that time.

The Forest Service believes that the standards and guidelines and the NEPA analysis for specific timber sales will adequately protect the fish resources in these watersheds. Reclassifying these watersheds to different LUDs is not required to meet resource protection objectives. Watershed analysis is designed to help set the stage for project planning and associated environmental analysis; however, requiring complete watershed analysis prior to any timber sale is not required to meet Plan objectives. Additional analysis was done for the Final EIS to determine the effect of each alternative on intact watersheds. This type of analysis will help ensure that watershed functions are maintained whatever project may be planned.

Comment: One comment noted that although the proposed Forest Plan includes increased protection for headwater streams, watershed analysis and cumulative effects analysis should be conducted before any significant resource extraction takes place.

Response: The Forest Service believes that the proposed standards and guidelines would adequately protect fish and water resources on the Tongass National Forest and does not see a need for additional restrictions at the Forest Plan level. Analysis conducted under the NEPA process would evaluate site-specific resource impacts and cumulative effects from individual timber sales or other extractive activities, and adjustments would be made as needed to ensure protection of these resources. The amount and location of land available for timber harvest varies greatly by alternative. Forest Plan standards and guidelines protect watershed resources and watershed analysis can be conducted where conditions indicate the need.

Comment: One comment provided information on the status of development in flood plain forests and stated the information provided indicated that some areas that have already been moderately developed should get greater watershed scale protections for flood plain forests associated with anadromous fish streams. They also noted this is justification for protecting a greater number of intact watersheds with high salmon values and pointed out that active restoration should occur in these areas.

Response: The current standards and guidelines include large buffers for floodplain streams, much larger than existed in past decades. The Forest Service believes that these are adequate to protect anadromous fish resources in flood plain areas. Additionally, the level of past development within watersheds is one of the factors considered when developing timber sales. These factors are all considered during the site-specific timber sale NEPA process. As noted in the Final EIS, there already are large tracts of watershed within the Tongass Forest that are not included in any harvest plan. At this time the Forest Service does not believe setting aside additional specific watersheds is needed to protect anadromous fish resources.

Comment: One comment noted that a recent Trout Unlimited document "Where the Wild lands are: Southeast Alaska" (Curley and Bristol 2006) states that 72 percent of all salmon populations in southeast Alaska are found in undeveloped watersheds. Another comment noted that the salmon and steelhead population distribution relative to roadless watersheds ranges from 67 to 76 percent, depending on the fish stock.

Response: Currently, approximately 70 percent of all VCUs in the Tongass National Forest have no roads (see Table 3.6-9 in the EIS), while the remaining 30 percent have varying amounts of roads. The ratio of "roaded" to "unroaded" VCUs is similar to the ratio of where salmon populations occur. Seventy-two percent of the salmon are in 70 percent of the VCUs. One implication of this comparison could be that the relative distribution of salmon populations is independent of roads and other development. We are not implying that past harvest has had no effect on fish resources; only that interpretation of this general statement does not present a good measure of effects of development.

Comment: Several comments requested that certain watersheds be restored. One comment included an ecologically based list of watershed restoration projects they would like the Forest Service to consider.

Response: The Forest Service has increased emphasis on restoration considerations in the Final Proposed Forest Plan. There are several ongoing actions in place, such as road decommissioning and repair, culvert improvement for fish, and various habitat enhancement projects. All of the activities are dependent on funding and overall assessment of needs with consideration of which specific watershed areas have priority for restoration activities. There are general plans to improve the common watershed problems related to roads forest wide.

Comment: One comment recommended that the Forest form one watershed analysis team to perform consistent, high quality watershed analyses prior to any timber harvest.

Response: The Forest uses an interdisciplinary approach to analysis, as required by NEPA. The Forest intends to provide training to ensure that analysis teams provide consistent analysis across the Forest.

Forest Plan and EIS Revisions

Comment: One comment asked why the word "assured" has been removed from before "protect riparian habitat" in Riparian standard and guideline 1.II.A.1?

Response: Numerous minor edits have been made throughout the Proposed Forest Plan to provide clarity, promote consistent interpretation, and to reduce redundancy. These minor edits were carefully considered so as to not significantly change the basic intent of the text or Plan itself. "Protect riparian habitat" is a direct, clear statement, while "Assure the protection of riparian habitat" is a somewhat convoluted way of saying the same thing. The basic objective remains the same.

Comment: One respondent suggested adding a fish restoration section to the Fish Standards and Guidelines in the Proposed Forest Plan.

Response: Fish restoration has been a priority on the Tongass for many years. It is one of the primary goals listed in the Proposed Forest Plan (see page 2-3). Standards and guidelines for fish restoration are included in the Fish section of the Final Proposed Forest Plan.

Comment: Concern was expressed that Class II fisheries value identified in the Proposed Forest Plan might be too closely tied to economic value and not consider ecological, genetic and other values.

Response: The intention was to simply contrast the value of Class II streams with Class I streams. While they all have important values, Class II streams clearly have less overall value to fisheries because, as stated in the text, they are not anadromous and often have natural barriers to fish movement.

Comment: One comment stated that steelhead should be listed as a species of concern in the EIS.

Response: A species of concern is a specific Federal ESA designation used by the U.S. Fish and Wildlife Service or the National Oceanic and Atmospheric Administration (NOAA) Fisheries. No steelhead population in Alaska is currently identified by either agency as a species of concern under this designation. Assigning this type of designation is outside the Forest Service's responsibility and the scope of this Forest Plan Amendment. The Forest Service does, however, develop a list of "sensitive species" which includes some fish, as noted in the EIS. No steelhead stocks have been determined to meet this designation on the Tongass National Forest. This species list is periodically reviewed and if warranted based on the status or sensitivity of a stock, the species on this list can be changed.

Comment: One comment recommended that "bankfull width" be changed to "average bankfull width" in the Fish Standards and Guidelines. They also recommend that the Proposed Forest Plan distinguish between restoration and improvement because they believe that the Forest should focus on restoration activities.

Response: Bankfull width is the correct term. The word "average" from "average bankfull width" was removed from the equation in the next line to be consistent. Restoration was added to the Fish Habitat Improvement section and the following statement: "Give priority to restoration projects" was added under Fish Habitat Restoration and Improvement.

Comment: One comment recommended that the Watershed Resources Improvement subsection in the Soil and Water Standards and Guidelines be changed to Watershed Restoration and that several similar changes be made in the text.

Response: These changes have been made in the Final Proposed Forest Plan.

Comment: One comment recommended that a passage and citation be added to Appendix G concerning the potential harmful effects of bark debris near Log Transfer Facilities.

Response: This change has been made in the Final Proposed Forest Plan.

Comment: One comment stated that the term "riparian project areas" used in Riparian Planning II, B. 3 (on page 4-62 of the Proposed Forest Plan) should be further described.

Response: This term is not used in the standards and guidelines. The term "Riparian Management Areas" is used throughout, including the location referenced in the comment. This term is defined in the glossary to the Proposed Forest Plan.

Comment: One comment recommended that the Riparian Management Area be expanded to include the "entire floodplain for unconfined alluvial flood plain channels, alluvial fan channels, and glacial outwash channel, high mass-movement hazard soils and wetland fens."

Response: As noted in Appendix D of the Final Proposed Forest Plan, the areas identified in the comment are generally included in the riparian buffers.

Comment: One comment stated that some of the groups involved with habitat enhancement activities were not identified in the *Fish* section under Fish Habitat Enhancement.

Response: This section has been modified in the Final EIS to identify additional groups involved in habitat enhancement.

Comment: One comment requested that several edits be made to the subsection of the Draft EIS *Fish* section that addresses invasive aquatic species. These changes included the addition of a specific citation and the addition of cordgrass and green crab to the discussion of invasive species.

Response: This information has been included in the Final EIS.

Geology, Soils, Karst and Caves

Comment: Several comments cited the unique and valuable nature of karst lands in the Tongass National Forest, the connection between karst lands and fisheries resources, and a legacy of damage to karst lands caused by historic timber harvest as justification for further protections of karst lands in the Proposed Forest Plan. Some comments favored no additional timber harvest or road construction activities on karst lands and one suggested that substantial portions of second-growth karst forests should be allowed to return to old-growth conditions. Several comments called for additional research into karst systems and potential impacts of land management before allowing any further timber harvest on karst lands. One comment noted that the Draft EIS did not present permanent protection of karst lands as the best way to ensure ecological integrity. Another suggested greater protections for moderate vulnerability karst lands, including avoiding road construction and rehabilitating and restoring existing roads.

Response: The Forest Service considered a range of alternatives that included differing degrees of potential timber harvest and road construction activities. All but Alternative 5 (the No Action Alternative) would move about 42,870 acres of high vulnerability karst lands into the Special Interest Area LUD. Geologic Special Interest Areas have unique geologic features, including caves. Chapter 3 of the Final Proposed Forest Plan states that Special Interest Areas would be classified as unsuitable for timber production. Under the action alternatives, limited salvage of windthrown timber would be allowed along existing roads within these areas, as long as karst and cave resource values were met. Opportunities for management of the young-growth stands in these areas are emphasized consistent with protection of karst and cave resources.

The Draft EIS evaluated the potential effects of each alternative on karst resources. These alternatives did not exclude harvest from all karst lands, in part based on the findings of the Karst Review Panel that the implementation of the Karst and Cave Standards and Guidelines from the current Forest Plan had ensured a high level of protection for karst resources overall (Griffiths et al. 2002). The Panel noted high standards in both the philosophy of management and the way that specific management practices were formulated and applied. Implementation of specific policies and procedures was found to be very good and in general compliance with the stated goals and objectives of the karst program. The Panel also noted the extent to which high vulnerability karst had been protected since 1997. In addition, the Panel outlined the actions required to more actively manage karst landscapes covered with second growth stands and recommended a new procedure for assessing the autogenic (precipitation on carbonate rocks) recharge component of karst units. These suggestions were incorporated into the action alternatives. Refer to the EIS for additional information.

The Karst and Cave section of Appendix B to the Final Proposed Forest Plan identifies several research needs, including studies that better define the effects of timber harvest and road construction on karst lands, and studies to determine the influences of forest road construction on sediment and woody debris delivery to karst drainage systems. The Proposed Forest Plan requires an adaptive management

approach for managing karst resources that will allow incorporation of research results in management approaches. More information is provided in Chapters 4, 5, and 6 of the Proposed Forest Plan.

Comment: A number of comments expressed concern about the lack of enforceable standards in the proposed Karst and Cave Resources Forest-wide Guidelines (and related Appendix H). Several comments noted that this section of the Proposed Forest Plan differed from others by providing only guidelines, as opposed to standards and guidelines. Many offered that the Proposed Forest Plan was significantly improved with respect to karst management, but several comments suggested that the language in the proposed Karst and Cave Resources Forest-wide Guidelines (and related Appendix H) allowed too much flexibility in karst management through the use of terms like "should" and "may" instead of "shall". A few comments noted that the Equivalent Clear-cut Area approach described in Appendix H could mitigate impacts from previous timber harvest on karst lands but that the approach was "hypothetical" and not enforceable.

Many suggested that the adaptive management approach would allow politics to sway decisions to the detriment of karst resources. Furthermore, two comments noted the lack of detailed monitoring requirements to implement the adaptive monitoring approach.

Response: The Proposed Forest Plan includes both standards and guidelines but generally requires managing karst lands with an adaptive management approach. The title of the section has been revised to Karst and Cave Resource Standards and Guidelines to reflect that Karst and Cave Standards and Guidelines are consistent with, and as enforceable as, standards and guidelines related to other resources in the Forest Plan. The Karst and Cave Resource Standards and Guidelines (Chapter 4) allow karst managers to exercise their professional judgment in developing karst management strategies and prescriptions. As knowledge is gained from implementation, monitoring, research, and studies, recommended practices will be modified to reflect the needed changes.

Chapter 5 of the Proposed Forest Plan describes monitoring and evaluation as key aspects of adaptive management, which provide feedback on implemented activities and the effectiveness of associated resource protection or mitigation measures. Additional sources of feedback include scientific literature and studies, resource inventories, changes in technology, and public concerns. Chapter 6 describes the monitoring and evaluation plan for Karst and Cave Resources. The monitoring and evaluation plan is not intended to depict all monitoring, inventorying, and data gathering activities undertaken on the Tongass, or to limit monitoring. Many other monitoring activities are conducted under direction contained in site-specific project plans developed under the programmatic guidance of the Forest Plan.

Comment: One comment supported the Autogenic Recharge Area Assessment Procedure and Equivalent Clear-cut Acre approaches described in Appendix H of the Proposed Forest Plan. These approaches allow for consideration of past timber harvest and other management activities on karst lands in evaluating karst lands for potential future activities. The comment expressed concern, however, that these approaches may not be implemented as proposed.

Response: The Proposed Forest Plan establishes the adaptive management strategy for managing karst resources. Using this approach, the Autogenic Recharge Area Assessment Procedure, Equivalent Clear-cut Acre, and other approaches would be overseen by qualified karst managers. See also the response to the preceding comment.

Comment: One comment stated that impacts from roads on moderate vulnerability karst lands should be monitored, and road maintenance activities, including culvert replacement, should not damage karst areas. Another comment noted that road construction seems to be addressed fairly well in the Proposed Forest Plan, but stated that standards and guidelines should require maintenance of existing roads to include construction of drainage systems that meet current

guidelines. The comment also stated that retired roads should include drainage systems that are protective of karst lands. A third comment requested that a standard be added requiring adequate "restocking on stored roads", and the exploration of restoration options, such as road obliteration, on moderate and high vulnerability karst lands.

Response: The Proposed Forest Plan is programmatic, meaning that it provides forest-wide management direction. Chapter 6 of the Proposed Forest Plan lists monitoring of compliance of land-disturbing projects (which would include roads) with Karst and Cave Forest-wide Standards and Guidelines, as well as monitoring of the effects of management activities (which would include roads) on karst resources. Road maintenance activities and any reconstruction or restoration activities would be covered under a project-specific plan which would be evaluated through a separate NEPA process. Road-related management activities would be implemented under the Karst and Cave Forest-wide Standards and Guidelines.

Comment: One comment stated that no recreation development should be allowed on high vulnerability karst lands and pointed out that the Proposed Forest Plan allows limited recreation development on high vulnerability karst lands.

Response: Section 3 (High Vulnerability Karst Lands), subsection b (Karst Management Objectives and Appropriate Land Uses) describes the limited recreational development that may be appropriate on high vulnerability karst lands. This section further explains that recreational facilities and trails would have to consider karst resource values and objectives, particularly with respect to reducing disturbance of significant epikarst features and sensitive soils, and the use of construction methods that avoid erosion and diversion of natural drainage waters into karst features. The Forest Service believes that this consideration would sufficiently limit recreational developments to protect high vulnerability karst lands.

Comment: One comment applauded the focus on managing second growth on karst lands, but wanted to see thorough scientific studies (including monitoring and evaluation) before any large-scale second-growth management is implemented. The comment stated that road construction for management would damage karst lands, and expressed concern that research be conducted to determine whether pre-commercial or commercial thinning would benefit karst lands and to assess the potential impacts.
Another comment noted that funds for pre-commercial thinning are limited, and that the Forest Service should prioritize thinning on second-growth areas that will be available for future harvesting and can benefit wildlife, rather than on karst areas where timber harvest is not allowed. Other comments stated that implementation and effectiveness monitoring of young-growth management on karst lands should be required to assess whether karst management objectives can be met.

Response: The Proposed Forest Plan notes that pre-commercial thinning is appropriate on all karst lands when the karst management objectives can be met. It does not attempt to prioritize funding for pre-commercial thinning projects on or off karst lands. The specific benefit of pre-commercial thinning projects on wildlife or timber potential would be assessed during the project-specific planning process. Chapter 6 of the Proposed Forest Plan describes implementation and effectiveness monitoring under karst and caves. This includes monitoring the compliance of land-disturbing projects with Karst Standards and Guidelines, and monitoring of effects of management activities on caves and karst landscapes, both of which would address young-growth management on karst lands.

As described in the response to a previous comment summary, the Karst and Cave section of Appendix B identifies the need for research to better define the effects of timber harvest and road construction on karst lands. The results of these studies will be incorporated into management decisions through the adaptive management approach described in the karst sections of the Proposed Forest Plan, as well as in Chapter 5. Finally, all the alternatives except Alternative 5 (the No Action Alternative) would move

about 42,870 acres of high vulnerability karst lands into the Special Interest Area LUD. These areas would be classified as unsuitable for timber production.

Comment: One comment stated that the Draft EIS failed to take into account past timber harvest on karst lands, and instead of protecting the remaining karst forest by strengthening standards and guidelines, it proposes to weaken them. The comment specifically notes that future timber harvests are proposed on karst lands in Tuxekan, Hecata, northwest Prince of Wales Island, and Kosciusko. Another comment notes that the cumulative effects of previous timber harvest and road construction on karst lands were not considered in developing the standards and guidelines for future timber harvest.

Response: The Final EIS takes into account past timber harvest activities. Furthermore, the EIS discloses that all but Alternative 5 (the No Action Alternative) would move about 42,870 acres of high vulnerability karst lands into the Special Interest Area LUD. As noted in response to a previous comment summary, Chapter 3 of the Final Proposed Forest Plan states that Special Interest Areas would be classified as unsuitable for timber production. The EIS includes a discussion of cumulative effects, including the effects of previous and proposed timber harvest and road construction activities on karst lands by alternative. This discussion has been expanded in the Final EIS. Site-specific activities, such as specific timber harvests, are beyond the scope of this document and are instead addressed at the local level under separate NEPA processes.

Comment: One comment expressed concern about the following statement under Karst in Table 2-18 (Summary Effects Matrix) of the Draft EIS: "The relative effects on karst resources are proportional to the amount of karst lands in the mapped suitable forest land base." The comment asserted that timber harvest would have no significant impact on karst and that construction would have very minimal impacts on karst.

Response: The Draft EIS states: "Potential effects on karst lands from planned timber harvesting, associated road construction, and quarry development may occur; however, with careful implementation of the current or proposed standards and guidelines (as modified through ongoing monitoring and adaptive management), and site-specific mitigation measures (designed and implemented at the project level), the Forest expects to mitigate the effects of any proposed activity. Site-specific mitigation measures include protection of the high vulnerability karst areas and features, partial cutting, reduced harvest unit size, use of logging systems that achieve at least partial suspension, reductions in rate of harvest, and other changes in logging practices."

This text in Table 2-18 has been clarified in the Final EIS.

Comment: One comment noted that the Tongass does not have a catchment area management strategy for autogenic recharge areas and asked what steps were in process to develop this strategy.

Response: The Proposed Forest Plan provides the direction necessary to protect and manage autogenic recharge areas and other specific needs associated with karst and cave resources.

Comment: Based on the Federal Cave Resource Protection Act, one comment requested that the word "feasible" be changed to "practical" in the sentence: "Maintain, to the extent feasible, the natural karst processes and the productivity of the karst landscape while providing for other land uses where appropriate."

Response: The proposed change from feasible to practical has been incorporated in two places in the Proposed Forest Plan, as suggested.

Comment: One comment requested more specific guidance regarding when, and how many, dye trace studies are needed to credibly delineate recharge areas during karst vulnerability mapping.

Response: The Proposed Forest Plan adequately addresses the need for design criteria for dye trace studies to delineate recharge areas during karst vulnerability. It is also reasonable to assume the proper skill level and expertise will be used in all karst-related work including dye trace studies.

Comment: One comment stated that the Draft EIS lacks important information to assess impacts of the alternatives on karst resources, including: miles of road on karst lands, acres of previously harvested karst lands, how well harvested karst lands have regenerated, how well roads on karst lands have been maintained, and the current road maintenance backlog.

Response: The Draft EIS states: "GIS queries show that a total of 95,479 acres (21 percent) of the karst lands managed by the Tongass National Forest have experienced timber harvest." The Draft EIS also explains, "In some portions of the Tongass National Forest, 70 to 80 percent of the commercial forest land within specific karst blocks has been harvested. It is estimated that about 50 percent of the karst lands below 1,400 feet in elevation and on slopes less than 60 percent in the Thorne Bay Ranger District have had timber harvest (based on the GIS database)." Additional information has been added to the Final EIS, including miles of road on karst lands, and a discussion of how well harvested karst lands have regenerated and how well roads have been maintained.

Comment: One comment requested that section D.1 on page 4-22 of the Proposed Forest Plan refer to section D.2.c. This reference would clarify the proposed management of a high vulnerability feature within a low vulnerability area and the applicable karst feature buffers that would apply.

Response: This change has been made to the Proposed Forest Plan, as suggested.

Comment: One comment expressed concern over the designation of "minor" resurgences with almost no connectivity between the open atmosphere and the underground system as moderate (as opposed to high) vulnerability karst lands. The comment mentioned observations of karst systems with resurgent springs with no surface connectivity but that may merit high vulnerability status. The comment expressed doubt that sufficient field reconnaissance would be possible to accurately characterize high vulnerability areas.

Response: The Proposed Forest Plan states that resurgences can be classified as moderate or high vulnerability depending on size, habitat, and level of atmospheric connectivity between the resurgence and the underground karst system. Minor resurgences which seep out of the ground between gravels with almost no connectivity between the open atmosphere and the underground system will be classified moderate vulnerability. This designation will be made by a qualified karst management specialist, who would also design appropriate protection measures for moderate vulnerability resurgences and springs on a case-by-case basis.

Comment: One comment strongly objected to the wording in the Proposed Forest Plan that indicated that the karst lands on the Tongass National Forest were considered open to mineral development. The Proposed Forest Plan states: "It is not the intent of these standards and guidelines to restrict any lands from mineral development, though that may be appropriate if a specific project or area is allocated to the "Special Interest Area" Land Use Designation." The comment paraphrased the 1988 Federal Cave Resources Protection Act requirement that the agency responsible for land management in karst areas must protect those caves and features.

Response: The Federal Cave Resources Protection Act of 1988 states that NFS lands will be managed in a manner which, to the extent practical, protects and maintains significant cave resources in accordance with the policies outlined in the Forest Service Directive System and the management direction contained in the individual forest plans. The Proposed Forest Plan states that the impacts of any proposed mineral development within the karst landscape would be analyzed through the environmental analysis that would be triggered once a Plan of Operation was received.

Comment: One comment expressed concern that the Forest Service will continue to hold cave location information confidential and not distribute location information per the 1988 Federal Cave Resources Protection Act. The comment encouraged continued collaboration with caving organizations, including collaboration to define appropriate uses, discuss cave classifications, consider potential cave developments, and solicit volunteers.

Another comment commended the Forest Service for the extensive rewriting of the Forest Plan, noting that management of karst and cave resources was better defined and more clearly described than in the previous Forest Plan. They anticipate future collaboration and volunteer work with the Tongass.

Response: The Forest Service intends to continue to "foster communication, cooperation, and exchange of information between land managers, those who utilize caves, and the public", per Section 4 (c)(2) of the 1988 Federal Cave Resources Protection Act. The Forest Service also intends to continue to implement 36CFR 290.4 and Section 5 of the Federal Cave Resources Protection Act, which requires that it maintain the confidentiality of information concerning the nature and location of significant caves.

Comment: One comment expressed concern about the change in non-harvest buffers related to insurgent streams in moderate vulnerability karst lands between the previous Tongass Plan Implementation Team clarifications and the Proposed Forest Plan. The Tongass Plan Implementation Team clarifications suggested that non-harvest buffers extend from the edge of a sinking or losing stream and cover 100 feet plus 2 tree lengths within no less than 1 mile upstream or to the stream's source. The Proposed Forest Plan indicates that the 100-foot no-harvest buffer would extend only 0.25-mile upstream. The comment stated that this change is significant and should be reassessed and justified to the public.

Response: The Final Proposed Forest Plan provides for protection of karst and cave resources and promotes adaptive management principles achieving this. Additional buffers could be implemented where recommended by a qualified karst manager to ensure compliance with the Karst and Cave Resource Standards and Guidelines.

Comment: One comment noted that the reference to harvest on 72 percent slopes had been moved from the karst appendix (Appendix H) to the Soil and Water section of the Proposed Forest Plan. Given the potential soil loss, hydrologic change, and mass wasting impacts related to timber harvest, roads, and other development activities on steep karst lands, the comment requested that no harvest on steep slopes be the standard and not under the discretion of the District Ranger on a case-by-case basis.

Response: The Proposed Forest Plan states:

> "At the forest plan level, slope gradients of 72 percent or more are removed from the tentatively suitable timber base due to high risk of soil mass movement and accelerated erosion of Class IV channel systems. At the project planning level, the Forest Supervisor or District Ranger may approve timber harvest on slopes of 72 percent or more on a case-by-case basis, based on the results of an

> onsite analysis of slope and Class IV channel stability and an assessment of potential impacts of accelerated erosion on downslope and downstream fish habitat, other beneficial uses of water, and other resources. It is anticipated that harvest of these areas will be a small percentage of the total harvest unit."

Proposed timber harvest on slopes greater than 72 percent would undergo an onsite analysis and an assessment of potential effects on downslope resources, including karst.

Comment: A number of comments noted that the Tongass should make sure that karst lands are not transferred to entities with fewer measures to ensure karst protection. They note that if karst lands are transferred, the transfer should include special considerations requiring management practices that are as protective or more protective of karst lands. Karst managers would need to work with land transfer experts to ensure that karst lands continue to receive at least the level of protection that the Forest Service currently provides. One comment noted that many of the proposed land exchanges and adjustments with Sealaska contain valuable karst lands. The comment notes that the Draft EIS does not discuss how the Forest Service will treat land exchange or adjustment requests that involve karst lands.

Response: While Appendix C discusses several proposed land exchanges, this does not mean that they are likely to occur or would occur exactly as depicted. Land exchanges are discretionary, voluntary real estate transactions between federal and non-federal parties. The Forest Service is not required to enter into a land exchange when presented with a proposal. Any exchange would require NEPA analysis, most likely an EIS, which would include public involvement and would disclose any adverse effects to karst and cave resources, as well as to other resources. The Draft EIS discloses that the Sealaska proposal presented to the Forest Service does not provide any assurances that important resources on the lands Sealaska proposes to acquire would be protected to the same degree as under national forest management. Specifically, the proposal does not include assurances that karst and cave resources would be protected.

The cumulative effects section of the Draft EIS has been expanded to include a discussion of the potential effects of future land exchanges on karst resources.

Comment: One comment supported the new Geologic Special Interest Areas. The comment noted that while legislated protections would be stronger and more protective of karst wilderness areas, the Special Interest Areas are an excellent first step in providing permanent protection for the "best of the best" karst lands. Continued collaboration was suggested to increase the protection of Special Interest Areas.

Response: The Forest Service considered a range of alternatives that included differing degrees of proposed timber harvest and road construction activities. The Draft EIS evaluated the potential effects of those alternatives on karst resources and disclosed the findings of the Karst Review Panel, which found that implementation of the Karst and Cave Standards and Guidelines from the current Forest Plan had ensured a high level of protection for karst resources overall (Griffiths et al. 2002). As noted in one of the preceding responses, the Forest Service intends to continue collaboration with those who use caves and the public.

Heritage and Sacred Sites

Comment: One comment requested that the Final EIS clarify the types of traditional use that are permitted in Conservation System Units, including designated Wilderness. The definition of traditional activities in the Region 10 Forest Service Manual (1/27/99) includes recreational pursuits. The comment authors stated that they strongly disagree with the inclusion of recreation in this definition and requested that the Forest Service adopt and implement a definition similar to that employed by the National Park Service, which defines "traditional" as an activity that occurred when ANILCA was passed and involves the consumptive use of one or more natural resources of Old Denali Park, such as hunting, trapping, fishing, berry picking, or similar activities.

Response: Traditional uses are allowed in designated wilderness as authorized by ANILCA. Updating Regional manuals and handbook definitions is beyond the scope of this Amendment.

Comment: Some respondents asked that protection of Native sacred sites be of paramount importance. They felt that working together was critical for any protection measures to succeed. One comment suggested that the Forest Service employ a tribal liaison to insure that sites are protected.

Response: We agree that protection of these sites is very important. All alternatives, except Alternative 5 (No Action), include updated heritage direction for sacred site identification and management. These changes include strong direction for communicating and working with tribal governments.

Comment: Some respondents felt that the Forest Service should seek National Historic Landmark designation, or otherwise protect, certain historic sites. Sites mentioned included the World War II site at Hunter Bay, the Russian Colonial sites at Salmon Lake, and the site near the falls of Redoubt Lake.

Response: We will share this information with our Heritage Program Manager but landmark designation is outside the scope of the Forest Plan Amendment.

Comment: One respondent felt that the Forest Service listens more to other agencies and organizations than it does to tribal governments indicating a bias.

Response: The Forest Service does not believe this to be the case. We continue to consult and communicate with tribal governments, as well as other agencies and organizations.

Comment: Some respondents expressed concern about timber harvest and new road and trail development and the potential impacts on sacred and traditional hunting, gathering and fishing sites. They wanted to be informed if new development was being considered.

Response: New development or other site-specific projects would only occur after project level analysis that includes public involvement and tribal consultation.

Comment: One respondent stated that the Forest Service needs to not only guard against future adverse impacts to native allotments but also should restore allotment lands damaged by timber harvest and road building.

Response: Native allotments are private land and beyond the scope of this Amendment.

Comment: One tribal corporation felt that the Proposed Forest Plan should have additional requirements related to sacred sites, greater specificity of disclosure, no confidentiality requirements, and a requirement to provide an annual report in person to the board of directors.

Response: The Proposed Forest Plan is consistent with updated Forest Service direction on management of sacred sites and consultation.

Lands

Comment: One comment stated that Sealaska Corporation's remaining entitlement acreage is underestimated in Appendix C and that Section 205 of the Alaska Land Transfer Acceleration Act increased the minimum additional acreage to be allocated to Sealaska. Sealaska estimates that between 65,000 and 85,000 acres is required to complete Sealaska's Alaska Native Claims Settlement Act (ANCSA) entitlement, not 64,000 acres as the Forest Service states.

Response: We recognize that the actual final acreage to be conveyed may be unknown at this time. Based on the best information available, both the Forest Service and the USDI Bureau of Land Management (BLM) agree that approximately 64,000 acres of ANCSA entitlement remain to be conveyed to Sealaska Corporation. This includes about 20,000 acres of unconveyed lands remaining from a 1988 AFN/BLM Agreement and approximately 44,000 acres of 14(h)(8) lands resulting from the 2004 Alaska Land Transfer Acceleration Act, PL 108-452. (Using exact figures, this totals 63,622.10 acres. In addition, Sealaska may be entitled to several additional acres in selected but unconveyed 14(h)(1) sites. It is unlikely that the total would exceed 63,650 acres.)

Prior to passage of PL 108-452 in 2004, BLM and the Forest Service estimated Sealaska's remaining entitlement as being between 59,000 acres and 64,000 acres. The 2004 legislation helped verify the current estimate of 64,000 acres.

Comment: One comment stated that Appendix C underestimates the public advantages of releasing the 327,000 acres of land that are withdrawn for Sealaska selections and conveyances. This large acreage remains encumbered and restricted from commercial timber production, investment, and active management while it remains withdrawn.

Response: Those lands that are withdrawn, but not selected by Native Corporations and also those lands that are selected, but not conveyed continue to be managed by the Forest Service, with certain requirements. The actual effects or public advantages of removing the encumbrances are difficult to quantify.

On lands withdrawn, but not selected by a Native Corporation, the requirements of 43 CFR, Section 2650.1(a) apply: "Prior to the Secretary's making contracts or issuing leases, permits, rights-of ways, or easements, the views of the concerned regions or villages shall be obtained and considered …" In addition, all proceeds collected from contracts (including timber sales), leases, permits, rights-of-way, or easements on lands withdrawn for Native selection are deposited in an escrow account managed by the Bureau of Indian Affairs. Road development and habitat enhancement projects may still be authorized on these lands.

On lands that have been selected, but not conveyed, Forest Service policy is to authorize no contracts, special use permits, mineral materials permits, easements, right-of-way or other third party interests without the consent of the affected native corporation, unless specific authorization is received from the Regional Forester.

Lands that are withdrawn, but not selected, are managed by the Forest Service subject to certain restrictions but they are not encumbered to the extent that the actual selected lands are.

Comment: One comment stated that Appendix C overestimates the effect on Tongass timber harvest from the completion of Sealaska's entitlement through land exchanges and adjustments, and understates the corresponding gain in available land and timber from acres transferred to the Tongass National Forest. These effects are portrayed as much larger than a potential transfer of a similar amount of acres to "unrecognized Southeast Alaska communities."

Response: This discussion was specific to the exchange proposal as submitted by Sealaska. The effects discussion was based on an actual analysis of the exchange proposal effects. Lands transferred to the Tongass (based on the proposal) would not be available for timber production but rather, were chiefly valuable for recreation and scenic values. These impacts differ to those identified for the "unrecognized Southeast Alaska communities" proposal because that analysis was hypothetical. There are no actual parcels that can be identified and analyzed. The Sealaska exchange analysis was based on actual parcels identified by Sealaska for their timber values.

Comment: One comment stated that Appendix C ignores the positive aspects of timber lands transferred to Sealaska and the corresponding positive impact to the Southeast Alaska forest industry and economy. Lands transferred to Sealaska would still be available to support the timber industry in Southeast Alaska.

Response: As virtually all timber from Sealaska lands has historically been exported in unprocessed form, it seems reasonable to assume that timber harvest from any transferred lands would support logging and transportation-related jobs, but would be unlikely to support local or regional sawmills or smaller value-added woodworking operations.

Comment: One comment stated that Appendix C mischaracterizes the change in other land allocations and resources attributed to the completion of Sealaska's entitlement by overestimating the acreage to be conveyed and by ignoring the effects of releasing the 327,000 acres of lands withdrawn and encumbered for Sealaska selections and conveyances and the benefits associated with Roadless and other lands valued for wildlife habitat, recreation, subsistence, scenery and other public uses that would be transferred to the National Forest.

Response: The discussion in Appendix C of the Draft EIS is very specific to the land exchange proposal submitted by Sealaska Corporation. The purpose of discussing the proposed exchange in Appendix C was to give a general estimate of the effects of completing the proposed exchange. It was not intended to provide a detailed accounting of the effects. As stated in Appendix C, it would be difficult to determine the actual acreage that might be transferred without an appraisal and very unlikely that all of the lands proposed for exchange would actually be transferred. Therefore, we cannot provide a full accounting of the possible effects. While there would be a benefit to some resources from acquiring the areas Sealaska proposes to exchange to the NFS, there would be a corresponding loss of these values on the 95,000 acres Sealaska wishes to acquire.

As for ignoring the benefits of releasing the 327,000 acres of encumbered land, we estimate that approximately 171,000 acres are encumbered by Sealaska selections, not 327,000 acres. We also estimate that approximately 64,000 acres of these selected lands would actually be conveyed to Sealaska Corporation, considerably less than the 95,000 acres Sealaska proposes to acquire. As noted in an earlier response in this section, the management restrictions on lands withdrawn but not selected are less than the comment suggests.

Comment: One comment stated that the adjustment to suitable timber land base shown on page 3-226 of the Draft EIS is an underestimate if the Forest Service used the 171,000 acre figure rather than the entire 327,000 acres encumbered within the Sealaska withdrawal areas. The effects to the timber program of resolving entitlement would be positive because the encumbrance on the remaining 327,000 acres would be removed and these acres could be managed for timber.

Response: As noted in the response to the preceding comment, the Forest Service believes that 171,000 acres is correct and the management restrictions that apply to withdrawn but not selected lands are less restrictive than the comment author states.

Comment: One comment stated that Appendix C erroneously suggests that heritage, karst and cave, and subsistence resources and uses could be adversely affected by conveyances to Sealaska because of differences in legal requirements applicable to Native Corporations compared to NFS lands. The comment notes that this suggestion ignores Sealaska's established leadership in heritage resource protection and in land stewardship.

Response: This discussion was specific to the land exchange proposal submitted by Sealaska Corporation. There were no assurances in the proposal or in discussions with Sealaska that resources on lands to be exchanged to Sealaska would be protected to the same degree as under current NFS management. The legal requirements for resource protection on NFS lands are different from those on private land. Information about the resource values on lands for potential exchange to the United States by Sealaska has been added to the Final EIS.

Comment: One comment stated that Appendix C does not recognize that Section 22(f) of ANCSA was included to provide for the adjustment of Native Corporation land conveyances and that legislative adjustments to ANCSA will continue until entitlements are resolved to meet the statute's original promise.

Response: Section 22(f) of ANCSA allows land exchanges with Village Corporations, Regional Corporations, individuals, or the State for the purpose of effecting land consolidations or to facilitate the management or development of the land. However, land exchanges are discretionary, voluntary real estate transactions between the federal and non-federal parties. The Forest Service is not required to enter into a land exchange when presented with a proposal. This is clarified both in the *Lands* section of the Final EIS and in Appendix C.

Comment: One comment stated that Appendix C is incorrect in stating that Sealaska is not currently authorized to receive lands outside the ANCSA withdrawal areas under ANCSA since ANCSA (Section 22[f]) clearly authorizes Sealaska to acquire lands outside the withdrawal areas through exchange. In addition the Appendix incorrectly indicates that exchanges generally must be for equal appraised market value. Both ANCSA and ANILCA contain authority for exchanges found to be in the public interest to take place for other than equal value.

Response: The Forest Service disagrees with the statement that Sealaska is currently authorized to receive lands outside the ANCSA withdrawal areas because of Section 22(f) of ANCSA. As noted in the preceding response, Section 22(f) of ANCSA allows for land exchanges with Native Corporations. Hypothetically, Sealaska could receive land outside of the withdrawal areas through a land exchange. Land exchanges are discretionary and voluntary. Currently, there is no binding land exchange agreement in effect between the Forest Service and Sealaska Corporation.

Generally, land exchanges are on an equal value basis and cash payments can be used to equalize land values up to 25 percent of the appraised value of the federal land. It is also correct that both ANCSA in Section 22(f) and ANILCA in Section 1302(h) provide that exchanges shall be based on equal value and contain provisions for cash equalization, except that exchanges can be made for other than equal value when the parties agree, and the Secretary of Agriculture determines that it is in the public interest.

Comment: One comment stated that Appendix C treats Sealaska's land entitlements and adjustment proposal as a negative encumbrance that the Forest Service will address grudgingly

and fails to recognize that completing conveyances of land to Sealaska in a sustainable configuration is an entitlement under ANCSA.

Response: The Forest Service recognizes Sealaska Corporation's right to receive its full entitlement under ANCSA and will continue to work with the BLM in processing conveyance documents for selected lands. Appendix C has been reviewed and edited in response to these concerns.

Comment: One comment stated that many of the "defects" in Appendix C also appear in the Draft EIS. The cumulative effects sections in the Draft EIS overestimates the potential adverse effects and underestimates the benefits of timber harvest on Sealaska and other Native Corporation lands by not adequately recognizing the protective BMPs that Sealaska and other owners apply.

Response: While the Forest Service agrees that the BMPs are beneficial, management on NFS lands provides a higher degree of resource protection and these differences were considered in the effects analyses included in the Draft EIS.

Comment: One comment stated that the statement on page 3-223 of the Draft EIS that a revision of the Forest Plan would be required to accommodate an exchange with Sealaska is erroneous. They noted that the Forest Plan provides for land exchanges and other adjustments.

Response: The Proposed Forest Plan does provide for land exchanges and other types of land adjustments. The referenced statement has been clarified to indicate that implementation of the Sealaska land exchange proposal would likely require a Forest Plan Amendment or Revision, based on the magnitude of the resulting changes in LUDs.

Comment: One comment stated that Appendix C did not adequately depict the real effects of the identified potential land exchanges.

Response: The purpose of Appendix C was to show that a number of Congressional bills for land conveyance and land exchanges have been proposed and that any of the proposals to convey land to the State or to Native Corporations, if enacted, could have a major impact on the mix of goods and services that the Tongass provides.

Many of the proposed land exchanges are unlikely to occur or occur exactly as depicted. Land exchanges are discretionary, voluntary real estate transactions between the federal and non-federal parties. The Forest Service is not required to enter into a land exchange when presented with a proposal. Before an exchange could occur a detailed environmental analysis, including public involvement, would have to be done. Due to the magnitude of these potential exchanges and their potential impact on the mix of goods and services, a Forest Plan Amendment would also likely be needed. We have updated Appendix C for the Final EIS and improved the analysis based on the comments received. Please keep in mind that Appendix C was not intended to be a full disclosure of site-specific environmental effects. That will come later as described above.

Comment: One comment stated that the 1995 Greens Creek Land Exchange included a 25 percent royalty paid to counties. Since there are no counties in Southeast Alaska, if there are any associated royalties, the City of Angoon should receive a share.

Response: This issue is beyond the scope of this Forest Plan Amendment.

Comment: One comment stated that the Forest Service should support hydroelectric power development in Angoon, where it is needed for economic development and to support local lifestyles.

Response: A hydroelectric project is currently being analyzed in an EIS. The Draft EIS was issued in April 2007 and the Forest is working on the Final EIS. This is a separate process from this Forest Plan Amendment and will continue regardless of which alternative is selected.

Comment: One comment stated that many of the provisions in the Plan Amendment are inconsistent with ANILCA (Off-Highway Vehicle [OHV] use restrictions, limits on the type of public recreation allowed in the wilderness, and limits on group size, restrictions on fish and wildlife management projects in Wild and Scenic River corridors, Research Natural Areas, and Experimental Forests).

Response: The travel management standard was revised in the Proposed Forest Plan to ensure that the plan did not make any travel management decisions. These decisions are made through local travel management plans. However, the Forest Service does have the authority to restrict access and use for overall sound management of public lands and to meet other laws and objectives. We believe that the proposed alternatives are compatible with ANILCA. ANILCA recognizes the need to be consistent with other laws such as the wilderness protection measures found in the Wilderness Act, the multiple use mandate found in the Multiple Use Sustained Yield Act, as well as the National Forest Management Act and TTRA. These laws give the Secretary of Agriculture considerable flexibility to provide public benefits and provide for sound management of public lands.

Consistent with Section 810 of ANILCA, the Final Proposed Forest Plan has been evaluated for potential effects on subsistence uses and needs. A cumulative effects analysis of resource developments on subsistence resources is included in the *Subsistence* section of the Final EIS. Two actions included in Section 810 were completed for the Draft EIS: (1) giving notice to the appropriate State agency, local committees and regional councils; and, (2) giving notice of, and holding, “a hearing in the vicinity of the area involved.” Because the area is the entire Tongass National Forest, such hearings were held in 23 communities throughout Southeast Alaska for the Draft EIS.

The plan does not authorize any land-disturbing activities. The continuation of subsistence opportunities, and reasonable steps to minimize effects on subsistence resources, are provided for, in each alternative, by the Forest-wide standards and guidelines for subsistence, as well as related standards and guidelines for riparian areas, fish, and wildlife. Many important subsistence areas were assigned LUDs that exclude timber harvesting. In addition, the beach and estuary fringe Forest-wide standards and guidelines apply to all beach fringe and estuarine areas not under more restrictive designations. Adverse impacts to subsistence uses and resources are minimized though these measures. Potential site-specific effects on subsistence uses and reasonable ways to minimize these effects will be considered and analyzed during project-level planning.

Minerals

Comment: A number of comments stated support for the mineral industry and noted that the industry history in Southeast Alaska included the creation of family wage jobs, as well as the provision of other economic benefits to communities. Comments also noted that mining occurs where economic deposits are found and expressed concern regarding reasonable access and cost of entry due to more restrictive LUDs. Some comments requested that the Forest Service devote resources to identifying and better understanding mineral resources on the Forest. Others were concerned about access to patented mining claims in Inventoried Roadless Areas.

Response: The Forest-wide standards and guidelines for Minerals and Geology support mineral development. The Forest Service also engages in minerals and geology-related research, with the extent of this research dependent on available funding. Mineral Resources, including the laws and regulations that provide for access to valuable mineral deposits, are discussed in the *Minerals* section of the Final EIS.

For all seven alternatives, 25 percent of the acreage of identified mineral resources is in areas that have been withdrawn. Alternatives 7 and 4 have the fewest acres of identified mineral resources in LUD allocations potentially causing higher costs for their exploration and development, and Alternative 1 by far the most. The other four alternatives fall between these two in a fairly close grouping near the middle of the range. None of the alternatives would prohibit reasonable access to patented mining claims.

Comment: Several comments suggested that compliance of the Proposed Forest Plan with the Mining and Mineral Policy Act of 1970 should be evaluated. This act, along with the General Mining Law of 1872, Federal Land Policy and Management Act of 1976, and the National Materials and Minerals Policy Research Act of 1980 were cited by several respondents in support of mineral development.

Response: The Proposed Forest Plan and the minerals analysis presented in the Draft and Final EIS documents are consistent with the Mining and Mineral Policy Act of 1970. The *Minerals* section of the Draft and Final EIS documents specifically states that the Forest Service: "recognizes that minerals are fundamental to the Nation's well being and, as policy, encourages the exploration and development of the mineral resources it manages. The Secretary of Agriculture has provided regulations (36 CFR 228) to ensure surface resource protection, while encouraging the orderly development of mineral resources on NFS lands."

Mineral Resources, including the laws and regulations that provide for access to valuable mineral deposits, are discussed in the *Minerals* section in the Draft and Final EIS documents.

Comment: Several comments were opposed to mineral exploration and development on Duke Island and suggested the area be withdrawn from mineral entry.

Response: No new withdrawals are proposed under any of the proposed alternatives. Future exploration and development on and around Duke Island would be subject to regulation by 36 CFR 228. For projects requiring a federal action (such as approval of a mining plan of operations), impacts to surface resources would be analyzed and disclosed on a site-specific basis, as required under NEPA.

Comment: One comment objected to the term "hardrock" when referring to locatable minerals and pointed out that many locatable minerals are recovered by placer mining.

Response: The term "hardrock minerals" is commonly used synonymously with locatable minerals. The comment is correct that locatable minerals are found in, and recovered from, placer deposits. The text in the Final EIS has been edited to make this clear.

Comment: One comment expressed concern related to the permitting delays of a specific project, and the process in general, as a result of public appeals.

Response: Project specific analysis, public disclosure, and response to public concerns are required of all projects as required by law. The regulations under which operating plans are processed would not be changed by any of the alternatives considered in this analysis and are beyond the scope of this analysis.

Comment: One comment suggested changing a reference to the U.S. Bureau of Mines, as it was abolished in 1996.

Response: The text in the Final EIS has been updated to reflect this.

Comment: Some comments disagreed with the *Minerals* cumulative effects finding that: "Other than mineral resources that are currently under development (specifically, the Kensington deposit), the Forest Service does not have sufficient information to identify any specific mineral development as reasonably foreseeable." They pointed out that exploration has been ongoing throughout the Tongass for years. They specifically noted the Niblack property, near Ketchikan.

Response: The Forest acknowledges that exploration is ongoing in varying degrees throughout the Tongass. As the likely development of such prospects is dependent on several factors, including the findings of exploration programs, metal prices, and private funding, it is not possible for the Forest to determine which projects are reasonably foreseeable at this time.

Comment: Some comments either opposed mining or expressed concern over potential impacts, such as water quality degradation or acid mine drainage.

Response: All existing and future exploration and development on the Forest are subject to regulation under 36 CFR 228 for the protection of surface resources. For projects requiring a federal action (such as approval of a mining plan of operations), site-specific impacts to surface resources, including wildlife and cultural resources, would be analyzed and disclosed as required by NEPA. Specific projects already analyzed and approved under NEPA are outside of the scope of this document.

Recreation, Tourism and Scenery

Comment: Several comments noted that restrictions on OHV use on inactive logging roads primarily deny local residents looking for local access and have a negative effect on local economies. Commercial operators, in contrast, are allowed wilderness access. Closing logging roads to OHV access to protect wildlife seems disingenuous when the same wildlife are regularly viewed from aircraft.

Another comment noted that all roads on the Tongass are currently open for OHV use and there has been an exponential increase in OHV use of roads on Kuiu, Baranof, and Chichagof islands where there are extensive road systems. The comment author notes that illegal OHV use of closed roads is increasing, as are detrimental effects to the environment. Others requested that OHV access be allowed only where specifically permitted.

Response: Each Ranger District will work with the state and local governments, tribes, and the public, as required by NEPA in developing their access and travel management plans. The Standard in the Final Proposed Forest Plan has been updated to state: "Each ranger district will designate the roads, trails, and areas open to motor vehicle use on a motor vehicle use map. All operations must be in accordance with those designations."

The revised Forest-wide Recreation and Tourism Standards and Guidelines also include the following directive:

3. Provide a diversity of OHV recreational opportunities across the forest where consistent with the criteria in FSM 2355 and 36 CFR 212, which include:
   a) The use is consistent with established land management and resource objectives.
   b) The use is consistent with the capability and suitability of the resource.
   c) There is demonstrated demand which cannot be better satisfied elsewhere.

More information is provided in Chapter 4 of the Final Proposed Tongass Forest Plan in the section that addresses Recreation and Tourism.

Comment: A number of people at the public hearing in Juneau commented that there is presently nowhere in the vicinity of their community where they are legally allowed to ride OHVs or snowmobiles. They requested that there be areas designated on the Forest for OHV use. Comments noted that there are more than 100 hiking trails and no authorized OHV trails/roads. One person commented that where there are potential conflicts between motorized and non-motorized uses, different uses should be authorized at different times. Others noted that the Forest Service should plan for balanced use between motorized and non-motorized uses. Others commented that hiking trails in the Juneau are fully used by hikers, bikers, runners, mountain climbers, and other non-motorized users and requested that OHV use not be permitted on the existing trail system in this area. Concern was also expressed about the impact OHV use would have on fragile soils and ecosystems along the existing trails.

Response: The Proposed Forest Plan is programmatic, meaning that it provides forest-wide management direction. Management direction with respect to OHV use is provided in the Forest-wide Recreation and Tourism Standards and Guidelines in the Final Proposed Forest Plan (Chapter 4). Site-specific activities, such as the designation of trails for OHV use, are beyond the scope of this document and are instead addressed at the local level. The issue of OHV use and access is addressed in the access and travel management plan that will be prepared for the Juneau Ranger District.

Comment: A number of comments expressed concern about resource damage caused by OHV use and requested that the Forest Service ensure that OHV use does not negatively impact wetland and habitat values. Potential negative impacts include fish habitat damage, the introduction of invasive species, alteration of successional pathways, and degradation of wetland vegetation, soils, and hydrology.

Response: As noted in response to the first comment in this section, each District is analyzing how to provide reasonable access for subsistence and other uses in their access and travel management plans and accompanying NEPA documents. See the earlier response and the Final Proposed Forest Plan for further information.

Comment: A number of comments requested that the Forest Service maintain and fix the existing cabins on the Tongass and also consider opening new cabins. In addition to this general request, comments were also submitted with respect to specific cabins that comment authors were particularly concerned about. These included the Karta River, Kook Lake, Smugglers Cove, and Helm Bay cabins.

Response: The Proposed Forest Plan provides broad strategic direction for overall management of the Forest. The Forest-wide Recreation and Tourism Standards and Guidelines in the existing and Proposed Forest Plans, for example, direct the Forest Service to identify opportunities to enhance existing, and provide additional, recreation opportunities, including those related to public recreation cabins. The Proposed Forest Plan also identifies where cabins and other types of recreation and tourism-related

development can take place on a Forest-wide basis based on LUD classifications. Cabins are considered minor developments in the existing and Proposed Forest Plans. Minor developments are considered compatible with the Semi-Remote Recreation, Recreational River, Scenic Viewshed, and Scenic River LUDs and may be allowed in 10 other LUDs based on a case-by-case evaluation. Site-specific projects or activities related to specific existing or proposed cabins are addressed at the project level. More information is provided in Section 4 of the Final Proposed Tongass Forest Plan in the section that addresses Recreation and Tourism. Cabin maintenance and construction depends on funding from Congress or other sources.

Comment: Several comments requested that the Forest Service do a better job of maintaining and marking existing trails and consider creating new trails for local residents, as well as visitors, particularly in areas surrounding communities where the majority of existing recreation opportunities require a boat to access. Some respondents identified trails that they were particularly concerned about. These included the existing Beaver Lake Trail and the potential for a new trail from Skagway to White Pass City.

Another comment noted that existing logging roads could be used to provide mountain biking and hiking opportunities in the vicinity of communities. The same comment author expressed concern that the road providing access to a favorite hiking trail was not adequately maintained.

Response: As noted in response to similar requests with respect to public cabins (see the preceding comment and response), the Final Proposed Forest Plan provides broad strategic direction for Forest-wide management. Site-specific projects and activities related to trails are addressed at the project level. The revised Forest-wide Recreation and Tourism Standards and Guidelines include a number of directives that pertain to local recreation facilities and planning. Trail maintenance and construction depend on funding.

Comment: One comment identified the following concerns with respect to recreation encounter rates. Are the recreation encounter rates identified in the Proposed Forest Plan meant to guide management activities, with action taken to reduce use if rates are exceeded, or are they meant as guidelines for visitor expectations? Using encounter rates to guide management activities across the board ignores the fact that other factors—such as weather or mosquitoes—may be equally or more important in measuring user satisfaction. Similarly the impact of encounters may vary based on terrain and vegetation.

Response: The recreation encounter rates are identified by ROS class in the Final Proposed Forest Plan in the proposed ROS standards and guidelines in Appendix I. The encounter rates have been updated in the Final Proposed Forest Plan for the Primitive, Semi-Primitive Non-Motorized, and Semi-Primitive Motorized ROS settings. Encounter rates for the other ROS settings (Roaded Natural, Roaded Modified, Rural, and Urban) are unchanged from the current Forest Plan. The main purpose for these updates is to clarify commercial group sizes in these settings. The identified encounter rates are generally intended to guide management activities and may also help guide visitor expectations. Action may be taken on a case-by-case basis if these encounter rates are exceeded. Group size guidelines will be enforced.

Comment: One comment observed that the niche market for eco-tourism is likely to remain unaffected because none of the alternatives would affect Wilderness and LUD II designations and all alternatives continue to set aside vast acreages of remote and semi-remote recreation. The comment also noted that only road-based recreation opportunities are likely to vary by alternative. Other recreation activities are likely to remain unchanged. Opportunities for expanded road-based recreation could occur under Alternative 4 through 7, but are not likely to occur under Alternatives 1 through 3.

Response: The potential impacts of the proposed alternatives on recreation and tourism are evaluated in the *Recreation and Tourism* section of the EIS. The alternatives would result in shifts toward the roaded end of the ROS based on the amount of timber harvest and associated road construction that could occur. Potential road construction would be greatest under Alternatives 4 and 7. However, while there would be a relative increase in new roads, with access provided to presently undeveloped areas, nearly all new roads would be closed following harvest and not available for use by highway or high-clearance vehicles.

Comment: Several comments noted that a survey of Tongass hunting and fishing guides showed that two-thirds of them support a prohibition on logging and new road building in roadless areas. Some comments also noted that:

> **"In the view of some long-term guides operating in the Tongass, we are nearing a "now or never" point in regard to how much habitat can be lost and still be able to sustain populations of fish and game that will allow for future opportunities for hunting and fishing on the Forest."**

Response: The comments did not provide any further information with respect to the cited survey, but this sentiment has been expressed by a number of people providing comments on the Draft EIS. Alternative 1 was modified between the Draft and Final EIS documents to reduce the amount of logging and road building, with all Inventoried Roadless Areas and a number of areas of concern, such as Kuiu Island, removed from the suitable land base. The potential effects of the proposed alternatives on fish and wildlife populations are evaluated in the *Fish* and *Wildlife* sections in the EIS.

Comment: Some felt that the Tongass would be better to emphasis recreation use rather than timber harvest. One comment noted that the Forest Service should manage the land base to meet recreation demand.

Response: The Final EIS shows that recreation is a large and growing use of the Forest. Each alternative allows for this trend to continue. The existing and Proposed Forest Plans provide management direction for the Forest as a whole. The Forest-wide Recreation and Tourism Standards and Guidelines provide recreation and integrated resource planning direction. This includes direction for land managers to identify opportunities to enhance existing, and provide additional, recreation activities, opportunities, and services where desirable to meet local or Forest-wide recreation demands.

The Forest Service uses the ROS system to inventory existing and potential recreation opportunities on the Forest. The *Recreation and Tourism* section in the EIS assesses the potential impacts of the proposed alternatives on recreation and tourism in terms of ROS settings and identified recreation places.

Comment: One respondent stated that local tourism businesses should be permitted to use the forest rather than businesses associated with cruise ships where the same service is being offered. Another comment encouraged the Forest Service to give priority to small businesses offering recreation opportunities on the Tongass because large-scale tourism related to increased cruise ship activity can be very difficult to manage and large scale users tend to drive out smaller business users.

Response: The Proposed Forest Plan provides broad strategic direction for Forest-wide management with respect to Recreation and Tourism and special use permits. Forest-wide direction for public outfitter/guide services is identified in Section 4 of the Final Proposed Forest Plan in the section that addresses Recreation and Tourism. In general, the services of outfitter/guides should facilitate use, enjoyment, understanding, and appreciation of National Forest recreation settings. The Final Proposed Forest Plan direction does not specify that local businesses should be given preference over cruise ship-related activities or that small users should be given preference over large (cruise ship-related) users.

Potential permit holders are evaluated on a case-by-case basis through the special use permitting process, which generally does not allow for a business size preference.

Comment: Concern was expressed that the Wilderness direction was being changed to discourage dispersed recreation use in pristine areas as a way to resolve conflicts in areas of concentrated use.

Response: The intent of this direction is to maintain the solitude found in pristine areas. The first choice for resolving conflicts in areas of concentrated use would be to relocate that use to areas outside the wilderness boundary.

Comment: One comment noted that the Proposed Forest Plan's Recreation and Tourism Standards and Guidelines acknowledge that commercial tourism may conflict with local residents use of the same area, but do not require the Forest Service to consider the off-site impacts of activities permitted on NFS lands. The comment notes that the Forest Plan should provide an adequate framework to protect local residents and nonmotorized recreationists from commercial recreation–related noise. The Recreation and Tourism Standards and Guidelines should clearly state that "one consideration to be weighed by the Forest Service in promoting additional commercial tourism use of the Forest is the impact such increased activity could have on Juneau or other similarly situated communities." The comment also stated that "natural quiet" should be identified as a forest value or resource.

Response: The Forest Service believes that the Final EIS and Final Proposed Forest Plan adequately recognize that noise associated with commercial and other motorized recreation can have detrimental effects on other Forest users, as well as on surrounding communities. Although not explicitly spelled out in the Final Proposed Forest Plan in the way suggested in the comment, the potential noise impacts associated with commercial tourism use are an important element of project-specific evaluations.

Comment: One comment expressed concern about a proposed LUD change that would occur north of Juneau under all of the action alternatives. This change would be from Remote Recreation to Semi-Remote Recreation. The comment noted that this area includes the Herbert Glacier and Eagle Glacier recreation areas, among others. The comment also noted that the rationale for this proposed change is not explained in the Draft EIS and was concerned that the change is proposed to allow an expansion of helicopter landing sites in the area. Any changes to helicopter operations on the Juneau Icefield should be part of a separate action, as they were in 2002.

Response: The snow accumulation zone on the Juneau Icefield has retreated to higher elevations perhaps as a result of climate change. This has rendered a number of minor development sites (e.g. dog sled camps) unsuitable for use as the thinning snow layers expose crevasses during the middle of the operating season. This hazard requires removal of the camps to a more suitable location, generally higher in elevation where there is more snow. The Remote Recreation LUD does not allow development of minor developments, like dog sled camps, while the Semi-Remote Recreation LUD would allow consideration of this type of use.

This change in the LUD boundaries would allow the Forest Service to consider moving minor developments into areas where standards and guidelines for the previous LUD would not have allowed this use. It should be noted that this change in LUD boundaries would not affect the Forest Service's ability to allow an expansion of helicopter landing sites in this area, because glacier landing tours are allowed in both the Remote Recreation LUD and Semi-Remote Recreation LUD under the current and Proposed Forest Plans. This explanation has been added to the *Recreation and Tourism* section of the Final EIS.

The 2002 ROD for the Helicopter Landing Tours on the Juneau Icefield will be reviewed for consistency with this Amendment, but any changes to the 2002 ROD would have to be made in compliance with applicable NEPA regulations and Forest Service policy.

Comment: Some respondents expressed concern regarding the impacts of timber harvest on scenic resources and ultimately on the tourism/visitor industry. They urged that this be a major consideration in the decision making process.

Response: The Final EIS discloses the potential impacts of timber harvesting on scenic resources (see the *Scenery* section). This was a major consideration in the design of alternatives. Even Alternative 7, with the highest amount of timber harvest, was designed to protect key seen areas. The basic scenery management information, including seen and unseen areas from high visitation sites, was updated as part of this analysis.

Comment: One respondent noted that while they had heard stories that tourists on cruise ships do not notice clearcuts, this was not the case with the passengers who traveled on the boats they operate on the Tongass under a special use permit. The respondent noted that they receive lots of comments from customers concerned about clearcuts.

Response: As part of the Forest Plan Amendment process, the Forest Service has updated the Seen Area analysis and Visual Priority Routes and Use Areas for the Tongass (see Appendix F of the Final Proposed Forest Plan). Scenery is emphasized from these areas. Please note that many of the clearcuts visible from ships are on non-NFS lands.

It seems reasonable to assume that timber harvest may be more visible from some locations than others and that some visitors are more sensitive to the visual evidence of clearcut or other harvesting than others are. The potential impacts to Visual Priority Routes and Use Areas are evaluated for each alternative in the *Scenery* section of the EIS. In addition, site-specific visual analysis is conducted at the project-level for all projects.

Roadless Areas and Wilderness

Comment: One respondent felt that the method to map and delineate Inventoried Roadless Areas (pg 3-357 of the Draft EIS) was illogical as it failed to recognize the difference between pristine roadless watersheds and parts of developed watersheds that do not have roads.

Response: The process for defining and mapping Inventoried Roadless Areas has been established for many years and was used in the 2003 SEIS. The Forest Service recognizes the potential difference in value between roadless areas and this is reflected in our alternative development and analysis. There is no policy that would have us not consider areas as roadless just because they happen to be in a watershed that has some level of past management activity.

Comment: Several comments suggested that the Proposed Forest Plan eliminate the roadless area designation.

Response: This is beyond the scope of this Forest Plan Amendment. The identification of roadless areas and their use as an inventory is well established in Forest Service policy. Management of these areas is a significant issue that must be addressed.

Comment: Many respondents asked that roadless areas be protected (from timber harvest, oil and gas development, and road building). Some specified that all roadless areas be protected,

while others were very broad in just saying the Tongass needed to be protected. Some listed specific "special areas" they wanted protected. Many asked for wilderness designation for these areas. One comment stated that the alternatives should include recommendations for additional Wilderness.

Response: Management of Inventoried Roadless Areas was one of the three key issues used to develop alternatives. Alternatives were designed to meet different levels of timber output while limiting entry into roadless areas. In each case, the more sensitive, higher value roadless areas were avoided as much as possible. In addition, Alternative 1 was modified in the Final EIS to ensure that all Inventoried Roadless Areas are outside the land base designated suitable for timber harvest. As the timber output level increases in the other alternatives, roadless areas were added to the suitable land base as necessary, starting with those within logical extensions of the current road system working up to higher valued roadless areas necessary to achieve the higher timber output levels in Alternatives 4 and 7.

Consideration of wilderness designation was outside the scope of this analysis. Recommendations for adding wilderness to the Tongass National Forest were evaluated in the 2003 SEIS (USDA Forest Service 2003). It was concluded that such recommendations were not needed because there was no compelling need for additional wilderness on the Tongass at that time. This decision was reviewed as part of this EIS process to ascertain if that conclusion is still valid today.

Comment: Several respondents felt that the National Roadless Rule should be reinstated to apply to the Tongass.

Response: While the application of a national policy is beyond the scope of this analysis, Alternative 1 has been modified to exclude timber harvest and road building from Inventoried Roadless Areas.

Comment: One respondent felt that the Draft EIS treated Designated Wilderness and Inventoried Roadless Areas as if they were the same, even though they are clearly different.

Response: The Forest Service recognizes the significant difference in management options between Wilderness and roadless areas. Wilderness has its own LUD while roadless areas are allocated to various LUDs depending upon the alternative. While management options are clearly different, these areas are viewed similarly in terms of current wildlife habitat and biodiversity analysis. They both provide unroaded, unmodified habitat that is valuable for some species.

Comment: One comment recommended that 66 Tongass rivers be designated as Wild and Scenic Rivers in accordance with the proposal prepared by the Southeast Alaska Conservation Council and the Tongass Rivers Coalition: Tongass Rivers: the Lifeblood of the Rainforest ("Citizens' Proposal"). The comment noted that these rivers and those proposed as Wild and Scenic in the current plan should have 0.5-mile (rather than 0.25-mile) buffers to protect their outstanding values. The same comment also expressed support for the Wild and Scenic rivers proposed in the 1997 ROD to be designated as such. Where there is conflict between the classifications in the 1997 ROD and the "Citizens' Proposal" the comment author requested that the "Citizens' Proposal" take precedent.

Response: Wild and Scenic River designations are made by Congress and are outside the scope of this Amendment. The 1997 Forest Plan ROD recommended to the Chief of the Forest Service over 30 rivers and lake systems be forwarded to Congress for designation. The current list of recommended river systems is not being considered for change in this Amendment.

Subsistence

Comment: Some respondents stated that hunting and fishing access are provided for all user groups and felt that the implication that roads have negative impacts on hunting is incorrect.

Response: The EIS states that under ANILCA, only rural Alaska residents qualify for subsistence hunting and fishing on federal lands. The Final Proposed Forest Plan directs the Forest to "maintain reasonable access to subsistence resources as required by ANILCA, Section 811 and to address subsistence concerns when developing road management objectives for forest roads" (SUB-1, I). The Final EIS states that road networks provide greater access to areas previously unconnected and can affect subsistence both positively and negatively by providing access, dispersing hunting and fishing pressure, and creating the potential for increased competition.

Comment: Some comments stated that timber harvest near towns has forced subsistence users (i.e., spruce root basket weavers, deer hunters) to move further out. They believe that debris and felled trees in harvest areas have negative effects on hunting.

Response: The EIS looked at the likely effects of the different alternatives on subsistence resources in two parts: effects on subsistence resources and uses important to each rural community and overall, on a Forest-wide basis, based on general considerations of effect in terms of abundance and distribution, access, and competition. The 1997 Forest Plan EIS included discussions of 32 Southeast Alaska communities with a state land-selection base. This EIS provides brief updates of the affected environment section of the community discussions, where applicable. Each community assessment provides potential effects by Community Use Area, Economy, and Subsistence. The Final Proposed Forest Plan contains Forest-wide standards and guidelines; for example, directing the Forest to locate and manage Forest management activities that consider impacts upon rural residents who depend upon subsistence uses of the resources of the NFS lands.

Comment: It is important to some respondents that the Forest Service ensure that fish and wildlife resources do not "reach a point where continued levels of harvest would jeopardize stock to unsustainable levels and result in use-priority restrictions."

Response: With regard to this Proposed Forest Plan, deer is the only subsistence resource that is potentially significantly affected by any of the alternatives. The EIS discusses the potential effects on subsistence by alternative and within the individual community assessment discussions, as appropriate. Different alternatives may result in a significant restriction of the subsistence uses of deer, due to potential effects on abundance and distribution, and on competition. However, the Subsistence, Fish, and Wildlife Forest-wide standards and guidelines are designed to help ensure that fish and wildlife resources do not reach a point where continued levels of harvest would jeopardize stocks to unsustainable levels and result in use-priority restrictions. The Forest Service will seek to maintain abundance and distribution of subsistence resources necessary to meet subsistence user needs. The Forest Service will also continue to consult with the Southeast Alaska Federal Subsistence Board. If, for some reason, population levels drop to where restrictions in use need to occur (i.e., severe winter such as occurred in 2006/07) the Forest Service would follow the regulatory process, working with the Federal Subsistence Board.

Comment: A number of comment stated that the Final EIS should take a closer look at the cumulative effects of past, present, and future logging on deer and other subsistence resources on Prince of Wales Island. Comments also stated that the Forest Service should consider changing LUD assignments in places like Craig or Hydaburg that are surrounded by lots of private and public logging.

Response: The Forest did take a good look at the cumulative effects of past, present, and future management on deer and other subsistence resources on Prince of Wales Island. Specific to Prince of Wales Island, the EIS assessed the potential impacts for Coffman Cove, Craig, Edna Bay, Hollis, Hydaburg, Kasaan, Klawock, Naukati, Point Baker, Port Protection, Thorne Bay and Whale Pass in the Communities subsection of the *Subregional Overview and Communities* section. Summary tables are provided for each community, comparing the acres allocated to types of LUD group by alternative. For example, LUD groups in Coffman Cove's community use area (1,228,786 acres total) would range from: wilderness – 122,719 acres; mostly natural – 758,086 acres, moderate development – 98,294 acres, intensive development 249,686 acres under Alternative 1 to wilderness – 122,719 acres, mostly natural – 218,709 acres, moderate development – 340,708 acres, intensive management – 546,652 acres under Alternative 7. A summary is provided of the potential impacts on subsistence resources by alternative for each of the community use area. If, as time goes on, it looks like a change of LUD is necessary, the Forest would follow its standard amendment process for the Forest Plan.

Comment: Some comments stated that Forest Service roads open up subsistence areas to outside use which often has a negative impact on local users and resource sustainability. They would like the Forest Service to study the effect that building roads adjacent to sensitive subsistence areas has on subsistence resources. Another comment said the Final EIS needs to address the effects of competition on subsistence use.

Response: The Forest has looked at the potential impacts or effects of road building on subsistence resources, areas, and users. The Forest acknowledges in the EIS that road networks provide greater access to areas previously unconnected and can affect subsistence both positively and negatively by providing access, dispersing hunting and fishing pressure, and creating the potential for increased competition. Monitoring and evaluation of wildlife, fish, and subsistence comprise an essential feedback mechanism within an adaptive management framework to keep the Plan dynamic and responsive to changing conditions. Monitoring population trends and their relationship to habitat changes for management indicator species (MIS) (a lot of which are subsistence species), as well as analyzing if the effects of management actions on subsistence users in rural Southeast Alaska communities are consistent with those estimated in the Final Proposed Forest Plan, will provide information to be used to determine whether changes in management direction are needed. Thus, the Forest is studying the effect that building roads adjacent to subsistence areas might have on subsistence resources and will work with the appropriate state agencies, local communities, the Southeast Alaska Federal Subsistence Regional Advisory Council, and State Fish and Game Advisory Committees to analyze potential changes.

The EIS does address competition on subsistence use. Competition for the more abundant wildlife and fisheries resources near rural communities results from a combination of factors. Examples include fish and game regulations, mobility, and the natural distribution of game species across the Tongass, decreases in resource populations because of habitat reductions, decreases in resource populations because of over-harvest, and access provided to rural communities in the form of roads, ferries, and commercial air carriers. Specific assumptions were used to analyze competition in the 1997 Forest Plan Revision Final EIS, which concluded that implementation of Alternative 11 (the selected alternative) would result in a significant possibility of a significant restriction of subsistence use by increasing competition for some subsistence resources by non-rural, as well as rural residents. The possibility of a significant restriction, resulting from a change in competition, would be the same as or less than the possibility under Alternative 11 of the 1997 Forest Plan Final EIS for Alternatives 5 and 6 evaluated in this EIS. There would be a relative reduction in risk under Alternatives 1, 2, and 3, and an increase in risk under Alternative 4 and especially under Alternative 7.

Comment: There was a concern shared by some respondents that the non-subsistence areas associated with the borough of Juneau will grow as their borough boundary grows.

Response: This concern is beyond the scope of this planning effort. However, if the borough of Juneau were to grow, there should not be a change to outlying communities with regard to rural versus non-rural

designation. The Federal Subsistence Board will determine if an area or community in Alaska is rural, not the Forest Service. In determining whether a specific area of Alaska is rural, the Board shall use the guidelines provided in 50 CFR Part 100.

Comment: Some respondents from various communities believe the Proposed Forest Plan needs to include a section that better protects specific fish and wildlife stocks for subsistence purposes. They state that these are areas of concern that have developed over the past few years with respect to the State's ability to continue management of 'subsistence resources' and affect the people of these communities on the Tongass.

Response: While many of the areas identified by respondents are specific sites that are important to the subsistence users of particular communities, the Forest-wide standards and guidelines for Subsistence, Wildlife, and Fish are in place to protect fish and wildlife resources for subsistence purposes, across the Forest. The Forest will seek to maintain abundance and distribution of subsistence resources necessary to meet subsistence user needs. Monitoring population trends and their relationship to habitat changes for MIS (a lot of which are subsistence species), as well as analyzing if the effects of management actions on subsistence users in rural Southeast Alaska communities are consistent with those estimated in the Final Proposed Forest Plan, will provide information to be used to determine whether changes in management direction are needed. The Forest will continue to work with the appropriate state agencies, local communities, the Southeast Alaska Federal Subsistence Regional Advisory Council, and State Fish and Game Advisory Committees to analyze if changes need to occur with regard to specific fish populations and management activities. A proposal would then go to the Federal Subsistence Board for a determination.

Comment: Some respondents believe the Proposed Forest Plan needs to plan and provide for deer populations for subsistence and that the current deer models are weak or not applicable to large-scale, landscape-level analysis involving landscape patterns, such as sizes and location and timber stands.

Response: The Forest will seek to maintain abundance and distribution of subsistence resources necessary to meet subsistence user needs. Subsistence use is addressed specifically in Forest-wide standards and guidelines and subsistence resources are covered by the Forest-wide standards and guidelines for fish, wildlife, and riparian areas and biodiversity, among others. Fish and wildlife habitat productivity would be maintained at the highest level possible under all alternatives, consistent with the overall multiple-use goals of the current Forest Plan, with improved protection under the Final Proposed Forest Plan. In addition, each of the Forest LUDs contains direction to follow the Forest-wide standards and guidelines for Subsistence. The potential effects of the alternatives on wildlife productivity are discussed in more detail in the *Wildlife* section of the EIS. The deer model used for the Plan is a tool, used to evaluate the relative differences among alternatives in the context of a risk assessment. The Forest acknowledges that there are weaknesses or limitations in the use of this model when applied at the watershed or project planning level. It is however, the most appropriate tool for analysis over large planning areas such as the entire Tongass National Forest or at the scale of a watershed analysis area (WAA). Specific concerns raised with respect to the deer model are addressed in the Wildlife, Biodiversity and Plants section of this appendix under Deer.

Comment: One comment stated that a decline in old-growth forest wildlife habitat capability due to timber harvest on Native Corporation, Tongass, and other lands does not translate into reduced abundance of deer or other subsistence resources.

Response: The potential effects of the alternatives on wildlife productivity are discussed in more detail in the *Wildlife* section of the EIS. While it's true that after the initial years following logging, there is a rapid increase in deer forage production about 20 to 30 years after harvest, the vigorously growing hemlock and spruce shade out the understory forage during the next 100- to 150-year period. However, as stated

in the EIS, it is important to note that forest management on the Tongass has produced more forage than assumed by the deer model, through the management of second growth stands. The Forest is looking at young-growth management (in cooperation with the PNW Research Station) to evaluate the potential benefits of treating pre-commercial stands to increase wildlife habitat and wood production. There are still many uncertainties related to appropriate young-growth treatment designs, specific beneficial effects of such treatments, and the implications for deer. Initial results are looking promising. However, when comparing alternatives for this EIS, Alternative 7 would not include OGR and would have the largest potential long-term effects on the availability of deer for subsistence purposes.

Comment: Some felt that the Draft EIS does not adequately recognize the importance of subsistence use taking place on the Tongass National Forest, does not provide sufficient protection for this use, and does not provide enough information to evaluate the foreseeable effects of proposed timber management and increased levels of tourism and non-subsistence consumptive use.

Response: The Forest does recognize the importance of subsistence use taking place on the Forest. There are specific Forest-wide standards and guidelines related to subsistence. Other Forest-wide standards and guidelines, such as for fish, wildlife, and riparian, provide for species habitat planning and protection, which benefit subsistence species and resources. The Forest will continue to work with the appropriate state agencies, local communities, the Southeast Alaska Federal Subsistence Regional Advisory Council, and State Fish and Game Advisory Committees to analyze if changes need to occur with regard to a specific subsistence resource and any of the Forest's management activities. The *Wildlife* section of the EIS provides an in-depth discussion of the potential impacts to subsistence resources by alternative. In addition, both the *Subsistence* and *Subregional Overview and Communities* sections of the EIS discuss potential impacts to subsistence, looking at many different factors related to Forest management.

Comment: Some believe that the Proposed Forest Plan should include a subsistence land-use designation that would protect the most important subsistence use areas for rural communities. The amended Forest Plan should plan for subsistence not just assess the effects of other plan activities on subsistence.

Response: While it's true that there is not a land-use designation specific to subsistence, subsistence resources are important to the Tongass. We think it is better to manage for subsistence on all NFS lands rather than designate certain lands to a subsistence LUD. There are Forest-wide standards and guidelines set up to protect subsistence resources. Monitoring and evaluation for subsistence is designed to make sure that our actions are not negatively impacting subsistence resources. The Forest will continue to work in accordance with ANILCA Title VIII. In addition, each of the Forest LUDs contains direction to follow the Forest-wide standards and guidelines for subsistence.

Comment: Some respondents stated that the provision for periodic harvest assessments and other studies of subsistence – included in the 1997 Forest Plan – appears to have been dropped from the Proposed Forest Plan.

Response: This provision has not been dropped. The Forest-wide standard for subsistence 1.D states: "evaluate changes in subsistence use patterns and activities in cooperation with appropriate state and federal agencies by conducting periodic surveys of fish and wildlife populations and subsistence harvest and consulting with subsistence user groups."

Comment: One respondent stated that "given the importance to the rural economy of subsistence hunting, we think impacts on subsistence should be heavily weighted when deciding on an alternative.

Response: Potential impacts to subsistence resources are one of many factors that will be taken into consideration by the deciding official when reviewing the various alternatives.

Comment: One respondent stated that the Draft EIS needs to show the relative impacts of the different alternatives. The alternatives with larger amounts of harvest (Alternatives 4 and 7) would result in larger restrictions and that the Draft EIS should also consider the impacts to important subsistence use areas as these impacts would have greater effect than impacts to less important subsistence areas.

Response: The Draft does show the relative impacts of the different alternatives. Deer habitat capability in 2005 and after 100+ years of full implementation under each alternative (expressed as a percent of the 1954 habitat capability) is displayed in table form for each of the 32 individual community assessments in the *Subregional Overview and Communities* section of the EIS,. These tables show that deer habitat capability would be potentially reduced the most under Alternatives 7 and 4, within the development LUDs. These assessments specifically address the potential effects to the WAAs that are most important for subsistence for each community based on past deer harvest patterns.

Comment: A number of respondents commented that the Draft EIS fails to demonstrate that the proposed restrictions on subsistence use are necessary, that the proposed harvest would involve the minimum amount of land necessary, or how adverse impacts to subsistence uses and resources would be minimized. A number of respondents also commented that under ANILCA Section 10 three conditions need to be determined by the head of the federal agency before any significant restriction on subsistence use may be affected.

Response: The EIS is not currently proposing a restriction on subsistence use. It states that, “the 1997 deer analysis was much in line with the earlier...analyses… It indicated that deer habitat capabilities in several portions of the Tongass may not be adequate to sustain the current levels of deer harvests, and that implementation of any Forest Plan alternative could, therefore, be accompanied by a significant possibility of a significant restriction on the abundance and/or distribution of subsistence use of deer.” The EIS further states: “Under the alternatives analyzed in this EIS, the possibility of a significant restriction, resulting from a change in abundance or distribution, would be the same as or less than the possibility under Alternative 11 of the 1997 Forest Plan Revision Final EIS for five of the seven alternatives. This risk would, however, likely be higher under Alternatives 4 and 7 because these alternatives anticipate a higher level of timber harvest than the current Forest Plan (Alternative 5, No Action).”

An ANILCA Section 810 evaluation and determination is not required for approval of a Forest Plan Amendment, which is a programmatic level decision that is not a determination whether to ”withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition” of National Forest land. This EIS is part of the Forest Plan Amendment process and, therefore, does not require an ANILCA Section 810 evaluation and determination.

Comment: The Tongass National Forest should collaboratively identify local subsistence and community use areas on the Tongass and incorporate these areas into an expanded protected areas strategy.

Response: The EIS looked at the likely effects of the different alternatives on subsistence resources in two parts – effects on subsistence resources and uses important to each rural community and overall or on a Forest-wide basis, based on general considerations of the effects in terms of abundance and distribution, access, and competition. The 1997 Forest Plan EIS included discussions of 32 Southeast Alaska communities with a state land-selection base. This EIS provides brief updates of the affected environment section of the community discussions, where applicable. Each community assessment provides potential effects by Community Use Area, Economy, and Subsistence. Each of the Forest LUDs

contains direction to follow the Forest-wide standards and guidelines for subsistence. Additional collaboration will occur at the project- or site-specific level for District projects.

Comment: Alternative 7 is better for subsistence than is portrayed in the Draft EIS. Alternative 7 would improve subsistence because of better access and timber harvest is much better for deer than is indicated in the Draft EIS.

Response: It may be that actively managed young growth is better deer habitat than the old growth based deer model predicts. That is one of the reasons young growth management has more emphasis in this Amendment. However, in the absence of a new scientifically based deer model that incorporates the ability to better account for differential habitat values, we will continue to use the best scientifically defensible information available. Old-growth habitat is still considered to be the highest value habitat for deer because of the quality of food in the understory and the high canopy cover, which results in lower snow depths on the ground during critical winter periods.

Comment: One respondent asked for a return of traditional rights to Hydaburg for the area from Cape Chacon to the Maurelle Islands.

Response: It is not clear what the comment means by "return of traditional rights" but changes to subsistence regulations are outside the scope of this Forest Plan Amendment.

Comment: Some respondents shared their opposition to subsistence regulations and their belief that the federal government does not have any authority over Indigenous tribes or Indigenous people. They talked about their rights as a sovereign nation and their opposition to subsistence rights being given to non-native residents. They feel that Indigenous people should have priority for use of natural resources. Some felt that the Forest Service should compensate tribes for cutting trees or turn over control of resources to tribal governments.

Response: These are complex legal issues that are outside the scope of this Forest Plan Amendment. The Proposed Forest Plan will continue to be consistent with current laws and regulations.

Comment: Some comments stated that the Draft EIS does not take into account the economic value of cultural and other Forest-related tribal activities.

Response: The comment does not provide any context for this statement or identify the specific values that the comment author believes the Draft EIS fails to account for. As a result, it is not possible to provide a specific response to these concerns. Other specific concerns raised with respect to subsistence and heritage values are addressed in the *Subsistence* and *Heritage* sections of this comment response volume.

Comment: One respondent was interested in an area being designated for harvest of 500 year old cedar trees for totem poles and canoes as well as bark for weaving. They also asked for an area for spruce roots for basketry.

Response: These specific needs should be brought to the attention of the local District Ranger who is in the best position to address them at the site-specific level.

Comment: One comment noted that healthy salmon stocks support commercial, subsistence, and recreational fishing activities and have been an important part of the cultural fabric of indigenous people of the Tongass for literally thousands of years, as they are in the present day.

Response: We agree that healthy salmon populations are an important component of the Tongass ecosystem that support many human uses, provide prey for a variety of wildlife species, and act as a source of nutrients for the environment.

Timber

The Timber comment and response subsection is divided into the following categories:

- Harvest Methods
- Old-Growth Timber
- Young-Growth Timber
- Alaska Yellow-Cedar
- Harvest-General
- Spectrum Model Analysis
- Timber Sale Economics
- Timber Supply
- Allowable Sale Quantity
- Tongass Futures Roundtable
- General

Harvest Methods

Comment: One comment noted that the Draft EIS did not appear to present information on how the timber would be harvested under each alternative.

Response: The Regeneration Methods subsection of the *Timber* section discusses harvest methods. Table 3.13-9 in the *Timber* section identifies the projected acres by harvest approach (even-aged, two-aged, uneven-aged) for each alternative.

Comment: Some respondents requested that the Forest Service concentrate harvest in fewer, more-intensively managed areas to avoid entering new watersheds. They noted that applying the conservation strategy forces the harvest to be spread over a larger area. Others suggested that cutting less efficiently but over more acres would be a greener approach.

Response: Concentrating harvest in fewer areas and harvesting these areas more intensively would reduce the area needed for a given harvest level. However, it could also lead to adverse effects on water quality, wildlife, visual quality and other resources in the intensively managed areas. On the other hand, cutting fewer trees per acre would disturb more acres of land for the same volume of timber and would also require more roads.

Table 3.13-9 in the *Timber* section identifies the projected acres by harvest approach (even-aged, two-aged, uneven-aged) for each alternative. All seven proposed alternatives employ a combination of harvest approaches with projected harvest levels more concentrated in some areas than others.

Comment: One respondent believed that trees retained in harvest units should be looked at as an investment in non-timber resources and should not be offset by harvesting larger units, harvesting more units, or harvesting the retention later.

Response: The Forest does view the retained trees in harvest units as important for wildlife and does not plan to harvest them later. However, one consequence of retaining trees in harvest units is a reduction in harvest per acre, which needs to be made up by harvesting more areas in order to meet a

given level of demand. This is the trade off between leaving structure in harvest units as opposed to harvesting a smaller area more intensively.

Comment: One respondent stated that: "The change from removing large volumes of timber from concentrated areas using cable yarding systems to scattered small, units has affected sale economics and logging systems capabilities."

Response: Changes to timber sale design and logging systems affect harvest economics as noted in the comment. Logging large units, with no stream buffers to break up the unit, is more economical and more easily accomplished with cable logging systems.

Comment: Several comments stated that harvest should be limited to salvage logging or to previously disturbed areas with low environmental value, such as unused roads. Another comment suggested harvest should be restricted to 40 MMBF per year, the harvest rate between 1909 and 1950.

Response: The overall objective of all seven alternatives is to provide a balance between supplying enough timber to meet demand while protecting the environment. Limiting harvest to salvage logging would not meet projected demand under any of the alternatives. Alternative 1 was revised between the Draft and Final EIS documents and restricts harvest to roaded areas only. This alternative has a projected ASQ of 49 MMBF per year, which is close to the 40 MMBF identified by the comment author.

Comment: Some respondents opposed the use of clearcutting as a common harvest method. They argued that clearcuts are ugly and have negative impacts on fish and wildlife and tourism. Others argued that not clearcutting amounted to high-grading and would not produce healthy young stands.

Response: The alternatives feature a range of potential harvest methods. All alternatives include acres scheduled for even-aged harvest, also known as clearcutting (see Table 3.13-9 in the *Timber* section of the Final EIS). Even-aged harvest can be an effective harvest method in many cases because it provides regeneration of desired species, effective tree disease control, viable harvest economics, compatibility with the use of standard logging systems, and minimizes windthrow problems. The circumstances under which clearcutting is practiced on the Tongass are discussed in the Regeneration Harvest Methods subsection of the *Timber* section of the Final EIS.

Research indicates that stands that regenerate following partial harvest are healthy and provide good habitat. Uneven-aged and selective harvest treatments are established forestry practices that, if done properly, can produce healthy stands; however, the risk of windthrow and dwarf mistletoe infection is higher. This is discussed further in the *Timber* section of the Final EIS.

The potential effects of the alternatives on fish, wildlife, and tourism are evaluated in the *Fish*, *Wildlife*, and *Recreation and Tourism* sections of the Draft and Final EIS documents.

Comment: One respondent stated that there are many reasons for clearcutting besides those listed in the Draft EIS and provided a brochure the Forest Service produced in 1972 in support of this claim. Another comment stated that clearcutting is the only way to harvest on the Tongass because thinning spruce-hemlock stands results in wounded trees.

Response: Timber harvest methods are discussed in the Regeneration Methods subsection of the *Timber* section of the EIS. The brochure from 1972 provides an interesting perspective on the thinking at the time. Much additional information has been acquired on forest management in the last 35 years.

Contemporary professional forestry practices include a wide range of tools, techniques, and treatment methods that are all part of the range of tools available for managing the Tongass. Thinning can result in tree wounds, as noted in the comment; however, research indicates that if done with care, thinning can be successful. This is discussed further in the *Timber* section of the Final EIS.

Comment: One respondent stated that two-aged stands are just clearcuts with a few clumps of trees left in the units or along the boundaries. This, they argue, still results in an even-aged stand.

Response: Timber harvest methods are discussed in the Regeneration Methods subsection of the *Timber* section of the EIS. Harvest methods on the Tongass include three broad groups of methods: even-aged systems, two-aged systems, and uneven-aged systems. Two-aged harvest systems do not result in "clearcuts with few clumps of trees." The description of two-aged harvest has been revised in the Final EIS and explains that the intent with a two-aged stand is to leave up to 30 percent of the trees in order to create a stand with two age classes. This is often done by specifying a diameter limit, for example, leaving all trees between 9 and 18 inches diameter at breast height (dbh). The reserve trees provide structural diversity and an older aggregation of trees within the otherwise young-growth stand. This system has been used on the Tongass to meet scenery and wildlife objectives.

It is possible that the comment author is confusing two-aged systems with the clearcut with reserves system, which could conceivably be described as "clearcuts with a few clumps of trees left in the units or along the boundaries." Approximately 10 percent of the trees are left in these units but the intent is an even-aged stand. This is discussed further in the Regeneration Methods subsection of the *Timber* section of the EIS.

Comment: Some comments stated that logging practices should be limited to selective cutting. High quality trees should be used for structural timbers not chips or pulp.

Response: High quality logs are used for lumber not chips or pulp. It is the low-quality logs and the outer portions of the other logs that are used for chips (see Figure 3.13-2 in the *Timber* section in the Final EIS). There are a number of advantages to selective cutting, described here as two-aged and uneven-aged harvest, such as less potential impact on wildlife habitat and scenery. There are also some drawbacks, more acres must be disturbed for a given volume of wood compared to even-aged harvest (clearcuts and clearcuts with reserves), more roads are typically needed, and there are some concerns with respect to windthrow and logging damage to the remaining trees.

Additional information on selective harvest has been added to the *Timber* section of Final EIS. All seven proposed alternatives employ a combination of harvest approaches with projected harvest levels more concentrated in some areas than others.

Comment: One comment stated that: "Eliminating clearcutting would reduce, though not eliminate, the need to deal with low grade utility logs."

Response: Low grade utility logs would be included in harvest units under all three of the broad groups of harvest methods (even-aged, two-aged, and uneven-aged) proposed under each alternative. Eliminating even-aged systems or clearcutting would not substantially reduce the utility log component of potential timber sales. Selectively logging only the high-quality trees could reduce the amount of utility logs harvested. This practice is often referred to as "high grading" and In the long run this approach may not result in healthy forests if only the best and healthiest trees are removed leaving the rest to reproduce. This type of selective cutting also requires more road building and more frequent entries for an equal amount of volume.

Comment: Concern was expressed that leaving low grade logs in the woods wastes resources and harms wildlife.

Response: Timber sale purchasers are only allowed to leave utility grade logs in the woods. Utility grade logs cannot be sawn into lumber due to rot and other problems. While the Forest tries to utilize low value logs, those left in the woods often provide habitat for many species for extended periods of time. The effects of leaving low value logs in the woods are evaluated for all potentially affected resources, including wildlife, at the project level.

The recently approved Limited Interstate Shipment Policy (March 2007) is expected to increase the utilization of timber harvested on the Tongass and improve the economics of timber sales by providing a market for smaller diameter and low grade material that cannot be processed profitably by sawmills in Southeast Alaska. This is discussed further in the *Economic and Social Environment* section of the Final EIS.

Comment: Concern was expressed that helicopter logging is too expensive to be practical. One comment suggested that helicopter logging can result in "high-grading" because of the high cost of removing lower value material. Others recommended helicopter logging as the best method.

Response: Helicopter logging is generally more expensive than cable logging. Many areas of the Forest are too costly to harvest with a helicopter. Some high-value stands with short yarding distances may be economical, depending on fuel costs and timber values. Helicopter yarding generally has less environmental impact than other methods and is often prescribed as a harvest method to protect resource values by reducing disturbance on the ground.

Comment: One comment expressed concern that the Draft EIS assumes that "timber stands of varying volume will be (logged) proportionate to their occurrence within biogeographic provinces or ecological subsections," but there is nothing in the Proposed Forest Plan that requires this distribution or prevents "high-grading." The comment argues that the Final EIS, therefore, needs to explicitly evaluate the potential effects of "high-grading" in the Environmental Consequences analyses. The comment notes that this practice results in unsustainable harvest levels and has detrimental effects on the environment, including wildlife.

Response: The potential environmental impacts are assessed based on the projected ASQ. Modeling indicates that all of the alternatives would harvest the suitable land base at a sustainable level, as discussed in the *Timber* section of the EIS.

Actual harvest is likely to be lower than the projected ASQ and actual volumes harvested under any of the alternatives may be affected by a range of different factors that are difficult to predict at this point. It is important to remember that the Forest Plan does not authorize any ground disturbing activities or create any environmental consequences. The main function of the Final EIS is to compare and contrast alternatives in a general way using broad projections based on full implementation of each alternative. With that in mind, the ASQ represents the maximum allowable timber harvest under each alternative and allows an appropriate and consistent comparison between alternatives. This essentially represents a worse-case approach that ensures that the potential effects of each alternative are fully accounted for. Also, the OGRs proposed in most watersheds contain high-value forests which have been set aside for wildlife habitat and legacy standards apply to VCUs that have high levels of harvest. This is discussed further in the *Wildlife* section in the EIS.

More detail on the proposed harvest methods is provided in the Regeneration Methods subsection of the *Timber* section of the Final EIS. Table 3.13-9 in the *Timber* section identifies the projected acres by harvest approach (even-aged, two-aged, uneven-aged) for each alternative.

Old-Growth Timber

Comment: Some respondents disagreed with the statement under Key Issue 3 (page 1-7 in the Draft EIS) that big tree old growth has been disproportionately harvested. They assert that big tree old growth is well distributed across the Tongass.

One comment pointed out that pulp companies were not seeking big trees and provided a graph that showed the size distribution of spruce trees harvested by the Ketchikan Pulp Corporation during selected years in the 1980s and 1990s. The comment also noted that the average tree harvested in the 1980s and 1990s was 10 inches in diameter.

Response: The text on page 1-7 in the Draft EIS states that: "Although less than 10 percent of the POG habitats on the Tongass have been converted to second growth, this percentage is much higher for certain types of old growth, such as lowland and big tree old growth." This statement is consistent with our experience on the ground and supported by the GIS analyses conducted in support of this Forest Plan Amendment EIS.

Comment: Some comments pointed out that the amount of old-growth harvest under any of the alternatives is very low and argued that this suggests that claims that the forest had been over-harvested are untrue. Some suggested that we either revise Table 2-16 on page 2-41 of the Draft EIS to show that even under Alternative 7 approximately 76 percent of the POG remains or discuss this in the text.

Response: Low is a relative term. To some, harvesting 20 percent of the old growth is a very high amount, while to others it is very low. Table 2-16 in the Draft EIS summarizes the key components of each alternative with specific reference to the conservation strategy. The amount of POG remaining under each alternative is identified in Table 2-17 on the following page in the Draft EIS.

Comment: Concern was expressed that most—with some citing as much as 96 percent—of the old growth forest has been cut and argued that the remaining old growth should be protected.

Response: This is not correct. Over 90 percent of the old-growth forest that existed on the Tongass 100 years ago still remains. Even under Alternative 7, more than 75 percent would remain after another 100 years of harvest.

Young-Growth Timber

Comment: Support was expressed for the Tongass to transition to a second-growth (young-growth) timber program. Some felt that the alternatives did not adequately develop this concept and the Draft Plan did not display a plan for managing young growth. Some felt that only second growth forest should be cut.

Response: Additional analysis has been done for the Final EIS to examine the potential for a greater reliance on young-growth timber. In general, projections show young growth becoming a major component of timber harvest in about 30 years and being the majority of timber harvested in 60 years. The Final Proposed Forest Plan has been modified to place greater emphasis on moving in this direction more quickly. While there are opportunities to both improve wildlife habitat and produce timber by thinning young stands that have reached commercial size, it will take time for these stands to reach commercial size as most young forests on the Tongass are less than 50 years old.

Comment: Some comments stated that accelerated harvest of young stands may require changing national policy and Tongass regulations to allow stands of young trees to be cut before they reach the culmination of mean annual increment (CMAI) of growth.

Response: It does not appear that CMAI is a constraint to harvesting young-growth stands. The benchmark analysis conducted for this Forest Plan Amendment shows little effect by removing this constraint. Without thinning, stands can be regenerated as young as 70 years of age. They can be commercially thinned as early as 40 years. In any case, changing the National Forest Management Act to permit stands to be harvested before they reach 95 percent of CMAI would require an act of Congress and is beyond the scope of this analysis.

Comment: Some respondents strongly support converting to young-growth management but recognize that it will be many years before stands are old enough. They believe that the rotation age should be 90 years not 160 years for young-growth stands. They believe that providing additional volume may require relaxing standards and guidelines such as selective logging in the beach fringe more than 500 feet from the shore and in riparian areas

Response: Based on Spectrum modeling, the rotation age for young-growth stands on better sites could be 60 years without precommercial thinning and 70 years with precommercial thinning. If commercial thinning is also implemented, the regeneration period is delayed. This is because thinning of either kind reduces the number of trees per acre, which extends the growth period for the remaining trees, which also extends the time it takes for them to reach CMAI. The Forest is strongly considering thinning young stands in the beach buffer and in other areas set aside for wildlife, in order to improve wildlife habitat conditions in these dense stands. Trees cut in these stands in excess of down wood habitat needs would be available to mills (this would contribute to available wood supply but not to ASQ). As noted in the Draft EIS, young-growth stands generally have much higher volumes and lower defect than old-growth stands. We anticipate that the current ASQ could be met entirely from young-growth stands by the latter part of this century.

Comment: One respondent found "The age class information provided is confusing. What is apparent is that no second growth will be available for regeneration for at least 30 years. This makes it even more important to have a standard that prevents high-grading."
Response: The age class information presentation has been revised in the *Timber* section in the Final EIS and the discussion of young-growth management has also been expanded in the Final EIS. There are some stands that could be regenerated in this planning period, though not a great deal of volume would be generated. Concerns with respect to high grading are discussed in the preceding section.

Comment: Several comments expressed support for a 200-year rotation with thinning in Scenic Viewshed and Modified Landscape LUDs because this is the minimum time needed to produce a quality saw log.

Response: Generally, modeling indicates a rotation of approximately 170 years for Scenic Viewshed; however, it may be longer in some areas, depending on site quality and stand management. Areas in the far north of the Tongass may require longer rotation periods to reach commercial size.

Alaska Yellow-Cedar

Comment: One comment expressed concern about the reported loss of 500,000 acres of yellow-cedar on the Tongass, which the comment author believed might be the result of climate change. The comment states that this offers an opportunity to salvage log dead and dying yellow-cedar instead of continuing to log healthy trees.

Another comment stated that no more live cedar should be cut and there should be no more salvage of cedar until studies show that cutting these dead trees is "sound science." Another comment argued that the Tongass mismanages yellow cedar and does not take into account its present ecological troubles. This comment also requested that the Proposed Forest Plan include a special section devoted to the careful management of this species.

Response: The EIS recognizes that the decline and mortality of yellow-cedar is one of the most widespread and important forest health problems in Southeast Alaska (refer to the *Forest Health* section). This decline is associated with wet, poorly drained sites, and research suggests that reduced snow pack in low-elevation areas associated with a warming trend that started in the 1800s has exposed fine surface roots to freezing, which in turn kills trees. As the climate continues to warm, yellow-cedar decline is likely to continue to spread, especially in the south and east. Conversely, yellow-cedar appears to be spreading northward as climate warms, into areas that retain snow longer into the spring.

Salvage logging of yellow-cedar is permitted under the current and Proposed Forest Plans. Harvest of healthy yellow-cedar is also permitted and is expected to occur under all seven alternatives. Cedar has been studied for many years. We are not aware of any studies that show harvesting cedar is more or less problematic than harvesting spruce or hemlock.

Harvest-General

Comment: Many respondents stated their opposition to logging. Some were opposed to all logging, while others were specifically opposed to logging old-growth. Many mentioned wildlife habitat protection as the primary reason while others simply said they wanted to protect the Tongass.

Response: The alternatives feature different levels of potential harvest activity which would likely result in different configurations of a wood products industry in Southeast Alaska. All of the alternatives feature some level of logging to meet the requirements of TTRA to seek to meet market demand for timber. Alternative 1 proposes the least old-growth harvest (approximately 1,180 acres per year) and Alternative 7 the most (approximately 10,000 acres per year). The Final Proposed Forest Plan places greater emphasis on harvesting young growth but a complete transition from old growth to young growth is likely several decades away.

Comment - One comment suggested that we not use the word "harvest" when discussing timber management activities. The comment author argued that the word was part of a marketing campaign to make logging of old growth forest more appealing.

Response: Timber harvest is a broadly accepted term used in a wide range of academic and professional contexts, including forestry texts, research studies, and scientific articles. The term is used to describe all forms of logging, not just logging on old growth forests.

Comment: One comment noted that one of the great things about the Tongass is the natural regeneration that follows timber harvest. Others commented that logged areas are slow to grow back, and need to be thinned, some twice. Another comment stated that trees in Southeast Alaska don't reproduce as fast as trees in other areas and harvest levels need to reflect this.

Response: The spruce-hemlock forests of Southeast Alaska are among the most productive in the world according to Silvicultural Systems for Major Forest Types of the United States (USDA Forest Service, 1983). Most areas on the Tongass regenerate naturally and very little tree planting is necessary. Most young stands need to be thinned to improve growth. Regeneration is generally rapid on the Tongass, with tree growth generally faster in the south than in the north.

Comment: One comment stated that any restrictions on harvesting timber should be based on peer-reviewed science.

Response: Standards and guidelines for timber harvest are based on science and many years of experience managing timber harvest on the Tongass.

Spectrum Model Analysis

Comment: Some respondents felt that the Forest Service failed to identify the benchmarks it uses to determine the range of alternatives. They believe the Forest Service used the benchmarks from the 1997 Plan but did not explain how these were used and did not identify: 1) the costs and benefits associated with the minimum level of management needed; 2) the maximum physical and biological outputs of forest resources and the associated costs and benefits; and 3) the estimates of the PNV of forest resources with established market value.

Response: Benchmark analyses were conducted for the Final EIS to determine the minimum and maximum physical and biological outputs of forest resources, the maximum PNV of the forest resources and the influence of management constraints on outputs of forest resources. These analyses are included in the updated AMS included in the planning record. Accordingly, the desired biological outputs of the Alternatives are set at feasible levels as determined by the analysis. Information about costs and benefits is described in detail in Appendix B of the Tongass National Forest Land Management Plan Final EIS.

Comment: One comment questioned if all withdrawn lands were properly considered in determining suitable lands. As an example, they cited land adjacent to the West Chichagof-Yakobi Island Wilderness that was purchased and should have become part of the Wilderness. The comment author noted that both the 2003 SEIS map and the 2007 Draft EIS map show this area as semi-primitive recreation instead of Wilderness.

Response: The area cited in the comment is part of the Wilderness. The mapping error that identifies this area as semi-primitive recreation has been corrected in the Final EIS. This area was not included in the suitable land base, as maps of the suitable land in the planning record show. Also, as can be seen in the alternative maps included with the Draft EIS, this area was not shown as available for harvest in any of the alternatives.

Comment: One respondent had questions about how the timber was modeled. They wanted more information about how lands identified as suitable were stratified into categories with similar costs and returns; how the level identifiers reflect the costs and returns associated with the location of suitable timber in relation to mills, one of the factors possibly contributing to the 1997 FORPLAN's overestimate of ASQ; how the agency stratified lands in the Spectrum model; how slope stability was factored into any of the 5 analysis areas; how slope stability was considered in the "operability analysis"; and whether this "operability analysis" formed the basis for the operability in Spectrum.

The comment also stated that "slope stability should appear in Spectrum as a stratification layer not as a constraint because slope divides the land into categories with similar management costs

and returns. In addition, the comment stated that the "roaded classification stratification may provide stratification for costs associated with transportation. Please explain to what extent this stratification accounts for costs associated with access limited areas. Access-limited areas are difficult to log because although the timber is operable, the costs associated with accessing and transporting logs to a mill cannot be covered by the value of the timber."

Response: Five unique level identifiers were used to stratify the landscape into Spectrum analysis areas. Slope was not used explicitly as a level identifier; rather it was considered in no fewer than three of the Spectrum modeling processes. First, lands with slopes greater than 72 percent were classified as having "extreme hazard soils" and were removed from the suitable land base (and the model) during the suitability analysis (Appendix A-3). Secondly, the logging systems and transportation analysis (LSTA) that was used to derive the operability level identifier considered slope indirectly through the road building necessary to access a stand. If an area could not be accessed by building a road (due to slopes or other factors), those analysis areas were assumed to require helicopter or cable logging at a higher cost. Finally, the Regulation Class of an analysis area is partially-derived from the slope-driven Visual Absorption Capacity (VAC) classification of the land. Regulation classes with lower VAC have more management restrictions and higher costs. We are confident that cost differences due to slope have been adequately captured in the stratification scheme and suitability analysis of the landscape.

Distances to mills and appropriate transportation costs are accounted for with the VCU level identifier. Analysis areas in VCUs farther from a mill will incur a higher transportation cost. See Appendix B for more information.

Comment: One comment questioned what legal authority allows the Forest Service to build roads with public funds in order to make sales sellable and wanted the EIS to explain: the total projected "pre-roading" and the locations of these needed roads and their purposes; what these purposes are and in what roads analysis this need is documented in; how the contract and management costs were included in Spectrum as direct costs against revenues; and requested that the Forest Service itemize contract management costs incurred for roads built since 2002.

Response: Funds for road building have been "earmarked" in annual appropriations enacted into law. The underlying authority to build roads for National Forest purposes is at 23 United States Code (USC) 205.

Pre-roading is a process whereby roads are constructed into a NEPA cleared project area prior to and separate from a timber sale or other resource activity. The intent of pre-roading is to develop or expand the transportation network without requiring one resource to carry the entire burden of road construction costs. Pre-roading is an administrative decision that requires funding from Congress and is subject to the same environmental laws and regulations (NEPA, NFMA, etc.) as other Federal actions. This practice is best addressed at the project level and is outside the scope of this programmatic EIS. Road contract and management costs have not been included in Spectrum as direct costs against revenues

The Forest Service does not track specific contract management costs on road construction. For budgeting purposes there is an estimated cost of about 10 percent of contract costs for administration of the contracts. Contract administration costs can vary depending on a number of factors, including but not limited to contract size, scope, technical complexity, and logistics.

Comment: One comment asked: "Where is the standard or guideline in the Plan that prevents high grading? Constraining this was clearly modeled in Spectrum but without a companion standard in the Forest Plan, what would prevent this from occurring. If it is the NIC 1 and NIC 2 requirement, is this a standard or a guideline? We are not aware of any language in Section 301 of TTRA that constrains or prevents this. If it is in the Forest Service Handbook (FSH 2409.18), which section prevents this? If it does, we do not consider Forest Service Handbook language a

sufficient protection from high grading considering that the Forest Service can change the handbook without public oversight or input."

Another comment expressed concern that the most valuable logs on the Tongass are being exported without primary processing because it is more profitable to export raw logs than to process them in Southeast Alaska. The comment noted that although cedar only comprises a small share of commercial forestland on the Tongass, it is the most highly valued species, and appears to be driving many Tongass timber projects. Another comment expressed the same concern and noted that the industry has been unable to find a market for anything other than the highest quality saw timber.

Response: The Multiple-Use Sustained-Yield Act requires the Forest Service to manage NFS lands in a sustainable manner. This direction is reflected in the goals and the desired condition for the Timber Production LUD on page 3-127 of the Proposed Forest Plan. Cedar occurs as a minor tree species in most stands. The comment that cedar is driving many Tongass timber sale projects is not supported by historical data.

Comment: One respondent asked how exactly was each constraint defined in Spectrum and were they defined and used in the same way for each alternative?

Response: Constraints, or limitations on management activities to motivate the model to achieve desired conditions, are complex in definition, function and application. Appendix B has been updated to more clearly address these questions. In general, constraints can be classified into four categories:

Stand-level exogenous constraints: These constraints are applied before the Spectrum model is built. They are generally applied by evaluating the entire suite of potential management prescriptions available to a stand and only giving the model a choice between those prescriptions that may make the most sense to apply on the ground. These are derived by the forest silviculturist and other specialists.

Stand-level endogenous constraints: These are typically accounting constraints applied to each stand to ensure that all acres are assigned a management prescription and that no more than the available acres of a stand get assigned to a management prescription. These are part of a standard model formulation.

Forest-level exogenous constraints: The suitability analysis used to identify potentially-manageable acres is an example of this type of constraint; typically a National Forest is not able to manage all acres within the Forest, and unsuitable acres on the Tongass were not included in the Spectrum model.

Forest-level endogenous constraints: Generally, the forest-level endogenous constraints are the ones generically referred to as "Spectrum constraints" or simply "constraints". They are often the most dynamic of the four constraint types, as the other three are usually static by the time the Spectrum model is run. Each Alternative used a unique set of forest-level endogenous constraints, although there were some that were standard and did not need to be modified between alternatives. Appendix B describes these constraints in more detail and how constraints were applied to the different alternatives.

Comment: **One respondent observed that the Spectrum model has an objective function that attempts to maximize present net worth and the present net worth of harvests is embodied in a single coefficient: Dij. They asked that we explain in detail how the grouping of analysis areas affects the value of Dij and how these coefficients were calculated.**

Response: Dij is the discounted objective function coefficient for stand "i" management regime "j" to represent the PNV of that management option. A management regime includes the management prescription associated with the stand as it exists today, as well as any and all prescriptions associated with stands regenerated in the future. Generalizing the landscape into the analysis areas is a standard part of the modeling process necessary to produce a model that can be solved in a reasonable manner.

Calculation of Dij is a standard part of the Spectrum model to account for the appropriate revenues and costs associated with each management option. Appendix B has been updated to better explain the PNV calculation and objective functions used in the model solution process.

Comment: One comment stated that "there is no information on how the management prescriptions were mapped for each alternative, nor on the exact methodology, rules, and sideboards that would allow for replication of the process with a common outcome. Please explain how the management boundaries were determined under each alternative."

Response: Table II-16, page 2-41 and the individual alternative descriptions in Chapter 2 of the Final EIS show that all the alternatives, except Alternative 2, were based on previously developed alternatives in prior analyses.

Comment: One respondent stated: "The requirements of 36 CFR 219.14(c) were not met. Lands that are not cost-efficient should not be suitable. Although Congress decided the Forest Service need not consider economic factors in identifying lands not suitable for timber production, this does not relieve the Forest Service of disclosing the costs and benefits associated with including uneconomical suitable lands in the timber base. The law does not exempt the agency from managing the Tongass on a cost-efficient basis. The Forest Service must disclose the results of the (corrected) Spectrum analysis as it pertains to cost-efficiency. There are three classes of land: 1) lands where agency revenue exceeds agency costs; 2) lands where agency costs exceed agency revenue; and 3) lands where logger costs exceed revenues to the logger. Modeling pond log values has obscured all of the above."

Response: The respondent's assertion that the requirements of 26 CFR 219.14(c) were not met is incorrect. The Spectrum model is designed to evaluate a management strategy for cost efficiency. This is most commonly addressed by an objective function that maximizes the cumulative PNV of all potential management prescriptions on all potentially suitable lands, with the requirement that the desired conditions of the forest are met (36 CFR 219.3 "*Cost efficiency*"). This is exactly the formulation used by the Tongass. One of the many desired conditions of the 2007 Tongass plan is to meet and maintain a timber demand level consistent with the Alternative being analyzed. In doing so, it may be necessary to employ management strategies on some lands where costs of the management activity are greater than the benefits realized for the timber under current market conditions. However, since the alternatives were evaluated using a linear programming optimization model (Spectrum) with an objective function to maximize PNV, the most cost-efficient management scenario is identified for each alternative in accordance with 36 CFR 219.14(c)(3).

The costs and benefits associated with each management prescription identified in the Spectrum model solution, while voluminous, are included in the planning record. Stumpage value varies according to logging system, distance from the mill, road building requirements, quality of the timber, etc. Recognizing all of the potential logger-incurred costs against the pond log value allows for site-specific stumpage values to be calculated internally by the Spectrum model in much more detail than a forest-wide externally-derived stumpage value. Factors contributing to the stumpage value in the model include the positive pond log value (adjusted downward to exclude logger profit and risk) less the logging cost, road building and reconstruction costs, felling and bucking costs, camp/commute costs, Log Transfer Facility costs, and timber hauling costs (raft, barge and/or road). Agency-incurred costs that are evaluated by the Spectrum model but do not contribute to stumpage include sale preparation and administration, precommercial thinning, and planting costs. Agency-incurred costs are included as a part of the cost-efficiency analysis outlined in 36 CFR 219.14(b). See Appendix B for further information on this calculation.

The comment author requested and has been provided with all of the information necessary to calculate stumpage value for any Analysis Area of interest. This information is sufficient to allow the comment author to identify the three classes of land they note in the comment.

Comment: One respondent asked that the Forest develop a map of lands not suitable for timber production to help implementers make sure they are not proposing timber sales in these areas.

Response: Maps of suitable acres for each alternative are included in the planning record. Suitable areas are mapped in a geographic information system (GIS). Lands not identified as "suitable" are considered to be not suitable for the purposes of timber sale planning. Further, field work is conducted as part of each timber sale planning process to determine if the map of the suitable lands in the project area is correct. There are generally features which cannot be detected without a field exam.

Comment: One comment noted that two aspects of MIRF were not accounted for in the Spectrum analysis: the habitat conservation areas (large, medium, and small), which blocks access to timber areas, and the legacy standard which requires that 10 to 30 percent of the timber in all units be left. As a result, the comment suggests that the modeling constraints significantly under estimate the adverse effects of these standards and guidelines.

Response: We believe that the Spectrum model adequately accounts for these factors. See Appendix B to the Final EIS for more information on modeling.

Comment: One comment stated that short-distance helicopter yarding should not be included in the NIC I. They believe that the definition of NIC 1 has been redefined from the 1997 Plan. There are no documents to the comment author's knowledge that "demonstrate that this "new" normal operability category would be economic under most market conditions." As a result, NIC I may have little relevance to an economic timber supply and the comment author states that Appendix B in the Draft EIS needs to be updated to fully describe the modeling process.

Response: This is not a change. NIC I under the current (1997) plan includes short span helicopter (see page 3-280 of the 1997 Final EIS). Appendix B has been revised for this Final EIS to address this and a number of other comments raised during the public comment period on the Draft EIS.

Comment: Analysis of bid price paid for sales of varying sizes from October 1, 2004 to December 31, 2005 showed a range of prices between $13.45 and $85.34 per MBF. This is in sharp contrast to the average pond log value used in Spectrum analysis of $273 per MBF. How was the timber sale revenue estimate ($11.69/MBF) used in the economic efficiency analysis estimated and was this figure used in the Spectrum analysis.

Response: To clarify, the Tongass recognized several unique pond log values in its economic analysis; for old growth this consisted of a value for each of three volume strata in each of the five geographic zones, or 15 unique values. Young growth values vary by the age at which they are harvested. However, as the respondent has pointed out, the actual bid price (stumpage value) of a timber sale has a great deal of variability associated with it. We contend that this variability is directly correlated with the costs associated with the timber removal, i.e., the logging system used, transportation requirements to get it to the mill, etc. Thus, stumpage value is an inherent calculation done by the Spectrum model to generate a unique value for each distinct geographic unit (Analysis Area). For the Final EIS, we have included a more detailed economic analysis for timber value in Appendix B Table B-2.

The $11.69/MBF average stumpage value used in the Draft EIS represents the forest-wide average price paid for timber sales in 2005/2006. This value does not consider the site-specific variability in stumpage values calculated by the Spectrum model and was not used in the Spectrum model analysis. It should be noted that the economic efficiency analysis has been updated in the Final EIS.

Comment: One comment summarized sales data from October 2004 to December 2005 and concluded that the average bid price per MBF was higher for micro sales and small sales, then for

relatively large sales. This, the comment noted, suggests that one of the alternatives in the EIS should have focused on microsales, rather than large sales. "Unfortunately," they note "none of the alternatives in the Draft EIS appear to be based on benchmark analyses that evaluate the option of shifting management resources away from large sales to micro and small sales."

Response: The seven alternatives evaluated in the Final EIS offer a broad range of potential responses to future timber demand. These alternatives do not specify the size of the sales that would be offered under each alternative. The Forest Service would continue to offer small and micro sales under all of the alternatives.

The benchmark analyses conducted show the difference in values between geographic areas, logging systems, stocking levels, maximum management size, and distances to nearest processing facilities. This is consistent with the planning rule that requires landscape stratification by factors that influence economic efficiency. Updated benchmark analyses were conducted according to this stratification.

Comment: One comment asked for more detail concerning the timber policy constraint used in the Spectrum model to ensure that all timber harvest meets sustained yield requirements. The comment asked that we explain the following:

"1. which specific constraints were applied for each alternative and in what sequence;
2. whether planners conducted a Spectrum run that does not maximize timber harvest in the first decade before maximizing present net value;
3. whether planners ask Spectrum to maximize present net value subject to the requirement that it cut the volume of timber in the above run;
4. what discount rate was applied to maximize the present net value run; and
5. whether planners used nondeclining net revenue constraints in any model runs."

Response: Regarding the constraints applied to each alternative, Appendix B has been updated to include more description as well as a table describing which constraints were applied to each Alternative. The nature of the Spectrum model allows for all constraints to be included simultaneously; there is no hierarchical order of importance assigned to the different constraints.

Regarding the timber harvest level in the first decade, the model is constrained to meet a harvest level consistent with the design of the alternative. These levels were derived independently of the maximum potential Decade 1 harvest level, save that to insure the ability to implement the plan, the level must be less than the maximum.

The model scenarios evaluated for each alternative found the maximum PNV of the alternative under the appropriate constraints, including the appropriate timber harvest level, of each Alternative.

The model used a 4 percent annual discount rate.

There is no constraint to consider non-declining revenues from decade to decade. See Appendix B "Solution Process" for more information on the Spectrum model formulation.

Comment: One comment noted that Appendix B in the Draft EIS indicates that the Spectrum analysis did not assign a value for utility logs under Alternatives 1, 2, 3, 5, and 6, but assigned utility logs a positive value under Alternatives 4 and 7 based on the assumption that there would be a market for these logs (MDF, Bioenergy, or similar facilities). Alternatives 3, 5, and 6 should also assign a positive value to utility logs because they assume there would be enough volume to operate a veneer mill. The decision to give no value to utility logs under certain alternatives also ignores the new Region 10 transshipment policy.

Response: For the Final EIS, a utility pond log value of $72 per thousand board foot volume was recognized for Alternatives 4, 5, 6, and 7. This price was based on an analysis of recent prices (see Appendix B for source information). However, we recognize that this positive revenue will rarely, if ever, outweigh the costs associated with its removal from the stand and transportation to the mill. The recently enacted Limited Interstate Shipment Policy (March 2007) allows limited interstate shipment (to the lower 48 U.S. states) of unprocessed Sitka spruce and western hemlock. This could provide a market for small diameter and low-grade material in the future under all alternatives, but the value this would add to utility logs is currently unknown. However, viewed in terms of the Spectrum analyses, utility wood value is not likely to have a large impact on the amount or timber produced or the management schedule of any Alternative.

Comment: One comment stated that the costs described in the Draft EIS Appendix B and used in the Spectrum analysis do not appear to correlate with the costs used to compare the alternatives in the economic efficiency analysis (Table 3.22-29, page 3-460).

Response: Appendix B shows two different types of costs used in Spectrum modeling; those incurred by the timber buyer and those incurred by the Forest Service. Costs incurred by the timber buyer are counted against the pond log value to determine actual stumpage value (see Final EIS Appendix B for further information on this calculation). Stumpage value calculated in the model as a function of pond log value less cost incurred by the timber buyer approximately corresponds to the historic stumpage value shown in Table 3.22-29 of the Draft EIS. The two analyses are discrete in that Spectrum uses stumpage values specific to each land area and Table 3.22-29 shows the historic average stumpage [base rate in the Final EIS] of sold wood. The analyses are similar in that ultimately they both evaluate each Alternative's anticipated revenues to the Forest Service.

Agency-incurred costs are included in the Spectrum model to determine the overall economic value of the harvest schedule associated with each Alternative. Agency-incurred costs in the model and described in Appendix B correspond to the agency-incurred costs shown in Table 3.22-29.

Comment: One comment stated that it is unclear from the documentation exactly what figures were included as revenues in Spectrum. The comment asked the following questions: Were any non-timber benefits modeled in Spectrum? Were any non-timber benefits modeled in Spectrum in determining the suitable land base and the PNV of harvest? If this occurred in either case, please explain why and what those figures were (dollar amounts).

Response: Pond log values that varied by volume class and geographic zone were the only monetary revenues modeled in Spectrum. These values are further described in the "Activities and Outputs" section of Appendix B. Only the costs and benefits described in Appendix B were used to determine the PNV of the Alternatives and Benchmarks analyzed with the Spectrum model. Pond log values were the only revenues used in the "Stage II Suitability Analysis" described in Appendix B.

Comment: One comment stated that mitigation measures to not seem to have been accounted for in the cost calculations and made the following points. The cost of mitigation activities needs to be accounted for in determining timber suitability. If the Forest Service must complete required mitigation measures then these costs should be reflected in either the stratification of analysis units according to a range of conditions or in a range of stumpage prices by mitigation requirements. The cost is especially tied to factors such as slope, proximity to streams, proximity to cultural resources, proximity to threatened and endangered plant and animal habitat, all of which can be stratified. As the mitigation costs are not the same on all sales some grouping of mitigation costs by harvest type or ecological condition or habitat location should be calculated.

Response: Appendix B describes two processes that were used to incorporate the effect of mitigation measures for each alternative. The "Regulation Class Process" describes how Scenic Integrity Objectives, Visual Absorption Capacity, Distance Zone, and LUD were used to identify lands that required varying levels of mitigation for scenery and other considerations. Regulation classes with more harvest restrictions generally have higher harvesting costs.

Secondly, the "Model Implementation Reduction Factors (MIRF)" section describes how the impacts of stream buffers, slope and soil hazards, wildlife concerns, and other factors were considered in the model. MIRF were applied to a stratification by Administration area, volume class, and harvest system.

Timber Sale Economics

Comment: A number of comments supported Alternative 7 with some modifications. They felt that some of the Conservation Strategy Standards and Guidelines lacked a basis in science and should be removed from Alternative 7. These standards and guidelines include: the 1,000-foot beach buffer, OGRs, Class III stream buffers, the Legacy standard, and the Goshawk and Marten standards. Many of these comments argued that these measures are the main reasons that the Tongass has been unable to offer economic timber sales.

Response: These recommendations were considered and evaluated as part of Alternative 7. These measures are all important components of the Forest's conservation strategy, which is an integral part of meeting our multiple use objectives and the legal requirement that we maintain viable wildlife populations. The wildlife assessments completed for the current Forest Plan found that alternatives that did not provide a comprehensive conservation strategy had a higher risk of not maintaining viable populations of some wildlife species. The U.S. Fish and Wildlife Service has indicated that the conservation strategy adopted under the 1997 Plan was a major factor in not listing the Queen Charlotte goshawk as threatened under the ESA. See Appendix D of the Final EIS for more information about the scientific rationale behind the conservation strategy.

Alternative 7 as proposed in the Draft EIS did not have these standards and guidelines except for the Class III riparian standard (see, for example, Table 2-16, page 2-41). Alternative 7 has been modified in the Final EIS and it no longer includes buffers on Class III streams.

Comment: One respondent believed that Forest Service sale design should maximize production while protecting the resources that need protection.

Response: Forest Service timber sale design is intended to meet market demand in an economically efficient manner, while protecting other resources.

Comment: One respondent felt that the timber market is cyclical so sales should be designed so that they are operable in all markets.

Response: This may not always be possible, given the high cost of operation in an island archipelago, spikes in fuel costs, and the location of the Tongass in relation to markets. One of the Proposed Forest Plan's stated goals (page 2-5) is to provide timber in an economically efficient manner.

Comment: A number of respondents stated that logging should not be subsidized with taxpayer dollars. Others stated that subsidies should be factored into the economic analysis of the alternatives. Conversely, one comment stated that subsidized logging was needed to revitalize Alaska's economy.

Response: The issue of whether or not the federal government is subsidizing the timber industry is beyond the scope of this analysis. During low market conditions the cost of planning, preparing and administering timber sales are often higher than the value paid for the timber. This is factored into the economic efficiency analysis presented in the *Economic and Social Environment* section of the EIS. One of the Forest Service's objectives for the Tongass National Forest under TTRA is to promote community stability by seeking to provide a stable supply of timber that meets annual market demand.

Comment: Some respondents felt that timber sales must be economic or it defeats the purpose of offering them. They argue that planning teams should include people with experience in planning economic sales. Some requested that a standard requiring sales to be economic be added to the Proposed Forest Plan. Not having economic sales has lead to the Forest not achieving the ASQ. Others felt that costs would always be too high to compete with other regions.

Response: We agree that timber sale expertise is important. The Forest Service is already prohibited from offering deficit timber sales. The high cost of doing business in Alaska as well as current market conditions contribute to the economics of timber sales. The Tongass will continue to work to make timber sales as economic as possible while protecting other resources. But it is not our responsibility alone. Industry needs to find new markets, develop value-added products, and become more efficient to reduce costs and improve profits.

Comment: Concerns were expressed about the difficulty of having economic harvest units in Scenic Viewshed and Modified Landscape LUDs where partial cutting is often required.

Response: The bulk of the timber harvest under all the alternatives comes from areas classified as Timber Production; these are areas that allow more intensive timber harvest, while still protecting other resources, such as fish and water quality through stream buffers and other standards and guidelines. The proposed Plan Amendment updates the Seen Area analysis and Visual Priority Routes and Use Areas as a step in this process (see Appendix F of the Final Proposed Forest Plan). While we want to foster more economic timber sales we also recognize the importance of maintaining our outstanding visual resources.

Comment: Several comments made the following general argument. The overall goal of the Tongass timber program should be to transition to second-growth timber. Full transition will take at least 50 years and in the interim the Forest Service needs to provide a sufficient, predictable supply of old-growth timber that will sustain the existing industry and have the flexibility to increase this supply if the industry were to expand. This harvest should be concentrated in intensively managed areas and standards and guidelines should be relaxed in these areas to improve timber sale economics, in exchange for more stringent guidelines applied elsewhere.

Response: The Forest Service supports the overall goal to transition to second-growth (young-growth) timber harvest over time; however, it will be decades before there are enough young stands to provide a sufficient timber supply to meet market demand in accordance with TTRA. Table 3.13-9 in the *Timber* section identifies the projected acres by harvest approach (even-aged, two-aged, uneven-aged) for each alternative. All seven proposed alternatives employ a combination of harvest approaches with projected harvest levels more concentrated in some areas than others.

None of the alternatives propose that standards and guidelines be "relaxed" in harvest areas in exchange for "more stringent guidelines" applied elsewhere. Alternative 7 does, however, exclude or relax the components of the conservation strategy—the 1,000-foot beach buffer, the Goshawk and Marten Standards and Guidelines, the 100-foot buffer on Class III streams, and the small, medium and large OGRs—that the timber industry argues result in uneconomic sales.

Comment: One comment stated that some State forests and all private forests can be managed for positive economic returns and argued that the Forest Service should also be able to move in that direction. Another comment stated that the Forest Service should avoid scheduling sales in areas that are uneconomic to harvest.

Response: NFS lands are governed by different laws than state and private forests and this affects the relative costs of harvesting timber. The Forest Service will continue to work to make timber sales as economic as possible while protecting other resources.

Comment: Several comments requested that the Forest Service set aside funds from timber harvest for post harvest treatments and studies.

Response: This program already exists. It is authorized by the Knutzen-Vandenberg Act. The Forest Service may "require any purchaser of National Forest timber to make deposits of money, in addition to the payments for the timber, to cover the cost to the United States of (1) planting...removing undesirable trees or other growth...improving the future productivity of the renewable resources of the forest..." Sale receipts in excess of base rates can be used for this program.

Comment: Some respondents requested that the Forest Service not allow round log exports. Concern was expressed about utility log exports and the recent decision to allow the export of low-grade and smaller logs. This, they argue, creates jobs and encourages investment in other states and countries not Alaska. Concern was also expressed that the Draft EIS and market demand analysis fails to take these log exports into account. One comment was also concerned that no NEPA analysis was prepared for this policy change.

Response: Export of logs is a policy decision and beyond the scope of this analysis. Issues surrounding NEPA for other projects and policy decisions are also beyond the scope of this project.

The limited interstate shipment policy referenced in this comment is not addressed in the Draft EIS because it was not approved until March 14, 2007, more then two months after the Draft EIS was published. The potential implications of this policy are discussed in a number of locations in the *Economic and Social Environment* section of the Final EIS.

People often use the term "export" to refer to the interstate shipment of logs, that is, shipment to other parts of the U.S. The shipment of these logs to other states directly supports employment in the logging and transportation sectors in Southeast Alaska. It also provides a market for low grade logs that currently are often left in the woods because there is no economical processing facility for this material in Southeast Alaska. The new policy, therefore, has the potential to indirectly support logging and sawmill employment because it improves timber sale economics and may allow sales to go forward that would otherwise not be profitable.

Comment: The Morse Report (2000) states cedar will be processed locally because the Seley Corp has a mill designed to process cedar but the Draft EIS says it will be exported.

Response: The text in the *Economic and Social Environment* section of the Final EIS has been revised to clarify that there are some local facilities that are able to process limited amounts of cedar.

Timber Supply

Comment: One comment stated that page 2-23 of the Draft EIS over estimates the amount of harvest from state and private lands under Alternative 4. The same comment author later states that the Brackley et al. (2006a) estimate of 6.8 MMBF per year from state and private lands seems reasonable, with no increase in available timber from state and private lands likely in the future.

Response: The only reference to state and private harvest on page 2-23 of the Draft EIS, or elsewhere in the referenced section, is the statement that "private and state lands also contribute to satisfying market demand". The amount is not quantified. The Brackley et al. estimate of 6.8 MMBF is referenced in the Draft and Final EIS documents. It may be noted that this estimate applies only to state lands and does not include projected future harvest on private lands in Southeast Alaska.

The analysis presented in the Draft and Final EIS documents evaluates how well the NIC I component of the ASQ available under each alternative would meet various demand-related benchmarks. This analysis focuses on Tongass timber, which is assumed for the purposes of analysis to be the only source of timber in the region.

Comment: A number of comments requested that the Forest Service provide sufficient economic timber to supply an integrated timber industry, which would support local employment and contribute to the regional economy. Some comments stressed the need for local mills that could process low-quality logs so they would not need to be exported.

Response: The EIS evaluates a range of alternatives. Alternatives 3 through 7 would provide sufficient volume to supply an integrated timber industry based on the demand projections developed by Brackley et al. (2006a). Alternatives 3, 5, and 6 would provide sufficient volume to support a Medium Integrated Industry (Brackley et al.'s Scenario 3). Alternatives 4 and 7 would provide sufficient volume to support a High Integrated Industry (Scenario 4). Timber demand is evaluated in detail in the *Economic and Social Environment* section of the Draft and Final EIS documents. Both the Medium and High integrated industry scenarios require some form of demand stimulus that would create demand for lower grade logs. Brackley et al. suggested that this might take the form of a medium density fiberboard (MDF) plant or a biomass facility established in the region.

Comment: One comment stated that development of an integrated industry would require an integrated land management policy across state, federal, trust, and private lands. The comment author offered a series of recommendations that included placing an emphasis on the most value and family wage jobs per board foot for the least volume harvested, providing incentives for local mills through tax breaks, and restricting the export of unprocessed logs, among others.

The same comment author pointed out that imported wood is used for many projects in Alaska and wanted the state to fund a state log grading agency. The comment also noted that more investment is needed to develop the local wood manufacturing industry.

Response: While the Forest coordinates management with other land owners where possible, state and private land managers often have different goals. The State of Alaska is a Cooperating Agency in this analysis effort. Although the Forest Service supports the restoration of an integrated timber industry, developing incentives and tax breaks is beyond the scope of this analysis, as is the log export policy for non-NFS landowners. Funding for state agencies is also beyond the scope of this analysis.

Alternatives 3, 4, 5, 6 and 7 are designed to provide a stable timber supply that would be sufficient to support a Medium or High integrated industry. This is discussed further in the *Economic and Social Environment* section of the EIS. The Forest Service also supports a number of initiatives and pilot programs, including the non-profit Ketchikan Wood Technology Center.

Comment: One comment suggested that the timber industry should be responsible for providing their own timber (such as fast-growing eucalyptus for pulp and bamboo) and the Forest Service should provide an incentive for this transition by charging high prices for any timber it does supply. Another comment suggested other plants or recycled material be used.

Response: The Forest Service has no control over what is grown on private lands. It may, however, be noted that neither eucalyptus nor bamboo are native to Southeast Alaska. The Tongass is required to seek to meet market demand under TTRA. Timber sales designed to meet this demand are offered using a competitive bid process, with prices determined by the interaction of supply and demand. In general, it seems reasonable to assume that recycled materials have the potential to replace some products that currently come from new lumber.

Comment: One comment pointed out that the Ketchikan Veneer Mill recently completed a successful test run of their equipment using local logs and project that the facility will initially need 2.1 MMBF of veneer-quality logs per month to operate, with this amount increasing to 3.65 MMBF per month after six months. The comment author notes that a commitment from the Forest Service is required before operations can proceed further.

Response: The Forest's goal is seek to meet the market demand for timber as required by TTRA. The projected demand identified in this comment would result in annual demand of 43.8 MMBF, approximately 13.8 MMBF higher than the installed production capacity estimated for this facility by the Juneau Economic Development Council (2007). The timber demand analysis subsection in the *Economic and Social Environment* section of the Final EIS evaluates the ability of the proposed alternatives to meet projected demand based on the PNW study (Brackley et al. 2006a) and a series of other measures, including installed capacity.

Comments: Many comments expressed support for local mills that either produce value added products or products required to serve local markets. Comments recommended that the Tongass provide enough wood to support value added mills. A number of comments stated that timber sales should be designed for small operators and spread across the forest to accommodate local operators without impacting other existing public uses. One comment expressed support for the Forest Service's recent decision to offer sales targeted at small operators.

Response: The Forest Service seeks to provide wood for mills that produce value added products and/or serve local markets as part of its requirement under TTRA to seek to meet the demand for Tongass wood. Many comments express support for some form of value added industry, but do not clearly define what they mean by value-added. The larger existing mills on the Tongass, which are not very large by most standards, produce value added products and support local employment. The demand associated with these mills is also part of the market demand that the Tongass must seek to meet under TTRA. The Final EIS identifies potential market demand for the planning cycle and identifies areas of the forest that need to be withdrawn from commercial timber production in order to protect wildlife and other resources.

The alternatives feature different levels of potential harvest activity that would likely be associated with different configurations of a wood products industry in Southeast Alaska. Projected harvest levels evaluated in the Final EIS range from 49 MMBF under Alternative 1 to 421 MMBF under Alternative 7 in the first decade following implementation.

Comment: One comment asked for specific information in the Final EIS on how each alternative would affect small mills in the Thorne Bay area.

Response: It is difficult to predict how any specific small mill would be affected by an alternative, beyond assuming that if demand is met then there will be enough wood to support small mills as well as larger mills. However, wood is sold through a competitive bidding process and there is no guarantee that a specific mill will succeed in meeting its needs in a competitive market.

Allowable Sale Quantity

Comment: One comment stated that: "if it is true that the lack of shelf stock is keeping industry from expanding then the agency has the authority to create additional shelf stock without raising ASQ. ASQ constricts the sale of timber not preparation of sales. If demand does increase, the agency can raise ASQ. Right now there is no reason to do so."

Response: While it is true that merely planning timber sales does not affect the ASQ, shelf stock that could not be sold without violating the ASQ would be of limited value. The Final EIS evaluates seven alternatives in detail. Three of those alternatives have a lower ASQ than the current plan, two are the same as the current plan, and two are higher.

Comment: Some respondents felt that the current ASQ seemed sufficient, but noted that the Forest Service should remain flexible in case demand rises.

Response: The Forest Service reviews demand on a regular basis and can amend or revise the Forest Plan as needed to meet its obligations under TTRA.

Comment: Some respondents believe that the Forest Service should act quickly to make timber available and to add timber to the "pipeline".

Response: The provision of timber is a priority under the current plan and would continue to be so under the amended Forest Plan at levels determined in the new plan and as funding and personnel allow.

Comment: Several comments stated that the ASQ is too high under the higher volume alternatives because: "Brackley et al.'s timber demand projections were used to model harvest and determine the ASQ."

One comment stated that TTRA requires the Forest Service to seek to provide "<u>a</u> supply of timber" (singular) that meets "<u>the</u> market demand" (singular) for timber from the Tongass (emphasis added in the comment), not the multiple demand amounts evaluated in the Draft EIS.

Response: The demand levels used to help develop a range of alternatives were developed by specialists at the PNW Research Station (Brackley et al. 2006a) and represent the only peer-reviewed demand estimate available. Specific concerns identified with respect to the Brackley et al. study are discussed in the *Economic and Social Environment* section of this Comments and Responses volume, under Timber Demand. Additional information on the Brackley et al. analysis is provided in an addendum report that addresses questions and concerns raised with respect to the original analysis (Brackley and Haynes, in press).

The Forest Service considered the Brackley et al. analysis and other studies of timber demand to create a broad range of alternatives. Implementation of the selected alternative will provide one supply of timber that will meet the market demand for timber from the forest in accordance with TTRA.

Comment: One comment asked for a 10 year timber sale schedule and stated that the National Forest Management Act and its implementing regulations require the Forest to publish a 10-year harvest schedule. Another comment requested that the Forest Service prepare a detailed timber harvest schedule to ramp up to the timber under contract level of 1,080 MMBF (3 years worth of timber at 360 MMBF per year).

Response: The requirement to identify a "planned timber sale program" in NFMA Section 1604(f)(2) is accomplished by the information provided in the Final EIS which displays the projected ASQ volume by Forest Plan alternative. The requirement does not mandate a compilation of individual proposed actions. The Forest Service currently prepares 5 year sale schedules to implement the Forest Plan and will continue to do so as part of the implementation process under the amended Forest Plan. The Forest Service would like to increase the volume under contract and the shelf volume (prepared but unsold sales) to help provide more stability to the timber industry. The amount of new volume to be offered to meet the Forest's general goal of having 2 to 3 years of unharvested timber under contract will depend on the selected alternative.

Comment: One comment stated that: "The Draft EIS states that it is unlikely that all acres modeled and scheduled for harvest will actually be cut. This is likely to be true as long as the federal bureaucracy controls the timber supply. This is another reason to keep the ASQ high."

Another comment stated that lawsuits by environmental groups have tied up the "few economically viable timber sales" offered on the Tongass in recent years actively leading to the "current situation." This comment argues that the Tongass should plan to offer sale volumes in excess of market demand—the comment author suggests twice the market demand volume may be necessary—to ensure that sufficient volume "make(s) it past the environmental appeals process and to the market."

Response: When crews review the areas scheduled for harvest by the model, they are likely to find some areas do not have sufficient volume to be considered commercial forest land, some areas will prove too costly to road or too uneconomic to log. This is likely to be the case regardless of who manages the land. In addition, because of the protections needed to maintain habitat for wildlife and protect viewsheds that are important to the tourist industry, additional falldown in harvest volume is anticipated and built into the model.

The ability of the alternatives to meet potential demand is assessed against a series of measures in the *Economic and Social Environment* section of the Draft and Final EIS documents. These measures include the four scenarios identified in the projections developed by Brackley et al. (2006a), current production levels, installed and active production capacity, and the minimum estimated volumes required to support various processing facilities. The comparison between the four scenarios presented in Brackley et al. and the alternatives is based on the total ASQ volume. The comparisons between the alternatives and the other measures are based on the NIC I component only, which includes lands that can be harvested with normal logging systems.

The Forest Service hopes that regional stakeholders can reach consensus and avoid lawsuits in the future and supports the efforts such as the Tongass Futures Roundtable.

Comment: Concern was expressed that the ASQ is a very poor indicator of how well each alternative would supply timber to the local industry. Actual production is historically well below the established ASQ.

Response: It is true that ASQ is a ceiling and not a guarantee of actual production. But it remains a viable measure of the potential of each alternative to supply timber to local markets. The actual amount of timber that might be sold and harvested in each alternative is always speculative as it is dependent

upon numerous factors such as timber demand, volume under contract, lumber prices, Forest Service budgets and appeals and litigation.

Comment: Several comments stated that the Spectrum model analysis overstates the likely economic sale volume by more than 30 percent. This has two effects on the analyses presented in the Draft EIS. First, the ASQ volumes overestimate the amount of economic timber that would be available under each alternative. Second, this overstatement results in an overestimate of potential environmental impacts in all cases where the ASQ is used as part of the analysis. The ability of the alternatives to meet the four demand scenarios identified in Brackley et al. (2006a) and the potential environmental impacts of the alternatives should be assessed using a new category, the "Programmed Sale Quantity" (PSQ), which should be based on less than 70 percent of the ASQ.

Response: As stated in a number of locations in the Draft and Final EIS documents, the ASQ is a ceiling; not a future sale level projection or target and it does not reflect all of the factors that may influence future sale levels. Actual harvest is likely to be lower.

The ability of the alternatives to meet potential demand is assessed against a series of measures in the *Economic and Social Environment* section in the EIS. These measures include the four scenarios identified in the projections developed by Brackley et al. (2006a), current production levels, installed and active production capacity, and the minimum estimated volumes required to support various processing facilities. The comparison between the four scenarios presented in Brackley et al. and the alternatives is based on the total ASQ volume. The comparisons between the alternatives and the other measures are based on the NIC I component only. The use of NIC 1 volume in the Final EIS generally corresponds to the suggestion to use the more economic component of the ASQ for evaluation purposes.

The potential environmental impacts are assessed based on the projected ASQ. Actual harvest is likely to be lower and actual volumes harvested under any of the alternatives may be affected by a range of different factors that are difficult to predict at this point. It is important to remember that the Forest Plan does not authorize any ground disturbing activities or create any environmental consequences. The main function of the Final EIS is to compare and contrast alternatives in a general way using broad projections based on full implementation of each alternative. With that in mind, the ASQ represents the maximum allowable timber harvest under each alternative and allows an appropriate and consistent comparison between alternatives.

Comment: Concern has been expressed that the ASQ would restrict movement toward the planning cycle demand of 360 MMBF per year if it was lower than the planning cycle demand.

Response: The ASQ is a decadal ceiling and should not be confused with the average or annual sale quantity. The ASQ is the maximum amount of timber that can be sold from regulated or scheduled timber lands during each decade over the life of the Forest Plan and is typically presented as an annual average. Annual harvest is not, however, constrained to this annual average, provided that the cumulative annual harvest volume does not exceed the decadal ceiling. This may result in annual harvests that exceed the average annual ASQ for a number of years. For example, if during the first part of the decade only half of the average annual volume was sold, that volume could be made up by selling more than the average during the remainder of the decade. With the current timber harvest levels low relative to the ASQ and planning cycle demand, such decadal flexibility should allow sufficient volume to respond to increases in industry growth and demand for timber.

The Forest Service also has established procedures (Forest Service Handbook 2409.13) for analyzing departure from the established ASQ ceiling to determine whether or not it is possible to better meet multiple use objectives. Those procedures include several criteria or conditions in which evaluation of departure from the ASQ would be needed. One of the set of conditions listed is when implementation of the ASQ could have a substantial adverse impact in the economic area in which the forest is located. For

example, if the level of harvest has increased and the cumulative amount of timber sale volume is approaching the decadal ceiling, there may not be sufficient new sale volume to support market demand. If this were likely to be too disruptive to the local economy, departure procedures could be triggered to sell more than the ASQ decadal ceiling. This volume could be made up in the next decadal ceiling or forest amendment processes, including public involvement, would be used to adjust the ASQ accordingly.

Comment: Is this statement in the Draft EIS true: "additional volume can be produced from, for example, wildlife habitat enhancement in young-growth forests..."

Response: Many OGRs contain old clear cuts. Thinning the young stands that have grown in these areas can enhance development of large trees. Any commercial-size wood removed from these areas would not count toward ASQ. This statement has, however, been deleted from the Final EIS because it was easy to misinterpret.

Tongass Futures Roundtable

Comment: A number of comments mentioned the need to find consensus on the lands available for timber harvest. Some mentioned the Tongass Futures Roundtable and expressed support for this group and its identified goals. As noted in the comments, one of the group's goals is to develop a 24- to 36-month supply of timber to bridge the period needed for a consensus approach among stakeholders to agree on which watersheds should be protected and which should be available for timber harvest.

Response: The Forest Service supports the goals and objectives of the Tongass Futures Roundtable and appreciates the work that this group is doing to work toward consensus on Tongass issues.

Comment: One comment expressed concern that the Tongass Futures Roundtable might have too much influence on the ROD. They felt that there was no way one group could represent all interests.

Response: As stated above, the Forest Service supports the efforts of the Roundtable to bring various interest groups together to discuss Tongass issues, but we recognize that this one group does not speak for everyone. It should be noted that as of the date of this publication the Tongass Futures Roundtable has not brought forward any specific recommendations beyond some very general goal statements. The rationale for the decision for this project will be discussed in the accompanying ROD.

General

Comment: Some respondents believe that Alternative 7 was not fairly treated in the Draft EIS. In particular they felt that the negative effects of timber harvest were overstated. A related comment was the impression that the Draft EIS has a "logging is bad" bias.
Response: As the Final EIS notes, timber harvest provides jobs and resources that people need, such as lumber for housing and also benefits species that are associated with early seral conditions. However, timber harvest, and the associated road construction, does increase the risk of negative effects on wildlife, old growth forests, streams, and other resources and the EIS attempts to depict this fairly. As Alternative 7 has the highest level of timber harvest, it also has the highest risk of possible negative effects.

Comment: Concern was expressed that Sealaska cannot be expected to continue harvesting at the same level it has been during the next decade if it does not get it's ANCSA entitlement in that period.

Response: The EIS assumes for the purposes of analysis that Private (Native Corporation) and State harvests would be 109 MMBF per year for the first decade following Forest Plan implementation under all of the alternatives (Brackley et al. 2006a). Private land management is not part of the scope of this analysis except to the extent that it informs the cumulative effects analysis for potentially affected resources. Specific questions and comments related to ANCSA and Sealaska are addressed in the Lands section of this comment and response appendix.

Comment: One comment noted the following concerns with respect to the tables presented in the Timber section of the Draft EIS:

- **Tables 3.13-1, 3.13-2, and 3.13-3 identify different numbers of total suitable acres**
- **The acres presented for items 7 and 8 in Table 3.13-8 are different under Alternative 1 than under the other alternatives**
- **The total suitable acres identified for Alternative 1 in Table 3.13-8 are slightly lower (6 acres) than those presented in Table 3.22-31**
- **Table 3.13-10 and the text on page 3-260 of the Draft EIS do not appear to match**
- **Table 3.13-14 is supposed to show age class distribution for suitable timberlands, but instead shows total timberlands**
- **Total timberlands identified in Table 3.13-14 do not match the totals for lines 13 and 14 in Table 3.13-8.**

Response: The suitable acre numbers have been updated in the Final EIS and are presented consistently throughout the document. The other identified typographical errors and inconsistencies have also been corrected in the Final EIS.

Comment: One comment stated that: "Using US Forest Service GIS data, there are over 1.8 million acres of commercial timber with an estimated 29 billion board feet of timber. This is enough to produce an annual sale volume of 365 MMBF over an 80-year rotation. Second growth will help augment this amount, easing the transition to second-growth management. Lowering the rotation age to 70 years would require less old-growth harvest."

Response: While this may be correct, not all commercial forest land is available for harvest due to the need to consider other resources and uses.

Comment: Several comments questioned why the acres in development LUDs and the ASQ for Alternative 1 in the Draft EIS do not match those for Alternative 8 in the 2003 SEIS. The number of acres increased from 1.1 million to 1.2 million, but the ASQ dropped from 96 MMBF to 52 MMBF. Concern was also expressed that the ASQ for Alternative 5 (No Action) in the Draft EIS is 267 MMBF compared to 259 MMBF for the same alternative in the 2003 SEIS.

Another comment pointed out that the statement in the Draft EIS that approximately 767,000 acres have been harvested in Southeast Alaska conflicts with the PNW Research Station General Technical Report (GTR) 386 from 2006, which states that over 1 million acres had been cut at that time.

Response: Alternative 1 in the Draft EIS included some roadless area, while Alternative 8 in the SEIS did not. Also, the ASQ under Alternative 1 was limited to the amount needed to reflect recent timber harvest levels on the Tongass. The alternative was not designed to maximize production from the roaded area. Page 3-442 of the Draft EIS mentions that this alternative has the potential to produce more timber

volume. For the Final EIS we eliminated all roadless areas from the suitable land base in Alternative 1, thereby reducing the number of suitable acres while keeping the ASQ the same. We left nearly the entire roaded area in Alternative 1 even though not all of these acres would be needed to harvest at the lowest demand level.

Regarding the no action alternatives, the SEIS used an excel spreadsheet to estimate ASQ based on the old FORPLAN runs. The Draft EIS used the new Spectrum model. This accounts for the differences in the two no action alternatives. In hindsight, it appears that the no action alternative in the SEIS could produce the 267 MMBF estimated in 1997 but the excel spreadsheet estimate used in the 2003 SEIS was reasonably close (less than 3 percent difference).

Recent estimates of the amount of harvest are more accurate due to improvements in GIS technology.

Comment: Some concern was expressed about blowdown, especially in light of prediction of increased storm events due to global warming. Comments were particularly concerned about blowdown along the margins of harvest units and in the 100-foot wide stream buffers. A number of comments recommended that the Forest Service conduct research on blowdown and windthrow patterns and use this information in harvest planning.

Response: Blowdown can be a serious problem, especially in areas that are subject to catastrophic wind events. Buffers on streams require more than the 100-foot buffers on each side of the stream. Standards require a reasonable assurance of a windfirm buffer. The width of each buffer depends on the windthrow risk of the area. We will continue to monitor and acquire more information about blowdown in Southeast Alaska. In addition, the Forest Service supports research on windthrow through the PNW Research Station.

Comment: Some disagreed with the statement in the Draft EIS that alternatives with more road building and harvest are likely to result in more blowdown if climate change results in more storms, as some predict.

Response: Windthrow associated with roads and harvest units is well documented, as is the increase in storm events in the last few decades. While, to date, the increase in storm events has not resulted in a documented increase in windthrow, the potential should not be ignored when planning harvest units.

Comment: One comment stated that "because of the risk of blowdown, logging prescriptions tend to not leave strips of unharvested old growth between units. Instead new units are placed adjacent to old units, which leads to mega-units much larger than the maximum 100 acres. The Plan needs to include standards that prohibit this practice."

Response: The average opening in recent years has been approximately 11 acres. A new unit is not placed next to an old one until the trees in the existing harvest unit are established (4.5 feet tall, and free to grow), as required by existing regulations. In some cases (especially in areas subject to catastrophic windstorms) adjacent units may only be 10 or 20 years apart because the risk of blowdown results in not leaving an area of old growth between units. This has some positive and negative effects. On the one hand, concentrating harvest in a smaller area reduces fragmentation and allows wider travel corridors to be maintained. Also, it reduces the problem of blowdown, assuming the new unit is placed correctly in regards to the wind. On the other hand, it can lead to larger areas of young-growth forest, which can reduce the usefulness of portions of the area to some wildlife species, including generalist species that like edge habitat.

Comment: Several comments pointed out that the north half of the Tongass has a very different ecosystem from the south half of the Forest and should be looked at differently when it comes to timber harvest. The north part of the Forest is slower growing and there are only a few small mills to support. Some also noted that communities in the south are dependent on timber harvest while those in the north are more dependent on recreation and tourism.

Response: The seven alternatives considered in detail in the Final EIS provide a wide range of options for management of the Forest**.** Most alternatives recognize that the south part of the Forest has more accessible and economically viable timber stands and this is reflected in how the timber LUD is allocated. Modeling assumptions in the Spectrum model also reflect higher growth rates and timber volumes and lower logging costs in the south part of the Forest. The decision maker also has the option of making a decision that could further recognize the differences between the north and south halves of the Forest. The regional economy is discussed in detail in the *Subregional Overview and Communities* section of the Final EIS.

Comment: One respondent stated that they understand pine is being replanted on the Tongass and requested that the Forest Service at least plant native species.

Response: Very little pine, if any, is planted on the Tongass. Only native tree species (using local seed sources) are planted. Most regeneration is from natural seeding from trees adjacent or within the harvest unit. This is discussed on page 3-245 of the Draft EIS. While the Tongass does contain one native pine species, the Forest Service is not aware of it ever having been planted for timber production.

Comment: One respondent requested that the Forest Service supervise all timber sales on NFS lands and not privatize this task. The comment also stated that helicopter loggers should be required to clean up areas they use.

Response: Forest Service directly oversees all timber sales on the Tongass National Forest. All timber sale contracts specify the cleanup required.

Comment: One comment expressed concern about the scaling practices used by the Forest Service and suggested that corrupt scaling practices may have resulted in larger harvest areas. The comment also questioned whether the Forest Service has an accurate picture of the harvested areas on the Forest.

Response: The comment provides no detail about the alleged “corrupt” scaling practices employed by the Forest Service and, therefore, it is not possible to provide a detailed response other than to say that the Forest Service is not aware of any “corruption” in the way it scales logs. The Forest Service conducted a detailed analysis of the Tongass National Forest as part of this overall Forest Plan amendment process. This included mapping productive forest land on the Tongass based on existing NEPA analyses, aerial photographs, LiDAR, LANDSAT, and GIS data, and local knowledge.

Comment: One comment stated that logging slash should be removed and noted slash is burned or chipped in Washington and Oregon.

Response: Leaving woody debris (logging slash) on site retains important wildlife habitat components and nutrients. Burning slash would release carbon into the atmosphere and would be out of place in an environment that does not normally have fire. Chipping slash would be costly and would not result in any meaningful benefit since fire risk is very low in Southeast Alaska. Slash is treated in Oregon and Washington in areas where fire risks require fuel treatment but many areas no longer burn (or chip) slash because fire risks are low. This is the case, for example, in most areas west of the Cascades in Washington.

Comment: One comment opposed all logging until surveys of wildlife, rainfall, tree growth, and soils have been completed. Another comment recommended that a watershed analysis be completed prior to every timber sale.

Response: Site-specific analyses required prior to timber harvest include wildlife surveys and vegetation surveys, including tree growth sampling to validate the growth potential of each site where harvest is being considered. Soil surveys have been completed for the Forest and these surveys are ground-truthed for individual project areas as part of the analysis prior to approving timber harvest. Watershed analyses are completed prior to a timber sale when the existing level of disturbance indicates the need.

Comment: The Forest Service should use all tools available for managing timber, such as the size-density model and the Marxan Model.

Response: The size-density model is a potentially useful tool that the Forest is currently developing and it was used in the analysis presented in the EIS. The Forest is also looking at the Marxan Model and other tools.

Comment: One comment requested that the Forest Service restore the timber volume class designations 1-7 in the Proposed Forest Plan. The comment stated that the system used to replace these classes is much less precise.

Response: Volume classes 5, 6, and 7 were combined because there is no significant difference between them. This is discussed on page 3-244 of the Draft EIS.

Comment: Several comments stated that local industry has done a poor job of managing their lands. Extensive harvest on private lands has adversely affected subsistence, wildlife, and streams and other resources.

Response: The Forest Service has no control over management of non-NFS lands. The impacts of management practices on adjacent lands are evaluated in the Cumulative Effects discussions presented for each resource, as appropriate.

Comment: Some comments stated that they have confidence in the Forest Service to manage public forest resources. One comment expressed support for the Forest Service, but suggested that the Forest Service also consider private sustainable forestry projects, such as the Pioneer Forest in Missouri.

Response: Thank you for the expression of confidence. The Forest Service continues to conduct research and develop new management approaches and strategies. The management of private lands is outside the Forest Service's jurisdiction, but innovations in other areas may be applicable to land management on the Tongass.

Comment: One comment recommended that Congress establish a dedicated timber reserve on the Tongass.

Response: Congressional actions are beyond the scope of this Forest Plan amendment process.

Transportation and Utilities

The Transportation and Utilities comment and response subsection is divided into the following categories:

- Roads
- Transportation and Utility Corridors
- Energy and Utilities

Roads

Comment: Some respondents expressed concern about the large backlog of maintenance work that needs to be completed and thought that roads should be the focus of restoration. They believe that the EIS should include transportation alternatives that look at various reasons to deconstruct existing roads and limit new road construction, such as protecting wildlife habitat, saving maintenance money, and protecting watersheds and fish.

Response: The Forest is working through the Roads Analysis Process and Travel Management planning to identify the roads that will be needed in the future and those that should be closed, as well as to identify and correct road problems, including fish passage. Both of these processes include extensive public participation. The Draft EIS did not include alternatives for managing the existing road system because this issue is being dealt with at the local level. The issue identification process for this EIS is discussed in the *Public Issues* section of Chapter 1 of the EIS. Using the Roads Analysis Process and Travel Management planning, the Forest has already decommissioned approximately 100 miles of roads and placed into storage a significant portion of the road system. The Forest used the roads analysis process to identify maintenance needs and prioritize funding to deal with the most serious problems first.

Comment: Concern was expressed about the use of road storage. One comment stated that storage can be a valuable tool that is a vast improvement over past abandonment practices, but, at its worse, storage can fail to prevent erosion and resource damage. They note that repeatedly opening and closing roads harms wildlife and introduces "pulses of sediment" into watersheds. Another comment noted that storing roads has limited effectiveness.

Response: Roads are placed into storage when there is a long-term need for the road but the road will not be needed in the near-term. In the past, these roads were left open and often revegetated naturally, which in effect closed them to vehicle use. However, culverts sometimes plugged and this has led to roads washing out. There have also been other erosion problems and fish passage problems with many of these roads. Placing roads in storage restores natural drainage where needed and corrects erosion problems. Roads may remain in storage for one or several decades. The intent is not to repeatedly open and close them, as the comment implies. These roads quickly revegetate reducing the fragmentation that roads can cause. Alder often dominates old roadbeds, which adds nitrogen to the soil and helps forbs and other understory vegetation grow. As noted in the Final EIS, recent research indicates that areas with alder provide high-value forage areas for deer. It is true that when they are reopened, some sediment may be released but there is much less disturbance than would be the case with new construction. We believe that road storage is a valuable strategy for managing the road system.

Comment: Concern was expressed about the long-term impacts of temporary roads, especially sediment produced in the first 5 years. Others suggested that the Forest Service consider the use of lower impact temporary roads instead of "spec" roads.

Response: We agree that temporary roads can cause sediment problems and that these roads should be constructed correctly and closed as soon as practical following completion of the project that they were

constructed for. This was not always done in the past. The Forest generally proposes lower impact temporary roads in areas where long-term access is not needed.

Comment: Some believe that the Plan Amendment is not consistent with ANILCA provisions of off-highway use as all areas will be closed to OHV use unless designated open. ANILCA requires that all areas be open for subsistence use, subject to reasonable regulation.

Response: The Plan Amendment will have no effect on this issue. Each Ranger District on the Tongass is analyzing how to provide reasonable access for subsistence and other uses in their Travel Management Plans and accompanying NEPA documents. The Draft EIS simply discussed what the National OHV rule states and the process for determining which areas and roads would be designated open. Each District will work with the state and local governments, tribes, and the public, as required by NEPA. The standard in the Final Proposed Forest Plan has been updated to state: "Each ranger district will designate the roads, trails, and areas open to motor vehicle use on a motor vehicle use map. All operations must be in accordance with those designations."

Comment: One comment stated that the conservation community may support some extensions of the road system into the margins of adjacent roadless areas on a case-by-case basis as long as connectivity is maintained.

Response: All alternatives except the revised Alternative 1 allow the extension of existing road systems and new road construction in roadless areas. Alternatives 2 and 3 would restrict these road extensions to lower value roadless areas. Refer to the alternative descriptions in Chapter 2.

Comment: One comment requested that the Forest Service require all roads to be constructed above grade and prohibit road-related alterations to natural surface water or ground water.

Response: The Forest has many different site-specific situations where it is best to construct roads either "above grade" or "below grade". The design and standards of roads are site specific and should be addressed and commented on during the planning phase at the project level under NEPA. The Forest will continue to coordinate management actions with the Alaska Department of Environmental Coordination (ADEC) and ADF&G in the implementation of existing BMPs and development of new BMPs.

Comment: Some comments expressed the desire for road access to the forest. Others noted the importance of roads originally built for timber harvest that connect communities.

Response: All alternatives include retaining existing roads and construction of new roads as needed for each alternative. The Draft EIS (page 3-229) acknowledges that the existing transportation system that connects communities was originally constructed largely in support of timber harvesting.

Comment: One respondent thought it would be more helpful for the Final EIS to display average road density in the individual VCUs with past harvest or proposed new harvest by alternative, and not include VCUs with no development in the average density calculation because this skews the average.

Response: The EIS displays existing and projected future road densities in many ways other than simple averages. In the *Fish* section, Table 3.6-8 presents average road densities for NFS lands, for non-NFS lands, and for all lands combined, under existing conditions and under each of the alternatives. As the comment implies, these averages are Forest-wide so they include areas with and without development. Since there are almost 950 VCUs on the Tongass, it would take many pages to present this information by VCU. Table 3.6-9 was developed (in lieu of presenting a catalogue of VCU road

densities in a multi-page table) in order to provide summary information on the number of VCUs on the Tongass that have different road densities by placing each VCU into road density categories and then calculating the percentage in these categories. Each VCU was placed into one of six road density categories, ranging from 0 miles per square mile to >4 miles per square mile. This was done for existing conditions and for future conditions under each alternative (after 100+ years). It was also done for NFS lands only and for NFS and non-NFS lands combined. If the reader wants to determine the exact number of VCUs in each category, the total numbers of VCUs used in the calculations are presented in footnotes at the bottom of the table and can be multiplied by the percentages in the table to calculate actual numbers of VCUs.

In addition, Table 3.10-10 at the end of the *Wildlife* section in the EIS presents the same information by WAA for both NFS lands and NFS lands combined with non-NFS lands. Further, it also presents the same information for open roads (those that are maintained as open for vehicle traffic).

Transportation and Utility Corridors

Comment: **Some respondents felt that the Final Proposed Forest Plan should include all 34 road and utility corridors in the State's Southeast Alaska Transportation Plan. They noted that the draft plan does not include 8 of the 34 corridors. They felt that the regional intertie system will allow communities to switch from diesel to low-cost, environmental friendly energy and surplus energy could be exported. They requested that the Plan state that hydropower and other renewable energy development is a legitimate, authorized use on the National Forest.**

Response: One of the stated goals of the Proposed Forest Plan (page 3-143) is: "To provide for, and/or facilitate the development of, existing and future major public Transportation and Utility Systems." The EIS specifically mentions those corridors specified in the MOU that the Forest Service and the State of Alaska recently signed. Most of these corridors are included in a separate LUD that overrides underlying LUDs. Those not included in the Proposed Forest Plan represent alternatives to these corridors or appear to be unlikely to be developed during the life of the Forest Plan. The Forest will consider all proposals recommended by the State, as well as any reasonable alternative corridors, during project-level NEPA analysis. Some additional corridors were added to the Final EIS after further discussion with the State of Alaska.

Comment: One comment stated that given that many of the roads and utility corridors authorized by Public Law 109-59 would take priority over all underlying LUDs, including many that do not normally allow road construction, it is critically important to fully analyze the cumulative effects, along with existing roads, roads proposed under each alternative, roads on non-NFS lands, and proposed energy infrastructure under Public Law 109-59. One comment stated that: "the Draft EIS fails to analyze the adverse effects of including a road right-of-way across North Baranof. This road would cross two large Inventoried Roadless Areas and harm wildlife, soils, water, fish, and subsistence. The majority of the road would go through OGRs and the beach buffer. It would cross 5 major watersheds, 2 of which are listed as impaired due to sediment. The proposed road corridor across Baranof crosses a fault line and the engineering reports indicate it will be closed weeks to months each year due to avalanches."

Response: This Forest Plan Amendment would not approve any of these road and utility corridors. It is only ensuring that the option to construct a road or power line is maintained. When a road or power line is proposed, it will be analyzed under NEPA, along with reasonable alternatives, including No Action (i.e., not building the road), along with the cumulative effects of that project and other foreseeable projects. As of this time, the North Baranof road mentioned in the comment is one of many roads that have been discussed, but it is not being actively analyzed. Additional information has been added to the Final EIS to examine the cumulative effects of those roads believed most likely to be constructed during the life of the amended Forest Plan.

Comment: Some respondents wanted road and utility corridors north from Angoon to Greens Creek, south to Hood Bay, and north to a patented coal mine.

Response: These routes are not listed by the State in their travel management plan. But when a project is proposed and examined in detail, other alternatives such as this could be considered. The Forest Service is unlikely to support major corridors through designated wilderness and such an action would require Congressional approval.

Comment: One respondent asked that we run the utility corridor a little further along Takatz Lake as the lake is a potential hydropower source for Sitka.

Response: This option could be considered as an alternative to the State proposal if this project were to move forward to the analysis phase.

Energy and Utilities

Comment: Some felt that the amended Forest Plan should recognize and address the prohibitive cost of regulations contained in the present Forest Service Handbook that limit or prevent efficient development, production, and distribution of energy resources. Identified constraints included stream buffers and scenery protections, required appraisals and acquisition of timber in proposed corridors. One comment also noted that, due to the high administration costs, small projects should be exempted from regulation.

Response: Utility development is an important use of the National Forest; however, laws and regulations governing the use of NFS lands apply to all projects.

Comment: Some respondents felt that the amended Forest Plan should identify existing and potential hydroelectric resources and federally recognized watersheds, reserves, or permit areas. Areas of identified concern included the Soule River and North Fork River valley and drainage and the Thayer Creek Hydro Reserve

Response: As noted earlier, the Final Proposed Forest Plan supports development of hydroelectric resources. Each project needs to be evaluated individually on its own merits. As noted in the Transportation and Utilities section, the Thayer Creek hydroelectric facility and transmission line are authorized by Congress and are currently being analyzed in a separate EIS.

Comment: Some comments stated that the Forest Service failed to adequately address energy development opportunities and that the Plan should prioritize the energy resources on the Forest. One comment believed that ANILCA provided the legal mechanism to implement less expensive corridors.

Response: Potential and ongoing energy developments are discussed in the Draft and Final EIS documents. Sufficient guidance under allowable uses as defined by the LUDs is contained within the Plan itself and procedures and permit processes are in place for such development. As noted in the Final Proposed Forest Plan, the corridors within the Transportation and Utility LUD take precedence over underlying LUD standards and guidelines.

Wetlands

Comment: Concern was expressed that the Proposed Forest Plan that accompanied the Draft EIS proposed to eliminate protections for forested wetlands covering more than 100,000 acres without disclosing the effects of this change.

Response: We assume that this comment refers to the organic soils discussed in Appendix B (Information Needs) in the 1997 Plan: Maybeso, Kaikli, Karheen, and Kitkun Soil Series. Additional information on the timber productivity and response to harvest on these soils was listed as a need. The 1997 ROD stated that information related to the effects of timber harvest on these soils was incomplete and harvest was to be avoided on these soils until the ongoing research study of these issues was complete, at which point the decision would be reevaluated (or earlier if monitoring information warranted). In 2000 the Forest issued a report on this study and the Forest Supervisor issued a decision stating that these soils were suitable for timber production. The Plan Amendment does not propose any change to the existing standards and guidelines for these soils.

Wildlife, Biodiversity and Plants

The Wildlife, Biodiversity and Plants comment and response subsection is divided into the following categories:

- General
- Conservation Strategy
- Old-Growth Mapping
- Legacy and Goshawk/Marten Standards and Guidelines
- Population Viability
- Management Indicator Species
- Wildlife Cumulative Effects
- Restoration and Young-Growth Management
- Threatened, Endangered and Sensitive Species
- Endemic Species
- Birds-General
- Marbled Murrelet
- Goshawk
- Marten
- Wolf
- Deer
- Elk
- Brown Bear and Black Bear
- Plants

General

Comment: The Draft EIS contains an inadequate discussion of the effects of climate change on Tongass fish and wildlife and should include a full analysis of climate change impacts on forest species and habitat distribution, including how climate change will alter the amount and distribution of old-growth.

Response: A discussion of the impacts to wildlife species from climate change has been expanded in the Final EIS text. Climate change is described in general terms due to the many unknowns surrounding its anticipated effects, though specific examples are brought forward. Discussion of potential changes in the amount and distribution of old-growth is also provided in the *Timber* and *Biodiversity* sections of the Final EIS. Also see comments and responses in the Climate and Air section of this appendix.

Comment: Timber harvest can result in the loss of habitat for deer and bear which are important to the lives of the local human population.

Response: Effects to deer and bear habitat are discussed in the *Wildlife* section of the Final EIS; effects to subsistence and subsistence resources is discussed in the *Subsistence* section and by community in the *Subregional Overview and Communities* section of the Final EIS. Note that timber harvest affects deer and bear habitats, but rarely would result in a complete loss of habitat.

Comment: A number of comments were received suggesting topics for future research. Topics included studies of Kuiu Island marten to assess implications of forest management practices and possible mitigation measures, marbled murrelet habitat associations, and how different structural and compositional attributes of old-growth forest affect wildlife species.

Response: Appendix B of the Final Proposed Forest Plan addresses information needs including processes for prioritization and updating such programs. This framework is an ongoing process and our intent is to develop a Web-based tool to better facilitate sharing information among the many state and federal agencies, academia, and other entities involved in the study and research of Tongass National Forest topics.

Comment: Habitat changes associated with forest harvest are temporary, with rapid recovery for such variables as amounts of edge and cover for hiding and dispersal; the plan contains limited recognition of these relationships or their contribution to habitat quality.

Response: Temporary is a relative term. For some species, such as black-tailed deer, recently harvested units provide suitable habitat in the years immediately following timber harvest due to increased forage production. However, these stands provide relatively low value after about age 25 and until about age 75 years or beyond, when forests are in the stem exclusion stage of stand development, which is characterized by small, dense trees with little understory vegetation. For some other species, harvested units provide little value until they regain old-growth characteristics either because of specific structural elements (e.g., large woody debris) found in these stands, or because of the presence of prey populations that are dependent on old-growth. Once stands transition out of the stem exclusion stage, they begin to provide the components of good quality wildlife habitat, including larger trees, small canopy gaps, snags and downed logs. This can begin to occur as early as age 50, however, the literature suggests that stands do not begin to take on the characteristics of old growth until they reach at least 150 years of age (Alaback 1982). As discussed in the *Timber* and *Wildlife* sections of the Final EIS, active management of young-growth stands may reduce this time to some extent.

Comment: Growing recreation and other resource needs on the Tongass require better identification of the value of non-forested resources (e.g., high elevation, beach fringe, and wetlands). For example, Aleutian tern, arctic tern, and black oyster-catcher use areas should be identified and protected from disturbance. Special protection should also be given to watersheds that encompass beach meadows, a rare habitat type in Southeast Alaska, and peri-glacial habitats.

Response: Beach and Estuary Standards and Guidelines are provided in the 2007 Forest Plan as well as in all of the 2008 Final EIS alternatives. In the 2007 Forest Plan and the 2008 alternatives (except for Alternative 7, which has a reduced Beach and Estuary buffer of 500 feet, a 1,000-foot buffer provides a high degree of protection for shoreline and marine habitats. These standards and guidelines emphasize the protection and maintenance of the ecological integrity of shoreline and shoreline forest habitats for shorebirds, other marine-associated species, and the many upland species that make high use of these habitats. In addition, the Riparian Standards and Guidelines address the protection of streamsides, lakes, and ponds, wetlands, other non-forested habitats, and floodplain/glacial outwash habitats. The Final EIS shows that recreation is a large and growing use of the Forest. However, this analysis effort is

being conducted in primarily in response to the August 2005 Ninth Circuit Court of Appeals Court Decision, which directed the Forest to take a second look at timber demand, the alternatives considered in response to timber demand, and cumulative effects. Therefore, the scope of the analysis focuses primarily on forested habitats that are likely to be affected by timber harvest and associated activities.

Comment: One comment stated: "We are very disturbed about discussions we are hearing about between the timber industry, the Forest Service, and others regarding the need for "intensive" timber management within the matrix lands. These conversations are happening outside the public arena in violation of NEPA, and appear to be based on the desire to increase timber economics rather than scientifically based publicly reviewed decisions. We consider the use of adaptive management to increase timber economics an extreme abuse of power and in clear violation of the numerous laws and public trust responsibilities the agency has." Another commenter was concerned about the Forest Service's move toward "intensive management" because the result of multiple entries into previously harvested units has often resulted in the creation of "creeping mega-cuts" which destroy wildlife corridors.

Response: The Forest Service meets with, and discusses ideas with, a wide range of stakeholders, including the State, local governments, industry groups, and environmental groups. The Forest is interested in developing economic timber sales and is willing to listen to ideas on how best to develop economic sales, while maintaining consistency with the Plan's goals and objectives, meeting the Plan's standards and guidelines, and being compliant with all laws and regulations. Modifications to certain standards and guidelines are being considered in some alternatives, but none of the alternatives include "intensive" timber management.

The "creeping mega-cuts" that the commenter refers to are a characteristic of logging that took place primarily in the 1960s through the 1980's, as well as more recently on some private lands. The adoption of the 1997 Plan created many "checks and balances" that result in avoidance of this situation on NFS lands. Adjacency requirements and watershed protection standards limit the size of clearcuts under all alternatives, and Class I, II, and III stream buffers, old-growth retention requirements, and many other standards and guidelines also limit opening size and total harvest acres per watershed. Even under Alternative 7, which includes the most intensive harvest among the alternatives, about 62 percent ((1.3 million of the 2.1 million acres) of the old growth within the matrix (development LUDs) would not be harvested, even after 100 or more years of harvesting at the maximum rate allowed by the alternative (see Table 3.9-12 in the *Biodiversity* section). This is in addition to the 2.8 million acres of old growth protected by reserves (non-development LUDs) under Alternative 7.

Comment: Fish and wildlife belong to the states and therefore identification of management objectives should be done by the State of Alaska and not the Forest Service.

Response: The Forest Service is responsible for setting management objectives for fish and wildlife habitats on NFS lands, including ensuring adequate habitat is maintained on the Tongass National Forest to sustain viable and well-distributed populations, as required under the NFMA. The Forest Service does work closely with the State of Alaska on joint matters related to management of fish and wildlife.

Comment: Roadless areas are crucial to the protection of the Nation's wildlife, fisheries, and water resources.

Response: We generally agree with this statement. However, what is more important is how the lands within roadless areas are managed through time. It is a primary purpose of forest planning to determine how best to balance the multiple-use objectives for all NFS lands, including those which are roadless. Over 90 percent of the Tongass is considered roadless; thus roadless areas are not a rare commodity on the Tongass, in contrast with roadless areas found in the national forests located in the lower 48 states.

Comment: Section II.H of the Wildlife Planning Standards and Guidelines do not require action until risk to long-term persistence is determined to exist. Also, the standards and guidelines assume that species abundances are known, but this is rarely the case on the Tongass, and the standard and guideline does not consider distribution.

Response: These standards and guidelines require evaluation of that species for designation as a Regional sensitive species by the Regional Forester, should a significant population or habitat decline occur. This does not preclude action being taken prior to that point. Additionally, they require coordination with state and other federal agencies where species concerns may be addressed well before they reach sensitive-species designation status.

Comment: We must preserve the ecological diversity of the forest, fauna, and salmon.

Response: The Forest Service agrees and strives to provide multiple resource uses while maintaining biological diversity.

Comment: To the extent possible, implementation of conservation measures should be flexible enough to enable tailoring them to site-specific conditions and facilitate design of economically feasible timber sales. Measures may vary from area to area to reflect different species concentrations and sensitivities, and to concentrate timber harvesting in intensively managed areas rather than dispersing harvest throughout the forest. Intensive timber management which minimizes the area affected by timber harvesting will have the least impact on conservation values and the best chance for broad public support.

Response: Standards and guidelines presented in the Forest Plan are purposefully general in some instances in order to allow site-specific conditions to influence their application. See also the comments and responses in the Timber section of this appendix.

Comment: As part of the The Nature Conservancy (TNC)-Audubon Alaska (Audubon) conservation assessment biological values and risks for focal resources (e.g., large trees, salmon habitat, deer habitat) were evaluated within each biogeographic province. An index of relative biological value, defined as the percent contribution of each biogeographic province to the total distribution of habitat values for each species or ecological system. Given that this suite of focal resource targets represents a range of terrestrial, freshwater, and nearshore marine ecosystems, this index provides a reasonably robust ranking of biological values associated with coastal forest ecosystems. Several comments suggested that the Forest Service incorporate the major elements of the conservation assessment and strategy, developed by Audubon and TNC (Albert and Schoen 2007), into the Final Proposed Forest Plan. This design is intended to provide watershed-scale protection to the highest ecological value intact watersheds in each biogeographic province on the Tongass and also maintain core areas of ecological value in a selection of the highest value modified watersheds. Rather than distributing timber harvest and road building across the entire forest, this design works to aggregate these activities in fewer watersheds. Comments from TNC and Audubon note that subsistence and community use areas were not incorporated into the design and that the conservation design should be fine tuned to incorporate these resources.

Response: Information from the TNC-Audubon conservation assessment has been incorporated into the Final EIS as appropriate to strengthen the biodiversity analysis, and in the modification of alternatives. The *Biodiversity* section also provides more extensive quantification of the existing levels of large-tree POG, high-volume POG, karst POG, and intact watersheds by biogeographic province; it also makes projections for these measures into the future under each alternative, on NFS lands and cumulatively, for all of Southeast Alaska. The alternatives considered in the Final EIS were not designed around the Albert and Schoen (2007) report, but Alternatives 1, 2, and 3 take into account some of the considerations

raised in that report. The *Biodiversity* section cites Albert and Schoen (2007) throughout the subsection that describes the forest-wide distribution of old-growth; however, while the Audubon and TNC assessment provides a summary of recent literature related to individual wildlife species, the *Wildlife* section incorporates information from individual studies, citing them directly.

Comment: The original 21 biogeographic provinces were based largely on topographic features and generalized information about biotic communities in Southeast Alaska, rather than scientific research. This Amendment incorrectly states that the original biogeographic provinces were based on conclusions drawn about similar species comparisons. Alternative biogeographic provinces have been proposed that do rely on peer-reviewed scientific research.

Response: The respondent appears to have drawn an incomplete conclusion from how biogeographic provinces are described in the EIS. The description summarizes that they are generally characterized by similar wildlife species composition, similar distribution of wildlife species, geologic and water barriers resulting from glaciation and other events, and generally similar climatic conditions and physiographic characteristics. It is recognized that these provinces are a broad land classification. It is useful to continue using the same classification for comparison with the 1997 Final EIS and it is very similar to the provinces used in the TNC-Audubon conservation assessment.

Comment: The Biodiversity section focuses on timber and forest management and addresses biodiversity from an ecosystem-level perspective. It should address species and genetic biodiversity.

Response: As stated in the *Biodiversity* section, conserving biodiversity is about maintaining genetic, species, community or ecosystem, and landscape levels of biological organization. As the respondent noted, the *Biodiversity* section addresses conservation of species and other elements of biodiversity by using a broader "coarse filter," or ecosystem/landscape based strategy for conserving biological diversity. Finer scales of biodiversity (i.e., individual species and genetics) are addressed in the *Wildlife*, *Plant*, and *Fish* sections of the Final EIS.

Comment: In the Biodiversity section, the first paragraph of the Old-growth Conservation Strategy subsection of the Affected Environment states "Approximately 78.5 percent, or 13.2 million acres, of the Tongass is in Wilderness or mostly natural settings…" These statistics mislead rather than contribute to the discussion of the conservation strategy because the focus of the strategy is on old-growth and very little old-growth occurs under these designations. This statement does not belong here at all.

Similarly, the next paragraph states "approximately 85 percent of the old-growth existing in 1954…" This statement presents statistics for the broadest of forestland categories, old-growth, by including both POG and non-POG. The real threat is to POG and therefore this statistic should include only POG.

Response: Although these portions of the *Biodiversity* section have been revised in the Final EIS, it is appropriate to discuss both the percentage of all lands and the percentage of POG within reserves. Secondly, old-growth percentages that are discussed do represent only POG – all of the percentages given for old growth in the effects analysis are for POG or a subset of POG (e.g., large-tree POG).

Comment: The sections of the Draft EIS that discuss biodiversity and wildlife are largely devoid of any analysis and clearly do not meet the hard-look standard required by NEPA.

Response: The *Biodiversity* and *Wildlife* sections in the EIS take into account the best scientific information available. Extensive quantification of effects using GIS analysis, habitat modeling, and forest management modeling, an inventory of harvest and road development on all lands of Southeast Alaska,

along with future development projections, and the application of expert wildlife viability panels. Nevertheless, the analysis presented in the Draft EIS was expanded substantially for the Final EIS and we believe these analyses are adequate.

Comment: For the discussion of forest "composition, structure, and function" the introductory section of the Draft EIS Biodiversity section refers the reader to sections of the 1997 Final EIS. This is confusing because much of that information has been updated on the following pages of the Draft EIS.

Response: It is true that much information with respect to biodiversity has been updated since 1997. The definitions of composition, structure, and function, however, have not changed from those given in the 1997 Final EIS, which is appropriately incorporated by reference because it includes further information on these components of biodiversity that might be of interest to the reader. What has changed, however, is how we take these ecosystem components into account. For example, the Size Density Model (SDM) is now available for use in the biodiversity analysis. Thus, the discussion in the *Biodiversity* section referenced in the comment differs from that in the 1997 Final EIS.

Comment: In contrast to parts of the world where significant logging has occurred, the Tongass can be an example of how sustainable logging can be conducted on public land, not only for Southeast Alaska, but for the world.

Response: We agree. The Tongass strives to manage a timber program that is sustainable, while providing for sustainability of multiple other resources.

Comment: The Draft EIS is incorrect in stating that logging will be concentrated in four biogeographic provinces; this is not true because all alternatives allow intensive logging under Timber Management as well as less intensive but still consequential logging in the Modified Landscape LUD.

Response: The majority of harvest would remain "concentrated" in these four biogeographic provinces. However, under some alternatives, logging and road construction would be more extensive in areas outside of these provinces. Alternative 1 would not enter any inventoried roadless areas whereas Alternative 7 proposes to harvest the most timber from roadless areas. The commenter also appears to be confusing biogeographic provinces with LUDs.

Comment: Increased predation occurs in logged area because there are so many more small mammals in those areas. This is good for raptors, etc. The Forest Service even issued an alert in the 1960s because they were alarmed at the dramatic increase in mice in clearcuts. The mice were allegedly eating too many of the tree seeds.

Response: It is true that timber harvest can benefit some species while adversely affecting others.

Comment: One respondent was very disappointed to see that National Monument Lands, which are fully protected from timber harvest, had relatively low value to wildlife and felt that the Forest Service depicted the alternative maps deceivingly. Another respondent made a similar comment about the inclusion of low value habitat in Wilderness and LUD II designations.

Response: The wildlife values depicted across the Tongass, including those within National Monuments, are reasonable. A National Monument is an area of land that is set aside to preserve some feature of it that makes the land important. This may include anything from scientific or historical interests to scenic beauty and wildlife protection. There are two National Monuments on the Tongass: Misty Fiords and

Admiralty Island. National Monument Lands are created by presidential proclamation, not by the Forest Service, thus the alternative maps depict these areas as they have been designated. Although Misty Fiords contains large expanses of non-forested lands, Admiralty National Monument represents one of the highest value habitat areas in all of Southeast Alaska. It contains the second highest acreage of POG among all provinces in Southeast Alaska (598,000 acres). The vast majority of Admiralty Island remains intact and, as a result of the abundance of POG in this province, including high-volume and large-tree POG, it represents a massive reserve and reservoir for biological diversity in Southeast Alaska. In addition, Wildernesses and LUD II areas are highly variable in terms of their wildlife habitat values and availability of POG. The Karta Wilderness and the Nutkwa LUD II area on Prince of Wales Island contain very high fish and wildlife habitat values and extensive areas of POG.

Comment: The Tongass manages one of the largest island archipelagos in the world and nowhere is this important point emphasized in the Proposed Forest Plan or Draft EIS, particularly in the description of the forest in Chapter 2.

Response: The point that the Tongass is an island archipelago is discussed in the *Biodiversity* and *Wildlife* sections of the EIS. The extensiveness of the island archipelago is also described in the description of the forest in Chapter 1.

Comment: There is very little young-growth on the Tongass. Converting a small portion of the old-growth to young-growth will actually add to biodiversity (i.e., broader more balanced distribution of forest age classes).

Response: At a landscape-scale, old-growth forests on the Tongass are highly diverse, typically including heterogeneous stands of productive forests within a mosaic of unproductive forests and non-forested areas comprised of shrub and herbaceous plant communities. They are also diverse at the stand-level, possessing structural attributes that provide habitats for a variety of species such as live old-growth trees, dead standing trees (snags), fallen trees/ logs, and an overstory consisting of multiple canopy layers; they also have smaller understory trees, canopy gaps, and patchy understories. Timber harvest reduces this diversity by creating a more uniform stand of young-trees. Old-growth forests can also provide ecological functions that are lacking, or less developed, in younger stands. There are opportunities to manage the more than 400,000 acres of young stands on the Tongass to increase biodiversity, which are described in the *Timber*, *Biodiversity*, and *Wildlife* sections of the Final EIS.

Comment: The Tongass National Forest should work with private and state forest managers in developing unified definitions and inventories for old-growth forest types, and accurately monitor their abundance and rates of change.

Response: The Forest Service routinely collaborates with other agencies and private landowners.

Comment: The Draft EIS does not disclose the sources and reasons for its assumptions that POG originally comprised 50 percent of all non-NFS lands and that 25 and 50 percent of the remaining private and state-owned lands, respectively, will be logged.
Response: The quantification of POG on non-NFS lands has been refined and is more accurately depicted in the Final EIS. Appendix E has been added to the Final EIS which provides a catalogue of past harvest, detailing the acres of harvest by owner by biogeographic province and by decade or period (where known), in addition to detailed information provided by the State on past harvest. An expanded cumulative effects discussion has been added to the *Biodiversity* section on future harvest on non-NSF lands.

Comment: One comment expressed concern that slash from helicopter logging could hinder wildlife movement.

Response: Silvicultural prescriptions routinely consider slash disposal requirements in light of resource issues which are tracked at the project level.

Conservation Strategy

Comment: Some respondents believe that Alternatives 1,2, 3 and 6 have better biological locations for the small OGRs, which were identified during the 2006-2007 interagency review effort and meet the 1997 Forest Plan Appendix K criteria, and believe that one of those alternatives should be selected.

Response: We agree that the changes made to old-growth reserves in these alternatives are an improvement from a biological point of view.

Comment: To help prevent the need to list the goshawk and wolf under the ESA several respondents recommended that the Forest Service select the preferred biological locations for the 48 other small OGRs as indicated by the interagency Small Old-growth Reserve Work Group (particularly if interagency review cannot be completed in time for the Final EIS) and maintain the existing elements of the conservation strategy, including the forest-wide network of OGRs, the 1000-foot beach and estuary fringe, and the existing Goshawk Foraging Habitat Standards and Guidelines; it was noted that the old-growth reserve system was cited by the Fish and Wildlife Service as reasons that these species did not warrant listing. Some respondents expressed concern that eliminating these measures would open the possibility that any decisions made by the Fish and Wildlife Service could be remanded.

Response: Alternatives that eliminate major elements of the conservation strategy are ranked as having a lower relative likelihood of sustaining well distributed goshawk and wolf populations. A detailed discussion of the existing and proposed changes to the Goshawk Standards and Guidelines is provided in Appendix D of the Final EIS. The USFWS published a new finding on the goshawk in November 2007, after the release of the Draft EIS. They found that the best available information on biological vulnerability and threats to the goshawk does not support listing the Alaska population segment as threatened or endangered at this time. This conclusion was based on conservation measures that were included in the 1997 Forest Plan. Conclusions from this finding have been considered in the goshawk subsection in the Final EIS.

Comment: The Draft EIS fails to disclose or consider findings and relevant data from recent literature or the 2006 Conservation Strategy Review workshop regarding endemics.

Response: .The discussion of endemism has been updated to include the most current literature on endemics, including information presented at the 2006 Conservation Strategy Review workshop.

Comment: A number of comments were received on the adequacy and necessity of the conservation strategy. Several respondents commented that the forest-wide conservation strategy adopted in the 1997 Forest Plan is an improvement over previous plans but is flawed. Some felt that it is overly protective and its value and effectiveness should be peer-reviewed. Respondents with this opinion viewed the conservation strategy as simply a way to give other agencies a "veto voice" in management of the forest, or felt that congressionally designated reserves or other protections (e.g., buffer and retention requirements and state BMPs) were adequate protection for plants animals, and landscape connectivity, making other reserves and species-specific standards and guidelines unnecessary. Other respondents felt it was a more

than adequate strategy to support well-distributed, viable wildlife populations. Finally, other respondents felt that the conservation strategy was not protective enough, stating that the Draft EIS does not provide science-based rationale for concluding that the conservation strategy continues to be valid. Several of these respondents suggested that the Forest should base management efforts on an island-centered model given that the Forest covers one of the largest island archipelagos in the world. These respondents felt the Draft EIS fails under NEPA to disclose the uncertainties behind the strategy.

Response: Although many uncertainties remain regarding managing wildlife on the Tongass and the effectiveness of the Tongass conservation strategy, the underpinnings of the strategy continue to be a valid model for conserving biodiversity on the Tongass. The conservation strategy was developed as an interagency effort and was peer-reviewed by independent scientists and natural resource managers using their expertise and best available science. The *Wildlife* section of the Final EIS discloses the existing uncertainties surrounding the conservation strategy. Appendix D of the Final EIS provides a summary of a review conducted by Haufler (2006) on the developments in the field of conservation science produced since 1996, which includes an evaluation of the Tongass conservation strategy.

Comment: The conservation measures proposed to provide for viability of wildlife species on the Tongass are inadequate (i.e., insufficient reserves, inadequate connectivity, too much fragmentation), as concluded by a joint statement issued by peer review committee members (Kiester and Eckhardt 1994). Any claim made in the EIS that well-distributed, viable populations are reasonably assured over the long-term under any of the alternatives is not borne out by scientific opinion

Response: Appendix D of the Final EIS summarizes the development of the conservation strategy and peer reviews conducted to date. It provides the rationale behind the reserve-based strategy and describes major steps leading to its development, including the pioneering work of the Interagency Viable Population Committee (VPOP; Suring et al. 1993) which designed an initial landscape conservation strategy they felt was capable of assuring the maintenance well-distributed wildlife populations across the Tongass. The joint statement, referred to in the above comment (Kiester and Eckhardt 1994), stemmed from an independent review of the VPOP strategy conducted by the Forest Service Pacific Northwest Research Station (PNW). This joint statement did identify several weaknesses in the strategy, as stated by the respondent. Importantly, however Kiester and Eckhardt (1994, p.3) noted that the PNW Review only considered the network of mapped VPOP large and medium HCA's and Congressionally protected areas such as Wilderness, Monuments and Legislated LUD II areas. The VPOP reserve network was not examined in the context of the entire Forest Plan or a fully articulated planning alternative containing the strategy. The scientists were unable to consider other LUDs that effectively function as reserves and conserve the old-growth ecosystem—a very important component incorporated into the development of the old-growth habitat conservation strategy in the Proposed Forest Plan and the analysis in the EIS. Please see Appendix D of the Final EIS for further discussion of the Forest Service response to the PNW review (Suring et al. 1994) and the progression from this response to the development of the final 1997 conservation strategy.

Comment: Appendix N of the 1997 EIS should be updated and this information should be incorporated into the Final EIS.

Response: Appendix D of the Final EIS serves as an update to Appendix N of the 1997 EIS and includes additional background information used to support the wildlife analysis.

Comment: Assumptions that timber harvest impacts on wildlife require restriction such as beach buffers, riparian buffers, and OGRs are simplistic because some harvest methods (e.g., selective cuts, small clear-cuts) can be conducted in these areas with minimal negative impacts.

Response: The reserve system serves two important functions in that it provides a means for protecting old-growth habitat as well as maintaining landscape connectivity. Though timber harvest can be done in a way to reduce effects to wildlife and may improve habitat quality for some species, any level of timber harvest increases the amount of habitat fragmentation which breaks large blocks of habitat into smaller parcels resulting in smaller and more isolated residual habitat patches. Open spaces left by timber harvest can act as travel barriers for some species, thus limiting interaction between subpopulations, and increase the risk of predation for other species that venture across them. For species that are sensitive to human activity or have restricted mobility, even small areas of timber harvest may create barriers to their ability to move across the landscape. A detailed discussion of fragmentation and its effects is included in the *Biodiversity* and *Wildlife* sections of the EIS.

Comment: Logging in the beach fringe causes obstructions for wildlife moving through; a reduced beach buffer would avoid this situation.

Response: Heavy log concentrations, such as that left as slash from selective logging, can obstruct the movement of larger wildlife species (i.e., deer), but benefit other species by providing places to forage, hide, seek shelter, and den. The beach fringe is classified as unsuitable for timber harvest, though a limited amount of timber harvest not counting toward the ASQ may occur (e.g., timber sold as part of a salvage sale, specialty wood products, for habitat restoration, for customary and traditional uses, etc.) Reducing the beach fringe would not reduce the amount of downed wood left from these uses, but would be more likely to increase the amount of slash by expanding the area in which timber harvest can occur.

Comment: Some commenters thought that the ecological rationale for expanding the beach buffer to 1,000 feet is not clear. Others felt that the 1,000-foot beach fringe buffer standard and guideline should be retained to support viable, well-distributed wildlife populations.

Response: The beach buffer provided under the current Forest Plan is 1,000 feet and would remain that size under Alternatives 1, 2, 3, 4, 5, and 6. None of the alternatives propose to expand it. Under Alternative 7 the beach buffer would be reduced to 500 feet. Rationale for this reduction is provided in Appendix D. The 1,000-foot buffer requirement was based on the recognized importance of the beach fringe zone as indicated by high habitat capability model ratings for a variety of species (bald eagle, marten, river otter, brown bears, black bears, and deer), observations of nesting bald eagles and radio-tagged goshawks, its high value for landscape connectivity, as well as the available scientific literature. The importance of the beach buffer to wildlife is discussed in the description of the affected environment in the *Wildlife* section.

Comment: Retaining the Tongass Conservation Strategy in its entirety will provide the Forest Service with a tool with which it can build ecosystem resilience on the Tongass and manage natural resources effectively in the face of climate change.

Response: We agree that a system of OGRs, various buffer requirements, and non-development LUDs are a means for maintaining a level of biodiversity capable of adapting to the effects of changing environmental conditions. A statement expressing this has been added to the discussion of cumulative effects in the *Wildlife* section of the EIS.

Comment: Several respondents suggested that a finer-scale analysis of landscape connectivity should be conducted at the level of ecological subsections to identify additional corridors and included in a Supplemental Draft EIS. Several respondents identified additional landscape pinch-

points or areas where landscape connectivity is an issue and suggested that these areas be addressed in the Final EIS; others requested that areas that could become pinch-points in the future due to future timber harvest be evaluated. Other respondents were not clear how the initial set of pinch-points were selected.

Response: We recognize that there are a number of additional pinch-points on the Tongass that were not addressed specifically in the Draft EIS. We provided a detailed evaluation of those pinch-points that were located in areas where a substantial amount of timber harvest has occurred and is likely to occur in the future. As noted in the *Wildlife* section, timber harvest could affect "ecological pinchpoints" or areas where habitat conditions, rather than landscape features, facilitate movement across the landscape. The detailed level of analysis required to assess effects to these areas is necessarily done at the project level when site-specific conditions and project-specific details can be taken into account.

Comment: Several respondents identified minimizing habitat fragmentation as an important issue in developing the Final EIS and Final Proposed Forest Plan.

Response: Habitat fragmentation is discussed in detail in the *Wildlife* and *Biodiversity* sections of the EIS. Alternatives that would result in the least habitat fragmentation (i.e., those with the smallest amount of timber harvest and road development) were rated as having the lowest level of effects to wildlife populations.

Comment: The timber industry requires about a quarter of the old-growth on the Tongass, which would leave the remaining old-growth for the conservation strategy; therefore the Forest should eliminate protective measures such as the Marten and Goshawk Standards and Guidelines, the old-growth reserve system, and Class III stream buffers, and should reduce the beach buffer.

Response: Providing an appropriate juxtaposition of habitats and ensuring connectivity across the landscape (both structural through buffers and reserves and functional through management of matrix lands) is essential to providing a functional landscape capable of supporting viable and well-distributed wildlife populations. Timber harvest on the Tongass has been disproportionate, focusing on forest stands at lower elevations, with the largest trees, and concentrated in certain biogeographic provinces. These areas are generally the most productive for wildlife and, therefore, timber harvest has disproportionately affected wildlife and habitat in these areas. Thus, simply allowing a quarter of the remaining old-growth to be harvested without consideration of the spatial distribution of harvest or provision for the protection of important elements within the old-growth ecosystem (i.e., legacy trees or specific forest structural stages) would result in further disproportionate effects.

Comment: The Forest Service should explicitly list the concerns and issues identified by scientists during the 2006 Tongass Conservation Strategy Review workshop and identify how each was addressed. Many issues appear to not have been incorporated in the Draft EIS or the Proposed Forest Plan.

Response: The NFMA planning regulations provide direction to conduct an evaluation of the Forest Plan after 5 years of implementation (36 CFR 219.12(g)), including a review of the effectiveness of the Plan's old-growth conservation strategy to conserve biodiversity and prevent the need to list species under the ESA. The 2006 Conservation Strategy Review workshop represented the first step in the evaluation process, with the purpose of identifying considerations to be addressed in the overall review of the strategy. A report documenting the workshop, found in the project record, represents the second step. It is one of several documents responding to the Forest Plan review that serve to provide issues and information for use in current Forest Plan Amendment process and in managing resources under the Forest Plan.

Subsequent steps will include an assessment of each consideration identified herein, based on workshop information, peer-reviewed scientific literature, the recent *Review of Conservation Science Produced Since 1997 and Its Relationship to the Tongass National Forest Land and Resources Management Plan* (Haufler 2007), as well as input from various state and federal agencies. These assessments will culminate in a determination of how each consideration will be dealt with. Some considerations have been addressed in time for incorporation in this Forest Plan Amendment Draft EIS, others in time for incorporation in the Final EIS, and others, which might require additional interagency consultation, the formation of specialized workgroups, and more detailed development, will be implemented after the Final EIS. These long term considerations could lead to conservation strategy-related adjustments to the amended Forest Plan through additional amendments or identified as information needs. This effort will be summarized in a forthcoming Conservation Strategy Review Proceedings Assessment Report, which will include a matrix of the consolidated consideration that will identify how individual considerations will be addressed. Additional scientific information presented at the workshop has been included in the Final EIS.

Comment: The Conservation Strategy and Landscape Connectivity discussion in Chapter 2 of the Draft EIS incorrectly characterizes Alternative 7 as having a poor distribution of high-quality old-growth, given that over 80 percent of the commercial old-growth and over 75 percent of the productive old-growth remain and are well scattered across the forest and the wide distribution of non-development LUDS, minimum development LUDS, and buffer requirements.

Response: The conclusion about Alternative 7 was based on what potential results would be over the long-term. Alternative 7 would have extensive areas consisting of development LUDs with no reserves and a reduced beach fringe for connectivity. Although there would be extensive old growth left within the development LUDs as a result of standards and guidelines, the lack of larger patches of old growth, as are found in reserves, is the major reason for the conclusion.

Comment: The forest-wide mapping of small OGRs could impact resources other than wildlife and should be fully analyzed in the Final EIS. Project-level adjustments to OGRs should continue to be allowed.

Response: Forest-wide small old-growth reserve mapping efforts provided an opportunity to conduct a landscape-scale review of the small OGRs. This effort was proposed primarily to develop a consistent and more efficient method of review, and to more accurately define the location of small OGRs to enhance the Proposed Forest Plan conservation strategy rather than complete the review on a project-by-project basis. The review process involved the incorporation of a biological consensus recommendation for each old-growth reserve under review, determined through interagency analysis, and was followed by another review that took into account other resource considerations, including timber and timber sale economics. Project level adjustments will be considered if significant new information becomes available.

Comment: The conservation strategy does not quantitatively assess the additional amount of productive old-growth reserved by restrictions to harvest on high hazard soils and karst lands.

Response: Standards and guidelines preclude or significantly limit timber harvest in areas of high hazard soils, steep slopes (greater than 72 percent), high vulnerability karst terrain, visually sensitive travel routes and use areas, and timber stands that are technically not feasible to harvest. The timber deferred from harvest by these standards and guidelines is determined at the project level, usually as a result of on the ground inspection during project implementation. Although it cannot be precisely determined at the forest planning level, the acreage of POG that is set-aside due to oversteepened slopes, other areas of very high mass movement potential, and karst , based on digital elevation modeling, soils mapping, and geologic mapping. In addition, estimates of the amount of additional restrictions that are implemented during a project are included in the Model Implementation Reduction

Factor. These combined reductions are used in all POG predictions and in calculations of the ASQ in the Spectrum model (see page 3-261 to 263 in the Draft EIS). These quantifications are used for describing and testing of the matrix part of the conservation strategy. The degree of old growth retained within the matrix through time, through OGRs, stream buffers, and implementation of standards and guidelines for karst, steep slopes and other resource concerns was considered and is a very important component of the overall strategy.

Comment: One comment indicated that the Draft EIS does not provide information necessary to evaluate the proposed conservation strategy and does not document the basis for the strategy, thereby violating NEPA. Some respondents requested an extension of the public comment period until the scientific rationale behind the conservation strategy is presented. The Final EIS should include additional discussion for the scientific basis for changes to the conservation strategy.

Response: The Draft EIS described the framework for the Tongass conservation strategy in detail in the Old-Growth Forest Conservation Strategy subsection of the description of the affected environment in the *Wildlife* section. The basis for the conservation strategy and overview of its development was provided in the introduction to the Environmental Consequences portion of the *Wildlife* section, followed by a description of what changes to the strategy are proposed under each of the alternatives. An analysis of effects of changes to that strategy is provided in general under the Old-Growth Forest Conservation Strategy subsection and under individual species where appropriate (i.e., goshawks and marten). The conservation strategy was also described and discussed in the *Biodiversity* section of the Draft EIS. Appendix D of the Final EIS elaborates on the information related to the conservation strategy provided in the Draft EIS and provides additional discussion of the history and background of the strategy and the scientific rationale behind changes. This appendix also provides a comparison between existing and proposed plan components.

Comment: The 2006 conservation strategy review did not allow public participation, either during or after presentations, and no final report has been prepared to date incorporating interagency review. Scientists comprising the panel of experts did not constitute an independent review body and members of the original 1997 panel were not asked to participate even though many continue to be leading experts in their field; in contrast there was a high level of participation of Forest Service employees without biological expertise.

Response: The purpose of the 2006 Conservation Strategy Review workshop was to 1) facilitate robust discussion among members of an interagency Workgroup and scientific and technical experts regarding new information attained since 1997 that may be relevant to the conservation strategy; and 2) generate and discuss science-informed “considerations” relative to the strategy. Scientists considered to be experts in their fields of study were invited to participate and were charged with the task of conducting an independent review of new scientific or other relevant information since 1997, presenting a summary of key findings regarding what the new information meant relative to the Tongass conservation strategy, and providing “considerations” for the workshop record and the Workgroup to discuss regarding the strategy. These presentations were followed by a discussion between the 6-member interagency Workgroup and the presenters, and other collaborating scientists. The Workgroup could call on other subject matter experts for input as necessary. Sometimes this included experts in resource fields other than biology who provided valuable insight into problems encountered when implementing Conservation Strategy Standards and Guidelines. A final report summarizing the workshop proceedings, including a written record of all discussion attributing comments to individual scientists and listing all considerations, is in the project record. The purpose of this report, and the workshop itself, extends beyond this Forest Plan Amendment and is intended to assist the Forest Supervisor in considering the need for adjustments to the Forest Plan Monitoring Program, Forest Plan standards and guidelines, and aspects of the conservation strategy. The results will also guide future investments in research and management studies by the Tongass National Forest and its interagency partners. Relevant new science presented during the workshop has been incorporated into the Final EIS and some considerations have been addressed as part of this effort.

The workshop was open to the public and consequently the audience included other subject matter experts, not participating in the presentations, and members of the public at large. During specific topic sessions, the audience was invited to submit written considerations for the workshop record. The same form that was being used by presenters and the Workgroup to describe considerations was provided for the audience's use. All considerations submitted by audience members were included in the workshop record. The public was also welcomed to submit considerations relevant to the conservation strategy review workshop via the project website which included PowerPoint presentations from the workshop, through April 21, 2006.

Comment: Project-level review of small OGRs that do not meet criteria in Appendix K of the 1997 Forest Plan should follow the format used by the 2006-2007 Interagency Small Old-growth Reserve Work Group (Hansen et al. 2006), including using a standardized review protocol, documenting changes made to OGRs, identifying how the proposed changes meet Appendix K criteria, assessing the effects of roads in and adjacent to OGRs, and documenting implementation of Tongass Plan Implementation Team clarification "Conveyance on Overselected Lands and the Old-growth Habitat Land Use Designation;" these items should be included in Appendix K of the Forest Plan.

Response: Appendix K has been revised in the Final Proposed Forest Plan to incorporate the format used during the 2006-2007 interagency review.

Comment: A forest-wide review of medium OGRs is warranted, comparable to that conducted for small OGRs by the Interagency Small Old-growth Reserve Work Group.

Response: There is little indication that such a review is warranted. Appendix D of the Final EIS provides a summary of a review conducted by Haufler (2007) on the developments in the field of conservation science produced since 1996. The author concluded that "the conservation strategies used in the plan are still valid at the present." New information and knowledge relative to conservation biology will continue to evolve. The amended Forest Plan, including the conservation strategy will be reviewed again in 5 years and if a more intense review to components of the strategy are warranted it can be done.

Comment: Many wildlife species live and travel through young-growth timber just as well as they do in old-growth, maintaining connectivity between OGRs; therefore Conservation Strategy Standards and Guidelines are unnecessary as roads provide travel corridors for wildlife whether closed or left open.

Response: Old-growth forest provides key habitat components for many species that are not available in young-growth (i.e., large trees, snags, downed trees, full canopy cover, and an open understory). These habitat components provide essential denning, nesting, foraging, perching, and hiding opportunities for a variety of species. Though roads may be used as travel corridors for some species, many species are extremely sensitive to activity along open roads and avoid areas near roads. Timber harvest and roads, whether closed or open, increase habitat fragmentation which breaks larger sections of forested habitat into smaller, isolated patches and reduces the effectiveness of interior habitat. Openings created by timber harvest and roads can also become travel barriers, particularly for species that are less mobile or have very limited gap-crossing abilities. Roads also increase human access and thus the susceptibility of wildlife to hunting (illegal and legal) and other disturbance. Therefore, maintaining well-connected old-growth forest across the landscape is key to maintaining well-distributed wildlife populations on the Tongass.

Comment: The Tongass conservation strategy is overly costly and is the primary reason the Forest Service has not been able to prepare economic timber sales and has resulted in the loss of hundreds of jobs. Alternatives 1, 2, 3, and 6 cannot be implemented because they include the conservation strategy that increases harvest costs.

Response: The conservation strategy is the primary means by which the Forest Service meets its multiple use objectives as required under the NFMA. It is designed to maintain viable, well-distributed wildlife populations while enabling an active timber sale program. We are not aware of evidence that the conservation strategy has resulted in the loss of hundreds of jobs.

Comment: The statement in the Draft EIS that "because of the reduction or elimination of the old-growth reserve system under Alternatives 4 and 7, respectively, these alternatives could have a low or moderate likelihood of maintaining viable, well-distributed wildlife populations" is incorrect.

Response: It is true that Alternatives 4 and 7 would have a reduced likelihood of maintaining viable, well-distributed wildlife populations relative to Alternative 5 which harvests less timber, involves less road building, and incorporates more protective conservation measures. This statement has been clarified in the Final EIS text**.**

Comment: One comment stated that the Proposed Forest Plan is focused on protecting old-growth blocks at the watershed scale, which will ultimately lead to reduced habitat diversity, increase fragmentation, increase road impacts and human access, and will generally lead to the erosion of ecosystem integrity within the watershed.

Response: During the planning process prior to the 1997 Forest Plan, small OGRs received varying levels of review but were placed within each VCU; roughly equivalent to a watershed) in an effort to ensure that the protection of old-growth habitat was well-distributed across the Forest. The 1998 Tongass Plan Implementation Team clarifications provided for further, project level evaluation and adjustment of these reserves. Initially these reviews were conducted in association with individual timber sales, focusing on specific VCUs, covered by the project area. However, more recently reviews have taken a broader focus and have been completed for all OGRs on an island or other logical geographic scale. Most recently, in 2006 and 2007 a forest-wide review of small OGRs was conducted which had the objective of enabling large-scale, landscape issues to be considered in the placement and configuration protected blocks of old-growth.

Comment: In addition to reserve lands mentioned in the Proposed Forest Plan, a number of additional reserve lands are present in Southeast Alaska and adjacent British Columbia that also provide habitat for a number of wildlife species addressed by the Forest Plan.

Response: The Forest Service agrees with this statement.

Comment: The Draft EIS recognizes that matrix lands play a vital role in providing functional connectivity across the landscape but fails to take a hard look at the impact of the alternatives. There are no alternative methods for matrix land management. Some respondents contend that because management of the matrix is important for maintaining viable populations of wide-ranging species, the matrix itself needs to be defined in terms of its role in the conservation strategy. They quoted various participants at the 2006 Conservation Strategy Review workshop who emphasized the importance of matrix lands in meeting habitat, prey, and connectivity requirements. They also felt that the Legacy Standards and Guidelines need to convey the role of matrix lands in the conservation strategy.

Response: Forest Plan standards and guidelines are the framework for matrix land management on the Tongass. Changes to standards and guidelines proposed under the alternatives are discussed under the corresponding sections in the Final EIS. Appendix D provides additional discussion of the rationale behind proposed modifications to or replacement of Wildlife Standards and Guidelines. We recognize the habitat and connectivity values of matrix lands; hence the numbers of standards and guidelines applicable to lands considered for timber harvest can contribute to longer term old growth within those lands. The sum of those ensures the functionality of the entire ecosystem from the reserves and between the reserves in the matrix. The reserves help us meet the requirement for species well distributed across the Forest; standards and guidelines applied to matrix lands help ensure we will not likely approach minimum habitat needs through time.

Comment: Some respondents felt that the Draft EIS and Proposed Forest Plan fail to take a hard look at landscape linkages and wildlife corridors and protect these areas, especially given that the ecological value of many of these areas has been reduced by historic (e.g., timber harvest) and current activities (e.g., recreation). Some felt that the Draft EIS does not cite any scientific evidence or peer-reviewed study to support the contention of the Forest Service that protected corridors (i.e., beach, riparian, estuarine buffers) will function to provide connectivity in heavily logged or roaded landscapes. Others felt that it seemed as though the Draft EIS and the Forest Pan assume these provisions will remain in pristine condition and function as corridors. One respondent commented that they would like to see patches of old growth modified so that they are associated with natural corridors for wildlife and stream protection.

Response: It is true that the effectiveness of conservation strategy reserves and buffers in relation to their size, landscape pattern, and geographic distribution has yet to be scientifically tested. A statement to this effect has been added to the Final EIS text. Landscape connectivity was an integral feature of the original VPOP landscape conservation strategy (Suring et al. 1993), one of the precursors to the current conservation strategy. VPOP reviewed the available literature and concluded that there was limited empirical support for corridors but that this should not preclude their inclusion in landscape conservation planning. They reasoned that landscape habitat connectivity was an important component of conservation planning to facilitate animal dispersal and movement, whether specifically designed as corridors or through overall management of a habitat matrix. Appendix D of the Final EIS provides a detailed review of steps leading up to the development of the conservation strategy.

Comment: The fact that roads contribute to habitat fragmentation should have been considered in the Draft EIS. Please consider additional road restoration and closures.

Response: Road-related habitat fragmentation is described throughout the *Wildlife* section of the Final EIS. A transportation objective under the Final Proposed Forest Plan is to manage and maintain roads to protect water, soil, fish, and wildlife resources. Decisions related to the restoration or closures of specific roads are made at the project level.

Comment: Several respondents feel that the Landscape Connectivity Standards and Guidelines are incomplete and lack a definition for connectivity, directives on critical aspects of connectivity (e.g., no requirement for corridor designation and no minimum corridor width or means for determining necessary width). Some suggested that the standards and guidelines should also mandate a procedure for connectivity analyses and evaluation of long-term population viability. One respondent thought there seemed to be an emphasis on connectivity within medium and large OGRs rather than between reserves, and no measurable means to ensure connectivity is provided. Several respondents pointed out that there is no requirement for connectivity between small OGRs and that connectivity is not being preserved on the ground; suggestions were made to designate physical corridors to provide direct connectivity between small OGRs and to develop standards and guidelines requiring connectivity between small OGRs.

Response: Connectivity between reserves was a consideration in the design of the Conservation Strategy and was also considered during the small old-growth reserve updates for this Plan. The Landscape Connectivity Standards and Guidelines are to be implemented during the environmental analysis for projects proposing to harvest timber, construct roads, or otherwise significantly alter vegetative cover. These standards and guidelines are purposefully general because decisions regarding connectivity are made most appropriately at the project level, when site-specific information can be incorporated. The intent of these standards and guidelines are to provide project teams with some flexibility for addressing this issue. As noted in the comment, these standards and guidelines are intended only for connectivity between medium and large OGRs. Corridors between small OGRs are not necessary because the intent of the small reserves is to provide old growth representation at the VCU or watershed scale. Connectivity throughout the matrix is an important part of the conservation strategy and is basically provided through time by a combination of Beach Fringe, Riparian Buffers, other standards and guidelines (e. g, unstable soils, low site soils, karst, etc), retention from Legacy, unscheduled timber, and other project-level retention, including patches that are not accessible due to logging system considerations.

Comment: A number of comments were received regarding proposed changes to small OGRs. Some respondents felt that changes were driven by timber production at the expense of conservation of wildlife habitat and were under the impression that the Forest Supervisor promised project-level reviews to fix inadequacies in proposed reserve design. These respondents requested discussion of the impacts of these changes on the conservation strategy. Concern was expressed that the Forest Service was in violation of NEPA by not making update maps of the proposed changes available to the public, involving the public in the decision-making process, or disclosing the objective of the review. Specific recommendations for individual reserves were also given, including use of the GIS database developed by The Nature Conservancy and Audubon Alaska. Several respondents voiced support for the original interagency review team's proposal.

Response: As part of the current Forest Plan Amendment process, the Forest worked with the State of Alaska and the USFWS to complete a more comprehensive small old-growth reserve mapping effort. The objective of the interagency team review was to develop a consensus biological recommendation on small reserve locations that is consistent with Forest Plan criteria, eliminating the need to conduct further project-level reviews in most cases. This process was conducted in 2006 and 2007 and included the development of a biological recommendation, a refinement of that proposal with Forest Service Ranger District staff, and a further refinement by the Forest Supervisor. This refinement process was conducted in order to consider multiple-use objectives in addition to pure biological ones. The result was an overall increase in Old-growth LUD acreage compared to the current plan. Appendix D of the Final EIS also includes a discussion of how these updates were made and related results.

Comment: The current strategy for designing OGRs is flawed in that it does not take into account individual island variation.

Response: Criteria for designing OGRs are provided in Appendix K of the Final Proposed Forest Plan and Appendix D of the Final EIS. The process for evaluating small OGRs on the project level is actually very location-specific in that it requires that Appendix K criteria be met on a site by site basis, taking into account local knowledge of species and habitats and thus variation among individual islands. Note that significant effort has been made during this amendment process to evaluate and adjust all of the small OGRs. Only a small number should require adjustment at the project level now.

Comment: Through the designation of small, medium, and large OGRs there is an inordinate level of emphasis placed on productive old-growth forest. This ignores the habitat value of managed forests, as well as non-productive and low-volume forests, and the fact that when harvest changes the seral stage of a forest there are "winners and losers" with respect to habitat

suitability. There will be a higher level of wildlife diversity associated with habitats found in a forest of a variety of development stages and therefore reserves should incorporate more than just productive old-growth.

Response: There are a variety of factors that go into the designation of OGRs in terms of their placement and configuration, productive old-growth habitat being one of them. Reserves provide connectivity between high and low elevation areas and between Old-Growth LUDS and other non-development LUDS, protect areas of high value winter range, and nesting habitat for goshawks and murrelets The naturally fragmented landscape of the Tongass means that many reserve incorporate forest stages other than old-growth, either created naturally through blow down or past timber harvest.

Comment: Some respondents feel that the coarse-filter component of the conservation strategy fails to recognize the MIS and Sensitive species addressed by the Proposed Forest Plan, whereas others feel that the conservation strategy fails to take into account logging on adjacent non-federal lands. Both groups of respondents suggested that the level of protection afforded by the Proposed Forest Plan should be increased or decreased accordingly.

Response: The conservation strategy was designed to provide a range of habitats within the boundaries of the Tongass National Forest in part to account for conditions or predicted conditions on adjacent or nearby non-NFS lands.

Comment: Several comments were received expressing support for maintaining some or all elements of the conservations strategy. Some respondents felt that the system of large, medium, and small OGRs, along with beach and riparian buffers, must remain the cornerstone of the conservation strategy because it provides a safety net for conservation of viable fish and wildlife populations.

Response: The array of alternatives evaluated in the Final EIS is designed to address a full range of roadless development and timber supply/demand levels. Alternatives that reduce or remove elements of the conservation strategy do so to increase the amount of harvestable timber, which increases the risk to maintaining viable populations of wildlife.

Comment: Comments were received that encouraged the Forest Service to review any remaining small OGRs (OGRs) not finalized during the forest-wide interagency review effort with an eye to timber operability as well as fish and wildlife conservation. The newly proposed locations and sizes for the reserves that were reviewed appeared better than they were previously. However, of particular concern is that project-level reviews have removed 5,100 acres of POG from the suitable land base from 1998 to 2005 (USDA 2005). This steady erosion of the timber base presents an obstacle to maintaining a viable timber industry in Southeast Alaska. Therefore the commenters indicated they supported the joint effort to finalize locations of small OGR across the Tongass and encouraged this collaboration past this planning effort and further urged that the transfer of POG from the suitable land base to small OGR be kept to a minimum to meet criteria in Appendix K.

Response: We agree that the OGRs revised during the 2006-2007 Interagency Review, with subsequent review by the Forest Plan Adjustment Interdisciplinary Team (IDT) and Forest Supervisor, are in better locations. The Forest-wide review of small OGRs was done primarily to develop a consistent and more efficient method of review and to more accurately define the location of small OGRs to enhance the Forest Plan conservation strategy, achieving consistency with criteria in Appendix K of the Forest Plan. Concerns identified as a result of the Forest Plan Maintenance Program were also addressed in this review, one of which was that total acres added to OGRs are reducing suitable acres. The net result of the review was an increase of 39,000 acres in the Old-Growth Habitat LUD (effective under Alternatives 1, 2, 3, and 6). In addition to this expansion, some areas containing Old-Growth Habitat LUD were converted to other non-development LUDs (e.g., Special Interest Area and Semi-Remote

Recreation) and remain a part of the old-growth reserve network. Appendix D of the Final EIS addresses changes in the Old-Growth Habitat LUD and other non-development LUDs resulting from this review.

Comment: Alternative 4 proposes to apply the Old-Growth Habitat LUD in four biogeographic provinces and maintain 33 percent of old-growth in the remaining provinces. It is detrimental to wildlife because it does not specify the distribution of the 33 percent retention requirement, potentially resulting in widely spaced single trees of little value to species dependent on large contiguous blocks of habitat, and disregards scientific information indicating the importance of other biogeographic provinces (Kuiu Island, Admiralty, and the mainland provinces) which contain endemic mammal populations.

Response: It is true that under Alternative 4 all VCUs (with minor exceptions) outside of the four biogeographic provinces where OGRs are required would be required to retain 33 percent of their old-growth with no requirement to consider spacing, location, size, shape, or composition in the design of the retained acres, as is the case under Alternatives 1, 2, 3, 5, and 6, where the direction provided in Appendix K of the current Forest Plan (Old-Growth Habitat Reserve Criteria) applies. The EIS discusses the effects of Alternative 4 on wildlife, including endemic mammals.

Comment: **The biodiversity analysis should also look at changes in connectivity redundancy, corridor width, and corridor effectiveness.**

Response: Corridor redundancy is addressed by the Legacy Standards and Guidelines (see Appendix D for discussion of the rationale for its development) and was also a consideration during the 2006-2007 Forest-wide interagency small old-growth reserve review (i.e., OGRs overlapping the beach fringe). Effects of proposed changes in corridor width are discussed in the *Wildlife* section of the Final EIS. There still remains uncertainty regarding the effectiveness of various elements of the conservation strategy, including connectivity requirements. This is addressed in the *Biodiversity* and *Wildlife* sections of the Final EIS.

Comment: Characteristics and outcomes that an effective conservation strategy should have were listed in the Draft EIS. This list should include: 1) it should anticipate and allow for losses of particular habitats to stochastic events (including catastrophes) on a landscape scale and, as may be appropriate for finer species, at a finer scale; (2) it should anticipate and make allowances for natural habitat losses, considering also the effects of climate change; and (3) other statements from the joint statements by the peer reviewers of the 1997 Forest Plan.

Response: The conservation strategy was developed primarily to maintain viable, well distributed old-growth associated wildlife populations. The objectives are to contribute to habitat capability of fish and wildlife resources to support sustainable human subsistence and recreational uses; maintain biodiversity and ecological processes in old growth habitats; and to restore previously harvested stands to old growth forest condition at an accelerated rate. Catastrophic events at a landscape scale would be difficult to predict and nearly impossible to plan for across the landscape. Similarly, predicting climate change effects to Southeast Alaska forests is problematic. The relatively large and comprehensive conservation strategy is expected to be resilient enough to accommodate such uncertainty. This coupled with the relatively small portion of the Tongass that is considered available for management of timber into the future deems the risk and uncertainty within acceptable limits. Additionally, the ongoing monitoring and study by state and federal agencies, academia and others along with periodic reviews of the Forest Plan provide ample opportunities to respond to such risk and uncertainty in a responsible manner into the future.

Comment: Concerns raised about the inadequacy of the old-growth reserve system (e.g., reserves not large enough to support intended number of female marten, encompass an entire wolf pack home range, or a sufficient number of female brown bears on Baranof and Chichagof islands) were not addressed in the Draft EIS.

Response: Each of these concerns emphasizes the importance of matrix management. Matrix management and the uncertainties related to the adequacy of the reserve system are discussed in the *Wildlife* section of the Final EIS. In addition, several alternatives include increases to the reserve system (Alternatives 1, 2, 3, and 6).

Comment: One respondent offered the following detailed comment: The Forest-wide old-growth reserve review erroneously excluded acreage of private lands in calculating mapped reserves. It is impossible to properly design OGRs without taking into account the cumulative impacts of logging and development of all lands within the VCU. In discussing the basic criteria for allocating small OGRs, the Proposed Forest Plan defines such reserves as "a contiguous landscape of at least 16 percent of the area of each VCU." If the intent of the Forest Plan is to create these reserves based only on Forest Service land it would clearly state so.

Response: Prior to the 2006-2007 Interagency small old-growth reserve review, there was no specific protocol describing how to complete or implement project-level interagency reviews. As a result, small old-growth reserve reviews have occurred in a variety of ways and with varying degrees of quality. One of the aspects of the review process that make it difficult to complete is that some of the Forest Plan criteria are subject to interpretation, such as the 16 percent area requirement. Some project level reviews have taken all land ownerships into account, others have not. The revised Appendix K of the Final Proposed Forest Plan clarifies that this should include only NFS lands.

Comment: The adverse effects of fragmentation, increased forest edge, small mammal isolation, and increased predation in harvest areas are greatly exaggerated and not founded in science.

Response: Additional citations of peer-reviewed literature have been added to the discussions of these topics in the Final EIS.

Comment: The Old-growth Habitat LUD allows activities that are not consistent with habitat reserves (i.e., allows roads to access adjacent timber lands if no other feasible option exists, salvage logging, and OHV use) and needs to be updated. This high likelihood of road construction through OGRs represents a failure of the old-growth reserve system and the viability strategy of the current Forest Plan and shows why legal protection of wilderness is necessary. Stronger wording should also be included in Appendix K criteria for designating small OGRs to ensure that they represent big-tree stands, and that no roading or OHV use is allowed. The Appendix K criteria for small OGRs should also be revised to require at least 800 acres of POG, rather than the minimum of 400 acres, because the 400-acre minimum is almost always chosen.

Response: The conservation strategy is one developed through an interagency approach along with the best available science information at that time. Through a series of science review panels and many other efforts it was deemed to provide for a moderate to high likelihood of achieving its objectives. The 2006 review of the conservation strategy brought forward new science and much other information relative to the strategy since 1997. The review also brought together many of the foremost experts on subjects relative to the conservation strategy and its implementation. That effort, which included a paper reviewing published research on conservations strategy design (Haufler 2006), resulted in the Forest Service being able to conclude the conservation strategy and its basic design is still valid. In addition, we believe that the limited activities allowed in the Old-growth reserve standard and guidelines are consistent with the conservation strategy. Further, Chapter 6 of the Plan describes a monitoring plan for old growth that will ensure activities, over time, are consistent with the intent of this strategy.

Comment: There are a number of medium and large reserves throughout the Forest that fail to meet the minimum criteria in Appendix K for total acres and acres of productive old-growth habitat. Please identify all medium and large OGRs and display these criteria to identify the reserves that do not meet them. Then please give rationale as to why medium and large reserves not meeting these criteria were not adjusted.

Response: As stated in Appendix K of the Final Proposed Forest Plan, large and medium OGRs were designed based on the most restrictive requirements of species with large home ranges and for which there were viability and distribution concerns. They were designed to provide for source populations of species, specifically brown bear, marten, northern goshawk, and wolf, and to provide refugia for dispersing animals. These reserves received rigorous review during the development of the 1997 Forest Plan and, when considered within the context of the entire strategy, are likely adequate considering the logistics of where each reside within the overall strategy.

Comment: Section VII.A.3 of Appendix K of the Draft EIS appears to mean that in VCUs where any portion is designated as a very large, large, or medium old-growth reserve, these VCUs do not need to contain additional productive old-growth to meet the minimum requirements of small OGRs. This is difficult to interpret because the Draft EIS fails to provide a map depicting these reserves, and large and medium reserves are often identified not as Old-growth Habitat LUD but as one of several other Non-development LUDs.

Response: This interpretation of the criteria is correct. The rationale for not requiring a small old-growth reserve in a VCU which has a portion designated as a medium, large, or very large old-growth reserve is that it is assumed that these reserves in combination with old-growth retained by standards and guidelines will provide sufficient productive old-growth to ensure connectivity across the landscape through time. Old-growth Habitat LUDs are depicted on the Forest Plan maps.

Comment: How much is enough [adequate portion of each ecosystem type maintained in an unmanaged state]? Ten to 30 percent of a biogeographic region is the generally accepted minimum. Most expert landscape ecologists would suggest 30 to 40 percent.

Response: Targets for landscape level conservation features are partially defined as the percentage of a resource's overall distribution that is contained within a given area (Dunn et al. 1999), but also must take into account specific planning objectives as well as the identification of vulnerable habitat types and critical habitats for vulnerable species. There are no defined thresholds for how much old-growth should remain within a biogeographic province on the Tongass. The Final EIS displays the amount of old growth that is predicted to remain after 100 years for each biogeographic province and identifies the resulting effects to wildlife and biodiversity. Table 3.9-14 in the *Biodiversity* section shows that none of the biogeographic provinces would have less than 53 percent of its original POG remaining on NFS lands after 100+ years of implementation under any of the alternatives at the maximum level allowed. Even if all lands in Southeast Alaska are considered together, the minimum percent of original POG remaining on all lands among all provinces would be 44 percent (see Table 3.9-20)

Comment: The Draft EIS fails to disclose the opposition to, and uncertainty behind, the Conservation Strategy.

Response: Additional discussion of risk and uncertainty related to the conservation strategy and wildlife viability assessments has been added to the *Wildlife* section of the Final EIS and Appendix D has been added which addresses these topics in more detail.

Comment: Some respondents felt that the process for preparing the amendment was flawed. They believe that the results of the conservation strategy review were not incorporated and that

the conservation strategy review itself was flawed because not all key experts were invited, the observers were not allowed to participate, and some key issues were not brought up.

Response: The conservation strategy review was designed as an interagency review of the conservation strategy focusing on new information and knowledge developed since 1997. As a structured information assessment it was not intended to be an all encompassing review of all aspects of the conservation strategy or to involve special interest groups with other agendas. The review focused on new information relative to implementation and monitoring of components of the strategy, especially within the matrix part of the strategy where development activities will occur through time. The review involved numerous interagency meetings to develop the agenda, much preparation time by the speakers and a full week meeting in Ketchikan in April of 2006. Expanding the meeting to encompass all subjects and all interested parties would have made it even more time consuming.

The information was very useful in the Forest Plan Amendment process but there was never any intent that the Amendment would address all of the ideas brought forward in the review. As noted on the Conservation Strategy Review Website at the time of the review:

> "The new information and knowledge will be presented at a science-based technical workshop designed to rigorously explore the subjects and to develop a suite of potential actions and investments the Tongass and its interagency partners can consider related to new information needs or exploring changes in how the conservation strategy is designed, implemented or monitored. The suite of considerations could lead to conservation strategy-related adjustments to the Tongass Forest Plan as well."

The planning record shows the findings from the review and the plan for how each finding will be addressed over time.

Comment: Some respondents also believed the process was flawed because changes to the small OGRs were completed after the Draft EIS was published. They also stated that the comment period was not long enough.

Response: Alternatives in the Draft EIS included those small old-growth reserve adjustments that had been completed by the interagency team at a point prior to the time of publication. The Draft EIS solicited comments on these changes and the interagency process in general. All of the small old-growth reserve adjustments were completed and posted on the Website with over 30 days of the comment period remaining. The comment period was then extended for an additional 18 days, because of the weather and because we wanted to ensure that those interested had a chance to comment on these changes. Even after the comment period closed, the Website was quite clear that we would continue to welcome comments on the small old-growth reserve changes.

The formal comment period on the Draft EIS lasted for a total of 108 days. In addition, most of the proposed changes to the Forest Plan were on the Website months in advance of the comment period. The public had a considerable amount of time to consider the changes we were proposing.

Old-Growth Mapping

Comment: Several comments were received regarding the use of the size-density model (SDM) for vegetation versus the original Vol-Strata vegetation model in the deer habitat capability model. Some feel this is unimportant provided model results are only used to make a relative comparison among alternatives. Others feel this is a modest improvement but that condensing the model into only three categories masks the loss of the highest value deer winter habitat due to past and future timber harvest. These respondents supported the modification of the model to represent all seven SDM vegetation classes.

Response: The deer model provides a means for making relative comparisons among alternatives in terms of their effects to deer winter range. The existing model parameters are based on the three volume

strata categories. In addition to this fact and the fact that sufficient information to accurately update the model to use all seven categories does not exist, the statistical precision of the SDM classification into the seven classes is low. New deer models are in development, but are not ready for use at the Forest planning scale.

Specific concerns regarding deer and the deer model are discussed in a following subsection of this appendix under the heading "Deer."

Comment: Much of the biodiversity and wildlife analysis in the Draft EIS is too "productive old-growth (POG)-centric" and the Draft EIS has violated NEPA by not disclosing this shortcoming. Some respondents felt that the general reference to POG as a key indicator for effects to many wildlife species made in Chapter 2 is incorrect in that many species have more specialized habitat requirements (i.e., coarse canopy productive old-growth provides higher quality winter habitat for deer) and the Draft EIS should have disclosed effects to individual SDM categories, particularly those that represent high-value POG including "big-tree" POG (i.e., SD67, SD5N, and SD5S categories).

Response: The summary statement in Chapter 2 that POG is a key indicator of effects to many wildlife species on the Tongass is correct, as this is the primary resources affected by timber harvest. Where appropriate, the wildlife analysis does separate out effects to the most important SD7 model categories of POG. A full analysis has been added to the *Biodiversity* section of the Final EIS showing effects to high volume (SD5N, SD5S, SD67) vegetation categories and large-tree (SD67) vegetation category POG, both on NFS lands alone, and on all lands in Southeast Alaska combined (by biogeographic province).

Comment: The Draft EIS fails to disclose how the assumed harvest of vegetation categories SD4N, SD4S, SD5H, SD5N, SD5S, and SD67 prior to 1954 was distributed among these categories for the estimate of 1954 deer habitat capability, and therefore violates NEPA.

Response: To estimate 1954 or original POG, it was necessary to "grow back" previously harvested units. Previously harvested units identified in the vegetation layer (HS1, HS2, and HS3 categories in the SDM GIS coverage) were assumed to have been stands of POG. To estimate original high volume and SD67 POG, an estimate was made of the percentage of past harvest in these categories using timber type mapping from the mid-1980s. Based on this analysis, prior harvest on NFS lands was estimated to have been 29 percent SD67 and 64 percent high volume (see Appendix B) These estimates are higher than estimates made by Audubon Alaska and The Nature Conservancy (Albert and Schoen 2007).

Comment: Populations of some species (bear, goshawk, marten, and wolf) occur at viable levels in habitats containing substantially less old-growth and greater levels of development than the Tongass. This suggests that habitat associations of species considered in the Proposed Forest Plan are in some instances less linked to old-growth than assumed.

Response: On the Tongass all of the species listed above are considered old-growth associates, being most closely associated with this habitat type. However, as described in their respective subsections in the *Wildlife* section of the Draft EIS, these species are all wide-ranging and their home ranges may encompass a variety of habitat types. Species-specific standards and guidelines focus on protecting old-growth because this is the habitat type most affected by timber harvest activity. Where new science has indicated that certain species are more adaptable than once thought, information from pertinent peer-reviewed literature has been included in the Final EIS.

Comment: The focus on retention of high-volume timber stands in the Proposed Forest Plan is based on the assumption that past harvesting targeted these stands. However, for purposes of economical and operational efficiency, harvests prior to 1976 more typically involved entire

watersheds or portions of entire watersheds and the range of volumes associated with stands occurring there.

Response: This is true to some degree, but there is no doubt that the lower elevation stands, which generally have the highest volume and wildlife values, were harvested at a disproportionate rate (Table 3.9-7 in the *Biodiversity* section).

Comment: The Draft EIS does not disclose the continued effects of high-grading on the forest or the cumulative effects of continued high-grading on non-federal lands. The Final Proposed Forest Plan must address past high-grading of the most productive forest types on federal and non-federal lands. Some respondents contend that because past high-grading has reduced forest and habitat diversity, additional conservation measures need to be applied on the Tongass to minimize the loss of additional diversity; others expressed opposition to all high-grading. Others brought up timber harvest statistics suggesting that the Forest Service's estimate that only 8 percent of the timber harvested on the Tongass is cedar is actually closer to 20 to 40 percent, based on independent ground truthing, evidence that the Draft EIS and market demand analysis under represent the role cedar exports play in the Tongass timber program and the corresponding impact on the environment.

Response: Additional discussion of the historical disproportionate harvest on certain landforms and of certain forest types has been added to the *Biodiversity* section of the Final EIS and includes NFS and non-NFS lands. The *Biodiversity* section also includes an expanded discussion of old-growth representation within reserves and matrix lands for high-volume and large-tree POG and the effects of the alternatives on this representation, as well as an expanded cumulative effects analysis evaluating future disproportionate harvest on non-NFS lands. We assume that this comment actually refers to the statement in the Draft EIS that 8 percent of POG historically occurring on the Forest has been harvested, not yellow cedar. As noted on page 3-241 of the Draft EIS, our records indicate that hemlock and spruce account for 94 percent of trees harvested in most sales on the Tongass. Cedar occurs as a minor tree species in most stands. The comment that cedar represents up to 40 percent of the total past harvest is not supported by historical data.

Comment: Historically, the most productive forest types have been disproportionately targeted for logging. As an example, low elevation karst and valley-floor forests have been logged at 560 percent and 160 percent of their proportional availability, respectively.

Response: More information on the disproportionate nature of past timber harvest in Southeast Alaska has been added to the *Biodiversity* section of the Final EIS.

Comment: A number of comments were received regarding the protection of high-value or rare habitats (e.g., large-tree old-growth, karst lands, yellow cedar) and the natural range of environmental variability across the forest. Some respondents asked the Forest Service to protect these habitats, some suggested that new standards and guidelines need to be developed for remaining rare and large-tree forests and others suggested these elements be protected in each biogeographic province. Others commented that areas of intense logging seem to correspond with areas of concentrated wildlife use.

In their comments TNC and Audubon describe an analysis in which they used the protection of high-value habitats as a measure of the effectiveness of the conservation strategy and analyzed the existing protection afforded to focal species and ecosystems (large tree forests, deer, bear, salmon, and marbled murrelet) within existing reserves by biogeographic province. This analysis revealed that, in general, the provinces with the highest biological value are also those with the greatest vulnerability (i.e., least amount of high-value habitats protected). North Prince of Wales, East Chichagof, Revilla/Cleveland, Kupreanof/Mitkof, and others rank as the highest priorities for

additional conservation and restoration measures. The analysis also looked at cumulative ecological risk, recommending this as a tool to be used for adjusting the Tongass Conservation Strategy to prioritize conservation and restoration actions.

Response: Harvesting high-value stands, which has affected high-value habitats such as large-tree old-growth, karst lands, and cedar) is discussed in detail in the *Biodiversity* section of the Final EIS. The fact that some areas of high value to wildlife coincide with areas of high value for timber harvest is also discussed in the *Biodiversity* section. Of note is that while it is true that there is high biological value in areas where timber harvest is allowed, there are also many high biological value areas on the Tongass (as ranked by TNC and Audubon) that are fully protected (for example, Admiralty Island National Monument).

Comment: Page 3-120 in the Biodiversity section of the Draft EIS states that "Albert and Schoen (2006) estimate that region-wide approximately 29 percent of 242,211 acres harvested since 1986 occurred in large-tree (SD67) ecosystems, and approximately 72 percent of these forests remain intact." This statement occurred in an earlier report to ADF&G prior to completion of our conservation assessment. The statement was preliminary and needs additional clarification. In our final conservation assessment (Albert and Schoen 2007) we stated the following: "Region-wide only 12 percent of all productive old-growth has been harvested since 1954, but at least 28 percent of Southeast's large-tree forest types have been cut. It is important to recognize, however, that this percentage-derived from post-1986 selectivity coefficients-represents a significant underestimate of the original high-grading of the large-tree stands." This should be corrected in the Final EIS.

Response: Additional information from Albert and Schoen 2007 has been added to the *Biodiversity* section of the Final EIS. Our independent estimate of the percentage of past harvest of large-tree POG is higher than the percentage calculated by Albert and Schoen (2007). Using timber type mapping from the mid-1980s, we estimated that 29 percent of the large-tree POG on NFS lands and 37 percent of the large-tree POG on non-NFS lands was previously harvested, for a cumulative harvest rate of 32 percent (see Appendix B).

Comment: The Size-density Model should have been used throughout the Draft EIS analysis and tables in Section 3.9 and 3.13 should be revised to provide a summary by SDM class. The fact that the ecological sensitivity analysis of the Size-density Model was omitted from the biodiversity analysis of the Draft EIS is a major flaw and should be corrected in the Final EIS. It would also be useful if the Final EIS could also account for the SD7 class separately from the SD6 class because of their great rarity and value on the Forest.

Response: Tables showing the amount of POG, high-volume POG (SD5N, SD5S, SD 67), and large-tree POG (SD67) harvested and remaining, and a cumulative effects discussion on future harvest of POG, high volume POG, and large-tree POG, have been expanded in the *Biodiversity* section of the Final EIS. SD7 is not one of the types in the Size-Density model. It is assumed the commenter is referring to the old volume class 7, which is not statistically distinguishable from other types, based on existing mapping.

Comment: One respondent discussed the new tools that are available such as the Size Density Vegetation Model and the modeling work recently completed by The Nature Conservancy. They suggest that implementation not begin until these new tools have been incorporated.

Response: The Size Density model has been used throughout the analysis. The Nature Conservancy's work has been examined closely and has informed the analysis, especially in the areas of biodiversity and roadless area evaluation.

Legacy and Goshawk/Marten Standards and Guidelines

Comment: Some respondents supported Alternative 7 with some modifications. They felt that some of the Conservation Strategy Standards and Guidelines lacked a basis in science and should be removed from Alternative 7. These standards and guidelines include the 1000-foot beach buffer, OGRs, Class III stream buffers, the Legacy standard, and the Goshawk and Marten standards.

Response: Table 2-16, page 2-41 of the Draft EIS illustrates that Alternative 7 has none of these standards and guidelines except for the Class III riparian standard. Alternative 7 has been modified in the Final EIS and it no longer includes buffers on Class III stream. See Appendix D of the Final EIS for more information about the scientific rationale behind the conservation strategy.

Comment: The Draft EIS provides no supporting science for adopting the Forest Legacy standard and guideline as a replacement of the Marten Habitat and Goshawk Foraging Standards and Guidelines. Without this assessment there is no way to evaluate any benefits of the standard and guideline to wildlife. The Final EIS should include a qualitative and quantitative analysis of how the Marten Habitat and Goshawk Foraging Standards and Guidelines have been applied and the extent to which these requirements have impacted timber harvest activities.

Response: Appendix D of the Final EIS provides the rationale behind the development of the Forest Legacy standard and guideline as well as an assessment of how it compares to the existing Marten Habitat and Goshawk Foraging Standards and Guidelines.

Comment: Risk levels (i.e., low, medium, and high) of VCUs used to determine application of the Legacy Standards and Guidelines in the Final EIS and Final Proposed Forest Plan should incorporate timber harvest on all land ownerships.

Response: The Final Proposed Forest Plan specifies only higher-risk VCUs in the application of the Legacy standard and guideline; the harvest level for determining risk category does not include all land ownerships, though it is anticipated that harvest on these lands will continue into the future. The overall conservation strategy design accounts for cumulative effects on non-NFS lands, and therefore the analysis of VCUs for application of Legacy has considered only the NFS portion of VCUs.

Comment: Because natural openings in old-growth forest on the Tongass average 2 acres, the Legacy standard and guideline should be implemented in all harvest units greater than 2 acres, as required under the existing Goshawk Foraging and Marten Habitat Standards and Guidelines, versus the 20 acre requirement under the Legacy standard and guideline. The loss of legacy retention in units between 2 and 10 acres in High Risk VCUs would increase impacts of logging on the goshawk and other old-growth associated species in landscapes where they are already most at risk.

Response: The use of 20-acres for the minimum unit size where the Forest-wide Legacy standard and guideline applies was selected because it represents a typical logical logging system setting, based on analysis of the LSTA. In order to better balance wildlife conservation concerns and timber sale operability concerns, this unit size was selected. This change may not be as beneficial as the 1997 Plan Goshawk Foraging and Marten Habitat Standards and Guidelines for some species. For wildlife species sensitive to forest fragmentation, clearly smaller units would have less impact than larger units. However, there is no strong empirical evidence on what the maximum unit size is before a clearcut becomes a barrier. It is also important to consider that wildlife encounter a range of conditions and natural fragmentation on the Tongass. Opening sizes from natural wind events range up to 1,000 acres, but are typically less than 40 acres (Nowacki and Kramer 1998). While there could be openings up to 20 acres without retention of legacy, we anticipate that there would be a mix of openings in a typical timber sale layout because of the

OGRs in buffers, over-steepened slopes, and other protection measures associated with those units. Appendix D of the Final EIS provides additional discussion of the rationale behind the development of the Legacy standard and guideline.

Comment: The Forest Legacy standard and guideline could result in trees retained along the perimeter of a harvest unit, unlike the Marten Habitat and Goshawk Foraging Standards and Guidelines which require that trees be individually spaced or retained in clumps.

Response: The legacy standard and guideline is simpler and clearer than the goshawk and marten standards. The intent is similar – retain forest structure in units. The standard is clear that this structure is meant to be within the harvest units, not on the edge, though it does provide for exceptions when logging systems preclude this. Continued Forest Plan monitoring provides for continual monitoring of this to ensure that legacy retention within units is occurring. Adjustments can be made through adaptive management if it is determined that objectives are not being met. Additional technical information has been added to the Timber and Forest Health sections to discussions regarding legacy and other retention standards and guidelines and to Appendix D of the Final EIS.

Comment: Several comments were received requesting clarification as to what harvest units the Legacy Standards and Guidelines would apply. One respondent stated that neither the Proposed Forest Plan nor the Draft EIS provide a scientific rationale for the criteria for defining the maximum sizes of units that can be harvested and still retain legacy forest structure, and how much legacy forest structure should be maintained, because both the maximum size of openings allowed and the amount of forest structure to be left depend on the risk level within the VCU. Other respondents were opposed to applying the Legacy Standards and Guidelines to all harvest units (or altogether), suggesting this would hamper timber sale economics by distributing timber harvest and setting aside the most economic timber stands in areas that are managed for multiple use.

Response: Based on further analysis and public comment, the Legacy standard has been refined for the Final Proposed Forest Plan. The Legacy Standards and Guidelines are to be applied only in higher-risk VCUs where 33 percent or more of the POG has been harvested as of 2005, or VCUs where less than 33 percent has been harvested but more than 67 percent of the POG is projected to be harvested by the end of the Forest Plan planning horizon. Within these VCUs the only criterion related to unit size is that the standard is to be applied to the original planned harvest units of 20 acres or greater. Appendix D of the Final EIS provides information on the rationale behind the development of the Legacy standard and guideline.

Comment: Several respondents questioned whether a mechanism would be in place for ensuring that legacy retention is protected from future removal, be it salvage or commercial harvest, firewood collection or personal use. A suggestion was made to develop a legacy structure tracking system.

Response: Standard and guideline IV.B of the Final Proposed Forest Plan states that Legacy forest structure should remain indefinitely after harvest and shall be tracked through the life of the next stand. Salvage logging of legacy trees is generally prohibited unless the rationale is clearly documented and the effects are clearly neutral or an improvement.

Comment: The Forest Legacy standard and guideline is a cookie-cutter approach that is inappropriate for an island archipelago. This approach fails to account for island size, fragmentation, the uniqueness of the area, the presence of karst or other landscape features, or the presence of endemic mammals. It also fails to account for impacts on adjacent private lands.

Response: The design of the conservation strategy took into account a variety of factors, including biogeographic province differences (which incorporates the fact that the Tongass is an island archipelago), fragmentation, and endemics. The OGR system in the conservation strategy fundamentally is a 'coarse filter' approach to addressing wildlife viability and the conservation of biodiversity. In addition, a variety of other coarse filter standards and guidelines provided connectivity between the reserves. At the "fine filter" level, species-specific standards were fully considered in light of additional information such as conservation assessments, panel assessment results, etc. and appropriate standards and guidelines were incorporated for species that needed additional protection measures to assure their viability and well-distributed status. The design of Forest Legacy standard and guideline also took into account past and future harvest within a VCU.

Comment: The Reserve Tree/Cavity-nesting standard and guideline leaves unanswered the question of how many trees and what sizes.

Response: The generality of these standards and guidelines is intended to leave some flexibility in its implementation as the quantity and quality of available reserve trees will vary by project location. This standard and guideline has not changed since 1997.

Comment: There is no science behind the 100-acre goshawk nest buffers. It is likely that the nest buffers afforded bald eagles would be sufficient for goshawks (8 acres versus 100 acres).

Response: Much information, including peer reviewed science, related to goshawk nest sites and use areas exists. Such information was used to inform development of the standard and guideline requiring the nest buffer included in the Final Proposed Forest Plan.

Comment: Foresters have recently field-applied the proposed Legacy standard and guideline and have concluded that it only slightly improves the economics of timber sales over the current Forest Plan and only marginally offsets the impacts of the OGRs and other conservation strategy measures in place. The commenter indicated they would like to see the research called for in the May 1994 "Response to the peer review of: a proposed strategy for maintaining well-distributed viable populations wildlife associated with old-growth forest in Southeast Alaska" completed and a full NEPA analysis made prior to proposing implementation of this standard and guideline.

Response: The various peer reviews conducted for the 1997 Forest Plan Revision were incorporated as applicable into the associated analyses which lead to the 1997 Forest Plan. That information is available in the 1997 Forest Plan planning record. The conservation strategy included in the 1997 Forest Plan was reviewed in 2006 and the Forest Service concludes the conservation strategy is still sound and an appropriate approach for the Tongass National Forest. The Legacy Standard has been modified for the Final Proposed Forest Plan.

Population Viability

Comment: The rating for Alternative 4 needs to be corrected on page 2-51 of the Draft EIS.

Response: This has been corrected in the Final EIS.

Comment: Carrying over results of the 1997 expert panel risk assessments and associated "likelihood ratings" into the Draft EIS should be justified, particularly in the case of wolves and endemic species in light of recent scientific findings..

Response: Appendix D of the Final EIS contains a detailed description of the 1997 panel assessment process, results, rationale for carrying over applicable results into the Final EIS, and a discussion of where new science differs from information used by the panel to rate alternatives.

Comment: Several comments were received about the population levels managed for under the Proposed Forest Plan. Some felt that the standard for fish and wildlife population levels should be based on sustainability rather than viability because a sustainable population provides for both human use and biological survival whereas viability only guarantees survival in the absence of human use. These respondents noted that the standard of sustainability is consistent with the State of Alaska's constitution. Others felt that the conservation strategy should focus on "abundant or moderate," "abundant and useable," or "sustainable and normally distributed" populations because they are more likely to sustain moderate levels of human use or meet regional subsistence needs.

Response: The Forest Service is complying with direction under the NFMA to maintain viable wildlife populations. It is recognized that minimum viable populations for many species may not satisfy the public need for wildlife populations depended upon to meet subsistence and/or sport hunting uses. Lengthy discussion is found in the *Subsistence* and *Wildlife* sections of the Final EIS regarding such species.

Comment: **The characterization of Alternative 7 as having a moderate to low likelihood of maintaining viable and well-distributed wildlife populations across the Tongass because of the elimination of the old-growth reserve system is not founded in science. The fact that this alternative is the least protective does not automatically translate into a risk for a species.**

Response: This statement has been modified to indicate risk relative to Alternative 5 No Action, which is equivalent to Alternative 11 of the 1997 EIS that had been evaluated by a risk assessment panel using the best available science. Due to elimination of the old-growth reserve system under Alternative 7 and the increase in area of development LUDs, Alternative 7 would have a reduced likelihood of maintaining viable, well distributed populations relative to Alternative 5.

Comment: The Draft EIS does not adequately address the potential value of harvest regulations and access control, in combination with habitat management, in helping assure the viability of some wildlife species.

Response: While the Forest Service has a role in setting harvest regulations through the Federal Subsistence Board, the Forest Service, by itself, cannot set or manipulate wildlife harvest levels. Therefore, harvest regulations are not considered as a sole means to mitigate effects to wildlife. However, we do recognize our ability to work within the federal system and to work cooperatively with the State in considering harvest regulations if needed. This is discussed as a specific means for mitigating the effects of timber harvest on species that are sensitive to over harvest (legal and illegal) due to increased human access along roads (e.g., marten, wolves). Access control is discussed in the *Wildlife* section of the Final EIS where appropriate; however decisions to close or maintain open roads are made at a district or project level and therefore are described only generally in the Final EIS.

Comment: The Draft EIS fails to address the joint statements issued by the Peer Review Committee, a distinguished panel of 12 PhD scientists assembled by the PNW Research Station, in 1996 in response to the release of the Draft EIS of the 1997 Forest Plan, and in 1997 after the release of the Final EIS. The 1996 statement concluded that (1) the best available science indicated substantial risk to the viability of wildlife associated with old-growth forests of Southeast Alaska; (2) none of the action alternatives included measures which would ensure the continued viability of all old-growth associated species on the Tongass; (3) deferring adoption of an effective plan to ensure viability of wildlife populations entails serious risk to Tongass wildlife;

and (4) the Forest Service should address new alternatives that a full array of necessary conservation measures. The 1997 statement concluded that the final management plan did not incorporate any of the review committee's findings in fundamental ways and the plan would not protect viable, well-distributed populations of vertebrate species on the Tongass.

Response: The Tongass conservation strategy has been implemented for 10 years and has not resulted in the decreased viability or listing of any species. It continues to be one of the most detailed and comprehensive strategies among national forests. In addition, over the course of its implementation the level of harvest has been substantially less than that anticipated by the peer review committee during their review. The 2008 alternatives also consider the peer review committee recommendations. The conservation strategies of Alternatives 1, 2, 3, 5 and 6 include enhanced connectivity through maintaining the 1,000-foot beach fringe, Riparian Standards and Guidelines, and other standards and guidelines that together would protect at least 66 to 74 percent of the existing POG inside the matrix (development LUDs) after 100+ years of maximum Forest Plan implementation (harvesting at the maximum harvest level). Further, from 71 to 93 percent of all existing POG on the Tongass would be protected in reserves. These alternatives would also provide at least one very large reserve within each biogeographic province. Appendix D has more information about the conservation strategy and the science that led to its development.

Comment: Several respondents expressed confusion over the conclusions drawn in Table 2-17 of the Draft EIS regarding viability ratings for some of the species under consideration.

Response: Appendix D of the Final EIS provides detailed background information on the viability panel assessments convened prior to the 1997 Forest Plan, and their application to the 2008 Final EIS.

Comment: Much of the Proposed Forest Plan deals with the management of "buzz words." The terms biodiversity, old-growth, endemics, extinction, protection, and endangered are not concisely defined or clearly set in the context of forest management. Old-growth appears to refer to "forest that has not been previously harvested by humans." Local extinction can be at any scale and should be defined, as should the term protect, which appears it the context of the Forest Plan to be protection from timber harvest. The Final Proposed Forest Plan should also define at what level endemism is considered (population, subspecies, species); the plan is also contradictory in describing "well-distributed" populations of endemic mammals across the Forest" (i.e., if populations are not well-distributed they are not endemic).

Response: The Glossary, which is located in Chapter 7 of the Proposed Forest Plan, defines these terms. Biological diversity is defined as "The variety of life forms and processes, including the complexity of species, communities, gene pools, and ecological functions, within the area covered by a land management plan." Endemic is defined as "restricted to a particular locality, or occurring at low levels" giving the example of "a particular species or subspecies may occur on only one or a few islands." Extinction is defined as "any species of animal or plant that is in danger of extinction throughout all or a significant portion of its range," the definition given under the ESA. An endemic population may occur within a restricted range (i.e., island or group of islands), but can be widely-distributed within this range. Extinction, as described under the definition of Endangered, relates to all or a significant portion of a species range.

Management Indicator Species

Comment: Several respondents made suggestions for species that should be added to the list of MIS, including the marbled murrelet, Canada lynx, and wolverine. One respondent believed that recommendations made in 1999 by the Interagency Monitoring and Evaluation Group MIS subcommittee to reduce the current list of 13 species to 6 had been accepted and implemented on the ground for numerous timber sales. This respondent also felt that a discussion of changes to

the MIS list should have been disclosed in the Draft EIS. Another respondent felt that use of the MIS concept was appropriate only at very broad scales (i.e., indicators of old-growth) because but was not sufficient for finer levels of habitat selection such as specific features within old-growth forest (i.e., canopy openings, snags, or downed wood).

Response: An effort to re-evaluate the current list of MIS has been ongoing since 1999; however it is separate from this Forest Plan Amendment because any changes will depend, in part, on the selected alternative. Any changes to this list will be considered during this process. As noted in the Final EIS, there are currently 13 MIS wildlife species, each of which was addressed in the analysis. Each of these species was selected for different reasons. Some are representative of large tracts of old-growth habitat, however others were selected for their use of other habitat types, sensitivity to human disturbance, importance as subsistence/hunting resources, or use of specific features within old-growth forest (i.e., cavity nesters).

Comment: The Forest Service should not use MIS that are introduced on islands because they often do not adequately represent the responses of native fauna to habitat conversion and human disturbance. Red squirrels and marten are two examples of MIS that have been introduced to several islands in the archipelago and therefore should not be used as MIS in these locations.

Response: The MIS for the Tongass were selected so under the auspices of the 1982 Planning Regulations in which species of interest, whether native or non-native, could be considered as MIS. The list of MIS is currently under review and is likely to change in the future. This is based in part on evaluations of monitoring information since 1997 and associated analyses summarized in Chapter 3 of the Final EIS.

Wildlife Cumulative Effects

Comment: The cumulative loss of habitat value for deer, bear, large-tree forests, marbled murrelets, and salmon under Alternatives 4, 5, 6, and 7, when considered in combination with activities on adjacent non-NFS lands, represents greater than 45 percent of habitat forest-wide, and greater than 67 percent of habitat value in the North Prince of Wales and Kupreanof/Mitkof biogeographic provinces, as demonstrated by the Coastal Mountains and Forests Ecoregional Assessment (Albert and Schoen 2007).

Response: It is true that two of the most heavily developed provinces are North Prince of Wales and Kupreanof/Mitkof. The cumulative loss of old-growth habitat, taking all land-ownerships into account, is quantified and discussed in the *Wildlife* and *Biodiversity* sections of the Final EIS. Table 3.9-20 in the *Biodiversity* section indicates that the cumulative loss of POG after 100+ years of Forest Plan implementation at maximum levels would be 24 to 29 percent for all of Southeast Alaska under these four alternatives counting all ownerships. For the North Central Prince of Wales province the cumulative loss would be 49 to 56 percent and the cumulative loss would be 39 to 47 percent for the Kupreanof/Mitkof province..

Comment: Assumptions that non-federal lands have zero habitat capability and that there is a direct relationship between the amount of productive old-growth and the abundance of marbled murrelets and flying squirrels are incorrect.

Response: Substantial timber harvest has occurred on non-federal lands adjacent to the Tongass. Therefore the analysis in the *Wildlife* section takes a conservative approach by assuming that these lands provide little habitat value because continuing harvest activities are expected to occur in the future. The *Wildlife* section recognizes that relatively little is known about the terrestrial habitat relationships or population trends and abundance of marbled murrelets in Southeast Alaska, though nesting has been documented in old-growth. Therefore, the analysis focuses primarily on harvest of productive old-growth

and because the scope of the analysis for this Forest Plan Amendment is related to timber demand. Harvest of productive old-growth is listed in the Final EIS as one of several possible causes of the estimated overall declines documented in the Alaska marbled murrelet population. Similarly, the Final EIS does not assume that flying squirrel abundance is solely dependent on old-growth but cites recent research that has documented their use of peatland-scrub-mixed conifer forests.

Comment: Table 3.4-3 of the Draft EIS suggests that Alternative 7 would reduce the productive old-growth by 31 percent. How is this possible when we will harvest less than 21 percent of the commercial timberland? Is the table referring to just the commercial old-growth outside of the congressional set-asides?

Response: Table 3.4-3 of the Draft EIS states that currently 88 percent of the POG existing in 1954 remains on the Tongass. Under Alternative 7, 69 percent of 1954 POG would remain long-term if percent Alternative 7 is selected and harvests at the highest rate modeled. The table also includes non-NFS harvests and the 31 percent refers to the reduction about 100 years from now relative to 1954 levels. In the Final EIS, this estimate has been refined to a 30 percent reduction relative to original POG levels.

Restoration and Young-Growth Management

Comment: Silvicultural treatments have been shown to be effective on the Tongass in increasing the amount of understory shrubs important as deer forage and as habitat for small mammals and shrub-nesting birds and should be recognized for their current and future contributions to habitat. Several respondents requested that the Final EIS acknowledge that there are many uncertainties related to the benefits and application of young-growth management as a tool for enhancing wildlife habitat given that some studies have documented correlations that indicate adverse effects (i.e., increased risk of black-tailed deer fawn mortality associated with pre-commercial thinning).

Response: A statement about the uncertainties related to young-growth management has been added to the text.

Comment: The Forest Service should shift priorities from timber harvest and road building to stream restoration and habitat enhancement.

Response: Stream restoration and habitat enhancement have been priorities on the Tongass for many years. The Final Proposed Forest Plan lists the maintenance and restoration of aquatic habitats as a forest-wide multiple use goal and lists designing and implementing structural and non-structural wildlife habitat improvement projects as a management objective (Forest Plan 2-3).

Comment: Please explain why you are adding "habitat restoration treatment" as a reason that programmed timber harvest can be done in the beach buffer. We fully support such restoration treatments, including commercial thinning, but this needs to be done with particular caution. The beach fringe should not be logged for commercial gain in anything other than a way that specifically benefits the beach fringe buffer values. When those interests overlap, then commercial timber harvest should be pursued.

Response: No programmed timber harvest would occur in the beach buffer; however, thinning or other treatments could occur if it is designed to improve wildlife habitat in dense young-growth stands. Timber cut for this purpose, if excess to down woody debris needs, could be sold, but this volume would not contribute to ASQ.

Comment: We recommend allowing selective harvest of second-growth timber in portions of the beach and estuary buffers that is more than 500 feet from the water, and in portions of riparian buffers that are more than 100 feet from rivers and streams; we do not support old-growth harvest in these buffers.

Response: The Final Proposed Forest Plan permits thinning dense young-growth stands in beach and riparian buffers to improve habitat.

Threatened, Endangered and Sensitive Species

Comment: Several suggestions were made to add species to the Regional Forester's Sensitive Species list as part of the Forest Plan Amendment. Several respondents suggested listing the marbled murrelet, given that the recent USGS status review indicates declines in the available habitat and the population in Southeast Alaska. Suggestions were also made to list *Martes caurina,* given its low numbers on Kuiu Island. Another respondent suggested adding endemic species.

Response: The Regional Forester's Sensitive Species list is currently undergoing review but this endeavor is separate from this Forest Plan Amendment and will occur on a separate time frame.

Comment: The U.S. Department of the Interior concluded that because the Kittlitz's murrelet, found in marine waters north of the Tongass, is most susceptible to recreation near tidal glaciers and high elevation land activities such as mining, changes reflected in the Proposed Forest Plan do not appear to pose a significant risk to this species.

Response: We concur with this conclusion, as indicated in the Final EIS.

Comment: No threatened or endangered species under the jurisdiction of the Fish and Wildlife Service exist within the project area. In response to the court-ordered remand the USFWS is currently evaluating the status of the Queen Charlotte goshawk and its habitat to determine if Vancouver Island is a significant portion of its range and, if so, whether listing under the ESA is warranted for all or part of the goshawk's range. In addition to the goshawk, the Alexander Archipelago wolf has previously been petitioned for listing; and the Kittlitz's murrelet is a candidate species. In addition there are numerous other endemic and sensitive species on the Tongass that will require continued collaboration between the Forest Service and USFWS in developing conservation provisions.

Response: The only federally listed species under the jurisdiction of the Fish and Wildlife Service determined in the past to occur on the Tongass National Forest is the peregrine falcon, which was delisted in 1999. An updated biological assessment has been prepared that addresses effects to this species. Information from the recent goshawk status review and 12-month finding has been incorporated into the Final EIS. Information regarding the Kittlitz's murrelet is also incorporated. We agree that there are many opportunities for collaboration with the Fish and Wildlife Service and are committed to continuing these endeavors.

Endemic Species

Comment: Standards and guidelines related to endemic mammals should emphasize climate change and connectivity between populations. Marten should be an emphasis of survey efforts.

Response: Standard and guideline VIII.A.2 of the Final Proposed Forest Plan relates to connectivity between populations of endemic mammals. Regarding species to survey, the species listed in standard and guidelines VIII.A.1.C of the Final Proposed Forest Plan are given as examples; it is inferred that

marten are included in the medium-sized mammal category. Also see comments and responses in the Climate and Air section of this appendix.

Comment: The Draft EIS fails to adequately assess impacts to endemic mammals and the proposed plan fails to ensure viability of these species. The Draft EIS does not address impacts of the proposed plan on endemic mammals. It also fails to list specific islands or groups of islands with endemic fauna or recognize that a different management scheme may be warranted for such areas. Despite concerns about the inadequacy of the conservation strategy to protect endemic species expressed at the recent 2006 Conservation Strategy Review Workshop the Draft EIS fails to recognize these concerns.

Response: Additional information, much of which was presented at the 2006 Tongass Conservation Strategy Review workshop, has been added to the Final EIS text, including the opinion of some scientists that an island-centered management plan would be appropriate for the Tongass. Effects of the proposed plan on endemic mammals are discussed in the *Wildlife* section; additional discussion related to the ability of the conservation strategy to support viable endemic mammal populations is included in Appendix D.

Comment: Several comments were received regarding the project-level Forest Plan requirement for mammal surveys. Suggestions included requiring surveys for endemic mammals on all islands, not just those less than 50,000 acres; requiring surveys for all timber sales; requiring that surveys be conducted for rare and endemic birds, amphibians, and insects; and that the Final Proposed Forest Plan include considerations for adjusting timber harvest on islands as more information is gained on the habitat associations and population status of endemic species. Suggestions were also given for the intensity of surveys.

Related comments suggested that standards and guidelines basing the need for endemic mammal surveys on whether there is a "high likelihood" of the presence of an endemic mammal is too low a standard, given the lack of knowledge about endemics on the Forest.

Response: Surveys are required on all islands smaller than 50,000 acres and on islands larger than 50,000 acres if there is a high likelihood that endemic taxa are present and a high likelihood that these species would be affected by the proposed project (Wildlife Standards and Guidelines). Survey intensity will be decided on a project by project basis, depending on the size and type of project and level of anticipated disturbance, and information gained from these surveys (as well as from ongoing research) will be used to minimize the effects of forest management activities on endemic species. In addition, site-specific NEPA analysis generally consider the effects of the project on a wide range of wildlife species. Biologists use a combination of existing information, surveys and habitat assessment to determine effects. While having survey information is valuable, biologists generally assess the effects to species habitat if the species is suspected to be present, whether or not actual presence is verified.

The OGR system in the conservation strategy fundamentally is a 'coarse filter' approach to addressing wildlife viability and the conservation of biodiversity. In addition, a variety of other coarse filter standards and guidelines provided connectivity between the reserves. At the "fine filter" level, species-specific standards were fully considered in light of additional information such as conservation assessments, panel assessment results, etc. and appropriate standards and guidelines were incorporated for species that needed additional protection measures to assure their viability and well-distributed status.

The Wildlife Standards and Guidelines direct the Forest to conduct surveys when existing information on the distribution of endemic mammals is inadequate to assess project-level effects. It states that surveys should be conducted if there is a "high likelihood" that an endemic mammal could be affected by the proposed project, not if there is a high likelihood of its presence. Thus a proposed timber harvest in an area with little or no information on endemic mammals would require surveys.

As new information on endemics or other species is obtained, changes to the amended Forest Plan can be considered through the periodic Forest Plan review process, which occurs every 5 years, or at any time through an amendment.

Comment: Some respondents suggested that removing islands less than 1,000 acres from the timber base (to eliminate risk associated habitat loss or alteration) was sufficient to ensure viability of the 14 endemic mammals considered by the risk assessment panel and that other protective measures were unnecessary and costly, resulting in road construction and development in areas that would otherwise be untouched.

Response: Since 1997 a wealth of new information has been gained regarding endemic mammals on the Tongass which, in addition to expanding the knowledge base, has highlighted the substantial uncertainties that exist related to the population status and distribution of many species. Recent studies have also identified species in addition to the 14 species considered by the risk assessment panel and indicated that within Southeast Alaska the Prince of Wales Island complex is an endemism hot spot. Protective measures for endemic mammals include conducting surveys in areas where knowledge about the presence or distribution of endemic species is lacking and where projects could affect endemic species. Given the uncertainties that exist and the prevalence of endemism, these protective measures are appropriate for minimizing effects to endemic species. Moreover, conducting project-specific surveys for endemic mammals has no relation to the expansion of road construction and development in undeveloped areas.

Comment: Given that the insular landscape of the Alexander Archipelago has produced highly endemic populations, and is considered a hotspot for lineage diversity. The 2006 Conservation Strategy Review indicated that endemism was a "top priority" for the Tongass and that the Conservation Strategy fails to adequately address endemism on the Tongass. A new conservation paradigm should be developed for the Tongass under which each island is considered a unique biological unit until a better understanding of connectivity among these divergent populations is developed. Similar comments related to the lack of alternative conservation strategies considered in the Draft EIS.

Response: The general structure of the conservation strategy includes a system of OGRs and species-specific standards and guidelines that apply to matrix lands. Furthermore, the development of this strategy for the 1997 plan did take into account endemic species. Given that there are many uncertainties related to the effectiveness of the conservation strategy, each element of the conservation strategy requires consistent implementation across all islands. However, during project implementation, characteristics of individual islands are taken into account. All islands less than 1,000 acres are also fully protected. In addition, in a review of the conservation strategy, which has been incorporated into the Final EIS, Haufler (2007) indicated that a complete revision of the conservation strategy is not needed. Increasing our knowledge of endemic mammals continues to be a high priority for information needs on the Tongass (Appendix B of the Final Proposed Forest Plan) and as new information on endemics or other species is obtained, changes to the amended Forest Plan can be considered through the review process. See also related comments and responses above.

Comment: The location and status of endemic species is absent from the Draft EIS. The Forest Service is not incorporating scientific information on sensitive species into its management plans and not trying to locate this information. Arthropods, birds, and plants have not been surveyed as thoroughly as mammals, though there is a high likelihood that endemic forms will be found across these groups. Surveys should be required for non-mammalian rare and endemic species.

Response: Knowledge related to endemism on the Tongass (i.e., number of endemic species, distributions, and population status) is constantly expanding and being refined. The Final EIS addresses this by referencing some of the most recent peer-reviewed publications on this topic, but focusing the

discussion of endemics on larger, Forest-level issues including landscape connectivity and fragmentation which relate to all endemics. We agree with the statement that survey efforts and existing scientific information are skewed toward endemic mammals but that there are likely many more non-mammalian endemic species on the Tongass. See also related comments and responses above.

Comment: The second definition for endemic in the Proposed Forest Plan glossary ("low occurrence of individual trees blowing over in a particular location") should be removed as this definition does not appear anywhere in the Proposed Forest Plan or Draft EIS.

Response: This term is used in the EIS. The definition in the glossary has been modified to better explain how it is used in the text.

Comment: The process for designating a subspecies is subjective and imprecise, and there are no quantitative criteria on which to base such designations. Therefore, it is inappropriate to uncritically accept designations such as the Queen Charlotte Goshawk and the Alexander Archipelago Wolf, which figure prominently in the Proposed Forest Plan.

Response: The Forest Service does not have legal authority to make determinations about the taxonomic status of a species. Subspecies addressed by forest planning documents are those currently recognized by the U.S. Fish and Wildlife Service.

Comment: The "Island Theory of Biodiversity" does not fit well with the Tongass. We have islands of development in a sea of old-growth. The short reaches of water between islands have proven not to be a barrier. Animals swim from island to island quite easily, which is why even very small islands have a diversity of wildlife. Differing areas traditionally have more or less of a particular species regardless of logging.

Response: It is true that some larger, more mobile species do swim between islands; however there are many smaller, less mobile species that are not capable of swimming and thus do not interact with subpopulations on other islands. It is likely that these less mobile animals populated the islands during periods when low sea levels created land connections.

Comment: Due to levels of past timber harvest, every timber sale on Prince of Wales Island should go through a rigorous scientifically designed inventory to assess impacts on endemic plants, birds, amphibians, and mammals.

Response: Endemic species were considered in the conservation strategy and some standards and guidelines, including Legacy, also take them into account. As noted in the *Wildlife* section of the Final EIS, there are likely many endemic non-mammalian species on the Tongass. However, current Forest Plan standards and guidelines focus on endemic mammals. Under the Forest Plan, surveys will be required for timber harvests on larger islands where there is a high likelihood that endemic taxa are present and a high likelihood that they would be affected by the proposed project. The extent and rigor of surveys will be commensurate with the degree of existing and proposed forest fragmentation, and potential risk to endemic mammals that may be present. See also related comments and responses above.

Birds—General

Comment: The selection of bald eagle nest sites in proximity to the shoreline makes it unlikely that a reduction in the beach buffer under Alternative 7 would result in risk to bald eagle

populations. Given the federal regulation for a 330-foot zone around bald eagle nests, a 330-foot beach buffer should be more than adequate.

Response: There is no statement in the analysis of effects to bald eagles that a reduction in the beach fringe under Alternative 7 would result in risk to the bald eagle population but rather it would reduce protection of nests located beyond 500 feet of shoreline to the 330-foot buffer surrounding them. Thus nesting habitat beyond 500 feet of the shoreline and outside of the nest buffers could be removed by timber harvest or road building. As stated in the Draft EIS, recent research indicates that nesting activity is reduced within 948 feet (300 m) of clearcuts, indicating that the 330-foot buffer may be inadequate to mitigate effects of harvest (Gende et al. 1998).

Comment: The local distribution of breeding birds may change but it is unlikely that any species will be at risk of major population declines. Timber harvest may create suitable habitat conditions for a number of species.

Response: It is true that timber harvest may adversely affect some species while benefiting others. A statement regarding the potential benefits of timber harvest to some bird species has been added to the Final EIS.

Comment: Surveys for raptors in proposed management areas should include forest owls, specifically western screech owls, barred owls, and northern saw-whet owls.

Response: The Wildlife standard and guideline for Heron and Raptor Nest Protection in the Final Proposed Forest Plan specifies that surveys required for raptor nesting habitat include the habitat of hawks and owls.

Comment: Classical fragmentation and effects of habitat loss (I.e., nest parasitism, loss of species, increased predation) are unlikely to be realized on the Tongass National Forest given the amount of remaining old-growth habitat, the rapid reestablishment of young forest on harvested sites, and the fact that some studies in western forests have not documented the same fragmentation/edge effects found in eastern forests.

Response: While studies of bird community response to timber harvest alternatives to clearcutting in Southeast Alaska indicate that creation of forest edge may increase nest predation rates, it is true that the actual response depends on a broad array of factors and is highly variable. This has been clarified in the Final EIS text.

Comment: Resident and migratory landbirds have been neglected in the planning process. Monitoring and habitat management considerations of cavity-nesters, other forest-associated species, and other species identified by state and national conservation plans as vulnerable (i.e., the olive sided flycatcher) should be incorporated into the Final Proposed Forest Plan.

Response: Maintenance of the biodiversity of all species was considered in the development of the conservation strategy. The Forest Service cooperates in the Alaska Landbird Monitoring System (ALMS) and other bird monitoring programs. Additional information needs by program area, including wildlife, will continue to be evaluated and prioritized using the framework described in Appendix B of the Final Proposed Forest Plan.

Marbled Murrelet

Comment: Respondents expressed opposing views on the status of marbled murrelet populations in Southeast Alaska. Some respondents were under the impression that the population was stable and did not appear to be in trouble, suggesting that the species was unlikely to be affected by levels of timber harvest proposed under the alternatives. Others cited the recent USGS status review (Piatt et al. 2007) which indicates that the population has declined substantially, as has suitable habitat. These respondents requested that this status review be referenced in the Final EIS and that additional species-specific standards and guidelines be added to the Final Proposed Forest Plan. One respondent commented that the analysis should consider effects of timber harvest on marbled murrelet habitat and should quantitatively evaluate how much marbled murrelet habitat is protected by OGRs and the effectiveness of this protection.

Response: Information on marbled murrelet ecology and status in Southeast Alaska published in 2007 has been added to the text. Effects of timber harvest on old-growth habitat are discussed under the marbled murrelet subsection of the wildlife analysis and tables indicating the distribution and protected status of this habitat are provided in the *Biodiversity* section.

Comment: Uneven-aged management should be specifically defined in relation to its use as mitigation for loss of marbled murrelet habitat and information on gap sizes and interspersion of individual trees or patches in cutting units should be provided to judge the effectiveness of this prescription.

Response: The definition and application of uneven-aged management is provided in the *Timber* section of the Final EIS. As noted in the *Timber* section, there is a lack of scientifically documented information on uneven-aged harvest in Southeast Alaska from which to document the effectiveness of this prescription. This has been the subject of retrospective study and is outside the scope of the Final EIS analysis. In terms of marbled murrelet habitat, uneven-aged management by definition reduces the loss of suitable habitat by maintaining mature forest within harvested units.

Comment: Providing 600-foot buffer zones around marbled murrelet nests provides no effective benefit because nests are difficult to detect. Respondents suggested eliminating this S&G and reinitiating marbled murrelet at-sea surveys. Other respondents voiced support for project-level surveys.

Response: A statement about the difficulty of detecting marbled murrelet nests has been added to the text. Given the current legal status of the marbled murrelet, it is unlikely that either at-sea or forest-wide nest surveys would be reinitiated or required. However, the Forest Service recognizes that declines in the population and available nesting habitat in Southeast Alaska have been documented. Information from the recent USGS status review (Piatt et al. 2007) has been added to the Final EIS text. The occurrence of marbled murrelets is assessed at the project level and surveys within suitable habitat could be conducted concurrently with other studies.

Comment: It is unclear what Forest Service supported marbled murrelet research is ongoing as stated in Appendix B.

Response: Appendix B of the Final Proposed Forest Plan has been modified to reflect the overall information needs program and acknowledges the many efforts to gain such information that is ongoing by state and federal agencies, academia, and many others. Specifics to marbled murrelet are not included in Appendix B now, but left to the appropriate entities that continue to study the species. Appendix B includes a greater intent to share and coordinate between those entities so all can benefit more readily when such information is available, as well as explore opportunities to share in the investments for new information.

Comment: For marbled murrelets, maintaining old-growth habitat for nesting is essential to the persistence of the species. When fully implemented the Tongass conservation strategy should provide adequate nesting habitat, therefore the old-growth reserve network should be maintained in the Final Proposed Forest Plan.

Response: The 1997 marbled murrelet panel assessment determined that the conservation strategy, including the old-growth reserve system, would have a high likelihood of maintaining well-distributed, viable populations in Southeast Alaska.

Comment: There is no science to support the conclusion that Alternative 7 would harm the viability of marbled murrelets.

Response: Additional information has been added to the *Wildlife* section of the Final EIS and Appendix D has been added which summarizes the 1997 marbled murrelet panel assessment.

Comment: The Draft EIS does not explicitly evaluate the cumulative effects of the alternatives on the long-term sustainability of marbled murrelets in Southeast Alaska.

Response: The effects analysis for marbled murrelets draws on the findings of the 1997 expert panel assessment. It is important to note that the conclusions drawn by the panel took into account the level of past and likely future harvest on non-NFS lands. Likelihood scores, which are described in more detail in Appendix D of the Final EIS, recognized this cumulative harvest. Therefore, the viability ratings represent a cumulative effects prediction for each alternative. The Biodiversity section quantifies the amounts of total POG, POG in reserves, POG in matrix, high-volume POG, large-tree POG, and other categories of POG at present and in the future under the alternatives.

Goshawk

Comment: Several respondents expressed concern that the existing and proposed Goshawk Nest Standards and Guidelines do not provide adequate protection. Reasons cited were that only a small number of nests have been found; proposed standards and guidelines potentially allow all the trees around a nest site be cut as long as there are 300 acres old-growth within a 0.75 mile radius (Threatened and Endangered Species II.K.1.e); and that a minimum no-harvest buffer of 500 acres surrounding active and alternate nests is needed to protect active goshawk nests from disturbance, preserve most alternate goshawk nests, and provide suitable goshawk post-fledging areas. Some respondents also requested that the Final Proposed Forest Plan retain the requirement for pre-project surveys using current protocols developed in cooperation with other agencies and that the Forest Service adopt an inventory and monitoring program for goshawk nests consistent with the guidance found in its recent publication on the topic (Woodbridge and Hargis 2006).

Response: Existing standards and guidelines require that a 100-acre no-harvest buffer be maintained around confirmed and probable active goshawk nest sites. The allowance for harvest in the future applies only to probable nest sites, not documented nest sites, and only if there is no evidence of occupancy in the future after two years. Though there is some risk that an occasional inactive nests may be affected by timber harvest, a majority of goshawk nests on the Tongass are protected by virtue of the fact that OGRs, beach and stream buffers and other standards and guidelines, and additional acreage removed from the timber base due to economic reasons protect over 90 percent of the existing POG over the life of the Forest under Alternatives 1, 2, 3, and 6. Additionally, on a forest stand level, most goshawk nests that have been found on the Tongass within timber sale project areas were included within the boundaries of small OGRs when districts were doing project level adjustments. This resulted in larger protection for most goshawk nests than just the nest stand. In regards to nest surveys, the Tongass will continue to do goshawk surveys for timber sale planning prior to NEPA decisions. Actual protocols will

consider current research on goshawk inventory and monitoring, including Woodbridge and Hargis (2006). This requirement was mistakenly deleted from the Proposed Forest Plan, but has been added to the Final Proposed Forest Plan. Appendix D of the Final EIS provides additional discussion of the rationale behind the proposed changes to the Goshawk Standards and Guidelines.

Increasing nest buffers to greater than 100 acres was considered by USFWS in their November 2007 finding (Federal Register vol 72, no. 216 page 63123). While they acknowledge that larger buffers would likely enhance goshawk conservation by providing better habitat for fledglings in the immediate vicinity of the nest, they conclude that lack of larger buffers is not expected to reduce fecundity or survival to an unsustainable level because of the amount of nesting habitat that is retained in OGRs in non-development LUDs and other retained forest patches retained in the matrix. We concur with this and therefore, did not consider an increase in nest buffers.

Comment: Several respondents requested the inclusion of recent peer-reviewed literature on goshawk habitat requirements needs to be expanded to include annual and final Southeast Alaska specific reports produced by ADF&G (e.g., Flatten 2001), diet studies published by Lewis and colleagues (2006), and other published studies from the Pacific Northwest. Some respondents also requested the clarification that goshawks inhabit *western* forests rather than all forests in North America, and that the statement that the Queen Charlotte goshawk is a distinct subspecies be attributed to a primary reference rather than the 1996 status review (Iverson et al. 1996).

Response: Additional scientific information on goshawks, including that listed above, has been added to the Final EIS.

Comment: The Forest Service should consider using habitat associations of key goshawk prey species as a tool for sustaining goshawks on the Tongass.

Response: This comment stems from a consideration suggested during the 2006 Conservation Strategy Review Workshop. We believe that the conservation strategy coupled with application of site-specific nesting habitat standards and guidelines in the Proposed Forest Plan provide adequate protection to maintain sustainable goshawk populations. We have however, added the prey habitat relationship topic to Appendix B of the Final Proposed Forest Plan as one of the higher priority information need categories.

Comment: Several comments were received regarding the association of goshawks with old-growth forests. Some respondents felt that the statement in the Draft EIS regarding goshawks nesting in forest types other than old-growth (Draft EIS p 3-161 to 3-162) incorrectly implied that goshawk telemetry data from Southeast Alaska has produced similar results to those observed in the Southwestern United States which showed use of a greater range of forest types for nesting, clarifying that telemetry data from the Tongass still suggests a strong selection for old-growth. In contrast, other respondents felt that the relationship between goshawks and old-growth forest was overemphasized, given new research, citing a study (Flatten et al. 2001) on the east side of Douglas Island, which had been clearcut in the early 1900s.

Response: As noted in the *Wildlife* section of the Draft EIS, recent research indicated that goshawks use a greater variety of habitats than once thought and that there is some documented use of second-growth by nesting goshawks, though most goshawks in Southeast Alaska are associated with older forests. Goshawks can nest successfully in relatively young stands if adequate-sized trees are available to support a nest; however a majority of the second-growth on the Tongass is less than 50 years old and lacks these conditions. Flatten et al. (2001) documented higher nesting activity in the contiguous second-growth forests of northern Southeast Alaska (Douglas Island) compared to the more fragmented forests of southern Southeast, which they attributed to the fact that as second-growth stands mature they increase in contiguousness and thus in forest-dwelling prey and suitable hunting habitat. The authors noted that this trend may also reflect the lack of prey (squirrels and blue grouse) in southern Southeast

Alaska, though they emphasized that region-wide there is a lack of prey associated with open habitat, rendering fragmented forests less productive for goshawks.

Comment: The Draft EIS fails to discuss the scientific opposition to the current 100-year harvest rotation in relation to its effects on goshawks and is therefore in violation of NEPA. The Goshawk Conservation Assessment prepared for the 1997 EIS recognized a rotation of 300 years as adequate for regaining old-growth forest characteristics in harvest units; a 300-year rotation was also recommended by the Department of the Interior and by the 2002 Supplemental Wilderness Review.

Response: In the Goshawk Conservation Assessment, Iverson et al. (1996) differentiated two types of rotations: a 300-year "ecological" rotation applied to all old-growth as a means to express age class distribution over time, and a silvicultural rotation applied to suitable acres scheduled for timber harvest. Iverson et al. (1996) concluded that landscapes that maintained a forest age structure consistent with a 300-year ecological rotation would provide a high likelihood of sustaining goshawks. This composition would generally consist of one-third each of 0- to 100-year old stands, 100- to 200-year old stands, and 200-year old or older stands, categories with increasing value to goshawks, which can be accomplished by implementing a shorter harvest rotation. Notice that this is on a landscape scale like at the VCU scale or larger. Text has been added to the Final EIS to clarify this.

Marten

Comment: **The statement in the Draft EIS about the lack of clear correlation between marten population trends and habitat alteration is related to the lack of effort to study this dynamic or lack of data (i.e., no long-term datasets), rather than there being no relationship. Some respondents requested that marten harvest on Kuiu Island be separated out from the rest of harvest in GMU 3 for clarification because of low marten numbers on that island. The lack of information regarding the distribution of the endemic *M. caurina* marten subspecies on the Tongass needs to be emphasized in the EIS, particularly the fact that many unsampled islands could support endemic marten populations, and made a high priority issue. The EIS should devote larger attention to fragmentation of marten habitat.**

Response: These points have been clarified in the text in the Final EIS. Information on marten harvest on Kuiu Island has been added to the Final EIS text. A statement about the status of information on the distribution of endemic marten has been added to the Final EIS text. Additional discussion of fragmentation has been added to the marten subsection of the Final EIS.

Comment: Available data suggest old forest is important for marten, but they will also use other habitats including younger forest provided that structural features such as large downed logs are present. Plan alternatives with the highest level of timber harvest retain 76 percent of productive old-growth suggesting suitable marten habitat will continue to exist across the Tongass. A more apparent contribution to population levels is fur trapping which confounds interpretation of habitat need and which should be amenable to regulatory controls.

Response: We agree with the statements regarding marten use of younger forests and that plan alternatives will retain a substantial amount of marten habitat, as stated in the Draft EIS. It is true that trapping is one of many factors that affect marten population levels.

Comment: There is no science that suggests that marten require legacy trees.

Response: Additional information related to marten use of legacy structure has been added to the Final EIS text and in Appendix D.

Comment: Some respondents were concerned that the Draft EIS relied on the marten model to predict marten habitat capability due to various inadequacies.

Response: The marten habitat capability model was not specifically used in the Draft or Final EIS; however, the acreage of high-volume POG below 1,500 feet elevation was used as one measure of habitat.

Comment: Marten viability is only guaranteed by large, unfragmented areas of high volume old-growth that is not accessible to legal or illegal trapping. Rather than disclose or analyze this, the Draft EIS relies on the Proposed Forest Plan to adequately protect this species. The Draft EIS fails to analyze how various alternatives will affect marten survival across the landscape and particularly within islands such as Kuiu where concerns for this species have been documented by the scientific community.

Response: As stated in the Draft EIS, marten are wide ranging and require large tracts of contiguous habitat to move across the landscape. Further, the Draft EIS notes that although marten populations appear to be sensitive to habitat alteration, there is no clear correlation between population trends and habitat change. This is due to the lack of research on this dynamic and the absence of long-term population datasets, in addition to the many unknowns related to marten distributions on the Tongass. Therefore the effects analysis focuses on habitat alternation.

Maintaining viability and well distributed population of marten is dependent on many factors, including habitat, prey abundance and trapping mortality. Assuring viable marten populations through trapping regulations involves cooperation with the State and the Federal Subsistence Board. While the Forest Service has a role in setting harvest regulations through the Federal Subsistence Board, the Forest Service, by itself, cannot set or manipulate wildlife harvest levels.

Comment: Some respondents expressed concern over the Kuiu Island population of endemic marten because there are two approved timber sales (Crane Rowan and Threemile) and one planned timber sale (Kuiu Timber Project) proposed on a proportion of the island where this species is known to occur.

Response: The Final EIS discloses effects to marten and the likelihood of maintaining viable and well-distributed populations, based in a large part on the amount of land within the suitable timber base. Timber sales fall within the suitable land and therefore, viability concerns have already been addressed at the Forest Plan scale. The NEPA analysis for these timber sales considered site-specific issues, including marten habitat, documented in their EISs, and included mitigation to protect marten (i.e., Marten Standards and Guidelines). Individual timber sales are not the appropriate scale to address issues related to viability on a wide-ranging species such as marten.

Comment: Several comments were received regarding guidelines marten and road closures. One respondent felt that Marten standard and guideline XVIII. A.1.3 requiring road closures where roads are a significant factor in unsustainable mortality is important. In contrast, another respondent commented that it is unnecessary to perform specific road closures in areas of identified marten mortality due to trapping because ADF&G is capable of implementing appropriate enforceable regulations restricting trapping.

Response: The Final Proposed Forest Plan clarifies open and closed road density analysis requirements for consistency in helping to determine road influences on marten mortality that can be incorporated into Travel Management planning with the objective of reducing mortality risk using local knowledge of habitat conditions, spatial location of roads, and other factors rather than solely relying upon road densities. This analysis would be a collaborative effort between the Forest Service and ADF&G to assess the relationship between hunter/trapper marten harvest and human access. Note also that the

open road density restrictions do not need to be applied without consideration of marten trapping harvest levels. Several thousand marten are trapped on a sustainable basis each year in Southeast Alaska.

Wolf

Comment: Some comments stated that the Draft EIS failed to consider the effects of climate change and other stochastic events on wolves and the predator-prey dynamic of wolves and deer. Wolves are depended on deer and the EIS needs to consider how declines in deer populations due to climate change will affect wolves.

Response: The exact effect of climate change on deer and wolves is uncertain; however, most researchers expect warmers winters. Current science supports that severe winters are the greatest threat to deer populations, as some comments state. Juday et al, (1998) predict that it is likely that there will be warmer winters and low snowfall in low elevation forests and this will lead to higher deer populations, which would increase prey for wolves. Conversely, Juday et al. also predict increased large-scale blow down from the increased in storm activity, though, as the Final EIS notes, this has not occurred even though the number of days with gale-force winds has doubled since 1950. Models cannot accurately predict whether snowfall will increase or decrease or whether blow down will increase or decrease in low-elevations; therefore, they cannot predict the effect on deer and wolves. This is why monitoring the effects of climate change on wildlife habitat was incorporated into Chapter 6 of the Proposed Forest Plan. One strategy the Forest is strongly considering is thinning dense young-growth stands in low-elevation areas, such as the beach fringe, to increase forage and to speed the development of mature forest structure. This may improve low-elevation winter habitat for deer, and therefore for wolves.

Comment: Some respondents questioned the statement in paragraph 2 on 3-170 of the Draft EIS that no clear link had been established between wolf population numbers and changes in habitat characteristics.

Response: This paragraph is referring to a direct link between project level habitat changes caused by forest management activities (e.g., timber harvest) and wolf population change on the Tongass. As noted, datasets available for monitoring wolves are insufficient for detecting all but very large changes in the wolf population and are not designed to track trends in the population resulting from changes in their habitat due to Forest Service actions. The Final EIS states that deer are the primary prey of wolves in Southeast Alaska, and the significance of predator/prey interactions indicates that wolf persistence is directly linked to deer habitat capability. That said, data on deer population trends across the Forest are also inadequate (i.e., consisting of limited pellet count data in heavily hunted GMUs) to enable a direct comparison between habitat changes associated with forest management activities and the Tongass deer population.

Comment: Respondents pointed out that a substantial decline in deer population could result in gaps in wolf distribution, particularly on islands, but a more likely outcome would be that wolf population density would be reduced as pack home range size increases. They also suggested that if deer numbers decline substantially wolves may experience increased harvest pressure from subsistence users in an effort to protect deer, which could ultimately further reduce wolf genetic diversity.

Response: Information on the potential response of the wolf population to changes in the deer population has been added to the Final EIS. This is speculative at best. If decreases in prey reduced wolf populations, density of wolves would also be reduced, decreasing opportunities to harvest wolves, despite potentially increasing pressure to harvest wolves. If over harvest of wolves were to become a concern, harvest regulations and closure of specific areas are tools the State and Federal Subsistence Board may use to limit that harvest.

Comment: Density-dependent population change in relation to habitat carrying capacity and the non-linear relationship between predation, carrying capacity, and deer population numbers should be discussed in relation to deer and wolves. Information from Person (2001) and Person and Bowyer (1997) regarding wolf population viability and the effects of the 1997 Forest Plan alternatives on the wolf population should be included in the Final EIS. New information presented at the Conservation Strategy Review regarding the ratio of recruitment to mortality in an unmanaged landscape should be included; respondents suggest using this ratio to compare OGRs in terms of their ability to support sources wolf populations.

Response: Additional discussion of density-dependence, predator suppression of declining deer populations, and other related information has been added to the Final EIS.

Comment: Several respondents noted that some of the new information presented at the 2006 Conservation Strategy Review workshop has not been incorporated into Wolf Standards and Guidelines. This includes information presented during the 2006 Conservation Strategy Review indicated that the den buffer standard and guideline needs revision.

Response: The Conservation Strategy Review workshop represents one step in the Forest Plan review process, with the purpose of identifying considerations to be addressed in the overall review of the Conservation Strategy. Subsequent steps will include an assessment of each consideration identified during the work shop based on workshop information, peer-reviewed scientific literature, the recent *Review of Conservation Science Produced Since 1997 and Its Relationship to the Tongass National Forest Land and Resources Management Plan* (Haufler 2006), as well as input from various state and federal agencies. These assessments will culminate in a determination of how each consideration will dealt with. Some considerations have been addressed in time for incorporation in the Final EIS however others, like the Wolf Standards and Guidelines, require additional interagency consultation, the formation of specialized workgroups, and more detailed development, and therefore will be implemented after the Final EIS. These long term considerations could lead to conservation strategy-related adjustments to the amended Forest Plan through additional amendments or may be identified as information needs.

Comment: The 2007 Proposed Forest Plan standards and guidelines for wolves specify an optimal deer density of 17 deer per square mile. This is incorrect and should be 18 deer per square mile, consistent with the Draft EIS and the science underlying the standard and guideline, however should not be confused with the 13 deer per square mile specified in the 1997 Forest Plan. The respondents note that there has been much confusion with these numbers, clarifying that the latter number represents population density, based on Person (1996), whereas the other numbers represent a habitat capability (18 deer per square mile being the accepted, correct number). The respondents request that the Final Proposed Forest Plan include specific guidance for computing the habitat capability deer density (using the deer multiplier to convert deer winter habitat capability models into deer densities) and clearly differentiate between the recommended actual deer density and habitat capability.

Response: The Forest Service primarily manages habitat and assesses effects to deer and wolves based on habitat capability rather than actual population numbers. The deer habitat capability density specified in the Wolf Standards and Guidelines has been corrected in the Final Proposed Forest Plan. Guidance for using the deer model is too detailed for inclusion in the Forest Plan, and may change as newer models are developed. Using the deer model is only one method of assessing effects to wolves and deer. The Final Proposed Forest Plan directs use of variety of methods, including the deer model, in assessing effects. This includes local knowledge of habitat conditions, spatial location of habitat, and other factors that need to be considered by the biologist rather than solely relying upon model outputs. In addition, the Plan allows for alternative tools to be developed as new information on assessing habitat for deer and wolves evolves.

Comment: The deer analysis is inadequate in that it does not quantitatively evaluate the risks under each of the alternatives associated with providing an adequate supply of deer for wolves and hunters and does show whether the alternatives meet the standard and guideline for maintaining a threshold habitat capability of 18 deer per square mile (as determined by the deer habitat capability model).

Response: Using a habitat capability of 18 deer/square mile is not a threshold. It is only one of several tools that can be used at the project scale to assess if sufficient deer habitat capability exists to maintain sustainable wolf populations. Other tools include local knowledge of habitat conditions and spatial location of habitat.. Other factors need to be considered by the biologist rather than solely relying upon model outputs. Habitat capability is also a tool to determine effects of a project on, human deer harvest demands. An analysis of the ability of the alternatives to meet the Wolf standard and guideline deer habitat capability has been added to the Final EIS text.

Comment: The Wolf standard and guideline for road density was based on the analyses described in Person et al. (1996) but has never been implemented in a manner consistent with Person et al. (1996). The 0.7 mile per square mile road density should account for all open, closed, and overgrown roads in areas below 370 meters elevation, not simply open roads. This is because it is hard to distinguish between open and closed roads (i.e., close roads may still be used by hikers and OHV users), and both may provide easier access for wolf hunting and trapping. Additionally, a majority of wolf activity occurs below 370 meters elevation (Person et al. 1996, 2001). The road density guideline should be applied at a scale equal to an average wolf pack home range (e.g., 300 km; Person et al. 1996). The incorrect use of this guideline has been brought up in interagency meetings since 1997, but has never been corrected in the Forest Plan. A respondent suggested that consideration should be given to peak road density.

In regards to the range or road densities, one respondent commented that an open road density requirement of 0.7 to 1.0 miles per square mile to reduce "human-caused mortality" of wolves is unnecessary because ADF&G is capable of applying and enforcing appropriate regulations to provide for abundant wolf populations. Conversely, another respondent felt that a less discretionary standard of 0.7 miles per square mile should be set.

Response: Specification of total road density for analysis purposes has been added to the Final Proposed Forest Plan to promote consistent interpretation and use. The misinterpretation of the guideline was described in the *Wildlife* section and, as stated, the analysis in the Final EIS accounts for lands below 1,200 feet in elevation, included both open and closed roads, evaluated road densities by WAA which are approximately equal in size to wolf pack home ranges in Southeast Alaska, and included all land ownerships. Because this EIS covers the entire Forest, all WAAs were included in the analysis. The wolf guideline of 0.7 miles per square mile road density is not a limit, but the lower end of a range of road densities (up to 1.0 miles per square mile) recommended if road access and associated human-caused mortality has been determined to be the significant contributing factor to unsustainable wolf mortality. Note that the 0.7 to 1.0 miles per square mile guideline does not need to be considered until that determination has been made and that consideration of wolf hunting and trapping harvest is also considered. In addition, local knowledge of habitat conditions, spatial location of roads, and other factors would also need to be considered by the biologist rather than solely relying upon road densities. As noted in the *Wildlife* section, the ADF&G currently enforces a harvest cap in GMU 2 to ensure that a viable wolf population is maintained, however there are other key components of wolf conservation, in addition to harvest regulations, including maintaining adequate deer habitat capability and minimally roaded core areas.

Comment: Transportation Standards and Guidelines need to implement the Wolf Standards and Guidelines for road density.

Response: Standards and guidelines in TRAN4.I.A requires the Forest Service to "perform route or site selection, location, geotechnical investigations, survey, and design to a technical level sufficient to meet

the intended use and commensurate with both ecological objectives and the investment to be incurred" and to "ensure consistency with Forest-wide Standards & Guidelines and Best Management Practices." This includes the Wolf Standards and Guidelines.

Comment: The discussion of habitat use by wolves needs to summarize Person (2001) otherwise it is outdated.

Response: Information from Person et al. (2001) has been added the Final EIS text.

Comment: Wolf numbers are limited by prey availability, not social interactions. The discussion in the affected environment section should refer to and summarize the appropriate sections in Mech et al. (1998) and Fuller et al. (2003). The density limit of 10 wolves per square mile stated in the Draft EIS is incorrect. For example, Isle Royale has had densities of wolves that substantially exceed that limit.

Response: Information from Mech et al. (1998) and Fuller et al. (2003) has been added to the Final EIS text. In regards to wolf density, the Draft EIS actually states that "Due to social interactions, wolf densities do not exceed certain levels even when prey abundance is high. A density of one adult wolf per 10 square miles is considered high, and this density is often considered as a saturation point beyond which wolf populations would not expand. Wolves have large home ranges (about 100 square miles per pack), use a wide variety of habitats, and are very mobile." This information came from the Alexander Archipelago wolf conservation assessment (Person et al. 1996) which presented wolf densities for 9 study areas in Minnesota, Ontario, Quebec, Vancouver Island, and Prince of Wales/Kosciusko islands. Wolf densities reported from these study areas ranged from 1 to 1.7 wolves per 10 square miles (8 study areas had densities of 1 wolf per 10 square miles or less).

Comment: Units 2 and 3 support modest wolf densities compared to other areas where wolves prey on deer rather than moose, caribou, bison, or other large prey. While wolf densities are high in Units 2 and 3 compared to other parts of Alaska (where deer are absent), they are not high when compared to other areas where deer are the principle prey (i.e., northern Minnesota, southeastern Ontario, and British Columbia). More information on this is available in Person et al. (1996, 2001). The wolf population in Unit 2 is currently healthy but that does not imply it will be in the future when more of the landscape is in stem-exclusion forest. Current populations are not indicators of the future. Reference should be made to the concept of "succession debt" described by Person (2001).

Response: Information from Person et al. (2001) has been added to the Final EIS text.

Comment: Prince of Wales Island wolves seem to be a distinct population segment. However, the Draft EIS fails to disclose what those profound implications are or take them into account in the impact analysis. Weckworth et al. (2005) should be reviewed and cited in the Final EIS.

Response: Information from Weckworth et al (2005) regarding the distinct wolf population on Prince of Wales Island has been added to the Final EIS.

Comment: Factors affecting the Alexander Archipelago wolf are primarily density of black-tailed deer and road access for wolf hunters/trappers. A strong inverse relationship between wolf home range size and critical deer winter range was found. Wolves are highly mobile and move between islands in Southeast Alaska, some being separated by up to 2.5 miles. Between 1993 and 2000, 85 percent of radio-collared wolf mortality was due to trapping, with equal amounts of legal and

illegal harvest. The presence of roads has a significant effect on wolf harvest. Historically, the ADF&G allowed year-round no-limit wolf harvest.

Response: Deer populations and road access were identified in the Draft EIS as important components in wolf conservation. The Draft EIS also discussed harvest regulations in GMUs 2 and 3. The Forest Service, by itself, does not have the authority to regulate wolf harvest.

Comment: The Draft EIS and Proposed Forest Plan fail to adequately protect this wolves from human disturbance. In fact the proposed plan would weaken the protections already in place. The plan does not trigger action until road density is determined to be the significant contributing factor to unsustained wolf mortality. This is a very discretionary standard. The trigger should be when road density is determined to contribute to unsustained wolf mortality. The plan also lacks teeth in its remedial action to protect wolves when the road densities are exceeded; it should trigger road closures and road building prohibitions.

Response: If and when open roads contribute to unsustainable mortality, actions to reduce that factor can and will be considered. This would be guided by the appropriate Forest Plan standards and guidelines including the wolf mortality guideline. The extent of actions taken will be in consultation with other agencies and the affected publics as well.

Deer

Comment: Assumptions of the Tongass deer habitat capability model need to be evaluated and updated and model results should be ground-truthed.

Response: The 1997 deer model habitat capability model represents the most current tool available for evaluating deer winter range conditions on the Tongass. The habitat types included in the model are broad and general, and they are not based on any particular site-specific data which would enable ground-truthing. Given the large differences in deer habitat value between many of these broad classes of habitat, the model provides a useful and reasonable estimate of deer habitat value for large-scale analyses. Despite limitations to the existing model, which are discussed in the *Wildlife* section of the EIS, the model provides a relative estimate of deer habitat value which is appropriate for comparing management alternatives. Modifications to the model, such as refining coefficients due to changes in vegetation mapping on the Tongass, are forthcoming but will occur outside of the timeframe for the Forest Plan Amendment. Scientific research published after the 1997 has increased knowledge about deer-habitat relations in Southeast Alaska, but does not contain anything that would change the 1997 expert-based model significantly. However, a nutritional-based model has recently been developed that could provide the basis for completely re-evaluating our analysis of deer habitat. However, since, it is an entirely data-driven system, and its data requirements cannot be met with existing Forest data it will take additional time to fully implement this new analysis. See Appendix B of the Final EIS for additional information on the deer model.

Comment: Clearcuts have been assigned high value by the deer model but during severe winters these habitats provide little value to deer.

Response: This comment is incorrect in that the 1997 deer model, which is currently the only model available for conducting large-scale analyses of deer habitat on the Tongass, assigns the highest values to forests with closed canopy (based on volume class rather than canopy cover), maritime influence, south facing slopes, and low average snow depth. Recent clearcuts are assigned moderate values. See Appendix B of the Final EIS for additional information on the deer model.

Comment: Some respondents expressed concern that the cumulative loss of deer habitat will result in catastrophic population crashes, reflecting lost winter habitat, that may have cascading effects to wolves and bears, and that deer will be extirpated from some islands or will fall into predator pits. Related comments suggested that restoration of deer winter range is needed.

Response: The deer model presents a worst-case scenario by assuming that all suitable acres are harvested under each alternative. However, the current level of road construction and timber harvest on the Tongass is at a 5-decade low and the life of this Amendment is expected to be 10 to 15 years at most, at which time a Plan Revision will likely be undertaken. In addition, there will be a period of preparation prior to the implementation of any sale during which no harvest will occur, even if the timber industry responds rapidly. The management of second-growth stands on the Tongass has helped offset the cumulative loss of winter range by accelerating the stem exclusion phase of forest development, which occurs roughly 15 to 25 years following a major disturbance when the growing space is fully occupied, tree crowns are crowded, and forage is limited. The creation of new foraging habitat is not reflected by the current deer habitat capability model.

The analysis of effects to deer winter range provided in the *Wildlife* section takes into account past timber harvest and therefore serves as an assessment of cumulative effects. This assessment is conservative in that it assumes that non-NFS lands provide no habitat capability. Currently there is no defined threshold for loss of winter range with which to predict the likelihood of a population crash. We can only speculate that losses could be amplified during severe winters; however, one expected result of the current warming trend is warmer winters. Management of young-growth was discussed in the *Wildlife* section of the Draft EIS as a potential way to improve the quality of deer winter range.

Comment: The second paragraph under Deer in the description of the affected environment for wildlife in the Draft EIS, fourth sentence should read: "the quantity, quality, distribution, and arrangement of winter habitat are considered the most important limiting factors for deer."

Response: This sentence has been corrected in the Final EIS text.

Comment: Several respondents questioned the use of the 1997 deer habitat capability model in relation to the application of the deer multiplier (i.e., high HSI scores, whether 1.3 or rescaled to 1.0, should correspond to a deer habitat capability density of 100 deer per square mile).

Response: A re-occurring appeal point against the interagency deer model is the proper use of the deer density multiplier. The Final EIS uses the currently approved version of the model. In the Draft EIS the deer model was employed only to compare alternatives based on HSI scores rather than population numbers in the deer and wolf effects analyses. However, to compare the alternatives in terms of their ability to meet the Wolf standard and guideline for deer habitat capability (expressed in terms of the number of deer per square mile), an analysis using the deer multiplier has been added to the Final EIS.

Comment: One comment stated that the deer habitat capability model is not a valid risk assessment tool because it does not provide probabilities of risk with which to compare alternatives.

Response: The term "risk assessment" has been removed from this sentence in the Final EIS.

Comment: The Draft EIS only mentions the FRESH-Deer model as an alternative to the deer habitat capability model, however this model can not be expanded from a stand-level to a landscape-level analysis.

Response: This statement is not correct. The FRESH-Deer model consists of two levels of application: a web-based, stand-level module; and a GIS-based, landscape-level module. For more information on model specifics please see the FRESH-Deer model home page located at http://cervid.uaa.alaska.edu/Home.aspx.

Comment: Respondents clarified that black bears were primary predators of newborn black-tailed deer fawns on Prince of Wales Island, rather than Heceta Island.

Response: This statement has been corrected in the Final EIS.

Comment: The analysis of effects to deer is insufficient in that the use of POG as an indicator is an overly broad classification, there is no means provided to assess the implications of percentage changes in habitat because there is no established threshold beyond which reductions in habitat capability are deemed unacceptable, and relative rather than direct comparisons among alternatives is made. This type of comparison does not facilitate meaningful analysis of impacts to wolves or subsistence due to changes in deer population numbers. The Draft EIS should include a comparison among the alternatives based on their ability to provide the required 18 deer/square mile density standard and guideline.

Response: The deer analysis does not use POG as a means for comparing alternatives with respect to deer, rather the tables in the discussion of effects to deer present percentage changes in deer habitat capability, as quantified by the deer model. As described in the affected environment section under deer, the deer habitat capability model takes into account the value of individual SD7 model POG categories to deer. The tables provided in the deer section displays the existing percentage of remaining deer habitat capability relative to 1954 levels, indicative of baseline pre-large-scale timber harvest conditions, and percentages projected under each alternative. This enables a relative comparison among the alternatives in terms of how each alternative will directly affect baseline deer habitat capability. Additional information on the deer model, including how these numbers are derived, is provided in Appendix B of the Final EIS. As noted by the respondents, currently there is no threshold reduction in habitat capability that has been identified by science and therefore the effects of reductions in deer habitat capability are appropriately discussed in general terms. An analysis of changes to deer habitat capability expressed in terms of a deer density has been added to the analysis of effects to wolves.

Comment: The Draft EIS evaluates reductions in deer habitat capability on Tongass National Forest lands only and disregards substantial past and future anticipated losses on other land ownerships in the region.

Response: The Draft EIS states that for the deer habitat capability analysis lands under non-federal ownership have an assumed habitat capability of zero because these lands have been, or will be, developed for intensive timber production and are expected to have lower habitat capability over time.

Comment: The definition and analysis of "high value deer winter range" are inaccurate because by defining quartiles by equal land area what is considered high value may differ by WAA.

Response: There is natural variation among WAAs in what is considered high-value winter range. For example, maritime and interior WAAs naturally show differences in habitat capability due to differences in winter severity (i.e., snow levels during average winters are typically different). Consequently, high quality habitat within the home range from a deer's perspective may differ depending on the location of that home range within a particular WAA. Thus, defining high value winter range as the quartile of acreage within a WAA with the highest HSI scores allows a more accurate, and conservative, portrayal of lost habitat capability, given that there are WAAs where there is no habitat that falls within the upper quartile of possible HSI scores (i.e., scores above 75 on a scale of 0 to 100) yet they are inhabited by deer.

Comment: Critical deer winter habitat, especially in areas relied on for hunting, should be protected and not slated for logging under the amended Forest Plan.

Response: Effects to deer winter range are discussed in the *Wildlife* section of the Final EIS. The 2006-2007 Interagency Forest-wide Small Old-growth Reserve review considered deer winter range as a factor when evaluating the placement and configuration of small OGRs. Though this effort eliminates the need to conduct project level reviews for the most part, additional reviews that take place on the project level will follow a standardized protocol, developed as part of this forest-wide effort. This includes using the Tongass deer winter habitat capability model to identify high value deer winter range that warrants protection.

Comment: Winter range should be more clearly defined as it applies to the deer habitat capability model to incorporate severe, rather than average, winters. The Draft EIS fails to evaluate the effects of severe winters on deer, particularly in areas where there are no wolves.

Response: The Forest Service feels that the Draft EIS adequately addresses the subject of severe winters by noting that effects of reductions in carrying capacity for deer would be greatest during severe winters when resources are most limited. Severe winters are stochastic events that are highly variable. Heavy snowfall may occur with increased or decreased frequency or magnitude as a result of global climate change, there are many uncertainties and differences of opinion related to these predictions. Information on these uncertainties has been added to the Final EIS. As the Climate and Air section of the Draft EIS states, models available for estimating climate change are designed to predict changes on a regional level and are not detailed enough to predict changes to the Tongass. Consequently, they do not agree on how global warming will affect Southeast Alaska. Thus, it is impossible to accurately predict the frequency or magnitude of severe winters, much less the effects of severe winters on deer under each of the management alternatives.

Comment: It should be noted that the forage production in recent clearcuts is of lower nutritional quality than the same forage types found in old-growth.

Response: This statement has been added to the Final EIS text.

Comment: Deer and bear are abundant on Native Corporation lands where silvicultural management of harvest units provides forage and cover for these species, compensating for lost habitat capability.

Response: We agree that young-growth management can potentially benefit wildlife; however, there are many uncertainties related to appropriate young-growth treatment designs, specific beneficial effects of such treatments, and implications for deer and other wildlife species. In addition, some studies have shown the opposite results. Additional discussion of uncertainties related to young-growth management has been added to the *Wildlife* section of the Final EIS text.

Comment: The likelihood of long-lasting declines in deer population under all alternatives appears to be low; the potential for stand treatments to improve forage conditions in young stands is high.

Response: We concur that the effects of the alternatives are unlikely to result in long-term population declines. A discussion of young-growth management was included in the *Timber* and *Wildlife* sections.

Comment: Several comments were received regarding timber harvest and road construction in specific areas. On respondent stated that targeting important deer areas like Tenakee Inlet will

have long-lasting impacts on deer populations and subsistence. Another respondent stated that timber harvest and road building in the Bostwick Inlet/Gravina Island area could jeopardize subsistence and hunting resources. Another respondent expressed concern over effects to eagles in the 11 Mile area.

Response: Any timber harvest planned for the Tenakee Inlet (or any other part of the Tongass) will require a site-specific environmental analysis which will consider effects on deer and subsistence resources.

Comment: Forest Service planning assumes a static average deer density needed to support hunter demand and proposes restricting federally ineligible hunters when habitat impacts from the Forest Plan result in a density below levels needed for local subsistence. This is a false trade-off because hunting and habitat loss due to clearcut logging affect deer populations in different ways; hunting tends to stabilize deer populations in areas with few predators whereas logging winter range is a destabilizing force. Restricting non-local hunting effort will not maintain deer for subsistence but will amplify deer population cycles ultimately reducing the number of deer available to subsistence hunters during population lows.

Response: The Forest Service does not assume static deer densities, but recognizes cycles. Hunting may need to be regulated in some areas if deer numbers decline and that could include restrictions to non-federally qualified hunters.

Comment: Some young-growth stands, particularly those located on hillsides where sunlight can reach the forest floor, and noncommercial forests provide forage for deer. Thus, the deer model is conservative.

Response: It is true that habitats other than productive old-growth provide habitat for deer. The conservative nature of the deer model analysis was noted in the *Wildlife* section of the Draft EIS.

Comment: The statement in the Draft EIS that the deer populations in GMU 2 are at moderate levels and expected to decline is incorrect because an article in the Ketchikan Daily News (2006) states that Prince of Wales deer populations are sky-rocketing.

Response: The statement in the Draft EIS refers to long-term population trends and is correct. The 2005 ADF&G harvest summary for deer in GMU 2 (Porter 2005) states “as clearcut logging continues to reduce old-growth habitat in GMU 2, deer populations are expected to decline.” This report also states that based on deer pellet-group counts, Unit 2 pellet-group densities represent low to moderate population levels relative to high pellet-group densities documented in Unit 4; they attributed this disparity to the presence of wolves in Unit 2 and their absence from Unit 4.

Comment: Every acre of high-quality old-growth cut greatly reduces the chance of survival of deer in hard winters. In areas that are clearcut deer are dying by the thousands and if the proposed alternative is implemented, that situation will only be made worse when we get another severe winter.

Response: The fact that effects to deer due to the loss of critical winter habitat would be of greatest concern during severe winters was noted in the Draft EIS. Individual timber sales will undergo appropriate environmental analysis and will address deer winter range at the project level.

Comment: The Proposed Forest Plan fails to adequately protect black-tailed deer; there is no definition of “critical winter range” and there is no means to ensure that an adequate number of

deer are maintained for wolves and subsistence use; standards and guidelines focus on assessing impacts to winter range as part of project-level analysis but do not require that an adequate amount of quality habitat be maintained. No mention of the Forest Service deer habitat capability model is made.

Response: The conservation strategy was designed to adequately maintain populations of wildlife, including deer. However, the Final EIS acknowledges that there may be impacts to deer in specific geographic areas due to timber harvest. The Proposed Forest Plan sets broad direction for project-level actions due to the variability in site-specific conditions. No definition is given for "critical" deer winter range because its identification will occur during project-level analysis and will involve local knowledge of habitat conditions, spatial locations of habitat, and other factors, in addition to outputs of the deer winter habitat capability model. Wolf standard and guideline XII.A.2 2 of the Final Proposed Forest Plan directs the Forest to provide for sufficient deer habitat capability to first maintain sustainable wolf populations and then to consider meeting estimated human deer harvest demands. It also requires use of the most recent deer habitat capability model along with field verification to estimate deer habitat capability in biogeographic provinces where there are wolves.

Comment: One comment noted that Southeast Alaska communities could face significant restriction to their deer hunting as a result of past and anticipated clearcutting and road building. The comment stated that the Forest should not log areas that provide corridors for deer and areas that are critically over-logged should be restored. They also note that thinning projects could provide valuable employment to residents in rural communities.

Response: Effects to subsistence and deer harvest in rural communities are discussed in the *Subregional Overview and Communities* section. Forest Plan Wildlife Habitat Planning (WILD1) standard and guideline VI directs the Forest to maintain landscape connectivity and standard and guideline VI.C requires the Forest to consider black-tailed deer habitat needs before or as part of project analysis. Forest Plan Wildlife Habitat Improvement Standards and Guidelines (WILD2) describe wildlife habitat improvement projects.

Comment: One comment noted that when Ketchikan Pulp was logging in the Thorne Bay area it was common to see deer with twins or triplets, probably due to good forage quality, but today, singles are more common. This, they conclude, suggests that timber harvest and deer exist well together. Another comment stated that more deer and more diverse wildlife habitat occurs forest edges and therefore timber harvest creates more wildlife habitat.

Response: There are numerous factors that can affect deer reproductive success, forage quantity and quality being one of them. Although timber harvest temporarily increases forage production in recently cut areas by increasing the amount of sunlight that reaches the forest floor, timber harvest also reduces other habitat elements that are important to deer, such as hiding cover and overstory cover for intercepting snow, and increases habitat fragmentation.

It is true that deer prefer to live on the forest edge adjacent to open habitat types where many resources (e.g., forage and cover) are available in proximity to each other. Though timber harvest does create more edge habitat, it also increases habitat fragmentation, resulting in remaining forested patches becoming smaller, more isolated, and less functional and therefore should always be considered in a landscape context. In addition, it is well known that old-growth forest provides important deer winter habitat.

Comment: The deer model is biased toward old-growth and over states the impact of timber harvest on deer habitat capability.

Response: The conservative nature of the deer model analysis is noted in the description of the affected environment under Deer in the *Wildlife* section of the Final EIS.

Comment: Important deer winter range should be displayed by development and non-development LUDs for each VCU to determine how much is fully protected under the reserve system and how much is partially protected in the matrix.

Response: Important deer winter range is identified by ground-truthing deer habitat capability model results and incorporating deer use levels, when available. This is required as part of the project planning process under the Forest Plan.

Comment: The standards and guidelines for deer, wolves, and subsistence are interrelated and all fail to define objectives in one or more of their sections; there is a lack of logic in how deer issues are distributed among the three broad standard and guideline topics. Some respondents felt that there needed to be a stated purpose or objective for protecting deer populations. Others commented that the focus was on assessing habitat rather than assuring an adequate amount or quality of habitat.

Response: It is true that deer, wolf, and subsistence issues are related, as discussed in the *Wildlife* section of the EIS. Standards and guidelines are included for species that were felt to be at risk or needed extra consideration at the project level. The extra consideration at the project level for deer that is provided under the Deer Habitat Standards and Guidelines is believed to be adequate.

Comment: Mitkof Island has some of the most restrictive deer seasons in all of Southeast Alaska due to the inability of the deer population to recover from several consecutive severe winters coupled with the effects of timber harvest, road construction, and habitat fragmentation.

Response: It is true that there are many factors at play in the status of Southeast Alaska deer populations and that the ADF&G takes these factors into account when setting harvest levels.

Comment: During severe winters, deer prefer southerly aspects below 500 feet elevation within 1,000 feet of the shoreline, medium- and high-volume stands, and forest edges; they avoid unforested and noncommercial habitats, predominantly north-facing gap phase old-growth and sheltered areas above 1,500 feet elevation. During summer and low-snow winters deer are habitat generalists and occupy a variety of habitats.

Response: Deer habitat relationships are described in the description of the affected environment of the *Wildlife* section of the Final EIS.

Comment: Past clearcutting, which has targeted high value deer winter habitat, has increased the likelihood of deer collapses during severe winters, and decreased the recovery potential when recoveries do happen. The occurrence of severe winters will remain a fact of life in Southeast Alaska in spite of climate change and this is beyond the control of the Forest Service. What is not beyond the control of the Forest Service is to limit the cutting of additional high quality deer habitat, and to not allow clearcutting where correct application of the deer model indicates that there is not sufficient habitat capacity to sustain sufficient deer numbers to provide for wolf needs and human consumption.

Response: As part of timber sale planning, Forest Plan standards and guidelines are applied to assure that sufficient deer habitat capability is maintained to provide for wolves and human consumption.

Elk

Comment: Although a radio-collared elk was located on Farm Island, at the mouth of the Stikine River, there is no evidence the elk have migrated up the river drainage.

Response: This statement has been corrected in the Final EIS text.

Brown Bear and Black Bear

Comment: Brown bears do not occur on all islands north of Frederick Sound.

Response: The description of the distribution of brown bears in the Final EIS has been modified to reflect this.

Comment: Some respondents requested clarification that hunting of brown bears is allowed throughout other parts of Southeast Alaska, outside of GMU 4, and a statement about outfitter uses of brown bears and available viewing areas.

Response: The statement about brown bear harvest has been clarified in the Final EIS. Outfitter and viewing uses have been noted in the text.

Comment: There is a lack of references provided for statements about the late-summer season being the most critical time for brown bears.

Response: Additional references for this information have been added to the Final EIS.

Comment: Black bears den in both harvested and unharvested forest stands. Because some dens on the Tongass have been documented in clearcuts it seems likely that black-bears prefer denning in clearcuts.

Response: It is true that black bears are habitat generalists and will use both early- (clearcuts and young growth) and late-seral (old-growth) forests. This was noted in the Draft EIS, though the focus of the analysis was road construction given that this species is sensitive to overhunting which can result from increased road access.

Comment: **One respondent commented that he would like to see commercial black-bear hunting on Prince of Wales Island abolished.**

Response: Sport hunting regulations are under the jurisdiction of ADF&G, and therefore not an issue that can be addressed by the Forest Plan Amendment process.

Comment: Several respondents cited information presented in Flynn (2007) regarding brown bear use of riparian areas along streams in two drainages, one intact and one heavily logged, requesting that it be incorporated into the Wildlife section of the Final EIS. They also requested that the recommendations provided by the authors for maintaining 500-foot no-cut buffers along all salmon streams in landscapes used by brown bears, and 1000-foot buffers along all streams (or complete watershed protection) in areas where bear management objectives are to maintain abundant healthy brown bear populations, be incorporated into the Final Proposed Forest Plan. Respondents noted that there are substantial risks to maintaining viable and well-distributed brown bear and black bear populations in some biogeographic provinces, particularly those where there is a low proportion of watershed-scale habitat protection, and that these areas may

warrant additional protective measures that maintain adequate habitat, minimize road densities, and maintain roadless areas.

Response: Information from Flynn (2007), which was also discussed at the 2006 Tongass Conservation Strategy Review workshop, was included in the Draft EIS. The recommendation for applying no-cut buffers to all salmon streams was initially made during the 2006 workshop, along with a number of other suggested items to be considered by the Forest Service. Some items were addressed in time for incorporation in the Final EIS, whereas others, such as the no-cut buffers, which might require additional interagency consultation, the formation of specialized workgroups, and more detailed development, may be considered after the Final EIS. These long term considerations could lead to conservation strategy-related adjustments to the amended Forest Plan through additional amendments or identified as information needs. The Final Proposed Forest Plan includes 500-foot buffers on important brown bear feeding streams. A discussion regarding brown bears can be found in Appendix D of the Final EIS.

Comment: The ADF&G allows a relatively substantial annual harvest of brown bears on northeast Chichagof Island, where one of the highest densities of this species occurs in Southeast Alaska; the area also experienced a high level of road building and timber harvest in the 1970s and 1980s. This brings the need for Brown Bear Standards and Guidelines into question.

Response: Species-specific standards and guidelines form the fine filter component of the Tongass conservation strategy. They are designed to ensure that the Forest's multiple use objectives are met, as directed by the National Forest Management Act, which include enabling continued subsistence and recreational uses (consumptive and non-consumptive) of wildlife resources. Therefore, the brown bear standards and guidelines, which work to minimize the effects of timber harvest on brown bears and reduce human-brown bear conflicts, contribute to the maintenance of sustainable brown bear populations and continue to let the ADF&G allow brown bear harvest on northeast Chichagof Island. A discussion regarding brown bears can be found in Appendix D of the Final EIS.

Comment: Several respondents commented on brown bear use of second-growth forest, some suggesting that brown bears do well in young-growth areas, and others stating that old-growth forests provide the only suitable habitat for brown bears. Respondents with the latter view suggested that the Forest maintain roadless areas to prevent clear-cut logging and attributed more restrictive regulations on outfitters and hunters to the loss of old-growth forest.

Response: Brown bears are habitat generalists in that they use a variety of habitats including young-growth. However, mature and old-growth forest, particularly in the form of riparian habitat along salmon streams, plays an essential role in brown bear population viability, both in terms of the maintaining adequate vegetative cover to support anadromous fish production (i.e., regulate stream temperature) and providing visual obscurity of bears from humans and other bears. The reserve system, including OGRs and other non-development LUDs, protects approximately 57 to 93 percent of the productive old-growth existing in 1954 on the Tongass, much of which is roadless, depending on the alternative.

Comment: The Draft EIS fails to adequately analyze direct, indirect, and cumulative impacts to brown bears and black bears, especially increased hunter access to bears (direct take, reduction in prey base, and human presence).

Response: The potential for increased human access under each of the alternatives was discussed in detail in the Draft EIS analysis of effects to both black and brown bears (pages 3-203; 3-205 to 3-207). The discussions focused on direct take, or other mortality associated with human-bear interactions, and the effects of human disturbance. The ability of each alternative to maintain important roadless refugia was highlighted for brown bears. Reductions in the prey base for each species was not discussed as

neither species is a predator that specializes in one type of prey whose population has the potential to be affected by increased human access.

Comment: One respondent stated that she was quite appalled to discover that the Forest Service's Proposed Action would "essentially render the Tongass uninhabitable by grizzly bears."

Response: The analysis does not indicate that any of the alternatives would render the Tongass uninhabitable by grizzly bears, known as brown bears in Southeast Alaska. Even Alternatives 4 and 7 which propose the highest levels of harvest and reduce or eliminate the reserve system, respectively, rank as having moderately high likelihoods of maintaining well-distributed, viable brown bear populations. Alternatives 1, 2, 3, 5, and 6 rank as having a high likelihood of maintaining well-distributed, viable brown bear populations.

Comment: Standards and guidelines IX.A, C, D in the Proposed Forest Plan regarding management of human-bear encounters should be effectively incorporated into road management and timber harvest planning at the project level.

Response: Forest Plan standards and guidelines are incorporated into road management and timber harvest plans.

Comment: Standard and Guideline IX.D, of the Proposed Forest Plan regarding roads, should be strengthened by closing more roads because roads are correlated with bear mortality.

Response: Site-specific needs to minimize human/bear conflicts will be taken into account at project level planning including assess and travel management planning with regard to road management.

Comment: There is no science to suggest that brown bears require a 500-foot buffer for foraging. For areas where human bear encounters are predicted (i.e., Anan Creek, Pack Creek, Salmon River) this may be appropriate but otherwise is not needed, considering that the highest concentration of brown bears in Southeast Alaska occurs in an area with substantial past timber harvest and road building and harvest of brown bears is permitted on the Admiralty, Baranof, and Chichagof islands.

Response: As stated in the *Wildlife* section of the Draft EIS, cover for visual obscurity, provided by riparian buffers, is important for minimizing interactions among bears and between humans and bears. During the salmon spawning season bears concentrate their use within 500 feet of salmon spawning streams (Schoen and Beier 1990, Titus and Beier 1999), though will make greater use of upland areas in watersheds with greater development. The 500-foot buffers required by the Final Proposed Forest Plan are intended to provide visual cover in the areas that receive the greatest use.

Comment: One comment requested that the Forest Service adopt the Flynn et al. (2007) recommendations for bear buffers of 500 feet along each side of all salmon streams that are used by brown bears, and a buffer of 1,000 feet along each side in areas where ADF&G management objectives are for a brown bear population that exceeds the level of minimum viability.

Response: Standard and Guideline WILD1 IX.B, (Bear Habitat Management) in the *Wildlife* section of Chapter 4 of the Final Proposed Forest Plan requires consultation with ADF&G to determine the best application of needed buffers. Some sites might warrant these types of buffers, but this is best determined at the project level.

Plants

Comment: The Forest Service and the Tribes must work together to address the issues of noxious or invasive animal and plant species.

Response: The Forest Service works with the Tribes, as well as with other agencies and organizations, on issues related to noxious and invasive species.

Comment: One comment noted that the Proposed Forest Plan does little to prevent the spread of invasive plants.

Response: The Final Proposed Forest Plan has been modified to include a section on invasive plants. The standards and guidelines reference the direction in the recently completed (November 2007) Region 10 supplement to Forest Service Handbook 2000, Noxious Weed Management, Chapter 2080. Standards and guidelines in the Final Proposed Forest Plan implement direction in this Regional Supplement.

Comment: One comment asked how many of the 46 species classified as invasive plants present on the Tongass are the result of logging operations.

Response: It is likely that many of these plants were spread by logging operations, especially prior to the Forest implementing measures to halt their spread. However, invasive plants are also spread by recreational traffic and by natural means. The Forest Service has recently completed a regional supplement to Forest Service Handbook 2000 Noxious Weed Management, Chapter 2080. Standards and guidelines in the Final Proposed Forest Plan implement the direction from this Regional Supplement.

Comment: **One comment requested that the Final Proposed Forest Plan protect orchids and goldenthreads.**

Response: Bog orchid is listed on the Regional Forester's sensitive plant list. The Final Proposed Forest Plan contains standards and guidelines to protect sensitive species, as identified in the effects analysis in the Final EIS. There are two species of goldenthread on the forest. One is found in bogs and is not likely to be disturbed by harvest operations. The other is found in moist forests where some populations may be disturbed by logging. Neither species is listed as sensitive, threatened or endangered because neither is uncommon.

Specific Geographic Area Comments

The following section presents comment summaries and responses that address specific geographic areas. These comment summaries are organized into two sections. The first section presents comments that requested information or suggested management direction for specific places. The second section lists and discusses specific places that were more generally identified for protection from timber harvest and road construction.

Specific Geographic Area Comments and Responses

Comment: Several comments expressed concern about the recommendation that the existing Young Bay Experimental Forest be declassified as an Experimental Forest and assigned to the Remote Recreation LUD under management of the Juneau Ranger District. These comments argued that the Young Bay should become part of the adjoining Kootznoowoo Wilderness and Admiralty National Monument. Respondents stated that this would be inconsistent with President Carter's Proclamation 4611 and ignores ANILCA. One comment encouraged the Forest Service to

consult with the Kootznoowoo to determine the potential impacts of this designation on the unique coastal island ecosystem. Another comment emphasized the value of Young Bay to the public and as a "crucial wildlife linkage" between Mansfield Peninsula and the rest of Admiralty Island. This comment recommended that the mineral entry withdrawal for this area remain in effect.

Response: The recommended declassification of the Young Bay Experimental Forest will be addressed in a separate decision outside of this Forest Plan Amendment effort. The above concerns are noted and will be considered in that decision process. However, it is important to note that adding this area to the Kootznoowoo Wilderness would require Congressional action.

Comment: One comment requested that Corner Bay on Chichagof Island be classified as a new Experimental Forest, not the Cowee Creek-Davies Creek area, which is recommended for this designation in the Proposed Forest Plan. The comment author would prefer the Forest Plan recommend Corner Bay because it has an established road system and has been logged in the past.

Response: The Corner Bay area was examined as a potential Experimental Forest location, but the PNW Research Station recommended that the Cowee-Davis area be classified as an Experimental Forest. Their preference is reflected in the recommendation in the Final Proposed Forest Plan. A final decision on changes to the Experimental Forest will be made outside of this Forest Plan Amendment effort.

Comment: Some respondents want the name of Admiralty Island National Monument Wilderness changed to the Kootznoowoo Wilderness with appropriate legal boundaries identified in the Final Proposed Forest Plan and supporting maps. Others asked that the name Kootznoowoo be spelled with an "X" as they felt that was more traditional. Another comment pointed out that Angoon elders maintain that "Young Bay" should in fact be "Young's Bay" and requested that the Forest Service make the applicable changes as soon as possible

Response: The alternative maps in the Draft and Final EIS documents clearly show both Admiralty Island National Monument and Kootznoowoo Wilderness. Text in the Final EIS refers to Kootznoowoo Wilderness. The boundaries of the wilderness were legislated by Congress, as was the name and spelling. Changing the name of the area is beyond the scope of this Forest Plan Amendment. This is also the case with the suggested change from Young Bay to Young's Bay.

Comment: A number of respondents from the community of Angoon expressed concern about a proposal by the Borough of Juneau to extend the Borough boundaries to include Admiralty Island. They asked that the Forest Service stop this effort.

Response: Annexation proposals by the Borough of Juneau are outside the scope of this Forest Plan Amendment.

Comment: One comment requested that the Final Proposed Forest Plan clearly identify the following areas of subsistence-related concern in the text and also depict them graphically: Chatham Strait Sockeye returns, voluntary closures, and migratory maps; Mitchell Bay Coho returns and existing commercial fishing areas; Southeast Herring Stocks, returns and commercial fishing harvest areas; and all areas within the Kootznoowoo Wilderness currently open to commercial fishing.

Response: The Forest Plan guides natural resource management activities on the Tongass. Subsistence fisheries management issues and mapping are outside the scope of the Forest Plan.

Comment: Some respondents stated that the navigable waters in the Angoon area such as Kootznoowoo Inlet, Favorite Bay, Mitchell Bay and Kanalku belong to the Kootznoowoo.

Response: This issue is beyond the scope of decisions made in this Forest Plan Amendment.

Comment: Some respondents felt that Admiralty Island should either be removed from the Tongass or at least put into a different category that would foster more attention to this island and the people that live there. They also suggest that an integrated management plan needs to be developed with Kootznoowoo. Several respondents felt that the Admiralty Island District office should be in Angoon rather than in Juneau.

Response: The Final Proposed Forest Plan provides broad strategic direction for the Forest as a whole, but it also recognizes the differences between areas and allocates areas to different LUDs for management purposes. Most of Admiralty Island is a National Monument and a Congressionally designated Wilderness, and this is reflected in the LUD designations and the management direction associated with them.

Location of Forest Service offices is an administrative decision and beyond the scope of this Forest Plan Amendment.

Comment: One comment asked for a detailed analysis of Goldbelt Corporation's proposed tourism activities in Hobart Bay.

Response: This Final EIS is a programmatic forest-wide analysis appropriate for a strategic Forest Plan Amendment. Site-specific projects or activities are best examined locally during the decision making process as appropriate for that action. Tourism and recreation developments are considered in cumulative effects analysis.

Comment: One comment recommended the LUD boundaries of the Greater Situk Watershed be moved to protect an important fisheries resource.

Response: The alternatives in the Final EIS are designed to show varying levels of development in this watershed, including Alternative 1, which would have no development LUDs. The Forest Service will consider the importance of the resources and potential level of effects if a timber sale is proposed in this area in the future.

Comment: One comment recommended that the Forest Service increase stream buffers from 200 to 500 feet in the Yakutat Ranger District for some streams. This request was based on a recommendation for this size buffer in a 1996 Forest Service document.

Response: All of the past information, including the Panel Assessments (referenced in the comment), was considered when developing the standards and guidelines for stream buffers. There is leeway in the guidelines to increase buffers on a case-by-case basis if on-site evaluations determine that greater buffers are need to protect the function of the system. This is a Forest-wide programmatic amendment; therefore, site-specific buffer requirements for individual areas are not included.

Comment: One comment recommended that small patch cuts and selective harvest be used in the Yakutat area.

Response: These prescriptions are available for consideration by Interdisciplinary Teams planning harvests in the Yakutat Ranger District, and elsewhere on the Forest. Additional information on selective harvest has been added to the *Timber* section of Final EIS

Comment: Some respondents requested adjustments to the proposed LUD boundaries and placement in the Niblack and Hyder areas where minerals activity is high or has the potential to increase in the future. A number of comments were opposed to the Wild and Scenic River and Old Growth LUDs in the NIblack area and wanted to see the Minerals LUD overlay extended.

Response: The alternatives include a range of levels of development LUDs in these two areas. It is possible in the future also, to make a LUD change if and when specific mining operations are proposed and approved.. Extension of the Minerals LUD overlay in these two areas is evaluated in the action alternatives of the Final EIS. These changes were made to recognize the valid existing rights in these areas along with the potential for additional minerals activity in these areas because of their minerals potential.

Comment: One comment proposed that all non-Wilderness lands in the Petersburg Creek watershed be designated Wilderness, with the remaining lands within the "Petersburg Creek Land Acquisition" designated Remote Recreation.

Response: No additional areas are considered for wilderness under this Forest Plan Amendment. Wilderness recommendations were considered in detail in the 2003 SEIS. The area would be allocated to Semi-remote Recreation under Alternatives 1, 2, 3, 5, and 6. It would be allocated to a mixture of Semi-remote Recreation and Timber Production under Alternatives 4 and 7.

Specific Places Identified for Protection

Many respondents wrote to urge protection of specific places from timber harvest and road construction. The importance of subsistence in these areas was often the main rationale, as was recreation use. In other cases the identified areas were viewed has having unique values. Legislative protection of some sort was often requested.

Each alternative was designed to include these areas needed to achieve the timber harvest levels established for that alternative. So Alternative 1, with the lowest harvest level, excludes most of the areas mentioned from development. On the other hand, Alternative 7, with the highest harvest level, has the potential to impact many of the identified areas.

This section identifies many of the areas identified for protection and discusses the LUDs allocated to these areas under each alternative. The list of places presented in Table H-2 includes the majority of the areas that were identified by more than one respondent, but is not intended to be fully inclusive. Readers concerned about specific places not included in this section can find the same type of information by reviewing the large alternative maps that accompany this EIS.

The places identified in Table H-2 are organized by Ranger District. In many cases, identified areas were located in proximity to one another. These areas are grouped by general area in Table H-2 and the following discussion. The text discusses these places by Ranger District and geographic area.

Table H-2
Specific Places by Ranger District

Ranger District	Geographic Area	Specific Place
Yakutat	Situk Watershed	Situk Watershed
Hoonah	Elfin Cove	Elfin Cove
	Chicken Creek	Chicken Creek
Sitka	Tenakee Inlet	Crab Bay
		Kadashan Watershed
		Long Bay
		Saltery Bay
		Seal Bay
		Tenakee Inlet
	Neka Bay	Neka Bay
	Peril Strait	Broad Creek
		Broad Finger
		Deep Bay
		Finger Creek
		Peril Strait
		Poison Cove
		Saook Bay
		Ushk Bay
	Redoubt Lake	Redoubt Lake
	Sitka North	Katlian Watershed
		Nakwasina Straits
		Starrgavan Watershed
	Silver Bay	Silver Bay
	Kruzof Island	Kalinin Bay
		Krestof Sound
		Kruzof Island
Juneau	Homeshore	Homeshore
	Taku Inlet	Rhine Creek
		Slocum Inlet
		Taku River
	Sweetheart	Sweetheart Creek

Table H-2
Specific Places by Ranger District

Ranger District	Geographic Area	Specific Place
Juneau (cont.)	Port Houghton	Hobart Bay
		Port Houghton
		Sanborn Canal
		Windham Bay
Petersburg	Farragut Bay	Farragut Bay
		Cape Fanshaw
	North Kuiu Island	Kadake Creek
		Port Camden
		Saginaw Bay
		Security Bay
		Three Mile Arm
		North shore of Rowan Bay
	South Kuiu Island	No Name Bay
		Reid Bay
		South Kuiu Island
	Duncan Canal	Castle River
		Duncan Canal
		Kah Sheets Creek
	Petersburg Watershed	Petersburg Watershed
	Wrangell Narrows	Mountain Point
		Peterburg Creek
		Tonga Mountain Point
	Kushneahin Creek	Kushneahin Creek
	South Mitkof Island	Southeast Mitkof Island
Wrangell	Madan Bay	Madan Bay
	Bradfield Canal	Bradfield Canal
	Navy Lake	Navy Creek
	Anan Creek	Anan Creek
Ketchikan	Cleveland Peninsula	Cleveland Peninsula
		Spacious Bay
		Union Bay
		Yes Bay
	Gravina Island	Bostwick Inlet
		Gravina Island
Thorne Bay	Honker Divide	Honker Divide
	Calder Holbrook	Calder Holbrook
	20 Road	20 Road
	Eleven Mile	Eleven Mile
Craig	Cat Island/Duke Island	Cat Island
		Duke Island
	Salmon Lake	Salmon Lake
	Sea Otter Sound	North Sea Otter Sound
	Dall Island	Dall Island
	Outside Islands	Outside Islands
	South Prince of Wales	Clover Bay
		Kassa Inlet
		Keete Inlet
		Mabel Bay
		Moira Sound
		Monie Lake
		Niblack
		Sunny Cove
		Trollers Cove

Yakutat Ranger District

Situk Watershed: This area is not available for timber management under Alternative 1. Portions of the upper watershed would be available for timber management under all other alternatives. All alternatives except 4 and 7 include a small old-growth reserve in the upper watershed. OGRs are withdrawn from timber management.

Hoonah Ranger District

Elfin Cove: This area is allocated to LUDs that do not allow timber management under all alternatives.

Chicken Creek: This creek is within an old-growth reserve under all alternatives except Alternatives 4 and 7. The area would be available for timber management under these two alternatives.

Sitka Ranger District

Tenakee Inlet: The southeast side of Tenakee Inlet includes Long Bay, Saltery Bay, Seal Bay, and Crab Bay. These areas would not be available for timber management under Alternative 1 and only small portions would be available under Alternatives 2 and 3. Nearly all of these areas are allocated to development LUDs under Alternatives 4 and 7. While most of these areas are within development LUDs under Alternatives 5 and 6, key portions are allocated to old-growth reserve, especially under Alternative 6. The Kadashan Watershed is allocated to LUD II under all alternatives. LUD II is withdrawn for timber management.

Neka Bay: The area around the bay would be entirely allocated to non-development LUDs under Alternative 1 and primarily to non-developement LUDs under Alternatives 2, 3, 5, and 6. This area would be allocated to a development LUD under Alternatives 4 and 7.

Peril Strait: Ushk Bay and Poison Cove are allocated to LUDs that do not allow timber management under Alternatives 1, 2, and 3 and to a mix of development and non-development LUDs under Alternatives 5 and 6. These areas would be allocated to development LUDs under Alternatives 4 and 7. Saook Bay would be allocated to a non-development LUD under Alternative 1 and primarily to non-development LUDs under Alternatives 2 and 3. The area would be allocated to development LUDs under Alternatives 4, 5 and 7 and to a mix of development and non-development LUDs under Alternative 7. Deep Bay would primarily be within an old-growth reserve under all alternatives except 4 and 7, which would allocate the area to development LUDs. Upper Peril Strait would remain LUD II under all alternatives. The Broad Finger or Broad Creek area to the southeast of the Pelican LUD II area would be an old-growth reserve under all alternatives except Alternatives 4 and 7. It would be available for timber harvest under those two alternatives.

Redoubt Lake: This area would not be available for timber management under any alternative.

Sitka North: This area, which includes Starrigavan Bay, Katlian Bay, and Nakwasina Sound, would not be available for timber management under any alternative, except for the area north of Nakwasina Sound which would be allocated to development LUDs under Alternatives 4 and 7.

Silver Bay: The area along Silver Bay would be allocated to LUDs that do not allow timber management under Alternative 1 and primarily to non-development LUDs under Alternatives 3, 4, 5, and 6. Most of the area would be allocated to development LUDs under Alternatives 4 and 7.

Kruzof Island: This island would not be available for timber management under Alternative 1. All other alternatives would allocate the island to a mix of development and non-development LUDs. The southern third of the island would be a special interest area under all alternatives. The northern portion of the island, including Kalinin Bay, would be an old-growth reserve under all alternatives except Alternatives 4 and 7. This portion of the island would have a development LUD under these two alternatives. Portofshikof Island to the east would be allocated to a non development LUD under all alternatives except Alternatives 4 and 7.

Juneau Ranger District

Homeshore: This area would be allocated to a non-development LUD under Alternative 1 and to development LUDs under all other alternatives.

Taku Inlet: Rhine Creek and Slocum Inlet near the entrance to Taku Inlet would be allocated to non-development LUDs under Alternatives 1, 2, and 3 and to LUDs that permit timber management under all other alternatives. Taku River would be allocated to non-development LUDs under all alternatives. There would be a Transportation and Utility LUD on the south side of the river under all alternatives.

Sweetheart: Both Sweetheart Creek and Sweetheart Lake would be allocated to non-development LUDs under all alternatives.

Port Houghton: The Windham Bay, Hobart Bay, and Port Houghton area would not be available for timber management under Alternative 1. Alternative 3 would allow some timber harvest near Port Houghton, while remaining areas would be allocated to non-development LUDs. Most of these areas would be allocated to development LUDs under Alternatives 4, 5, 6, and 7. The Sanborn Canal area would be within an old-growth reserve under all alternatives except Alternatives 4 and 7. The area would be allocated to development LUDs under those two alternatives.

Petersburg Ranger District

Farragut Bay: The Cape Fanshaw and Farragut Bay area would not be available for timber management under Alternative 1. Only a small area near Farragut Bay would be allocated to LUDs that allow timber management under Alternative 2. Alternative 3 would allow some timber harvest near Farragut Bay, while the Cape Fanshaw area would be allocated to non-development LUDs. These areas would be allocated to a mix of development and non-development LUDs under Alternatives 4, 5, 6, and 7, with Alternatives 4 and 7 allowing the most timber management.

North Kuiu Island: This area includes Port Camden, Security Bay, Saginaw Bay, Kadake Creek, Rowan Bay, and Three Mile Arm (Table H-2). These areas would not be available for timber management under Alternative 1. Most of North Kuiu Island would be allocated to development LUDs under the remaining alternatives. The west side of Security Bay would have a non-development LUD under all alternatives. The north side of Rowan Bay would be allocated to a non-development LUD under Alternative 1; to a mixture of development and non-development LUDs under Alternatives 2, 3, 5, and 6; and to development LUDs under Alternatives 4 and 7.

South Kuiu Island: This area includes Reid Bay and No Name Bay. No timber management would be permitted in these areas under Alternatives 1, 2, and 3. Both areas would be allocated to development LUDs under the other alternatives. Only Alternatives 4 and 7 would permit timber management in the Roadless Area south of the Kuiu Wilderness.

Duncan Canal: The west side of Duncan Canal, which includes Kah Sheets Creek and Castle River, would be allocated to non-development LUDs under Alternatives 1, 2, and 3 and to a mix of development and non-development LUDs under the other alternatives. The east side of Duncan Canal would have a mix of development and non-development LUDs under all alternatives, with Alternatives 4 and 7 allowing the most timber management.

Wrangell Narrows: The area along the Narrows would be allocated primarily to a mix of development and non-development LUDs under all alternatives, with Alternatives 4 and 7 allowing the most timber management and Alternative 1 the least.

Kushneahim Creek: The southwest corner of Kupeanof Island would be allocated to non-development LUDs under Alternatives 1, 2, and 3 and primarily to development LUDs under Alternatives 4, 5, 6, and 7. However, Alternatives 5 and 6 would include three OGRs in southwest Kupreanof Island, while Alternatives 4 and 7 would not.

South Mitkof Island: This area would have a mix of development and non-development LUDs under all alternatives, with Alternatives 4 and 7 allowing the most timber management and Alternative 1 the least.

Wrangell Ranger District

Madan Bay: The Madan area would be allocated to non-development LUDs under Alternatives 1 and 2 and to a mix of development and non-development LUDs under the other alternatives. Most of Madan Bay borders an old-growth reserve under all alternatives except Alternatives 4 and 7.

Bradfield Canal: The Bradfield Canal area would be allocated to non-development LUDs under Alternatives 1 and 2 and to a mix of development and non-development LUDs under the other alternatives.

Navy Lake: This area would be allocated to development LUDs under all alternatives except Alternative 1.

Anan Creek: The Anan Creek area is allocated to LUD II under all alternatives.

Ketchikan Ranger District

Cleveland Peninsula: The peninsula southwest of Yes Bay would be allocated to non-development LUDs under Alternatives 1 and 2. The area southwest of Spacious Bay would be allocated to non-development LUDs under Alternative 3 while the area to the north would be a mix of development and non-development LUDs. The area southwest of Meyers Chuck/Helm Bay would be allocated to non-development LUDs under Alternatives 4, 5, and 6, while the remainder of the peninsula would have a mix of development and non-development LUDs. Nearly all of the peninsula would be allocated to development LUDs under Alternative 7.

Gravina Island: All but a very small portion of the island would be allocated to non-development LUDs under Alternative 1. The small area of development LUD is not near Bostwick Inlet. Most of the island would have non-development LUDs under Alternatives 2, 3, 4, 5, and 6, with a development LUD extending north from Bostwick Inlet to California Ridge. Most of the island would be allocated to development LUDs under Alternative 7.

Cat Island/Duke Island: Both islands would be contained in the Duke Island Zoological Special Interest Areas under all alternatives. This area was designated because of its abundant wildlife, especially waterfowl.

Thorne Bay Ranger District

Honker Divide: This area would be allocated to non-development LUDs under all alternatives except Alternative 7, which would allocate the area to development LUDs, except for the Recreational and Scenic River corridor along the Thorne River/Hatchery Creek.

Calder Halbrook: The Mt. Calder/Mt. Halbrook area is allocated to LUD II under all alternatives. The area immediately to the northeast of the LUD II area would be allocated to development LUDs under all alternatives.

20 Road: The area along the 20 Road would be allocated to a mix of development and non-development LUDs under all alternatives.

Eleven Mile: The Eleven Mile Watershed would be allocated non-development LUDs under Alternatives 1 and 2; to a mix of development and non-development LUDs under Alternatives 3, 5, and 6; and to development LUDs under the Alternatives 4 and 7.

Craig Ranger District

Salmon Bay Lake: This area is allocated to LUD II under all alternatives. The area to the east would have development LUDs under all alternatives except Alternative 1. The area to the west would be allocated to non-development LUDs under all alternatives except Alternative 7.

Salmon Lake: This area is allocated to LUD II under all alternatives. Adjacent areas would have varying levels of development LUDs depending on the alternative.

Sea Otter Sound: Most of the area along Sea Otter Sound would be allocated to development LUDs under all alternatives.

Dall Island: NFS land on the island south of Diver Bay (which is on the north end of the island) would be allocated to non-development LUDs under all alternatives. The area north of Diver bay would be allocated to non-development LUDs under Alternatives 1, 2, and 3 and development LUDs under the other alternatives. The island would have several Special Interest Areas under all alternatives.

Outside Islands: With the exception of San Juan Bautista Island, all the islands west of Craig would be allocated to Wilderness, LUD II, or other non-development LUDs under all alternatives. San Juan Bautista Island would be allocated primarily to a development LUD under Alternatives 4, 5, 6, and 7 and to a non-development LUD under Alternatives 1, 2, and 3.

South Prince of Wales Island: Nine specific places were identified on south Prince of Wales Island were identified for protection (Table H-2). The south half of the island includes Keete Inlet, Mabel Bay, Kassa Inlet, Sunny Cove, Niblack, Clover Bay, and Moria Sound. These areas would be allocated to non-development LUDs under Alternative 1. Under Alternative 2, most of south Prince of Wales Island would be allocated to non-development LUDs except for the Cholmondeley Sound area, which includes Sunny Cove. This area would be allocated to development LUDs. Keete Inlet, Mabel Bay, Kassa Inlet, Sunny Cove, Niblack, and Moria Sound would primarily be allocated to development LUDs under Alternatives 4, 5, 6, and 7. As noted in the preceding section, the Minerals LUD overlay was extended in the Niblack area under all of the action alternatives.

The south side of Clover Bay would be allocated to a non-development LUD under all alternatives but the north side of the bay, and the Monie Lake area, would be allocated to development LUDs under all alternatives except 1 and 2. Trollers Cove would be allocated to non-development LUDs under all Alternatives 1 and 2 and to a mix of development and non-development LUDs under all other alternatives. The west side of south Prince of Wales Island would be allocated to non-development LUDs under Alternative 3, while most of the east side would be allocated to LUDs that permit timber management.

C. References

The references cited in this appendix are included in the reference section presented in Volume I, Chapter 6 of this EIS.

Attachment A

Letters from Agencies, Elected Officials, and Tribal Governments

Attachment A
Contents

Federal Agency/Elected Official

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

April 20, 2007

Dennis E. Bschor
Regional Forester
USDA Forest Service
Alaska Region
P.O. Box 21628
Juneau, AK 99802-1628

RE: Tongass Land Management Plan Amendment, DEIS

Dear Mr. Bschor:

The National Marine Fisheries Service (NMFS) reviewed the Tongass Land Management Plan (TLMP) Amendment Draft Environmental Impact Statement (DEIS). Our specific comments are enclosed and our general summarized comments follow below.

Overall Comments

The revised TLMP provides an opportunity to restore fish habitat and improve fish passage in areas that have been degraded as a result of past management practices. Below and in the enclosure we recommend several changes for the Final EIS and TLMP Amendment to ensure that future timber sales and forest management decisions incorporate measures to restore access to fish habitat blocked by inadequate culverts, restore fish habitat, and minimize further impacts to anadromous fish.

The proposed plan makes some changes in the Soil and Water, Riparian, and Transportation Standards and Guidelines (S&Gs) which improve the S&Gs from a fish habitat perspective. In particular, the Transportation S&Gs now include road storage and decommissioning, providing greater specificity as to what to consider and how to conduct road closure activities.

The Final EIS should provide additional clarity and information in the following areas:

Effects of Roads on Fish

NMFS recommends the environment and effects fish section include an analysis of the number of culverts on the forest that do not fully meet the criteria for passing fish (red and gray culverts). The analysis should include the potential cumulative effect of constructing additional roads with culverts that may not meet fish passage criteria. NMFS recommends that the products of the Fish Passage Working Group (decision information matrix and biological significance model) be incorporated into the EIS and into the proposed plan.

Restoring fish passage through red culverts should be a high priority in the Forest Plan. In addition to disclosing the number and location of problem culverts the Final EIS should include plans or opportunities for remedies in future timber sales pursuant to the revised TLMP.

Road Density

The density that is displayed by alternative is the average road density in all value comparison units (VCUs) including VCUs with no development. NMFS recommends that the average road density in VCUs with past and or proposed harvest be displayed and discussed for all alternatives. Such information would give a better idea of the density of roads in developed VCUs where impacts are most likely to occur.

Riparian Management Objectives and Riparian Standards and Guidelines

NMFS supports the continuation of riparian buffers along Class III streams. NMFS is aware of some discussions to eliminate riparian buffers along Class III streams. We are glad this was not a proposed change in the DEIS. As documented in a March 10, 2006, paper titled "Evaluation of Concern 04-25, Class III Stream Management" by Steve Paustian, Colleen Grundy, Dennis Landwehr and other Forest Service staff there is compelling scientific rationale to continue buffers along Class III streams . Recommendations made by this group include the following: *The literature review indicates that the Riparian Management Objectives and Standards and Guidelines in the forest plan are appropriate. Class III streams need large woody debris to function properly and that woody debris inputs need to be understood at the scale of decades or centuries. The literature indicates that forest plan objectives could be broadened to include invertebrate production, the majority of streamflow within a watershed, and contributions to primary productivity. Cumulatively Class III and IV streams may account for 60 to 80 percent of the runoff volume in Tongass Watersheds. Headwater streams need to be understood on decadal scale or centuries scale.*

Watershed Restoration

NMFS recommends that the Forest Plan place a greater emphasis on watershed restoration as a means of reversing the negative consequences of past forest management activities on watershed health, especially timber harvest and road building impacts. Restoration of aquatic habitat and ecological processes should have priority over mitigation (so-called watershed improvement projects).

NMFS Recommendations for a Preferred Alternative

Fish and the aquatic resources on the Tongass National Forest support major subsistence, commercial, and sport fisheries, as well as traditional and cultural values. Road building and timber harvest can negatively impact fish resources. Adverse effects can be minimized with best management practices but not eliminated. Alternatives 1, 2 and 3 provide for a range of timber harvest and have less potential effects on fish than alternatives 4, 5, 6, and 7 with higher allowable sale quantity (ASQ). NMFS recommends that the Forest Service preferred alternative be Alternative 1, 2, or 3. This alternative range allows for harvest at the present rate and higher and will satisfy a medium integrated-industry level of timber demand according to the Brackley study cited in the DEIS. These alternatives minimize entry into roadless areas which would leave most roadless watersheds in the forest intact. These alternatives provide a mix of National Forest uses and activities and allow up to an ASQ of 204 million board feet which significantly exceeds current demand.

If you have questions regarding our comments contact Cindy Hartmann at (907) 586-7585 or John Hudson at (907) 586-7639.

Sincerely,

Robert D. Mecum
Acting Administrator, Alaska Region

Enclosure (1)

cc: * r10_tongass_juneau_rd_plan_adjustment@fs.fed.us
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Lee Kramer, Project Team Leader, Forestry Sciences Laboratory, 2770 Sherwood Lane, Suite 2A, Juneau, AK, 99801-8545
*Chris Meade, EPA Juneau
*Tom Schumacher, ADF&G, Juneau
*Bill Hanson, USFWS, Juneau
*Kevin Hanley, ADEC, Juneau
*Cindy Hartmann and John Hudson, NMFS, Juneau
*Steve Kokkinakis, NOAA, Silver Spring
*Cristi Reid, NOAA, Silver Spring

*email

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John Hudson
Cindy Hartmann

April 20, 2007

National Marine Fisheries Service (NMFS) Comments on TLMP Amendment - Enclosure

Comments Specific to the: Tongass Land and Resource Management Plan, Draft Environmental Impact Statement (EIS), Plan Amendment, January, 2007.

Page 3-57 to 3-58, Environment and Effects, Fish, Essential Fish Habitat (EFH)
The EIS states "Habitat areas of particular concern are identified as living marine substrates in shallow and deep waters, and freshwater habitats used by anadromous fish (NMFS 2003)." This definition is no longer valid. An August 8, 2005, record of decision (ROD) selected Alternative 3 of the April 2005 Final Environmental Impact Statement (FEIS) for Essential Fish Habitat Identification and Conservation in Alaska (EFH EIS) for the identification of habitat areas of particular concern (HAPCs). Under this alternative the previous HAPC identifications (living marine substrates in shallow and deep waters, and freshwater habitats used by anadromous fish) were rescinded. Existing HAPCs in the vicinity of the Tongass are offshore on the Fairweather Grounds and near Cape Omnaney.

The descriptions of EFH for Pacific salmon were also modified per the August 2005 EFH EIS ROD. NMFS refers you to Appendix D pages D-77 to D- 82 (EFH descriptions for Alternative 3) of the EFH FEIS found at http://www.fakr.noaa.gov/habitat/seis/efheis.htm.

Page 3-59, Environment and Effects, Fish, Invasive Aquatic Species
NMFS recommends that the Forest Service make changes to this section as noted below (additions are underlined and deletions are lined through). The recommended additional citation follows the paragraph on invasive aquatic species.

Invasive aquatic species can affect native species by eating them, competing with them, hybridizing with them, disrupting or destroying their habitat, or introducing pathogens or parasites that sicken or kill them (Schrader and Hennon 2005). In addition to natural range extension, several potential pathways exist for introduction of invasive aquatic species. These pathways included fish farms, international and local movement of bait and game fish, trade in live seafood, aquaculture, and contaminated sport angle gear brought into Alaska, as well as ballast discharge from international vessels (Fay 2002, Schrader and Hennon 2005). Several aquatic species have been noted as potential threats to Alaska, including fish (northern pike, Atlantic salmon, yellow perch, ornamental aquarium fish), invertebrates (green crab, New Zealand mudsnail, Chinese mitten crab, zebra mussel, signal crayfish, spiny water flea), plants (cordgrass) and several additional other miscellaneous taxa (Fay 2002, Schrader and Hennon 2005). Additionally, eastern brook trout (non-native) and non-endemic rainbow trout have been stocked in many areas where they were not native and compete or hybridize with native trout (Schrader and Hennon 2005). Of these fish, transplanted northern pike and Atlantic salmon are the two fish species of greatest concern (Fay 2002). The invertebrates Chinese mitten crab, green crab, and New Zealand mudsnail, even though they have not been found in Alaska, are of major concern because of their potential to do serious damage to

~~the~~ Alaskan ecosystems (Hines et al. 2004; Schrader and Hennon 2005). Atlantic salmon that have escaped from fish farms pose a threat to native salmon by competing for habitat and introducing diseases and parasites. This species has already been observed in Southeast Alaska marine waters and rarely in streams (Fay 2002). Also, northern pike, which has not appeared in Southeast Alaska (with the exception of a native stock in Yakutat), have caused widespread damage to resident trout where they have been introduced, and could potentially affect coho salmon through predation. Northern pike have the potential to cause serious environmental and economic damage to highly productive salmon streams in Southeast Alaska (Fay 2002). In the Tongass there is a risk that these and possibly other non-native sport fish may be introduced into lakes and rivers by individuals seeking to increase sport fishing opportunities. As the road network is extended into more areas of Southeast Alaska, this risk increases.

Additional Citation:
Hines, A.H., G.M. Ruiz, N.G. Hitchcock, and C. deRivera. 2004. Projecting Range Expansion of Invasive European Green Crabs (Carcinus maenas) to Alaska: Temperature and Salinity Tolerance of Larvae. Smithsonian Environmental Research Center, Research Report Submitted to Prince William Sound Regional Citizens' Advisory Council. 1 Febuary 2004.

Page 3-61, Environment and Effects, Fish, General Effects, Roads
A previous section on fish habitat enhancement (page 3-55) had a paragraph on restoration of habitat access to streams through replacement of culverts that did not meet current fish passage design criteria. It stated that approximately 240 culverts have been replaced through 2006. It also stated, "The culvert replacement program declined in 2006 due to funding reductions and is projected to continue to decline in future years." The roads effects section should include a discussion on the number of culverts that do not meet current fish passage design criteria. Culverts that do not meet current fish passage design criteria (Q2-2day duration design flow or the stream flow that exists two days before and two days after a peak flow) have been classified as RED culverts, GRAY culverts require more analysis to determine their juvenile passage ability, GREEN culverts have a high certainty of meeting juvenile fish passage at all desired stream flows. There are currently approximately 2000 red culverts on the Tongass National Forest. Because of changes in standards and guidelines, better engineering ability, and implementation monitoring the number of red culverts from past road construction may not be predictive of future fish passage problems. However, fish passage through culverts is an important issue that needs further discussion in the general effects/cumulative effects section. The number of red and gray culverts should be identified and their impacts discussed in the EIS. Restoring fish passage through culverts should be a high priority in the Forest Plan.

NMFS participated in an interagency Fish Passage Working Group regarding red and gray culverts. The working group completed a number of products that could be used to further efforts to remediate red culverts. These products included a decision information matrix and a biological significance model. These products are tools that could be used

in a process or decision framework designed to identify which red culverts to fix, and which culverts to submit for Clean Water Act 404 permitting (compensatory mitigation) instead of fix. The products were tested on the North Thorne Watershed stream and culvert replacement data set. The results of this test are documented in a January 27, 2006, paper titled "Test of a Process to Assign Fish Passage Remediation to Culverts in the North Thorne Watershed." The January 27 paper identified three components of the overall process that needed to be completed before expansion to the entire Tongass. Automating data acquisition was one component which included completing a stream crossing layer in the Forest Service GIS that contains all the attributes to run the biological significance model. NMFS hoped that these components would have been completed in time for this process to be incorporated into the Forest Plan Amendment and EIS. We recommend that the Forest Service make completing these components a high priority. At a minimum the data acquisition component should be automated and data gaps filled so the number of red culverts can be included in the EIS as well as the costs of fixing them. Our preference is for the full modeling and decision process to be incorporated into the Forest Plan Amendment.

Given funding reductions in the culvert replacement program, it is unlikely sufficient funding will be available to remediate the fish passage problem at one time Tongass-wide. Until such time, NMFS recommends that an analysis of the red and gray culverts within a timber sale area be incorporated into the timber sale NEPA process. Opportunities to fix red culverts should be expanded from the road maintenance planning process and the capital investment program to timber sale planning.

References that emphasize the importance of the potential effects of roads on fish include the following two references:

"Numerous studies show that watersheds with fewer roads are often associated with healthier fish populations, and roads may have unavoidable effects on streams, regardless of how well they are located, designed, or maintained (USDA Forest Service and USDI Bureau of Land Management 1995).

Citation: USDA, Forest Service and USDI, Bureau of Land Management. 1995. Decision Notice/Decision Record, Finding of No Significant Impact, and Environmental Assessment for the Interim Strategies for Managing Anadromous Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California. Washington, DC. 206 pp.

And from "Fisheries", Vol. 30, No. 1

".....the Alaska Department of Fish and Game reported that 66% of the culverts in salmon streams in the Tongass National Forest may be inadequate for fish passage, and 85% of the culverts across trout streams may be likewise (Flanders and Cariello 2000). A briefing document by Trout Unlimited (J. Konigsberg, Trout Unlimited, Anchorage, Alaska, pers. comm.) reported that one of the more significant threats to Alaska's wild

salmon was barriers created by culverts, causing loss of spawning and rearing habitats upstream."

Citations:
Gibson, J.R., R.L. Haedrich, and C.M. Wernerheim. 2005. Loss of fish habitat as a consequence of inappropriately constructed stream crossings. Fisheries Vol. 30 No. 1.

Flanders, L. S., J. Cariello. 2000. Tongass road condition survey report. Alaska Department of Fish and Game Technical Report 00-7.

Page 3-62, Environment and Effects, Fish, General Effects, Roads
The EIS states: "Currently the average road density in all VCUs is 0.19 mile per square mile, while the average road density in only VCUs with some past harvest is approximately 0.46 mile per square miles." "After more than 100 years of Forest Plan Implementation, the estimated overall road density on NFS lands would range from 0.26 under Alternative 1 to 0.43 mile per square mile for Alternative 7." NMFS interprets your use of "overall road density" to be the average road density in all VCUs. Since many VCUs are designated wilderness, national monument, remote recreation or LUD II (congressionally-designated unroaded areas) displaying only the average road density in all VCUs by alternative does not provide a true picture of road density in VCUs with moderate and intensive development. Since roads pose the greatest risk to fish resources on the Tongass (page 3-61) NMFS recommends adding a line to Table 3.6-2 which has the average road density by alternative for VCUs with timber harvest (past and/or future harvest) and adding a table and/or graph showing the distribution of road densities among all VCUs. These numbers then need to be fully discussed in the effects section.

Page 3-69, Environment and Effects, Fish, Essential Fish Habitat Assessment
NMFS offers the following clarification: Section 305(b)(2) of the Magnuson-Stevens Act requires all Federal agencies to consult with the Secretary on all actions or proposed actions authorized, funded, or undertaken by the agency that may adversely affect EFH.

Comments Specific to the: Tongass National Forest, Proposed Land and Resource Management Plan with EIS Appendices, January, 2007.

Pages 2-4 and 2-5, Chapter 2 - Goals and Objectives, Soil and Water Resources
Under Soil and Water Resources two objectives (see below) related to watershed restoration were deleted from the DEIS.

Deleted: Perform watershed restoration projects in at least two large watersheds (over a ten-year period). **Replaced with:** Complete Hydrologic Condition Assessments and Restoration Plans for priority watersheds.

Deleted: Perform an average of 3 single-year-type watershed improvement projects annually across the Forest. **Replaced with:** Complete watershed restoration projects in conjunction with Integrated Resource Program (see Appendix C).

These objectives were replaced with statements that lack the narrowly defined, precise, and measurable quality of an objective. The deleted objectives should be retained in the Final EIS because they provide a better means of gauging progress towards the stated goals of protecting and restoring watershed integrity. Many of the other objectives in this chapter are rather vague "general intentions" lacking the details required to properly evaluate progress towards achieving goals. All objectives should be reviewed and, if necessary, re-written as narrowly defined, precise, and measurable statements.

Page 4-4, Chapter 4 – Forest-wide Standards and Guidelines, Beach and Estuary Fringe, I. C. 1.
The proposed plan states: "The estuary fringe is an area of approximately 1,000 feet slope distance around all identified estuaries." If available, this definition should include reference to the source or sources that give the location of estuaries on the Forest.

Pages 4-8 to 4-12, Chapter 4- Forest-wide Standards and Guidelines, Fish Habitat Planning: FISH112
Past forest management practices that failed to consider the impacts of certain logging and road construction practices on watershed health have resulted in degraded fish habitat and productivity in many watersheds on the Forest. NMFS appreciates and supports the numerous references to restoration in the Fish Habitat Planning (FISH112) Standards and Guidelines. Fish habitat restoration should be a critical component of the Forest Plan. In the current draft, guidelines for fish habitat restoration are found in section IV under the Fish Habitat Planning heading (pages 4-9 and 4-10). NMFS would like to see fish habitat restoration elevated to a higher level within the Forest-wide Standards and Guidelines for Fish. To that end, NMFS recommends the addition of a "Fish Habitat Restoration" section to the Standards and Guidelines for Fish.

Page 4-8, Fish Habitat Planning, III. Fish stream value classification, B. 2. Class II
In defining Class II streams the phrase "have limited fisheries values" is used. Does "fisheries values" refer to the economic value of a fish population to a fishery? If so, why should the economic value of a fish population determine the classification of a stream channel? Fish populations can exhibit a wide variety of values - ecological, genetic, and economic among others. NMFS recommends that term "fisheries values" be defined and, if necessary, quantified and include the genetic and ecological benefits of a fish population.

Page 4-8 and 4-9, Fish Habitat Planning, III. Fish stream value classification, B. 3. Class III
The definition for Class III streams should describe the objective and measurable characteristics of a stream reach that result in an "immediate" influence on downstream water quality and fish habitat. How does one quantify whether a stream reach has an immediate or delayed or gradual influence on downstream reaches? Would a perennial or intermittent stream that is not flowing at the time of a survey be misclassified because it does not influence downstream water quality and fish habitat? The Forest Plan should clarify what immediate means. Also, NMFS recommends retaining the following statement from the current forest plan in the definition of a Class III stream: "in channels

with less than 30 percent gradient, special care is needed to determine if resident fish are present."

Page 4-9, Fish Habitat Planning, IV. Objectives/guidelines for management affecting fish habitat, A. 1.
Modify guideline number 1 to read:
1. Width-to-Depth Ratio. Relationship between average bankfull width and average bankfull depth, expressed as average bankfull width / average bankfull depth.

Page 4-12, Fish Habitat Improvement: FISH22
NMFS recommends that the Forest Plan distinguish between the terms "improvement" and "restoration" as applied to watershed and fish populations and habitat. This distinction would help to avoid confusion over projects that may have similar goals yet are achieved by very different means and with different ecological effects (e.g. stocking hatchery fish versus adding large woody debris to a stream. While both enhance fish populations, the former enhances an existing population – for example, with hatchery fish - while the latter allows an existing population to expand in numbers by increasing the quality and quantity of habitat). Although not explicitly defined in the Forest Plan, watershed and fish habitat improvement projects appear to be those projects which seek to enhance existing populations or create new populations such as through the construction of fish ladders, stocking programs, or lake fertilization. These types of projects are often promoted as mitigation for unavoidable impacts to fish habitat from timber management activities. Improvement projects can be quite costly (e.g. fish ladders) and certain improvement projects (e.g. lake fertilization) require continual expenditures and oversight to ensure long-term success. Despite careful planning and design, many improvement projects do not meet their target goals. In the case of fish ladders and stocking projects, the resulting enhanced fish production may come at the expense of resident fish populations through competition, predation, or interbreeding. In contrast, restoration projects seek to restore the original functionality and productivity of a watershed and associated fish population to its pre-managed condition. Watershed restoration projects may include road obliteration, enhanced fish passage (i.e. culvert replacement), tree thinning, and fish habitat creation. Although up-front costs for restoration can be quite high, restoration projects are typically self-sustaining because they re-establish ecosystem components and processes that sustain fish production without management intervention. As written, the Forest Plan focuses on watershed and fish habitat improvements. NMFS would like to see the Forest Plan address improvement and restoration separately with restoration being a priority. For example, under Section VIII Projects in the Fish Standards and Guidelines, the highest priority for fish habitat project work should be restoration/rehabilitation, followed by mitigation and enhancement (a.k.a. improvements).

Page 4-92 to 4-93, Watershed Resources Improvements: S&W2, I. Soil and Water Quality Protection and Improvement
Management activities have negatively impacted watershed health and fish habitat in numerous watersheds throughout the Forest. To date, restoration efforts have occurred in

only a small percentage of these watersheds. Watershed restoration must be a major component of a new forest management plan. Use of the term "improvement" in the Soil and Water standards and guidelines fails to recognize the current impaired status of many watersheds. Restoring watersheds to their pre-impact condition should be the goal of a new forest plan, not merely implementing improvement projects. NMFS recommends modifying the Soil and Water Standards and Guidelines as follows (additions are underlined and deletions are lined through):

Watershed ~~Resources Improvements~~ Restoration: S&W2
I. Soil and Water Quality Protection and ~~Improvement~~ Restoration
A. Protect or ~~improve~~ restore water quality and sustain soil productivity.
1. Conduct Watershed Condition Surveys and develop Watershed Restoration Plans to determine treatment priorities and needs. Consideration of treatment needs should include evaluating changed fish habitat and population levels, riparian vegetation community structure and function, and hydrology as measured against natural conditions predicted by baseline ~~fish habitat~~ objectives (see Fish Forest-wide Standards & Guidelines). Identify and prioritize needs in the NRIS Watershed Improvement Tracking (WIT) database. Complete watershed restoration project plans and coordinate with fish habitat ~~improvement~~ restoration projects. Include projects in Sale Area Improvement Plans and use K-V funds as appropriate. (Consult FSM 2510 and 2520.)
2. Give priority to cost-effective watershed ~~improvement~~ restoration projects in watersheds with the most erodible conditions directly affecting the beneficial uses of water.
3. For revegetation of disturbed sites, erosion control, fire rehabilitation, riparian restoration, forage enhancement, and other revegetation projects, consider natural revegetation as an alternative to seeding or planting. Encourage natural revegetation where seed source and soil conditions are favorable. Use native species of seeds and plant in revegetation projects where seeding or planting is appropriate. Native plant material sources include commercial nurseries, agency native seed programs, and local seed collection.
4. Inspect all watershed ~~improvements~~ restorations until the final evaluation indicates that maintenance is no longer needed.
5. Road decommissioning and storage projects to ~~improve~~ restore watershed conditions should pay special attention to fish passage, channel stability and water quality issues (Consult *Tran 24* guidance, and Soil and Water Conservation Handbook, FSH 2509.22).

Page B-2, Appendix B – Information Needs, II. Priority Research Needs
NMFS strongly supports research need #8: "Assess the effectiveness of restoration efforts in increasing fish habitat and fish production."

Page B-9, Appendix B, N. Soil and Water
Change Information Need number 20 from "Classify and develop a cost effective mapping scheme to map wetlands on the forest" to "Develop a cost effective mapping scheme to classify and map wetlands on the forest."

Page G-4), Appendix G - Log Transfer Facility Guidelines, S7. Sensitive Habitats, Discussion
The discussion concerning impacts of bark deposition on benthic water quality and biota tends to understate the biological impacts of bark accumulations. This section should be modified as noted (additions are underlined). The recommended additional citation follows the discussion on woody debris.

Woody debris from log transfer and water storage can be carried by currents and deposited on these plant and animal communities. Debris may cover the area and physically smother plants and animals. There is a concern that debris accumulation may reduce dissolved oxygen concentration in the water below the minimum level required by fish and other aquatic life. Bark debris is expected to reduce dissolved oxygen concentration in the bark interstices. High oxygen demand can lead to an anaerobic zone within the bark pile where toxic sulfide compounds are generated, particularly in brackish and marine waters. Reduced oxygen levels, anaerobic conditions, and the presence of toxic sulfide compounds can result in reduced localized habitat value for groundfish species and their forage base (National Marine Fisheries Service 2005). One study found that the dissolved oxygen, pH, oxidation reduction potential, and concentration of toxic products of decomposition in the water column at 30 centimeters (12 inches) above the bark were not significantly different than at the control sites. Reductions in dissolved oxygen below Water Quality Standards have not been documented.

National Marine Fisheries Service. Appendix G, Non-fishing Impacts to Essential Fish Habitat and Recommended Conservation Measures. April 2005

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Congress of the United States

Washington, DC 20515

April 30, 2007

Chief Abigail Kimbell
USDA Forest Service
1400 Independence Ave., SW
Washington, DC 20250-0003

Dear Chief Kimbell:

We are writing to express our concern about the proposed action for the January 2007 Draft Land and Resource Management Plan for the Tongass National Forest. Under the revised plan, the timber sale program would continue to require annual federal subsidies of $40-50 million

Since 1982, the Forest Service has lost nearly a billion dollars subsidizing timber sales on the Tongass. During this time, timber employment has significantly decreased due to declining demand for Tongass timber products, however; program costs remains high. As a result, fewer than 300 jobs are now attributable to the Tongass timber sale program. The cost to federal taxpayers is over $150,000 per job per year.

The high cost of the Tongass timber sale program is based on past economic conditions in southeast Alaska. The new Forest Service plan fails to address these changes. The agency continues to plan timber sales at volumes far exceeding the demand.

Most timber sales continue to be planned in remote areas requiring expensive road construction, and resulting in significant adverse effects on wildlife, tourism, subsistence, and recreation. The Tongass National Forest contains the largest remaining tracts of old-growth temperate rainforest in the world, including many roadless watersheds with native species such as bald eagles, brown bears, wolves, black-tail deer and salmon. Given that almost four percent of the Tongass is made up of the large old growth that is vital to fish and wildlife, this habitat is a valued treasure. Already, more than half this rare and valuable old-growth in the Tongass has been clearcut.

The Tongass forest planning process now underway presents an opportunity for change. However; the proposed action does not make any substantial changes to the current plan. The annual allowable timber sale quantity would remain at 267 million board-feet; the total volume logged on the Tongass in the last six years combined. Like the existing plan, the proposed action leaves 2.4 million acres of roadless areas open to road construction, with most of the timber coming from these costly-to-access sections. The new plan should reduce costs to the federal taxpayers by decreasing the planned timber sale volume and eliminating new logging roads. Continuing without change is not sustainable and is a disservice to the American people and the residents of southeast Alaska.

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We strongly encourage the USDA to reject the proposed action for the Tongass plan and adopt a balanced solution which meets the true needs of Southeast Alaska's communities and economy.

Thank you for your attention to this matter. We look forward to your response.

Sincerely,

Robert E. Andrews — Raúl M. Grijalva
Rahm Emanuel — Ron Kind
Jim Moran — Sander Levin
Maxine K. Waters — Linda T. Sánchez
Sam Farr — Betty Sutton
Michael McNulty — Betty McCollum
Michael H. Michaud — Earl Blumenauer

William D. Delahunt

Bill Pascrell, Jr.

Tom Lantos

Bob Filner

Stephen F. Lynch

Eliot L. Engel

Gregory W. Meeks

Jerrold Nadler

Carolyn B. Maloney

Elijah E. Cummings

Gary L. Ackerman

Jim Moran

Barney Frank

Ben Chandler

Eddie Bernice Johnson

Tim J. Walz

Leo Capps

John W. Olver

Tom Allen

Jerry F. Costello

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Jim McDermott

John B. Larson

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Rep:

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Mark Kirk
Pete Stark
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Mazie K. Hirono
Howard Berman
Jose Serrano
Dale Kildee
Keith Ellison
Gwen Moore
Brian Higgins
Thomas Allen
Jerrold Nadler
Hank Johnson
Eddie Bernice Johnson
Emanual Cleaver
Ben Chandler
Frank Pallone
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April 30, 2007

Mr. Forrest Cole, Forest Supervisor
Tongass National Forest
648 Mission Street
Ketchikan, Alaska 99901

Dear Mr. Cole:

The U.S. Department of the Interior has reviewed the Draft Tongass National Forest Proposed Land and Resource Management Plan Amendment (Proposed Forest Plan) and Draft Environmental Impact Statement (Draft EIS). The Draft EIS evaluates seven alternatives for managing the 17 million-acre Tongass National Forest. We believe the information included in this letter needs to be taken into account in the Final EIS and in the Final Forest Plan. These comments are submitted in accordance with the Fish and Wildlife Coordination Act, the Multiple Use-Sustained Yield Act, the National Forest Management Act, the Alaska National Interest Land Conservation Act, the National Environmental Policy Act, and the Council on Environmental Quality guidance for providing special technical expertise on water, biological, and geological resources.

We support the Proposed Forest Plan goal of maintaining viable and well-distributed fish and wildlife populations across the Tongass. We appreciate the long history of the U.S. Forest Service (USFS), the Fish and Wildlife Service (FWS), and the Alaska Department of Fish and Game working together to develop and implement conservation measures to address this goal. As you know, the 1997 Tongass National Forest Land and Resource Management Plan addressed this goal through implementation of the Tongass Conservation Strategy, a landscape conservation approach with special emphasis on species and habitats associated with old-growth forests. The strategy helps reduce risks to rare and endemic species, and therefore helps minimize, and/or avoid, wildlife species' numbers declining to the point of requiring protection under the Endangered Species Act (ESA).

The USFS is evaluating potential changes to the Tongass Conservation Strategy as part of this Proposed Forest Plan revision. Elements of the Tongass Conservation Strategy essential to Queen Charlotte goshawks and their prey include Old-Growth Reserves (OGRs), nest buffers, beach and estuary fringe, and tree retention under the Goshawk Foraging Habitat Standards and Guidelines and the American Marten Standards and Guidelines. Key Tongass Conservation Strategy elements for the Alexander Archipelago wolf and its prey include OGRs for habitat, and beach and riparian buffers for connectivity between habitats. Landscape pinch points are also

important to wolf movement and dispersal across the landscape. Therefore, some of our key recommendations include: (1) eliminating, in the Final EIS, further consideration of Alternatives 4 and 7; (2) maintaining the Tongass Conservation Strategy in any alternative selected in the Final EIS, and implementing in the Final EIS and the Final Forest Plan, biological locations for Small and selected Medium OGRs as recommended by the Interagency Small OGR Work Group; (3) retaining in the Final EIS and the Final Forest Plan, the existing Goshawk Foraging Habitat Standards and Guidelines; and (4) improving in the Final EIS, the USFS proposed alternative 6 by adopting the Interagency Small OGR Work Group preferred biological locations for 48 additional Small OGRs and by retaining the existing Goshawk Foraging Habitat Standards and Guidelines, so as to help prevent the need to list the goshawk under the ESA. For more detailed information regarding these and other recommendations, see Attachments A, B, and C.

No threatened or endangered species under the jurisdiction of the FWS are currently known to exist in the project area. In response to a court-ordered remand, the FWS is currently evaluating the status of the Queen Charlotte goshawk and its habitat to determine if Vancouver Island is a significant portion of the goshawk's range and, if so, whether listing under the ESA is warranted in all, or part of, the goshawk's range. In addition to the goshawk, the Alexander Archipelago wolf has previously been petitioned for listing; and Kittlitz's murrelet is a candidate species. In addition, there are numerous other endemic and sensitive species on the Tongass that will require our continued collaboration in developing conservation provisions. More detailed information on specific Proposed Forest Plan revisions that may affect those species is included in Attachments A, B, and C.

If you have questions concerning our comments, or if we may be of further assistance with regard to fish and wildlife resource information, please contact Mr. Bruce Halstead, Juneau Fish and Wildlife Field Office, at 907-780-1161.

Sincerely,

Pamela Bergmann

Pamela Bergmann
Regional Environmental Officer - Alaska

Attachments

ATTACHMENT A

GENERAL COMMENTS

Tongass Conservation Strategy

We support the retention of the "Desired Condition and Goal" of maintaining viable, well-distributed fish and wildlife populations throughout the Tongass as outlined in the Draft Tongass National Forest Proposed Land and Resource Management Plan Amendment (Proposed Forest Plan) (Proposed Forest Plan, Pages 2-1 to 2-6). The Tongass National Forest Land and Resource Management Plan (1997 Forest Plan) addressed this goal through implementation of the Tongass Conservation Strategy, a landscape conservation approach with special emphasis on species and habitats associated with old-growth forests. These habitats are most at risk from timber harvest and road construction. The Tongass Conservation Strategy helps reduce risks to rare and endemic species in this naturally-fragmented landscape of islands, which are isolated from the rest of North America by coastal mountains, ice fields, and the Gulf of Alaska.

The Tongass Conservation Strategy is based on scientific information and assessments that specifically addressed species viability on the Tongass (Suring et al. 1993; Kiester and Eckert 1994; Suring et al. 1994). In April 2006, the U.S. Forest Service (USFS) convened a Tongass Conservation Strategy Workshop to review applicable scientific work completed since 1997. An expert panel including representatives of the USFS, U.S. Fish and Wildlife Service (FWS), and Alaska Department of Fish and Game (ADF&G) reconfirmed that the overall architecture of the Tongass Conservation Strategy continues to represent the best available science; and compiled more than 100 considerations for updating the Tongass Conservation Strategy and addressing scientific work published since 1997 (USFS 2006).

We believe it is important to retain the Tongass Conservation Strategy in its entirety throughout the Tongass, particularly the network of Old-Growth Reserves (OGRs), the 1,000-foot Beach and Estuary Fringe Standards and Guidelines, and the Goshawk Foraging Habitat Standards and Guidelines (Goshawk Standards and Guidelines). We also believe the Tongass Conservation Strategy represents the best management approach to help minimize, and/or avoid, wildlife species' numbers declining to the point of requiring protection under the Endangered Species Act (ESA). It is important to note that in 1997, the FWS found the revised 1997 Forest Plan and its Tongass Conservation Strategy adequate to sustain the Queen Charlotte goshawk (goshawk) and Alexander Archipelago wolf (wolf) in Southeast Alaska; therefore, concluding that ESA listings for those species were not warranted. Therefore, we recommend the Final Environmental Impact Statement (EIS) and Final Forest Plan retain the Tongass Conservation Strategy in its entirety throughout the Tongass, particularly the network of OGRs, the 1,000-foot Beach and Estuary Fringe Standards and Guidelines, and the Goshawk Standards and Guidelines.

Management of natural resources during climate change requires increased emphasis on building ecosystem resilience (WWF 2003). One of the most effective ways to help ensure ecosystem resilience is to eliminate or limit additional stresses through a system of OGRs and buffer zones (Noss 2001). We believe that retaining the Tongass Conservation Strategy in its entirety throughout the Tongass will provide the USFS with an important management tool for dealing with these changing conditions.

Old Growth Reserves

OGRs contain large blocks of old-growth forest set aside from timber harvest and most road construction to provide habitat for a wide array of old-growth associated species. Very Large, Large, and Medium OGRs are important for helping ensure the viability of wolves and goshawks, and for providing benefits for a wide array of endemic and other species. Small OGRs provide a system of "stepping stones" between the larger OGRs and help ensure that habitat is protected in each watershed. Small OGRs emphasize habitats important to birds (e.g., marbled murrelet and goshawk [e.g., known goshawk nests], small mammals (e.g., flying squirrel and marten), and deer [e.g., deer winter range]) (USFS 1997b, Appendix K; USFS 1997a, Appendix N).

It should be noted that implementation of OGRs across the entire Tongass was the most important factor in the 1997 ESA Finding that the goshawk did not warrant listing as a threatened or endangered species (FWS 1997b). It was also an essential factor in the "not-warranted Finding" for the wolf in 1997 (FWS 1997a). Appendix K of the 1997 Forest Plan (Appendix K) and various Tongass Plan Implementation Team (TPIT) clarifications (as identified in TPIT 1998) provide guidance for locating OGRs, including acreage requirements and other considerations pertaining to species of concern (e.g., marbled murrelet, black-tailed deer, marten, and goshawk) and special habitats (e.g., large blocks of productive old-growth, rare plants, highest volume stands, and deer winter range).

Small Old Growth Reserves

Biological Locations for OGRs. We believe that Alternatives 1, 2, 3, and 6 include better biological locations for Small OGRs than Alternative 5, the no-action alternative. Alternative 4 eliminates Small and Medium OGRs in 17 of 21 biogeographic provinces, effectively negating the overall Tongass Conservation Strategy. Alternative 7 eliminates all OGRs regardless of size and location. Therefore, we recommend that the Final EIS adopt an alternative (such as Alternative 1, 2, 3, or 6) that implements better biological locations for Small OGRs.

We believe it is important that the revised locations for Small OGRs, which fully meet the criteria specified in Appendix K and either fully implement, or implement, the intent of the Tongass Conservation Strategy, are adopted in the Final EIS and the Final Forest Plan. It is important to note that the proposed locations of 191 Small OGRs (see Attachment B, Tables 1 and 2) fully meet Appendix K criteria and either fully implement, or implement, the Tongass Conservation Strategy. Of those, 133 Small OGRs (see Attachment B, Table 1) implement the preferred biological locations. An additional 58 Small OGRs (see Attachment B, Table 2) implement acceptable (although not preferred biological) locations, thereby fully meeting Appendix K criteria, while implementing the Tongass Conservation Strategy and accommodating timber harvest, road construction, and/or other development activities. Therefore, we recommend that the Final EIS and the Final Forest Plan adopt the revised locations for Small OGRs that fully meet Appendix K criteria and either fully implement, or implement, the Tongass Conservation Strategy.

Revised Locations for Small OGRs. The 1997 Forest Plan identified draft locations for Small OGRs, and established an interagency process to identify the preferred biological location for each OGR (USFS 1997b, TPIT 1998). In accordance with that process, in 2006 and 2007, the Interagency Small OGR Work Group (which was comprised of USFS, ADF&G and FWS biologists and lead by the USFS) reviewed each of the draft locations for the 239 Small OGRs and recommended the preferred biological location for each Small OGR. The Interagency Small OGR Work Group then met with each of the USFS District Rangers and their respective foresters, engineers, and biologists, with the goal of reaching joint recommendations, through a collaborative process, that resolved potential conflicts between preferred biological locations and areas for proposed timber harvest and road construction. The results of that work were provided to the Forest Supervisor, who then reviewed and accepted 133 (see Attachment B, Table 1) of the joint recommendations as proposed locations. In addition, the Forest Supervisor proposed, in March 2007, additional changes to 48 Small OGRs (see Attachment B, Table 3) and 49 Medium OGRs (see Attachment B, Tables 4 and 5). It is important to note that the 48 Small OGRs listed in Attachment B, Table 3 do not fully meet the Appendix K criteria or fully implement the Tongass Conservation Strategy. Recommended changes for each Small and Medium OGR will be documented in the Interagency Small OGR Work Group's final report, which we anticipate will be completed by June 2007 and presented to the Forest Supervisor for additional consideration.

Small OGR Resolution. While it is our understanding that the USFS plans to modify the 48 Small OGRs to ensure that each of these Small OGRs meet the acre criteria in Appendix K, we believe additional changes are necessary in order for each Small OGR to fully meet Appendix K's other criteria and to fully implement the Tongass Conservation Strategy. We recommend that these changes be completed for as many of these Small OGRs as possible, so the resulting appropriately-modified Small OGRs may be included in the Final EIS and the Final Forest Plan. We believe this will result in more predictability, less uncertainty, and a reduced potential for conflict for the USFS and its Tongass stakeholders regarding these Small OGRs. Including this information in the Final EIS and the Final Forest Plan will also eliminate the need for time-consuming individual project (e.g., timber sale) reviews. If it is not possible for the necessary additional interagency review and analysis for the 48 Small OGRs to be completed and included in the Final EIS and the Final Forest Plan, we recommend that the Final EIS and the Final Forest Plan adopt the preferred biological locations as recommended by the Interagency Small OGR Work Group.

Interagency Small OGR Work Group Procedural Changes. As noted above, in the event there are Small OGRs remaining that do not fully meet the criteria in Appendix K or fully implement the Tongass Conservation Strategy, those Small OGRs will need to be addressed during individual project reviews. The process for the interagency review and analysis is delineated in Appendix K and various TPIT clarifications, as identified in TPIT 1998. We recommend that from this point forward, all interagency reviews and analyses of any OGRs include the following additions, which were identified and used in 2006 and 2007 by the Interagency Small OGR Work Group (Hanson et al. 2006):

- Development of a consistent protocol for incorporating interagency recommendations into the Forest Plan and individual National Environmental Policy Act projects.

- Documentation of the Appendix K criteria for each OGR, and periodic updating of that information.
- Assessment of the effects of roads in, and adjacent to, OGRs.
- Implementation of the TPIT clarification entitled "Conveyance on Overselected Lands and the Old-Growth Habitat Land Use Designation."

We further recommend that these additions to the interagency review and analysis identified above and TPIT clarifications as identified in TPIT 1998 be included in Appendix K in the Final Forest Plan.

[See Alexander Archipelago Wolf section below for information on the importance of adopting the Interagency Small OGR Work Group-recommended Small OGR for Value Comparison Unit (VCU) 5960 for the Rio Roberts watershed on Prince of Wales Island to address connectivity issues related to the wolf.]

Medium Old Growth Reserves

Out of a total of 130 Medium OGRs on the Tongass, as noted above in the Small OGR section, the USFS proposed in March 2007, changes to 49 Medium OGRs (see Appendix A, Tables 4 and 5). The proposed changes include relocations, addition and deletion of acreage, and replacement of some Small OGRs by adjustments to Medium OGRs. These changes, which were proposed primarily to facilitate potential timber harvest and road construction, have not undergone interagency review and analysis to fully consider the effects of these activities on the OGR system, to determine whether Appendix K criteria have been fully met, and/or whether the Tongass Conservation Strategy has been fully implemented.

While the remaining 81 Medium OGRs throughout the Tongass have not been reviewed, we believe such a review also needs to be undertaken for those Medium OGRs. As stated above, since 1997, land selections and transfers have affected, and in some cases, eliminated Medium OGRs. It is anticipated that this will continue to be the case in the future. For example, the Interagency Small OGR Work Group identified a small number of Medium OGR adjustments that need to be made to meet the 10,000 acres minimum size and the high-volume productive old-growth acres criteria required by Appendix K for Medium OGRs. We believe that Medium OGRs need to be considered in their overall landscape context, not only in relation to individual projects and/or OGRs, but also with respect to potential consequences to the Tongass Conservation Strategy.

We also believe a review and adjustment of Medium OGRs is warranted: (1) if any of the Medium OGRs fail to meet the Total Acreage, Productive Old-growth Acreage, and High Volume Acreage Standards described in Appendix K; (2) if any of the Medium OGRs have been compromised by land selections made by, and/or land transfers to, the State of Alaska and/or Native Corporations; and/or (3) if any of the Medium OGRs no longer fully meet Appendix K criteria and/or fully implement the Tongass Conservation Strategy. As shown in Attachment B, Table 5, at least 28 of the 49 Medium OGRs proposed for changes do not meet Appendix K acreage criteria.

In summary, we recommend that the USFS defer changes to Medium OGRs (see Tables 4 and 5) until a comprehensive interagency review and analysis of all Medium OGRs has been completed to determine whether these Medium OGRs continue to fully meet Appendix K criteria and fully implement the Tongass Conservation Strategy. As stated above under the Small OGR section, we further recommend that any comprehensive interagency review and analysis of Medium OGRs also include the additions to that process, which were identified in 2006 and 2007 by the Interagency Small OGR Work Group (Hanson et al. 2006), and the TPIT clarifications, as identified in TPIT 1998.

Beach and Estuary Fringe Standards and Guidelines

We believe retaining Beach and Estuary Fringe Standards and Guidelines of at least 1,000 feet will help support viable, well-distributed wildlife populations. Beach and estuary fringes, along with riparian management areas, are the primary landscape linkage between OGRs. Beach fringes protect long-term bald eagle habitat capability (Gende et al. 1998); help sustain habitat for goshawks and their prey; buffer the primary beach and estuary fringe from windthrow; and provide critical winter habitat for black-tailed deer, which are the primary prey of wolves and an importance species for subsistence users (USFS 1997a, Page 3-21).

Results from recent research conducted in Southeast Alaska support the retention of beach and estuary fringes at least 1,000 feet in width to mitigate loss of habitat for most forest-dwelling birds, such as the pacific-slope flycatcher and red-breasted sapsucker (Kissling and Garton in Review). Several species of thrushes had higher reproductive success in large (e.g., >1,000 foot) buffers (Sperry 2006). Some species (e.g., Townsend's warbler, brown creeper, and hairy woodpecker) are sensitive to small amounts of fragmentation on the landscape and require a minimum beach and estuary fringe of 1,000 feet in order to help maintain viable populations (see Kissling and Garton for details). Some goshawks preferentially use (presumably for foraging) areas close to the shoreline (Iverson et al. 1996). Birds constitute more than 70 percent of prey deliveries made to goshawk nests (Lewis et al. 2006). Thrushes are particularly important prey for goshawks early in the nesting period, and healthy beach and estuary fringe forests are critical to robust thrush populations. Therefore, we recommend that the Final EIS and the Final Forest Plan retain a Beach and Estuary Fringe Standards and Guidelines of at least 1,000 feet to help support viable, well-distributed wildlife populations.

Pinch Points

We believe it is important that the Final EIS and the Final Forest Plan (1) retain protection for pinch points, including those identified in the 1997 Forest Plan (USFS 1997b, Page 4-123) and the Proposed Forest Plan (Page 3-157); and (2) add protection for pinch points identified during the Small OGR review. The Draft EIS recognizes the importance of landscape pinch points to endemic species and other wildlife. Those pinch points serve as critical links between larger land units where future alterations in habitat could significantly reduce natural connectivity and limit the ability of land-based species to disperse or migrate (Draft EIS, Page 3-157; Kiester and Eckhardt, 1994). Four pinch points were included in the 1997 Final EIS and 1997 Forest Plan, and two more were added in the Proposed Forest Plan. We believe that pinch points are adequately addressed in Alternatives 1, 2, 3, 5, and 6. That is not the case, however, for Alternatives 4 and 7, since Alternative 4 only protects 1 pinch point and no pinch points are protected in Alternative 7 (Draft EIS, Table 2-17). It is important to note that none of the

alternatives or proposed changes to Small OGR protect pinch points at Anita Bay on Etolin Island or at Rio Roberts on Prince of Wales Island (see also the Alexander Archipelago Wolf section below). Therefore, we recommend that the Final EIS and the Final Forest Plan (1) retain protection for pinch points identified in the 1997 Forest Plan and the Proposed Forest Plan, and (2) add protection for pinch points identified during the Small OGR review, including pinch points at Anita Bay on Etolin Island and at Rio Roberts on Prince of Wales Island.

Connectivity

We believe it is important that corridors and connectivity meet the Viable Population Strategy described by Suring et al. 1993. The 1997 Forest Plan requires Tongass District Rangers to analyze connectivity during project reviews (USFS 1997b, Page 4-118). In addition, the TPIT identified a number of key areas requiring additional connectivity analysis (TPIT 1998). It is unclear, however, to what extent this has been accomplished. Therefore, we recommend that the Final EIS and the Final Forest Plan require the development of a standardized protocol for conducting connectivity analyses as directed in the Proposed Forest Plan (Page 4-123).

Legacy Forest Structure

Standards and Guidelines

The Proposed Forest Plan proposes replacing the American Marten Standards and Guidelines (Marten Standards and Guidelines), the Goshawk Standards and Guidelines, and Reserve Tree/Cavity-Nesting Habitat Standards and Guidelines (Cavity-Nesting Standards and Guidelines) with a Legacy Forest Structure Standards and Guidelines (Legacy Standards and Guidelines). The proposed Legacy Standards and Guidelines would require retention of forest structure within harvest units throughout the Tongass, depending on the amount of harvesting in the surrounding landscape and the size of the harvest units. We agree that retaining legacy forest structure (e.g., residual trees and snags and clumps of trees remaining in timber harvest units) throughout the Tongass provides important wildlife benefits. Along with the Marten and Goshawk standards and guidelines, the 1997 Forest Plan addressed the need for residual forest structure in harvest units through a combination of the Cavity-Nesting Standards and Guidelines and two-aged forest management, which were intended to benefit red-breasted sapsucker, brown creeper, hairy woodpecker, and red squirrel (USFS 1997a, Page 3-364).

While we understand that the Legacy Standards and Guidelines are intended to provide similar benefits, it is not clear that it does so. For example, while the Legacy Standards and Guidelines would encourage retention of trees in harvest units across the entire Tongass; it would reduce retention of trees in the most heavily harvested biogeographic provinces where goshawks are most at risk. Furthermore, the Draft EIS provides no scientific assessment to support the general or specific changes included in the proposed Legacy Standards and Guidelines. If the Legacy Standards and Guidelines are adopted, we believe the changes would reduce the existing conservation standards for the goshawk. As always, the FWS is ready to work with the USFS and ADF&G to identify ways to modify the existing Goshawk Standards and Guidelines to address wildlife values, while helping ensure timber harvesting operational feasibility. In the meantime, however, we recommend that the Final EIS and the Final Forest Plan retain the existing Goshawk Standards and Guidelines.

We believe it is important for the USFS to analyze the effects of replacing Marten, Goshawk, and Cavity-Nesting standards and guidelines with the Legacy Standards and Guidelines, since the Marten, Goshawk, and Cavity-Nesting standards and guidelines were each designed to reduce risks to species identified during panel assessments (USFS 1997a ROD, Page 33-35, USFS 1997a, Appendix N). We further believe that the analysis needs to compare the number of harvest units to which each of the Marten, Goshawk, and Cavity-Nesting standards and guidelines would apply and the total acreage protected under each; and that this needs to be analyzed for biogeographic provinces as well as other logical landscape units for each species.

Risk Levels of Value Comparison Units

We believe that "Risk" levels of VCUs – which are landscape units designated on the Tongass that generally compare to small watersheds – need to reflect the cumulative effects of harvesting both throughout the Tongass and on adjacent, non-Tongass lands, since forest-dependent wildlife respond to the availability of habitat across the landscape. Some watersheds have been heavily harvested by USFS contractors and by operators on adjacent land owned by non-Tongass entities (e.g., private, local government, and State of Alaska entities). We believe that Risk levels (i.e., "High," "Moderate," and "Lower") of VCUs need to be defined to include all ownerships within each VCU. Therefore, we recommend that the "High", "Moderate", and "Lower" Risk levels of VCUs include, in the Final EIS and the Final Forest Plan, cumulative effects of timber harvesting on both Tongass and adjacent, non-Tongass lands.

High-Risk Value Comparison Units

We believe it is important in High-Risk VCUs, to retain the legacy forest structure in all units larger than 2 acres. Current Goshawk and Marten standards and guidelines require uniform distribution of at least 30 percent canopy cover in harvest units larger than 2 acres in High-Risk (i.e., heavily harvested) VCUs. The Goshawk and Marten standards and guidelines were designed to retain key elements of legacy forest structure similar to old-growth forest. The key features of old-growth forest were derived from scientific literature (C. Iverson, USFS, personal communication, 2006). Natural openings in old-growth forest on the Tongass average less than 2 acres (Nowacki and Kramer 1998). We believe the loss of legacy retention in harvest units between 2 and 10 acres in High Risk VCUs would increase impacts of logging on the goshawk and other old-growth dependent species in landscapes where they are already most at risk. Therefore, we recommend that the Final EIS and the Final Forest Plan retain in High-Risk VCUs, legacy forest structure in all units larger than 2 acres.

Horizontal and Vertical Structure in Harvest Units

To accomplish the objectives stated in the Proposed Forest Plan for the Legacy Standards and Guidelines, legacy forest structure needs to penetrate into created openings. Uniform distribution of retained legacy forest structure throughout a harvest unit, as required by the Goshawk and Marten standards and guidelines, is less important than attaining both vertical and horizontal diversity within the harvested area (Franklin et al. 2002). Retention of windfirm patches and clumps can effectively accomplish this, if the windfirm and patches and clumps are

distributed within, rather than around the edges of, harvest units. Since the intent of the Goshawk, Marten, and Legacy standards and guidelines is to provide horizontal and vertical structure in harvest units, we recommend that the Final EIS and the Final Forest Plan retain legacy forest structure within harvest units, rather than along the perimeter of the units.

Maximizing Unit Size for Harvest Criteria

As currently written, neither the Proposed Forest Plan nor the Draft EIS provide a scientific rationale for the criteria for defining the maximum sizes of units that can be harvested and still retain legacy forest structure, and how much legacy forest structure must be maintained. This information needs to be included in the Final EIS and the Final Forest Plan, since both the maximum size of openings allowed without retention (i.e., 10, 20, or 30 acres) and the amount of legacy forest structure to be left (i.e., 10, 20, or 30 percent) depend on the risk level (i.e., amount of harvest) within VCUs. Therefore, we recommend that criteria (based on the best available science) that define the maximum sizes of units that can be harvested and still retain legacy forest structure, and how much structure must be maintained, be included in the Final EIS and the Final Forest Plan.

Since dead and downed trees are important habitat features, we believe retained legacy forest structure needs to be protected from firewood cutting and salvage logging, even if the trees die or blow down. Therefore, we recommend that the Final EIS and the Final Forest Plan retain legacy forest structure until the surrounding stand provides mature or old-growth structure. In addition, we recommend that the Final EIS and the Final Forest Plan include a system for tracking legacy forest structure and retention.

Threatened and Endangered Species and Species of Concern

Queen Charlotte Goshawk

OGR System and Beach and Estuary Fringe Standards and Guidelines. We believe it is important to retain the OGR system and 1,000-foot Beach and Estuary Fringe Standards and Guidelines throughout the Tongass to help protect key goshawk habitats. In 1994, the FWS was petitioned to list the goshawk as endangered under the ESA. Goshawks nest and forage in mature and old-growth forests and, therefore, are sensitive to habitat loss caused by logging. The FWS found the 1979 (amended 1991) Forest Plan to be inadequate to sustain goshawks in Southeast Alaska (FWS 1995). It should be noted that the 1979 (amended 1991) Forest Plan was similar to Alternative 7 and much of Alternative 4 in the Draft EIS. Subsequently, the FWS determined the revised 1997 Forest Plan and its Tongass Conservation Strategy were adequate to sustain goshawks in Southeast Alaska, concluding that listing was not warranted (FWS 1997b). That conclusion was subsequently challenged in court; and litigation is ongoing. The FWS is currently re-evaluating the status of the goshawk and its habitat to comply with a court remand.

OGRs and other non-development Land Use Designations (LUDs), linked by beach, estuary and riparian buffers and other habitat corridors, help maintain key prey species, and provide nesting and foraging habitat. Goshawk nesting territories tend to be evenly spaced across the landscape, where habitat is suitable. We believe elimination of OGRs would likely result in loss of viable nest territories in harvested landscapes, as adjacent unharvested areas are likely to be occupied by resident pairs. OGRs also help support local prey populations, which are largely dependent

on mature and old-growth forest in Southeast Alaska. Beach fringes similarly provide important breeding habitat for goshawk prey species and foraging habitat for goshawks. Information presented at the Tongass Conservation Strategy Workshop confirmed that many species of birds preyed on by goshawks rely on both OGRs and beach buffers for nesting habitat, and that beach and estuary fringes should be at least 300 meters (1,000 feet) wide to provide adequate nesting habitat (DeSanto et al. 2006). Therefore, we recommend that the Final EIS and the Final Forest Plan adopt an alternative that (1) retains the Tongass Conservation Strategy in its entirety throughout the Tongass, since it contributed to an ESA Finding of "not warranted", and (2) offers protections at least equivalent to the 1997 Forest Plan. We further recommend retaining the OGR system and 1,000-foot Beach and Estuary Fringe Standards and Guidelines throughout the Tongass to help protect key goshawk habitats.

Nest Buffers. We believe it is important for goshawk nest buffers to be increased to 500 acres of productive old-growth to protect active and alternate nest sites and post-fledging habitat. Nest buffers protect known nests from disturbance and offer long-term protection to habitat features selected by goshawks in locations consistent with natural spacing between adjacent resident pairs. Existing Goshawk Standards and Guidelines require the retention of at least 100 acres of productive old-growth around known and suspected goshawk nests. Alternate nests are often clustered near an active nest, but may be up to several miles away. Circular nest buffers of 100 acres protected 54 percent of alternate nests used in subsequent years in 24 active territories studied on the Tongass. Alternatively, 775 acre buffers (1 km radius) would have protected 80 percent of the subsequent-year nests (Flatten and Lowell 2001; Titus et al. 2006), although the entire circular buffer would not be productive old-growth (or nesting habitat) in most cases. For this reason, although they did not specify a particular size, Flatten and Lowell (2001) recommended expanding nest buffers beyond 100 acres.

Goshawk fledglings learn to fly and hunt in the mature and old-growth forest surrounding their nest. This area is known as the post-fledging area and is important to the survival of fledglings. While the size of post-fledging areas has not been measured in Southeast Alaska, studies of goshawks elsewhere have documented post-fledging areas of approximately 500 acres (Reynolds et al. 1992, Kennedy et al. 1994, McClaren et al. 2005). The British Columbia study by McClaren et al. (2005) documented post-fledging areas for Queen Charlotte goshawks. Although the studies by Reynolds et al. (1992), and Kennedy et al. (1994) documented post fledging areas of the northern goshawk, which is the more common subspecies of goshawk, the nesting and post fledging requirements of all goshawks are similar enough to believe that the 500-acre buffer recommended for the Queen Charlotte subspecies is justified.

Currently, almost all known goshawk nests on the Tongass are located in old growth reserves or other non-development LUDs. Therefore, no goshawk nest buffers have been established to date (P. O'Conner, USFS, personal communication, 2006). As new nests are discovered during project development, monitoring programs, and/or other activities on the Tongass, OGR delineations will need be adjusted to encompass the goshawk nest and 500-acre buffer. If it is not feasible to enclose the goshawk nest and buffer within an OGR, then we recommend that a nest buffer of 500 acres of productive old growth be established around the active nest.

In summary, we believe buffers of 500 acres would protect active goshawk nests from disturbance; preserve most alternate goshawk nests; and provide suitable goshawk post-fledging habitat. Therefore, to protect active and alternate nest sites and post-fledging habitat, we

recommend that the Final EIS and the Final Forest Plan include goshawk nest buffers that are increased to 500 acres of productive old-growth.

Partial Canopy Retention. We believe it is important to retain partial canopy of legacy forest structure in all harvest units larger than 2 acres throughout the Tongass, including High-Risk VCUs. Forest legacy structure helps reduce impacts for many species, including goshawks and their prey. Because goshawks hunt primarily from perches, we believe leaving forest legacy structure in harvest units is likely to improve foraging habitat by providing perches and hiding cover. Kenward (1978, Page 458) reported that goshawks in Britain captured over 90 percent of their prey within 50 meters (164 feet) of cover, unless newly-fledged or starving prey were present, since newly-fledged or starving prey could be overtaken by goshawks on longer pursuits. Because a circular 2-acre opening has a radius of about 50 meters, larger openings are likely to have areas beyond the effective striking range of goshawks. We further believe that retention of forest legacy structure in High-Risk VCUs is likely to help reduce impacts on goshawks.

While the existing Goshawk Standards and Guidelines apply only to heavily harvested VCUs on Prince of Wales Island, the proposed Legacy Standards and Guidelines would be expanded to apply throughout the Tongass. We believe that if the proposed Legacy Standards and Guidelines require residual structure within, rather than along the perimeter, of harvested units, goshawks throughout the Tongass are likely to benefit. Therefore, we recommend that the Final EIS and the Final Forest Plan adopt partial canopy retention of legacy forest structure in all harvest units larger than 2 acres throughout the Tongass, including in High-Risk VCUs. (See the Legacy Forest Structure section for additional consideration.)

Nest Surveys. Effective management of goshawk nest sites depends on knowledge of nest locations. The Proposed Forest Plan eliminates the requirement for pre-project inventories. We recommend that the Final Forest Plan retain the requirement for pre-project (e.g., timber sale) surveys to locate goshawk nests as required under the 1997 Forest Plan (USFS 1997, Page 4-90). We further recommend that the Final Forest Plan include a requirement that the USFS adopt a goshawk inventory and monitoring program consistent with the guidance found in the USFS's recent publication on this topic (Woodbridge and Hargis 2006).

Investigation of Goshawk Biology. The Proposed Forest Plan eliminates the Goshawk Standards and Guidelines for cooperative investigation of goshawk biology. Much remains unknown about the goshawk and its responses to forest management. For example, the effects of increasing proportions of second-growth forest on survival and reproduction of both goshawks and their prey are not well understood. Despite considerable effort, we still do not have a good understanding of nesting densities or population size for goshawks throughout the Tongass. We believe these and similar unanswered questions are best investigated through cooperative, interagency research and monitoring. Therefore, we recommend that the Final Forest Plan retain the Goshawk Standards and Guidelines requirement for cooperative investigation of goshawk biology.

Alexander Archipelago Wolf

We believe it is important to retain the OGR system and 1,000-foot Beach and Estuary Fringe Standards and Guidelines throughout the Tongass to help protect key wolf habitats. The FWS

was petitioned in 1993 to list the wolf, an endemic subspecies confined to Southeast Alaska, as a threatened species under the ESA. Following adoption of the 1997 Forest Plan and Tongass Conservation Strategy, the FWS concluded that listing the wolf was not warranted (FWS 1997a), assuming full implementation of the 1997 Forest Plan.

Person (2006a) reviewed scientific information and submitted considerations concerning viability of the wolf during the 2006 Tongass Conservation Strategy Workshop. Person concluded that maintaining well distributed, viable wolf populations depends on retaining the Tongass Conservation Strategy in its entirety throughout the Tongass, including fully-functioning, well-distributed OGRs. It was also noted that even with the existing Tongass Conservation Strategy and 1997 Forest Plan, it is likely that wolf and deer populations will be lower in the future. Since OGRs and other non-development lands serve as population sources for wolves (and possibly deer), we believe that eliminating or degrading OGRs and other non-development lands would increase the likelihood that wolf populations will decline. Therefore, we recommend that the Final EIS and the Final Forest Plan retain the OGR system and the 1,000-foot Beach and Estuary Fringe Standards and Guidelines throughout the Tongass to protect key wolf habitats.

Landscape pinch points are important to wolf movement and dispersal across the landscape. The largest and most complex system of OGRs is associated with Honker Divide on Prince of Wales Island. These OGRs provide refugia in which wolves produce enough offspring to supplement areas with higher risk and less stable populations (Person et al. 1996). The Rio Roberts watershed is an important denning area and provides for dispersal through a pinch point created by timber harvest from the Honker Divide area to the southern half of Prince of Wales Island, as confirmed by ADF&G telemetry studies from 1998 to 2002 (D. Person, ADF&G, Personal Communication, 2006). Therefore, we recommend that the Final EIS and the Final Forest Plan adopt the Interagency Small OGR Work Group-recommended Small OGR for VCU 5960 (see Attachment B, Table 3) to protect the Rio Roberts watershed.

Murrelets

Kittlitz's murrelet, a candidate species for ESA listing, is found in marine waters adjacent to the northern Tongass. This species is likely to be most susceptible to increased recreation near tidal glaciers and high-elevation land activities such as mining. Therefore, we believe that proposed changes in the Proposed Forest Plan do not appear to pose a significant risk to Kittlitz's murrelets.

Since 1993, the marbled murrelet has been listed in the Lower 48 States as threatened under the ESA. Marbled murrelet populations in Alaska have declined by about 70 percent during the past 25 years (Piatt et al. 2007). While it is unlikely that the decline is attributable to timber harvest alone, we believe that maintaining old-growth habitat for nesting is essential to the persistence of the species. When fully implemented, we believe the existing Tongass Conservation Strategy should provide adequate nesting habitat for the marbled murrelet, while the factors that are leading to the population decline are identified and addressed, where possible. Therefore, in order to continue providing marbled murrelet nesting habitat, we recommend that the Final EIS and the Final Forest Plan retain the OGR system throughout the Tongass.

Subsistence

The Draft EIS states that "deer habitat capabilities in portions of the Tongass may not b adequate to sustain current/future harvest levels under any of the alternatives" (Draft EIS, Tabl 2-18, Page 2-57). Therefore, to help minimize, or prevent, restrictions on subsistence an competition with other users (including the wolf), we recommend that the USFS maximiz protection of important deer winter range, which is the primary limiting factor for dee populations (Person 2006b). To that end, we further recommend retaining the Tongas Conservation Strategy in its entirety throughout the Tongass, including OGRs and the 1,000-foo beach and estuary fringe.

Areas with High Wildlife Values

In 2003, the USFS revised the 1997 Forest Plan to address inventoried roadless areas (USF 2003). In reviewing this revision, FWS biologists conducted on-the-ground and/or aerial visit to each area, and then ranked the quality and importance of each area's habitat. As a result o this work, 13 inventoried roadless areas with outstanding fish and wildlife values and 2 inventoried roadless areas that contain important fish and wildlife habitats and populations wer identified (DOI 2002). We recommend that the alternative selected by the USFS in the Final EI include the 36 areas listed in Attachment C for their habitat value and their importan contribution to maintaining viable, well-distributed fish and wildlife populations throughout th Tongass.

Conservation Principles and Priorities

As in comments previously made by the U.S. Department of the Interior, (DOI 1996), w continue to support the USFS using the best available scientific information for planning an forest management activities related to the Tongass. Scientific assessments and risk assessmen panels ensured that the Tongass Conservation Strategy and 1997 Forest Plan were based on strong scientific foundation. We believe proposed changes to the Tongass Conservation Strateg and the 1997 Forest Plan need to be based on an equivalent level of science. Therefore, w recommend that the Final EIS provide the scientific rationale for any changes to the Tongas Conservation Strategy and 1997 Forest Plan as well as a comparison of the effects between th existing and proposed plan components.

Alternatives

In developing the Draft EIS for the Proposed Forest Plan, the USFS developed 7 alternatives tha are fundamentally the same as alternatives in the 1997 Final EIS (Draft EIS, Page 2-50). Th USFS adopted this approach so the panel assessments from the 1997 Final EIS may be applied t the 7 alternatives included in the Proposed Forest Plan. The panel assessments rated th likelihood that each of the alternatives would ensure viable, well-distributed populations o wildlife species throughout the Tongass. Alternatives 4 and 7 of the Draft EIS are designed to b essentially the same as Alternatives 2 and 6 in the 1997 Final EIS.

Alternatives 4 and 7

We believe the adoption of Alternative 4 or Alternative 7 would eliminate or undermine the Tongass Conservation Strategy, which, in turn, would fail to ensure that viable, well-distributed populations of goshawk, wolf, endemic mammals, and other species, would be maintained (Draft EIS, Table 2-17, Page 44). It is important to note that alternatives similar to Alternatives 4 and 7 were removed from final consideration during the 1997 Forest Plan revision process because those alternatives would not provide a "relatively high assurance that the habitat needed for long-term viability of all wildlife species would be maintained and commercial, sport and subsistence use sustained" (TLMP 1997 Record of Decision (ROD), Page 15). The Draft EIS identifies the "distribution of high quality old-growth blocks" as the key indicator of "protection of the wildlife habitat and biodiversity" across the Tongass (Draft EIS, Page 1-8), and concludes that Alternatives 4 and 7 would provide only "poor" distribution of high quality old-growth blocks across most or all of the Tongass (Draft EIS, Page 2-50). The 1997 Record of Decision stated that a "relatively low level of risk" to these resources was considered essential in order to meet stated goals of the 1997 Forest Plan, which included a biodiversity goal to "maintain healthy forest ecosystems [and] maintain a mix of habitats at different spatial scales (i.e., site, watershed, island, province and forest) capable of supporting the full range of naturally occurring flora, fauna, and ecological processes native to Southeast Alaska." (USFS 1997b, Page 2-2). The goal identified in the Proposed Forest Plan (Draft EIS, Page 2-7) has not appreciably changed over the goal included in the 1997 Forest Plan. Therefore, we recommend that in the Final EIS, Alternatives 4 and 7 be eliminated from further consideration.

Alternatives 1, 2, 3, 5, and 6

We believe Alternatives 1, 2, 3, 5, and 6 retain the Tongass Conservation Strategy in its entirety throughout the Tongass and provide reasonable assurance that viable, well-distributed wildlife populations will be maintained. For example, Alternatives 1, 2, and 3 are rated "high" to "very high" for all species except endemic mammals, which are rated as "moderate" to "high". Alternatives 5 and 6 are rated "moderately high" to "very high" for the goshawk, wolf, and brown bear, and "moderate" for endemic mammals and marten (Draft EIS, Table 2-17, Page 44). Therefore, we recommend adoption of an alternative in the Final EIS that retains the Tongass Conservation Strategy in its entirety throughout the Tongass and provides reasonable assurance that viable, well-distributed wildlife populations will be maintained.

Alternative 6

With respect to Alternative 6, the USFS proposed alternative, we note that it retains the Tongass Conservation Strategy; implements improved locations for 191 Small and 21 Medium OGRs; and retains the 1,000-foot beach buffer. However, we believe that Alternative 6 could be improved if it (1) included the Interagency Small OGR Work Group preferred biological locations for 48 additional Small OGRs; and (2) retained the existing Goshawk Standards and Guidelines. To help prevent the need to list the goshawk under the ESA, we recommend that in the Final EIS, Alternative 6 be amended to include the preferred biological locations for 48 additional Small OGRs (see Attachment B, Table 3) and to retain the existing Goshawk Standards and Guidelines.

SPECIFIC COMMENTS

Proposed Forest Plan, Page 2-51: The description of Alternative 4 needs to be corrected in the Final Forest Plan to match the ratings in Table 2-17 (Page 2-44) from which it is drawn. As currently written, the narrative incorrectly uses the ratings from Alternative 3.

Proposed Forest Plan, Page 3-5: In recognition of its high fish, wildlife, and subsistence values, we recommend that in the Final Forest Plan, the area currently designated "Young Bay Research Natural Area (RNA)" revert to the same LUD as Admiralty National Monument. The Young Bay RNA on Admiralty Island is proposed to be released and a new RNA is proposed for establishment in the Cowee Creek watershed near Juneau. As written, the Draft Forest Plan leaves the new LUD for Young Bay unspecified.

Proposed Forest Plan, Page 4-126: Forest owls, specifically western screech-owls, barred owls, and northern saw-whet owls need to be included in the Final Forest Plan in the list of nesting raptors to be surveyed in proposed management areas.

Proposed Forest Plan, Page 4-128: We believe the "Endemic Terrestrial Mammals Standards and Guidelines" need to be re-titled, in the Final Forest Plan, as "Endemic Terrestrial Wildlife Standards and Guidelines". We also believe the Endemic Terrestrial Wildlife Standards and Guidelines need to be: (1) revised to include surveys for rare and endemic mammals, birds, amphibians, and insects, which may represent populations that are unique and/or which have restricted ranges; and (2) subsequently included in the Final Forest Plan.

Draft EIS, Page 3-173: The population decline estimates and discussion for the marbled murrelet need to be updated in the Final EIS, using the recent U.S. Geological Survey status review (Piatt et al. 2007).

Draft EIS: Since Appendix N of the 1997 Forest Plan, "Additional Evaluation of Wildlife Habitat Conservation Measures," (USFS 1997a, pp. N1 - N50) provides essential background information related to the Tongass Conservation Strategy and provides an important reference for understanding the rationale for specific components of the strategy, we believe Appendix N needs to be revised to include updated information and then included in the Final EIS.

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ATTACHMENT B

Table 1.

Small OGRs that implement preferred biological locations. These OGRs fully meet Appendix K criteria and fully implement the Tongass Conservation Strategy (Small OGR Work Group Report, in prep.). (See Small Old Growth Reserves section for additional information.)

Value Comparison Units* (Total 133)

190, 240, 250, 380, 520, 550, 690, 700, 720, 730, 740, 750, 800, 810, 880, 890, 950, 960, 970, 1060, 1080, 1090, 1100, 1110, 1170, 1970, 2050, 2070, 2080, 2090, 2250, 2300, 2330, 2340, 2360, 2380, 2390, 2400, 2410, 2420, 2450, 2460, 2790, 2800, 2810, 2880, 2920, 2930, 2960, 2980, 2990, 3010, 3060, 3130, 4020, 4160, 4190, 4200, 4250, 4260, 4270, 4271, 4290, 4300, 4330, 4390, 4410, 4411, 4430, 4460, 4480, 4500, 4580, 4610, 4620, 4670, 4680, 4690, 4700, 4710, 4750, 4760, 4770, 4780, 4830, 4870, 4890, 5020, 5040, 5140, 5150, 5160, 5170, 5210, 5230, 5250, 5290, 5310, 5330, 5420, 5440, 5550, 5560, 5570, 5590, 5600, 5700, 5820, 5860, 5872, 5880, 5900, 6090, 6200, 6290, 6330, 6350, 6370, 6740, 6800, 6830, 7220, 7320, 7350, 7330, 7400, 7470, 7530, 7560, 7570, 7600, 7640, 7650

Table 2.

Small OGRs that implement acceptable (but not biologically preferred) locations to provide for development activities. These Small OGRs fully meet Appendix K criteria and implement the Tongass Conservation Strategy (Small OGR Work Group Report, in prep.). (See Small Old Growth Reserves section for additional information.)

Value Comparison Units* (Total 58)

200, 230, 510, 680, 2040, 2170, 2180, 2220, 2310, 2320, 2940, 3070, 3230, 4170, 4180, 4310, 4360, 4380, 4420, 4540, 4560, 4650, 4800, 5010, 5200, 5240, 5260, 5300, 5380, 5390, 5400, 5470, 5490, 5500, 5710, 5790, 5800, 5810, 5830, 5840, 5871, 5910, 5972, 6230, 6380, 6390, 6780, 6850, 6880, 6920, 6930, 7100, 7170, 7360, 7370, 7460, 7552, 7610

* Value Comparison Units are landscape units designated on the Tongass that generally compare to small watersheads.

Table 3.

Small OGRs that do not fully meet Appendix K criteria or fully implement the Tongass Conservation Strategy (Small OGR Work Group Report, in prep.). These Small OGRs require interagency review and analysis to determine how these Small OGRs need to be changed to ensure that each of these Small OGRs fully meet Appendix K criteria and fully implement the Tongass Conservation Strategy. (See Small Old Growth Reserves section for additional information.)

Value Comparison Units* (Total 48)

160, 410, 770, 790, 820, 830, 870, 1180, 1930, 2290, 2160, 4220, 4320, 4400, 4440, 4520, 4570, 4640, 5320, 5341, 5350, 5360, 5371, 5372, 5430, 5450, 5460, 5542, 5580, 5620, 5720, 5850, 5940, 5960, 5980, 6100, 6140, 6150, 6160, 6340, 6360, 6710, 6750, 6890, 6910, 7180, 7380, 7390

Table 4.

Proposed Medium OGR changes that appear to meet Appendix K acreage and other Appendix K criteria and appear to be in appropriate locations. It is unknown whether these Medium OGRs (as proposed) fully implement the Tongass Conservation Strategy. These Medium OGRs need interagency review and analysis: (1) to verify whether each of these Medium OGRs fully meets Appendix K criteria and fully implements the Tongass Conservation Strategy; and if not, (2) to identify changes that will ensure that Appendix K criteria are fully implemented and the Tongass Conservation Strategy is fully met for each of these Medium OGRs. Small OGR Work Group Report, in preparation). (See Medium Old Growth Reserve section for additional information.)

Value Comparison Units* (Total 21)

1960, 2230, 2240, 2430, 2440, 6120, 6130, 6210, 6220, 6240, 6700, 6720, 6770, 6790, 6810, 6820, 7190, 7230, 7430, 7440, 8642

Table 5.

Proposed Medium OGR changes that do not meet Appendix K acreage and/or other Appendix K criteria and may (or may not) be in appropriate locations. It is unknown whether these Medium OGRs (as proposed) fully implement the Tongass Conservation Strategy. These Medium OGRs need interagency review and analysis to determine how each Medium OGR needs to be changed to ensure that it fully meets Appendix K criteria and fully implements the Tongass Conservation Strategy (Small OGR Work Group Report, in preparation). (See Medium Old Growth Reserve section for additional information.)

Value Comparison Units* (Total 28)
840, 2010, 2260, 2270, 2280, 2890, 2910, 3980, 3990, 4210, 4350, 4470, 4790, 5050, 5410, 5510, 6110, 6170, 6180, 6190, 6250, 6300, 6310, 6320, 6760, 7200, 7210, 7630

ATTACHMENT C

Inventoried Roadless Areas with Special Values (DOI 2002)

Roadless Areas with Outstanding Fish and Wildlife Values (total 13)
201 Fanshaw
207 Harding
209 Anan
215 Castle
242 Camden
244 Bay of Pillars
245 East Kuiu
308 Windham-Port Houghton
311 Chichagof
328 Hoonah Sound
507 Eudora
528 Cleveland
529 North Cleveland

Roadless Areas with Important Fish and Wildlife Habitat and Populations (total 23)
204 Madan
205 Aaron
218 Woewodski
225 Kadin
233 Mosman
234 South Etolin
240 Security
243 Rocky Pass
246 South Kuiu
301 Skagway-Juneau Icefield
302 Taku-Snettisham
303 Sullivan
304 Chilkat-West Lynn Canal
306 Mansfield Peninsula
307 Greens Creek
326 North Kruzof
330 North Baranof
339 Yakutat Forelands
515 Koskiusko
519 McKenzie
530 Hyder
531 Nutkwa
577 Quartz

1001

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

April 30, 2007

Reply to
Attn Of: ETPA-088

Ref: 06-015-AFS

RECEIVED MAY - 4 2007 Nam MS

Forrest Cole, Forest Supervisor
USDA Forest Service
Alaska Region, Tongass National Forest
648 Mission Street
Ketchikan, Alaska 99901

Dear Mr. Cole:

The U.S. Environmental Protection Agency (EPA) has reviewed the **Draft Environmental Impact Statement (DEIS) and Proposed Tongass Land and Resource Management Plan (TLMP) Amendment** for the Tongass National Forest in southeast Alaska (CEQ No. 070003). Our review has been conducted in accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act. Section 309 specifically directs the EPA to review and comment in writing on the environmental impacts associated with all major federal actions. Under our Section 309 authority, our review of the DEIS will consider the expected environmental impacts, and the adequacy of the EIS in meeting procedural and public disclosure requirements of NEPA.

The 16.8 million acre Tongass National Forest is the largest forest in the National Forest System. Management of this forest is guided by the Tongass Land Use Management Plan (Forest Plan). The current Forest Plan was revised in 1997, and was intensively reviewed in 2005 (5-Year Review). Since 1997, the Forest Service (FS) has been responding to a variety of appeals and litigation on the processes that were used to create the 1997 Plan. In August 2005, the U.S. Court of Appeals for the Ninth Circuit issued a decision that found deficiencies in the process used to develop the 1997 Forest Plan revision. Specifically, the Court found inadequacies related to timber demand, the range of alternatives considered relative to timber demand and potential effects on roadless areas, and cumulative effects from activities conducted on non-National Forest System lands.

The current DEIS is intended to address these deficiencies, and to incorporate opportunities identified through the 5-Year Review into the Plan. The DEIS considers projections of timber products output and timber harvest over the next 20 years under four different timber demand scenarios (low to high). The DEIS evaluates seven alternatives that encompass all of these demand scenarios in a variety of ways, while addressing three key issues. Those key issues are identified as:

- Key Issue 1 – Protection of high value roadless areas from road development and timber harvest activity on the Tongass National Forest is of local and national importance, particularly for wildlife and biodiversity, recreation, and tourism.

- Key Issue 2 – The Tongass National Forest needs to provide a sufficient timber supply t meet the market demand and help maintain a vibrant economy in Southeast Alaska.
- Key Issue 3 – Protection of the wildlife habitat and biodiversity of the Tongass National Forest is of local and national significance and is affected by road development and timber harvest activities.

The alternatives differ principally in the amount of land designated for development (in development land use designations or LUDs), and the amount of timber harvest propose

- **Alternative 1** would place 1.2 million acres in Development LUDs, and 15.6 million acres in Non-development LUDs. The estimated suitable forest land base (harvestable land base) would be .43 million acres, and the allowable sale quantity (ASQ) would be 5 million board feet (MMBF).
- **Alternative 2** would place 2.0 million acres in Development LUDs, and 14.8 million acres in Non-development LUDs. The estimated suitable forest land base would be .54 million acres, and the ASQ would be 152 MMBF.
- **Alternative 3** would place 3.0 million acres in Development LUDs, and 13.8 million acres in Non-development LUDs. The estimated suitable forest land base would be .68 million acres, and the ASQ would be 204 MMBF.
- **Alternative 4** would place 4.7 million acres in Development LUDs, and 12 million acre in Non-development LUDs. The estimated suitable forest land base would be 1.01 million acres, and the ASQ would be 360 MMBF. In addition, Alternative 4 uses a different strategy to provide old-growth habitat.
- **Alternative 5** is the no action alternative. This alternative would maintain 3.6 million acres in Development LUDs, and 13.2 million acres in Non-development LUDs. The estimated suitable forest land base would be kept at .76 million acres, and the ASQ woul remain 267 MMBF.
- **Alternative 6** is the proposed action alternative. This alternative is similar to Alternativ 5 (3.6 million acres in Development LUDs, and 13.2 million acres in Non-development LUDs), however, it includes refinements to the boundaries of a number of small old growth reserves and other refinements. The estimated suitable forest land base would b .79 million acres, and the ASQ would be 267 MMBF.
- **Alternative 7** would place 5.1 million acres in Development LUDs, and 11.7 million acres in Non-development LUDs. The estimated suitable forest land base would be 1.15 million acres, and the ASQ would be 421 MMBF. In addition, Alternative 7 would hav the least restriction on harvest in old-growth forest. It does not include old-growth reserves or have minimum old-growth retention requirements.

The EPA appreciates the efforts of the Tongass National Forest in preparing this DEIS and i developing an innovative website and CD to help agencies and the public analyze impacts associated with the proposed alternatives. We have assigned a rating of EC-2 (Environmental Concerns – Insufficient Information) to the DEIS. This rating and a summary of our comments will be published in the Federal Register. A summary of the rating system we used in conducting our review of the DEIS can be viewed at http://www.epa.gov/compliance/nepa/ comments/ratings.html. The FS did not identify a preferred alternative, therefore we focused our review on the full suite of alternatives within th context of the three key issues identified in the document.

Based on this review, we find alternatives 1, 2 and 3 to be environmentally preferable. These alternatives provide significant protection of water quality and a connected network of aquatic and terrestrial habitats, afford extensive protection of old growth, minimize road development and associated impacts, and provide a sustainable supply of timber consistent with current and recent timber harvest levels. The conservation emphasis under these alternatives is less sensitive to agency budget levels and less dependant on active management. Our environmental concerns with Alternatives 5 and 6 primarily relate to high and moderate intensity land use designations, increased road development, and associated impacts to aquatic and terrestrial habitats and water quality. Additional information on how these impacts will be minimized and on monitoring and adaptive management strategies should be provided in the FEIS. We believe that as currently proposed, Alternatives 4 and 7 do not address key issues 1 and 3, and hence, are not viable. EPA would have serious objections to the selection of Alternative 4 or 7 as the Preferred Alternative in the Final EIS/Record of Decision.

In general, we recommend that the FS select an Alternative in the Final EIS and Record of Decision that:

- Minimizes the acreage of forest designated for Intensive or Moderate Development;
- Protects high value roadless areas for wildlife and biodiversity, recreation and tourism, thus supporting local and regional economic viability and subsistence activities;
- Accurately reflects the most recent timber industry market trends; and
- Clearly identifies monitoring plans and adaptive management strategies to be employed for the next planning cycle.

Thank you for the opportunity to comment on this draft EIS. If you would like to discuss our response further, please contact Jennifer Curtis, at (907) 271-6324 or me at (206) 553-1601.

Sincerely,

Christine Reichgott, Manager
NEPA Review Unit

Enclosure

cc: Lee Kramer, Project Manager, Tongass National Forest

EPA Region 10 Detailed Comments
Tongass Land and Resource Management Plan Amendment
Draft Environmental Impact Statement

As noted above, the FS identified three key issues to frame each of the alternatives. EPA appreciates this strategic and focused approach to the Plan amendment. We have accordingly structured our own detailed comments around the identified key issues.

Key Issue 1 - Protection of high value roadless areas from new roads and timber harvest is locally and nationally significant for wildlife and biodiversity, recreation, and tourism.

EPA agrees with the identification of high value roadless areas as a key issue, and we commend the FS for establishing this as a standard of review. The Tongass is the earth's largest, intact temperate rainforest, and contains some of the largest, intact blocks of forest in North America. Each of the 21 distinct bio-geographic provinces within the Tongass contributes to the biodiversity of the national forest system, making the Tongass rich with endemic species. The Tongass also contains nearly 5,000 salmon-supporting streams (Halupka et al. 2000). These streams provide the spawning and rearing habitat for more than 90 percent of the salmon commercially caught in southeast Alaska.

As recognized in the document, those alternatives that place emphasis on maintaining inventoried roadless areas (IRA), protecting productive old growth (POG), and limiting road construction and the amount of acreage placed in Development LUDs, pose a lower risk of direct and indirect effects to focal resources. Alternatives 1 and 2 perform well against this measure. As noted on page 2-41, none of the 21 biogeographic provinces would contain less than 50 percent of their areas in Non-development under these alternatives. Alternatives 3, 5, and 6 represent higher harvest levels and additional road building, but would retain good to very good spacing of old growth reserves and other Non-development LUDs. These alternatives are less protective than Alternatives 1 and 2 but, when taken together with site-specific analyses and interagency monitoring, continue to address Key Issue 1. Alternatives 4 and 7 would each result in five biogeographic provinces with less than 50 percent in Non-development LUDs, and do not appear to be as responsive to Key Issue 1.

We are particularly concerned about the number of roads that would be constructed under Alternatives 4 and 7. At present, there are 4,942 miles of road on the Forest. The Tongass Road Condition Survey Report (ADFG, 2000) looked at approximately 40 percent of these roads (2,153 miles). The report documents numerous instances of ditch plugging, ditch erosion, cut-slope and fill-slope erosion, road surface erosion, catch basin failure, ditch blockage, culvert inlet and outlet erosion, and other system failures. These are the very kinds of failures that resulted in the listing of Katlian River and Nakwasina River on the CWA 303(d) list for sediment and turbidity. In addition, the Road Condition Survey indicates that 66 percent of the culverts across anadromous streams (Class I streams) are assumed not to be adequate for fish passage, and eighty-five percent of the culverts across resident fish streams (Class II streams) are assumed not to be adequate for fish passage. EPA acknowledges that the FS has used the results of this report to help target restoration work, and to acquire additional road maintenance funding. We also note, however, that the 2003 Forest Level Roads Analysis for the Tongass (p. 75) indicates that deferred costs for solving all passage problems at maintenance level 3, 4, and 5 road-stream crossings could be as high as $30 million. Given current budget shortfalls and anticipated

reduction in staff, we question the ability of the FS to maintain the existing road network, address fish passage and other road-related issues (such as drainage and road stability), while at the same time undertaking to construct over 5,000 miles of new road. We recommend that the document give discussion to how the FS will meet the proposed construction, maintenance and decommissioning goals while continuing to address the deferred maintenance backlog. A recent letter from the Wrangell District Ranger, Mark Hummel, regarding the decision to select an alternative for the Wrangell District Road Analysis and Access and Travel Management Plan stated the following: "This alternative will reduce the potential for resource damage more than any other alternative by removing the most miles of risk from culvert failure, loss of fish passage, erosion, and sedimentation. The sooner the District acts to close roads it can no longer maintain, the more likely that funding is available to close them. Funding is currently anticipated for the next few years. After that, the likelihood is greatly reduced." This statement recognizes that budget shortfalls will continue into the future.

In addition, we note that many of the transportation corridors authorized under Public Law 109-59 would cross the Tongass, as would a number of power transmission lines currently proposed by the State of Alaska. Given that Transportation and Utility LUDs would be given priority over all underlying LUDs, including LUDs that do not normally allow road construction, it is critically important to fully analyze road-related cumulative impacts. We recommend that the document more fully address the cumulative impacts of existing roads, the proposed increase in roads under the various alternatives, road activity on non-NFS land, and the proposed road and energy infrastructure under Public Law 109-59.

Lastly, we note that the DEIS states that, "[p]rotection for riparian areas would be the same under all alternatives" (p. 3-40). Regardless of which alternative or combination of alternatives the FS selects, EPA recommends that the Forest Plan Amendment include the riparian standards and guidelines as shown in the Proposed Land and Resource Management Plan (p. 6-41).

Key Issue 2 – The Tongass National Forest needs to provide a sufficient timber supply to meet the market demand and help maintain a vibrant economy in Southeast Alaska.

EPA agrees with the identification of sufficient timber supply as a key issue. As noted in the document (page 3-424), the Tongass Timber Reform Act (TTRA) of 1990 states that "…the Secretary shall, to the extent consistent with providing for the multiple use and sustained yield of all renewable forest resources, seek to provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber and (2) meets the market demand for each planning cycle." Additionally, we recognize that there is a particular need in southeast Alaska for year-round, family wage employment, as well as a need to strengthen and diversify the regional economy.

The Alternatives proposed in the DEIS roughly correspond with four timber demand scenarios developed by Brackley et al. (2006): (1) Limited Timber Production (under this scenario, total derived demand is projected to be 65 MMBF in 2020); 2) Expanded Lumber Production (163 MMBF in 2020); 3) Medium Integrated Industry (204 MMBF in 2020); and 4) High Integrated Industry (325 MMBF in 2020).

The document gives discussion on page 3-441 to the ability of the various alternatives to meet these demand scenarios. In general, Alternatives 1 and 2 would be sufficient to meet

limited timber production. Alternatives 3, 5 and 6 would provide volume sufficient to meet scenarios 1 thru 3 (up to the medium integrated industry scenario). Only Alternatives 4 and 7 would provide volume sufficient to meet scenario 4 (high integrated industry). We do not disagree with the premise that sufficient "shelf volume" is needed in order for the timber economy to fully realize market demand and stimulate investment (thereby addressing key issue 2) but we do question the attainability of the highest volume scenario (scenario 4 - high integrated industry).

The model developed by Brackley et al. considers a number of drivers affecting timber demand (timber statistics, trade data, etc.), but is unable to account for other factors potentially affecting timber demand, such as competition, fuel costs, labor costs, complicated shipping logistics, litigation and Congressional action. The study in fact notes (p. 34) that changing conditions in Alaska and world markets are rapidly making the existing model and approach obsolete, and that future attempts to project demand for National Forest timber in Alaska will require new methods and additional information.

We also note that the Forest has not harvested over 50 MMBF annually since 2000, and that the wood products industry accounted for only 1 percent of total regional employment in 2004 (p. 3-413). Notably, this is under the current ASQ of 267 MMBF, which according to the study is enough to support medium integrated industry. The lack of investor response to date would seem to indicate that there are variables outside the realm of FS influence (and available ASQ) that are limiting investment into wood products in the Tongass region.

Additionally, we question some of the assumptions in the DEIS related to projected employment. Page 3-449 indicates that projected timber industry employment figures were calculated assuming a linear relationship between harvest and employment levels (a one percent change in harvest resulting in a one percent change in employment). We are concerned that not only will changes in employment will lag changes in harvest, but that given current trends in automation, there is not a direct linear relationship between harvest and employment. This could lead to an overestimation of the amount of employment generated by the higher timber output scenarios. An examination of the timber market in Oregon concluded that even if harvest levels could be maintained, increased productivity would result in a 1.2% drop in employment over a 7-year period (Conway and Wells 1994).

In summary, Alternative 1 would maintain current harvest levels. As noted by the Brackley study, this may be the "most probable outcome" (p. 32), but it also falls short of fully satisfying key issue 2. Alternatives 2, 3, 5 and 6 would provide for a timber economy that is expanded from present levels. It is likely that each of these alternatives would, to varying degrees, satisfy key issue 2. Alternatives 4 and 7 would clearly provide ASQ levels sufficient to meet any potential timber demand, but, given the noted uncertainties surrounding the timber economy in Alaska, we question the whether these sale quantities are in fact attainable.

Key Issue 3 – Protection of the wildlife habitat and biodiversity of the Tongass National Forest is of local and national significance and is affected by road development and timber harvest activities.

EPA agrees with the identification of wildlife habitat and biodiversity as a key issue. The Tongass is naturally fragmented by islands and coastal ice fields and many of the islands have

distinct climatic, floral, and faunal differences. This presents a challenge for conservation of biodiversity and highlights the need to manage for intact habitats as a priority.

Impacts to habitat and biodiversity vary under the alternatives according to the amount of road construction and timber harvest proposed. Because ecosystems in naturally fragmented landscapes are less resilient to further fragmentation, logging additional unroaded areas poses a higher risk to species existence and persistence.

Chapter 3 of the DEIS provides an excellent discussion of the effects of the alternatives on landscape connectivity and biodiversity, noting the importance of an intact Old Growth Reserve (OGR) strategy in terms of ensuring long-term habitat viability. The reduction of OGR protections under Alternative 4, and the elimination of OGR protection under alternative 7, would effectively eliminate old-growth connectivity across numerous ecological "pinch-points" (3-187) and reduce the functional connectivity of the old-growth ecosystem (3-188).

Based on the information provided, we concur that Alternatives 4 and 7 could have a low likelihood of maintaining viable, well-distributed populations (3-186), and that Alternative 7, in particular, would result in the greatest loss of biodiversity among the alternatives (3-143). Based on the analysis, it seems clear that Alternatives 1 and 2 would result in good distribution of high quality old-growth over the long term, Alternatives 3, 5 and 6 would likewise continue to provide good habitat distribution, though to a lesser degree (affecting one ecological "pinch-point") and Alternatives 4 and 7 do not meet key issue 3.

In addition to old-growth as a habitat component, we are concerned about affects to wetland structure and function due to timber harvest and road construction. As noted on page 3-47, wetlands provide important physical, biological, and chemical functions that contribute to the overall functioning within a watershed and landscape. These functions are particularly critical to maintaining stream health. Page 3-45 indicates that 22 percent of existing road miles are in wetland areas. New road miles under the various alternatives range from 434 miles under alternative 1 to 2,043 under Alternative 7. As noted above, road impacts have resulted in the listing of two Tongass streams on the state 303(d) list. We are concerned that opening new wetland areas to road construction and harvest could increase sediment yield to streams within the Tongass and, subsequently, add more miles of streams to the 303(d) list. Site specific analysis and the TLMP riparian conservation strategy will help to mitigate some of these impacts, but as the FS has recognized, road construction can have significant unavoidable adverse impacts to water quality, regardless of how well the roads are designed constructed or maintained (USFS, 2001). Given the potential adverse effects of roads on aquatic life, we feel that in order to be consistent with key issue 3, the FS should pursue an alternative that minimizes road construction, particularly in wetland areas.

EPA Recommendation for a Preferred Alternative

Alternatives 1, 2, and 3 place the most emphasis on maintaining inventoried roadless areas (IRA), protecting productive old growth (POG), and limiting road construction and the amount of acreage placed in Development LUDs. These alternatives are environmentally preferable from a water quality, habitat, and roadless value perspective. Alternatives 5 and 6 are more responsive to key issue 2, and seek to strike a balance on habitat and roadless values, but result in significantly greater impacts. Given site-specific analysis and interagency monitoring, it is likely

that Alternatives 5 and 6, together with the robust TLMP aquatic and riparian strategy, would continue to address key issues 1 and 3. Alternatives 4 and 7 appear designed to respond principally to key issue 2, and in fact go beyond the ASQ deemed necessary for a highly integrated industry. We are concerned not only with the assumptions driving this high ASQ, but also with the lack of responsiveness these alternatives demonstrate to key issues 1 and 3.

Regardless of which alternative is selected in the Final EIS and Record of Decision, we cannot stress enough the importance of continuing to engage Federal and non-Federal partners in the monitoring and assessment of the Land Management Plan (including POG designation). The Forest's use of the 1984 planning rule to pursue this amendment is testament to the Forest's commitment to broad collaboration. We commend you for making this a priority, and encourage you to maintain that focus as the plan moves once again into implementation. Specifically we request that the Interagency Monitoring Group be engaged in the 5-Year Review process, in addition to the involvement it has in the annual assessment report.

Comments Specific to the Tongass National Forest, Proposed Land and Resource Management Plan with EIS Appendices, January, 2007

Page 4-92 to 4-93, Watershed Resources Improvements: S&W2, I. Soil and Water Quality Protection and Improvement

Past road building and timber harvest activities, in combination with extensive harvest on adjacent private lands, have negatively impacted water quality and watershed health. This is particularly true for those biogeographic provinces with a history of intensive timber harvest (such as Kupreanof-Mitkof islands). Watershed restoration should be a major focus of the Forest Plan for these areas in order to ensure that they do not lose their ecological integrity.

The Soil and Water standards and guidelines talk of the need to "improve" these areas. This terminology does not adequately convey the current impaired status of these watersheds. Furthermore, when speaking of water quality protection, the wording in the Plan should be consistent with wording in the Clean Water Act. That Act mandates *restoring* and *maintaining* the chemical, physical and biological integrity of the nation's waters. We recommend amending S&W2 to remove the words "improve" or "improvement" and insert the words "restore" or "restoration."

Page G-2, Appendix G – Log Transfer Facility Guidelines, S7. Siting Guidelines

Impacts of Log Transfer Facilities (LTFs) typically include: 1) disruption of biota during log transfer and storage; 2) leaching of soluble materials that may be toxic; and 3) loss of bark and resultant effects on the benthos (Jackson, 1986). In order to avoid cumulative effects on sensitive marine environments, an examination of past and current LTF impacts should be made prior to siting. We recommend that the Siting Guidelines require a cumulative impact assessment prior to siting that references the following parameters: 1) measurements of bark and organic accumulation; 2) measurements of the concentration of organic log leachates, biological oxygen demand, dissolved oxygen, and hydrogen sulfides; and 3) a comparative survey of the kinds and relative abundances of benthic organisms.

Page 4-20, Invasive Species Protection

Invasive species can aggressively spread into areas altered by road construction and harvest activities. Nationally, as well as in Alaska, the establishment of invasive nuisance species has rapidly become an issue of extreme environmental and economic significance. EPA commends the FS for incorporating invasive species standards and guidelines into the Plan. We recommend that the new section be expanded upon to include discussion of Integrated Pest Management (IPM). EPA promotes IPM because it represents a prudent approach to understanding and dealing with environmental concerns. IPM promotes a thoughtful awareness of the pest management inherent in natural systems through an understanding of pest life cycles and through the use of beneficial organisms, cultural modifications, physical barriers and other mechanical controls. It does not rule out the use of pesticides, but requires that their use be thoughtfully considered.

We also recommend that the Invasive Species section discuss compliance with Executive Order (EO 13112) on invasive species. This Order emphasizes the need to address invasive species in the context of NEPA, and mentions six key categories of issues federal agencies should consider. Specifically, the Order states: "Each Federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law:

> (1) <u>identify</u> such actions. [and]
>
> (2) use relevant authorities to: (i) <u>prevent</u> the introduction of invasive species, (ii) <u>detect and respond rapidly</u> to and <u>control</u> populations of such species..., (iii) <u>monitor</u> invasive species populations reliably and accurately, (iv) provide for <u>restoration</u> of native species and habitat conditions in ecosystems that have been invaded; (v) <u>conduct research</u> on invasive species and develop the technologies to prevent introduction and provide for environmentally sound control of invasive species and (vi) <u>promote public education</u> on invasive species..., and
>
> (3) not <u>authorize, fund or carry out actions</u> that it believes are likely to <u>cause or promote</u> the spread of invasive species in the U.S. or elsewhere unless...benefits of such actions clearly outweigh the potential harm caused....".

Page 6-3, Monitoring and Evaluation

EPA continues to view the Monitoring and Evaluation Plan in Chapter 6 as a critically important element of the proposed Plan, especially with the FS's application of an adaptive management strategy to forest planning activities on the Tongass. An interagency monitoring and evaluation program designed to provide the necessary feedback on the successes (and failures) of management practices specified in the Plan and implemented on-the-ground is the cornerstone of a successful adaptive management strategy. EPA's support of the current Plan continues to be predicated on the full implementation of a successful interagency monitoring and evaluation program. In light of budget shortfalls, we are encouraged that the FS is continuing to place a high level of emphasis on monitoring in the Plan. We ask that you continue to work in close collaboration with other Federal and non-Federal partners as you move forward with this program.

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April 27, 2007

Mr. Forrest Cole
Forest Supervisor
Tongass National Forest
Federal Building
648 Mission Street
Ketchikan, AK 99901-6591

Re: State of Alaska Comments on the Tongass Land and Resource Management Plan Amendment and Draft Environmental Impact Statement

Dear Mr. Cole:

The State of Alaska (State) appreciates the opportunity to work with the USDA Forest Service (USFS) as a Cooperating Agency under the 2006 Memorandum of Understanding to amend the Tongass Land and Resource Management Plan (TLMP). A Management Plan that will minimize legal challenges and stabilize the supply of resources to the economic enterprises of Southeast Alaska is essential to the well-being of the entire region. Our comments describe our goals and principles for the plan amendment and Draft Environmental Impact Statement (DEIS). These comments focus on timber management in the context of wildlife conservation. Overall, we seek to balance protection of fish and wildlife resources, recreation and tourism activities, and development of timber and minerals within the Tongass National Forest (TNF). This letter summarizes our general comments, with more detailed information in the following pages and appendices.

I understand that this plan amendment is primarily in response to timber issues, and our comments are accordingly focused. However, I must emphasize that the State of Alaska acknowledges that the Tongass National Forest has many other uses and benefits to the local residents, the State of Alaska, and the Nation. However we decide to manage the timber resources of the TNF, we must always consider these non-timber uses in our decision making.

Timber industry. The State of Alaska supports a sustainable timber industry in Southeast Alaska as part of a diversified regional economy. A sustainable timber industry is one which operates efficiently and supports reinvestment in capital infrastructure. Sufficient timber must be available from federal land to allow the

existing industry to operate efficiently and sustainably. This will require annual timber sales of at least 167.5 million board feet of economically feasible timber (see Appendix A). Historically, the volume of economically feasible timber offered has been significantly different than the gross Allowable Sale Quantity (ASQ) figure. The focus should be on the volume of economically feasible timber offered, not the ASQ. More detailed comments on this topic follow in the section on specific issues (see page one of our detailed comments).

Transitioning to a sustainable industry supported by second-growth timber is a key objective. However, given current timber stand ages, fully transitioning to second-growth harvests will take at least 50 years. Reaching this goal will require considerable investment, and intensive management of second-growth stands. We are committed to working with the USFS, the timber industry, and the full range of interests in Southeast Alaska to develop a strategy for this transition.

In the interim, it is critical that the USFS provide a sufficient, predictable supply of old-growth timber that sustains the existing industry and has the flexibility to incrementally increase timber supply as the industry expands. This will best be achieved by concentrating timber harvest in areas that are intensively managed. This will reduce the area affected by harvesting, improve timber sale economics, and increase the undisturbed area for wildlife, recreation, subsistence, and other uses. Within intensively managed harvest areas, it is appropriate to relax some Standards & Guidelines (S&Gs), in exchange for more stringent S&Gs in other areas.

Conservation Strategy. The timber goals must be balanced with a sound, science-based, conservation strategy. Conservation values and economic values are not mutually exclusive – both are needed for a healthy economy and a healthy environment. Regardless of land status, the State is obligated to manage all renewable resources on a sustainable basis, including habitat for fish and wildlife, public access, and wilderness values.

These resources should be managed on the basis of the most recent, credible, scientific studies available, including information compiled by the 2006 Conservation Strategy Review. We request that the USFS complete a synthesis of key findings from the review so that the information can be used to identify and address proposed or anticipated modifications to the S&Gs. To the extent possible, implementation of conservation measures should be flexible enough to enable tailoring them to site-specific conditions and facilitate design of economically feasible timber sales. Measures may vary from area to area to reflect different species concentrations and sensitivities, and to concentrate timber harvesting in intensively managed areas rather than

dispersing harvesting throughout the forest. Intensive timber management which minimizes the areas affected by harvesting will have the least impact on conservation values and the best chance of broad public support.

The system of small, medium, and large old-growth reserves (OGRs), along with beach and riparian buffers, must remain the cornerstone of the wildlife conservation strategy. The system of buffers and reserves provides a safety net for the conservation of viable fish and wildlife populations. Combined with the other protected areas in Southeast Alaska (e.g., wilderness areas) and prudent management of the lands where timber harvest is allowed (matrix lands), the overall strategy provides habitats sufficient for providing sustainable and usable fish and wildlife populations.

Tongass Futures Roundtable. We strongly support the efforts of the Tongass Futures Roundtable (TFR) to find common ground among the many entities with deep interest in the Tongass National Forest. The TFR is striving to build consensus on a plan to convert to an industry based on second-growth and to identify areas where more intensive timber management can occur with minimal impacts on fish and wildlife conservation. We are committed to active participation in these efforts. We believe that building consensus offers the best chance to alter the pattern of litigation over Tongass management. The TLMP amendment must retain flexibility to implement consensus recommendations developed by the TFR, without compromising adoption of the amended plan this fall.

Implementation Strategy

The State recommends that the USFS employ a phased strategy to implement the plan quickly, stabilize timber supply, protect fish and wildlife resources, and provide time for the TFR to develop consensus recommendations. Throughout implementation of this strategy, we also support development of other commercial and personal uses of the forest such as recreation, tourism, subsistence, commercial fishing, and mining. The following outline describes this strategy.

Phase 1 – Short-term – Support the existing timber industry and continue to apply the existing Conservation Strategy.

- Offer at least 167.5 million board feet of economically feasible timber annually to support the existing timber industry at an efficient level and allow for a facility that can utilize low value timber. Focus harvests on roaded areas. Limit incursions into unroaded areas to the level necessary to provide economically feasible timber during the transition to a second-growth industry. Due to the young age of most existing

stands, timber harvest would continue to be predominantly old-growth in this phase. Monitor timber demand and encourage local, value-added timber uses.
- Maintain the existing Conservation Strategy, including the old-growth reserve system, beach and riparian buffers, and Standards and Guidelines. Monitor the effectiveness of the Strategy.
- Continue TFR efforts to plan for conversion to a timber industry based on second-growth, identify areas for intensive timber management and flexible implementation of S&Gs, and assess opportunities for flexible implementation of the S&Gs that would improve operability for timber harvesting without compromising fish and wildlife conservation.
- Prepare for the conversion to second-growth harvesting by:
    - Developing a coalition to work with Congress to revise the National Forest Management Act (NFMA) requirement for use of Culmination of Mean Annual Increment to determine rotation age. The NFMA should be revised to allow shorter rotations for second-growth;
    - Considering appropriate means to reduce the rotation age for second growth stands through intensive management; and
    - Working with recreation, tourism, timber, and conservation interests to review portions of Modified Landscape and Scenic Viewshed LUDs that are outside areas protected under the Conservation Strategy, for potential inclusion in Timber Production LUDs.

Phase 2 – Mid-term – Expand timber harvest based on industry growth, demand, and demonstrated success of the Conservation Strategy with a goal of developing an integrated timber industry.

- Review results of monitoring on timber demand and conservation effectiveness.
- Update the Conservation Strategy based on consideration of research (including the 2006 Conservation Strategy Review), monitoring results, and TFR recommendations on flexible implementation of S&Gs in intensively managed areas.
- As the timber industry grows and demand increases, increase the volume of economically feasible timber offered for sale.
    - Most harvests would continue to be old-growth due to the young age of most second-growth stands; harvests would include second-growth where suitable stands exist.
    - Concentrate timber harvests in intensive management areas and incorporate TFR recommendations on the location of these areas.

Phase 3 – Long-term – Convert to a timber industry focused on second-growth harvests.

- Offer economically feasible timber sales in second-growth based on demand. Given the distribution of stand ages in the forest, full conversion to a second-growth

harvesting will not be feasible until at least 2057. Intensively manage second-growth to maximize the available timber volume and minimize the area needed to support the timber industry. If intensively managed, we expect second-growth stands to produce a greater volume of timber per acre and provide more flexibility in management.

- Review the Conservation Strategy and modify it as necessary to tailor it to conditions of second-growth harvesting, address slash management, and incorporate restoration activities. The review should include information developed in the Tongass-Wide Young Growth Study (TWYGS) and other research.

Under all three phases,

- Continue restoration management work, including commercial thinning in second-growth, stream habitat restoration, road removal and fish passage improvements.
- Support development of other economic activities that utilize the forest for recreation, tourism, mining, commercial fishing, and subsistence activities at a variety of scales and from commercial to personal in scope.

ANILCA AND FEDERAL LAND MANAGEMENT ISSUES

The proposed plan amendment is inconsistent with several provisions of the Alaska National Interest Lands Conservation Act (ANILCA) and other federal-state laws and policies. In particular, there are issues with restriction of off-highway vehicle use for subsistence activities, application of required zoning for public recreation and encounter rates to limit public uses on Forest Service lands, and allowance for fish and wildlife management activities and facilities in Wild and Scenic River Corridors, Research Natural Areas, and Experimental Forests. We request that the Final EIS and plan amendment be consistent with ANILCA and other federal-state agreements on these issues.

The State of Alaska supports completion of Alaska Natives Claims Settlement Act (ANCSA) land conveyances for Sealaska Corporation. The lands to be conveyed to Sealaska must be of a nature and character to fulfill the promise of ANCSA. This can only be achieved by the conveyance of lands suitable to meet Alaska Native cultural, traditional, and economic needs.

AGENCY STATUS AND PLAN IMPLEMENTATION

The State urges the USFS to implement the TLMP amendment in a timely fashion. While the recent legal settlement allows Tongass timber to make it into the "pipeline" and provides short-term relief to the timber industry, final plan approval

and implementation is critical to the industry and economy of Southeast Alaska. Until the timber supply is stabilized, there is no assurance that the industry can survive.

Under the 2006 MOU between the State and USFS, the State is a cooperating agency for TLMP amendments and revisions through 2013. We are committed to working with you throughout the remaining process. We strongly believe that an interagency effort that includes expertise in timber management, economics, and fish and wildlife science and management has the greatest chance of success.

In addition to the overview of our goals and policies above, specific comments on the DEIS and Proposed Amendment follow.

We look forward to working with you during the completion of the TLMP amendment process and implementation of the plan. I am confident that our collective efforts will result in a viable and widely supported plan amendment.

Sincerely,

Sarah Palin
Governor

Enclosure

cc: The Honorable Ted Stevens, U.S. Senator
The Honorable Lisa Murkowski, U.S. Senator
The Honorable Donald E. Young, U.S. Congressman
Dennis Bschor, USDA Forest Service, Region 10
John Katz, Office of the Governor
Larry Hartig, Commissioner, Department of Environmental Conservation
Tom Irwin, Commissioner, Department of Natural Resources
Denby Lloyd, Commissioner, Department of Fish and Game
Emil Notti, Commissioner, Department of Commerce, Community, and Economic Development
Erin Dovichin, Tongass Futures Roundtable

DETAILED COMMENTS

Timber Issues

Timber Sale Thresholds. In this document, the State refers to three harvest levels that represent different thresholds for the timber industry.

- First, a volume of 83.5 million board feet (MMBF) is the bare minimum needed to keep existing Southeast Alaska mills in operation over the next one to two years while the supply of timber from the Tongass National Forest is increased. With this amount of timber, the existing mills could operate only a single shift daily and could not stay in business long-term.
- Second, 167.5 MMBF are needed to 1) allow the existing mills to operate two shifts daily, and 2) provide 30 MMBF per year for development of a new facility that utilizes low-value timber. This level of volume is necessary for efficient mill operation over the longer term, and for development of an integrated timber industry. This is the level of sales that must be achieved to support a sustainable timber industry in Southeast Alaska.
- Lastly, 231.7 MMBF would be required for the existing mills to operate at full capacity (three shifts daily) while still providing 30 MMBF for a facility to utilize low-value timber.

These volumes refer to the volume of economically feasible timber that is required annually, not the Allowable Sale Quantity (ASQ). See the section on Timber Sales and ASQ on page 8 for a more detailed discussion of this topic.

Timber volume. A stable, moderate-sized, integrated timber industry is an important component of a vibrant economy in Southeast Alaska, and is a feasible objective. To make this a reality, TLMP must provide a sufficient, stable supply of timber from the Tongass National Forest. Timber industry survival depends on a sufficient supply of economically feasible timber. This requires that at least 167.5 million board feet be offered annually, and that all timber sales be economically feasible for the purchasers. Economic considerations and expertise in timber harvesting must be included from the very beginning of timber sale design.

Timber supply and demand. The new analysis of the demand for Tongass timber prepared by Brackley et al. (2006), and released by the Pacific Northwest Research Station (PNW) is a significant improvement over the demand analysis prepared by Brooks and Haynes (1997), which was used in the 1996 Supplement to the DEIS and the 1997 Record of Decision. Specifically, Brackley et al. (2006) includes results from other analyses since 1996, describing the potential markets for Tongass timber if sufficient supply is made available (*e.g.*, McDowell 1999 and McDowell 2004). We disagree, however, with some of the assumptions that were made in the timber demand study by Brackley et al. (2006), and note that it did not consider several important factors affecting timber sale purchases.

First, the study failed to acknowledge the influence of timber supply on timber demand. Until a few years ago, the Southeast Alaska timber industry was set up to process all of the components of a timber sale, with the possible exception of some of the utility volume. Utility logs are

defined as cull logs with 50% chip volume. Low value and small diameter logs were being processed by Viking Lumber and Pacific Log and Lumber. Both mills also chipped the better quality utility logs for sale to the Pacific Northwest. They were also ready to provide the Ketchikan veneer mill with veneer quality logs. Shake and shingle mills were operating on Prince of Wales Island. The reason this partially integrated industry did not persist was the lack of a sufficient, long term supply of economic timber. Without a reasonable assurance of sufficient supply, the veneer mill could not continue to operate, forcing the existing mills to process this volume. The lack of a consistent supply also affected the existing mills' ability to fill the market requests for their products. The supply of timber was not enough to meet the market demands, and the mills lost part of their market share. At reduced production levels, the mills' costs per unit increased. Current mills are operating at just a third of their capacity or less. At this level of production, they must focus solely on high quality logs. If the existing mills (including the veneer mill) had a sufficient supply of timber to operate at full capacity, we would expect to have an integrated industry. Supply greatly affects the level of demand!

Second, high logging costs that result from poorly designed sales also affect the mills' ability to process all of the volume from the timber sales. Higher logging costs increase the delivered cost of logs to the mills, negating the mills' ability to process low quality and small diameter logs. Reducing the logging costs by providing economic sales would allow the mills to process all the volume from these sales, as they did in the past.

The quality of the timber in the timber sales is the third factor. Areas of non-merchantable timber should be excluded from timber sales. Tongass timber sales contain more and more non-merchantable timber. This strongly affects the economic viability of the sale and forces the purchaser to deal with unusable volume.

Finally, re-establishing an integrated timber industry in Southeast Alaska will require a means to fully utilize lower grades of logs. When the pulp mills ceased operation, there was no longer a market for low grade logs. This contributed substantially to the problem of uneconomic timber offerings in the Tongass. Efforts made by the USFS to address this problem in the short term have included offering some sales with the option of leaving utility volume in the woods, and granting more export permits for low grade hemlock. These measures have not been entirely satisfactory in addressing harvest economics, and the challenge of finding an economically viable means of utilizing the low grade timber remains. The timber industry should be given an opportunity to redevelop itself so that the full range of Tongass timber resources can be utilized and processed efficiently in the mid-term and long-term scenarios. The USFS should continue to support efforts to identify new products and markets for low-grade timber, and ensure that the Plan allows a harvest level that can support new operations that can use low-grade timber.

Timber Sale Design. As noted above, the timber sale planning process often fails to adequately incorporate timber sale economics into sale design decisions. Many proposed sales are not economically feasible, which defeats the purpose of the sale and wastes agency resources. Sales must be designed so that they still include sufficient economically feasible timber after meeting the requirements of the Conservation Strategy.

We request that the plan amendment and DEIS recognize that providing economically viable timber is the primary consideration for timber sale design within the sale boundary. Timber sales can be designed within the constraints of the existing Conservation Strategy, but only if economic feasibility is the clear goal throughout the design process. Except for site-specific concerns about endemic species of fish and wildlife[1], conservation requirements beyond those required by the Conservation Strategy should not be instituted for individual sales during the sale design process. A standard requiring economic timber sale design should be included in the section on Standards and Guidelines.

We also request that the USFS include personnel with experience and expertise in timber economics in all stages of the timber sale design process. The process should include people with a thorough knowledge of timber value, road construction and harvest costs, harvest methods, and access construction in Southeast Alaska. We look forward to working with you to accomplish this through the Economic Timber MOU between the State and the Tongass National Forest.

Timber sales and ASQ. Timber offered for sale must be economically feasible to have any value to the timber industry. Several factors result in a significant falldown between the ASQ set for the Tongass and the amount of economically feasible timber that is purchased and processed locally. Factors contributing to falldown include:

- In the sale design process, standards and guidelines established to protect non-timber values decreases the amount of timber available for harvest in a unit. This increases the cost of road access and the cost of harvesting the timber.
  - The Interdisciplinary Team (IDT) process used to design timber sales often fails to adequately incorporate timber sale economics into design decisions for individual harvest units and for total sales. Many proposed sales are not economically feasible, and are pulled from offerings prior to sale or are not purchased when offered.
    - Timber sales that are economically feasible are commonly subject to court challenges that delay or eliminate the sale.
      - Export is allowed on up to 50% of the timber in USFS sales. This improves the sale economics but decreases the volume that goes to support local mills.

As a result, the current timber supply to support local mills is actually far smaller than the ASQ volume. Based on work prepared for the bridge timber committee of the Tongass Futures Roundtable[2], 167.5 MMBF per year is required for the existing mills to operate efficiently (i.e., at two shifts per day) and allow for a facility to use low-value wood (see Appendix A). The existing mills need this volume to stay in business. Operating at full three-shift capacity would require 237.1 MMBF (see Appendix A).

[1] Endemic species are those that are prevalent in or peculiar to particular isolated localities.

[2] It should be noted that the TFR never adopted the bridge timber committee report. This work was done at the committee level and presented at a work session in Juneau on July 12-13, 2006. Some TFR members do not agree with the report's finding concerning mill capacity, which is a controversial subject. The mention of the TFR is not meant to imply an endorsement of this statement, but rather cites the source for where the work was accomplished.

Timber supply timing. If the amendment and implementation of TLMP fails to promptly provide sufficient economically feasible timber, the remaining family-owned companies that depend on Tongass timber will go out of business in the next few years. Even if the plan amendment is adopted and implemented quickly, there will be a lag between the current situation and a significant increase in timber sales. The federal timber pipeline is constricted at the top and has a weak outflow that may produce less then 25 MMBF of timber for purchase in the next year. At least 83.5 MMBF is needed to run a single shift at the existing mills – this volume could keep the mills in operation temporarily while timber flow increases, but it is not sufficient to support long-term operations (see Appendix A).

The year 2010-2011 is a crux year for timber supply. The old timber pipeline is not producing sufficient economic volume, a new pipeline under the TLMP amendment will not be flowing, and state bridge timber efforts will be nearing completion. Over the past three years the state stepped up its timber sale program in Southeast Alaska to supply some critically needed volume to the industry. However, this effort can continue for only 1-2 more years before reaching the cap on what the state can offer within its sustained yield capability of 12.8 MMBF per year. Federal timber sale volume for 2009 and 2010 is primarily in roadless areas where timber sales have been subject to litigation from the environmental community. Based on the USFS sale projections for the next five years, there is only enough volume in the pipeline to supply timber for Alternatives 1, 2, and 3, and that is only possible if there are no roadless issues. If appeals and litigation over roadless areas impede the timber sale process, there will only be enough volume for Alternative 1. The roadless issue must be resolved promptly to provide enough volume to keep the mills open even to 2010.

The state requests that the USFS promptly adopt and implement the TLMP amendment, and continue efforts with the TFR to find innovative and collaborative ways to keep timber volume flowing to the mills while a long-term management solution is crafted.

Second-growth and old-growth. The State strongly supports efforts to convert the current industry from old-growth timber to second-growth timber. However, it will take at least 50 years to reach the point where sufficient second-growth volume could be available to fully support the local industry. Continued harvest of old-growth timber will be necessary during the conversion period and may need to continue on a limited basis after that to provide sufficient economically feasible timber to meet demand.

Based on USFS studies on second-growth stands, the rotation age for second-growth stands should be at 90 years, not 160 years. Maintaining a 160-year rotation on second-growth stands will produce only enough volume for Alternative 1.

Converting the industry to second-growth manufacturing should result in intensive management and harvest of these second-growth stands. Changing just the rotation age will only provide enough volume for Alternatives 1, 2, and 3. Providing additional volume may require relaxation of current Standards and Guidelines (S&Gs) within second-growth areas. Some of the S&Gs established to protect wildlife in old-growth harvest areas do not reflect second-growth conditions, and may need to be applied differently in those areas. For example, we recommend allowing selective second-growth harvesting in the portion of beach and estuarine buffers that is

more that 500' from the water, as well as within the portion of second growth riparian buffers that is more than 100' from rivers or streams. We anticipate this requiring project level review to define appropriate amounts and layouts for such harvests. Other guidelines that should be reviewed for possible revision in intensively managed second-growth areas include the S&Gs for marten and goshawks.

We recommend that the USFS emphasize pre-commercial thinning in second-growth stands that are available for harvest. The goal of the pre-commercial thinning is to shorten the rotation age from 160 years to 90 years, which will greatly increase the second-growth volume that is available for harvest. Pre-commercial thinning also creates openings in dense second-growth stands which have short-term benefits for wildlife. By contrast, commercial thinning is aimed at producing large, high quality logs. Mills designed to process second-growth are not likely to be able to handle large (>32" DBH) logs.

Conversion to a second-growth industry will be expensive. Existing mills must be replaced with new mills capable of efficiently processing smaller trees, and second-growth stands must be managed more intensively than old-growth stands. A second-growth industry uses mechanized harvesting equipment and manufacturing equipment specifically designed for smaller logs. After businesses convert to the new equipment, their ability to harvest and manufacture large logs will be severely limited. Sufficient second-growth volume must be provided to justify the capital investment. Much of the initial supply of second-growth is on outer islands where handling and transportation of small timber will be costly. Log transfer facilities (LTFs) will have to be secured and roads maintained to facilitate harvesting in second-growth areas. Finally, to be profitable, second-growth mills will have to process a larger volume of timber than existing mills, to offset the increased costs of handling more, smaller pieces of wood to produce a given volume. On the positive side, intensively managed second-growth stands should produce more volume per acre than typical old-growth stands.

Concentrated vs. dispersed timber harvest areas. Concentrating timber harvesting may benefit both the timber industry and wildlife conservation, and is an approach suggested previously by the State. Allowing more intensive harvest of timber within certain areas -- especially in areas that are already roaded -- may reduce the need for roads into new areas. Reducing the footprint of logging on the landscape would likely reduce the cost of logging operations and decrease the area affected by new timber harvesting. Human access, ATV use, hunting, trapping, and fishing typically increase along new roads, even if they are closed to vehicular use after logging. Potential benefits could accrue to wildlife if concentrating harvest areas allows conservation of more high-value old-growth. Timber management strategies that minimize road development are generally better for certain wildlife species and should be considered whenever possible. Roads pose one of the greatest risks to fish habitat on the Tongass, and minimizing road development often benefits fish as well.

Existing S&Gs apply throughout the Tongass. S&Gs contribute to the high cost of harvesting timber in the Tongass and reduce the available timber. The plan should strive to identify areas where harvesting would have relatively low impacts on other resources and focus harvesting on these areas. Within these areas, timber should be managed intensively to improve economic feasibility and timber volume output. The goal for these areas would be continued second-

growth production and harvest rather than a return to old-growth conditions. Concentrating harvest areas to reduce impacts may require conscious tradeoffs in the application of S&Gs between intensively harvested areas and other more sensitive lands. In intensively managed areas, S&Gs might be loosened in exchange for applying more stringent requirements in other areas.

This approach assumes that more impacts occur to wildlife if logging activity is dispersed. This assumption should be tested through studies to confirm whether it is correct and assess the benefits and impacts of concentrating harvests in intensively managed areas.

Fish and Wildlife Issues

Best available data. Use the best available information for evaluating impacts to fish and wildlife and establishing the Conservation Strategy. At a minimum, the amendment should include a synthesis of key findings from the 2006 Conservation Strategy Review workshop, incorporate the findings into the Final EIS where possible, and identify when and how other study results will be addressed subsequent to adoption of the amendment. Appendix C of our comments includes a summary of new information from the workshop that is relevant to the Conservation Strategy. This includes information presented by State staff on specific species (e.g., goshawks, forest birds, wolves, deer, marbled murrelets, and brown bears). Appendix D of our comments includes a list of associated references and cited literature.

Sustainability. The Plan protects habitats capable of providing for viable, well-distributed populations of fish, wildlife, and other resources, but also recognizes a need to provide for a variety of uses, including subsistence harvests, big-game guiding, fishing charters, and wildlife viewing programs. The standard for fish and wildlife population levels should be based on sustainability rather than viability. A sustainable population provides for both human use and biological survival; viability only guarantees survival in the absence of human use. A standard of sustainability is consistent with the State of Alaska's constitution.

Conservation Strategy

Old-growth reserves. The system of small, medium, and large old-growth reserves (OGRs) is, and must remain, the cornerstone of the wildlife conservation strategy. The reserve system provides a safety net for the conservation of habitat for minimum viable populations. It was not designed to ensure habitats necessary to provide for the sustained yield use of key fish and wildlife populations in the locations where the public has a history of subsistence or recreational harvest. For the reserve system to ensure sustainable populations of wildlife, it must include plant communities whose structure and composition are representative of the forest types. Reserves should be established in proportion to their occurrence and abundance across the Forest before widespread logging. The reserves also need connectivity to allow for animal movements. Finally, they must be well-distributed across biogeographic provinces and larger islands, as well as across the range of elevations and aspects. Failure to adhere to these design principles will jeopardize sustained yield and increase risks of extirpation for some wildlife species on the forest. Insights on this are offered by Cushman et al. (2006; see Appendix D).

Some of the timber management options under consideration in this plan revision would require modifications or reductions to the existing OGR system. While the state recommends assessing possible flexibilities within the Conservation Strategy, any relaxation of existing requirements must not unduly compromise the conservation of fish and wildlife habitats. Changes that reduce the OGR system will increase the risks associated with maintaining viable populations of some wildlife species and eventually could lead to consideration of listing species, subspecies, stocks, or endemic populations under the Endangered Species Act. Recent wildlife surveys have shown significant levels of mammalian endemism on some islands within the forest. In these isolated areas, current reserves may not be adequate to maintain an acceptable level of risk for population viability. We encourage the USFS to work with other agencies to assess such risks and consider alternative conservation measures.

Small OGRs: Specifications and design requirements for establishing small OGRs were included in the 1997 TLMP; however, many small OGRs were never finalized, some were subsequently relocated, and several have been blamed for creating issues for timber sale reviews and analyses. As a result, the USFS, Fish and Wildlife Service (USFWS) and ADF&G reviewed all small OGRs to resolve remaining issues of size and location, and map the final small OGRs in the TLMP amendment. We supported this goal and contributed significant amounts of staff time and expertise to the process. USFS district staff reviewed the recommendations from the interagency group, and with few exceptions agreement was reached on their final configuration and placement. The Forest Supervisor subsequently reviewed all the small OGR decisions and changed roughly 40% of the agreed upon locations. The interagency group reconvened to assess and comment on these changes.

At the time of this review, the group expressed discomfort with some of the placements and agreed to place the reviewed small OGRs into one of three categories: (1) those that were considered biologically preferred (IOGR), (2) those that were not considered biologically preferred, but could be accepted (FPOGR), and (3) those that were not considered to be acceptable and should be further evaluated as part of project level reviews (PROGR).[3] The group also identified 13 small OGRs that raised especially high levels of concern for wildlife. These were later reviewed cooperatively by the group and Forest Supervisor, and resulted in 4 being classified as IOGR, 6 as FPOGR, and 3 as PROGR. Overall, of the 238 small OGRs identified on the Tongass, it is our understanding that 133 (56%) are now classified as IOGRs, 58 (24%) are classified as FPOGRs, and 47 (20%) are classified as PROGRs. We encourage the USFS to review future PROGRs with an eye to timber operability and economics as well as fish and wildlife conservation. Overall, we conclude that the newly proposed sizes and locations for the small OGRs are better than they were previously.

Since the adoption of the 1997 Forest Plan, small OGRs have been examined and adjusted during project level reviews. In most cases, the result has been growth in the gross acreages included in OGRs and a reduction in available timber. Appendix B shows the resulting reduction in suitable and available acres by project over the past 10 years. Of particular concern is that project-level reviews removed more than 5,100 acres of Productive Old Growth (POG) from the suitable land base during 1998 – 2005 (USDA, unpublished 2005 monitoring report found at http://www.fs.fed.us/r10/tongass/projects/tlmp/2005_monitoring_report/#1).

[3] IOGR = Interagency OGR; FPOGR = Forest Plan OGR; PROGR = Project Review.

This steady erosion of the timber base presents a significant obstacle to maintaining a viable timber industry in Southeast Alaska. Therefore, we appreciate the joint effort under way to map final locations of small OGRs across the Tongass. We urge that this cooperation continue beyond the current planning effort and further urge that transfer of POG from the suitable land base into small OGRs be kept to the minimum necessary to achieve the stated wildlife goals and to satisfy the criteria in Appendix K of TLMP.

Medium OGRs: The interagency OGR group only reviewed small OGRs. The USFS has modified some medium OGRs, and some of the existing medium OGRs do not meet the minimum requirements specified in Appendix K of TLMP. We do not know how these changes and conditions will affect the Conservation Strategy, and we urge the USFS to undertake an interagency assessment of medium OGRs. This process should include state and federal expertise on both wildlife conservation and timber management. We further urge the USFS to do this as soon as possible in order to avoid limiting or eliminating suitable options to meet requirements for the size, placement, and composition of medium OGRs.

Beach and Riparian Buffers. In 1997, forested beach buffers were extended from 500 to 1,000 feet. This extension reflected the value of this habitat to a host of wildlife species, including river otters, mink, bears, wolves, Sitka black-tailed deer, bald eagles, goshawks, and others. Beach buffers are a key component of the Conservation Strategy and must be retained. At the same time, we recognize the utility of allowing some selective timber harvesting of second-growth within beach buffers, to the extent that it accelerates a return to characteristics of the old-growth condition and is a benefit to wildlife. For this reason, we recommend allowing selective harvesting of second-growth timber in the portion of beach and estuarine buffers that is more than 500' from the water, and within the portion of riparian buffers that is more than 100' from rivers and streams. We do not support the use of beach buffer or riparian buffer areas for old-growth harvesting.

Forested buffers along all Class I and II streams are critical elements of the Conservation Strategy. Class I and II streams provide valuable spawning and rearing habitat for species of Pacific salmon, trout, and char, and forested riparian buffers along Class I, II, and III streams provide protection from erosion, sedimentation, and temperature increases.

Class III streams are also a component of the Conservation Strategy and are important sources of water, energy, nutrients and organic matter for downstream reaches. Land uses along headwater streams influence this linkage with downstream areas (Wipfli 2005). At the same time, we appreciate that implementation of Class III stream buffers can reduce the timber base and create difficulties for timber economics. This issue is further complicated by mis-classification of some Class III streams. Field verifications of Class III streams often occur during the drier summer months, when fish typically are not present. As a result, some streams classified as Class III may actually provide fish habitat and have fish present at some time during the year and should be reclassified as Class I or II streams. In other cases, some streams classified as Class III streams may be more accurately classified as Class IV.

We recommend that the USFS in consultation with the State, develop objective criteria and protocols to use for stream classifications, and train USFS staff in application of the classification criteria. We also urge the USFS to use existing flexibility in the Class III guidelines to protect water quality and downstream fish habitat in a manner that is practical for timber harvesting. Lastly, we would like to discuss with the USFS, industry, and other agencies and groups flexibilities within the existing Class III S&Gs, and would be willing to discuss possible alternatives to existing stream buffer requirements for Class III streams, provided that they assure conservation of habitats for fish and wildlife.

Riparian buffers are important to wildlife, including river otters, which are known to use cavities adjacent to inland streams as natal dens (Woolington 1984), and to brown bears, which strongly select for these areas during the salmon spawning season (Schoen and Beier 1990, Titus et al. 1999, Flynn et al. 2007). They also provide critical connectivity between old-growth reserves and are important for maintaining the ecological function of small OGRs.

Marten & Goshawk / Legacy Forest Structure Standard and Guideline. Under the amended plan, a new "Legacy Forest Structure" (legacy) S&G is proposed as a substitute for the existing "Marten and Goshawk" S&G. We understand this change is being proposed because: (1) the existing S&G is not particularly effective for conservation of marten and goshawks, and (2) the marten and goshawk S&G creates significant difficulties from a timber harvesting standpoint (feasibility, safety, and cost).

The proposed legacy S&G would apply when the harvest levels in various planning units exceed set thresholds, much as it does under the existing marten and goshawk S&G. However, unlike the requirement for trees to be individually dispersed or clumped under the marten and goshawk S&G, the legacy S&G could result in trees being retained primarily along the back edges of cutting units. Following are our observations and uncertainties associated with replacing the existing marten and goshawk S&G with the proposed legacy S&G. These are follow-ups to two letters sent by ADF&G to the USFS on this subject during September, 2006.

1. To the best of our knowledge, there is no supporting science for adopting the legacy S&G. At the same time, it is our understanding that the proposed legacy S&G does not significantly benefit the timber industry. To better understand this, we encourage the USFS to include in the FEIS a scientific assessment for the proposed legacy alternative. Without that assessment, we have no information with which to assess any benefits of the S&G to marten or other wildlife populations. At the same time, because the legacy S&G provides less habitat value for martens, it cannot be considered a replacement that would maintain the same level of risk. We also encourage the USFS to include a quantitative analysis of how the marten and goshawk S&G has been applied, and the extent to which the existing S&G has impacted timber harvesting activities. Included in the analysis should be the number of units that have been harvested in a manner that results in retention of "individual trees" versus retention of "clumps" of trees; the average size of retained trees; the amount of retained timber that has been suitable and merchantable versus non-developable or non-merchantable; and how the implementation of the S&G has affected the design of safe and economically feasible timber sales. Also, we would appreciate clarification of the proposed legacy S&G relative to the amount of timber harvesting that would be allowed. As presented, it appears that there is no upper limit to the amount of harvesting that could occur within areas where this S&G would be applied. It seems to us that leaving 1/3 of the old-growth with each successive entry could result, in the extreme, in having only 3 trees left in a given area and still being able to harvest 2 of them. There should be a lower threshold for remaining old-growth within areas below which no more timber harvesting is allowed.

2. It is our understanding that the current marten and goshawk S&G includes flexibility to locate retention trees in ways that facilitate safe and economically feasible timber sales. For example, retention trees may be clumped to avoid conflicts with logical cable settings. We would appreciate affirmation or correction of this understanding. Additionally, we encourage the USFS to ensure that training and policy direction for unit lay-outs are clear and well understood so that available flexibilities can be used to better provide economically feasible timber sales.

3. The possibility of intensifying timber harvesting in some areas while avoiding or minimizing harvesting in other areas may require some level of flexibility within existing or newly-developed S&Gs. These flexibilities should be explored as a way to better provide economically feasible timber harvesting while also providing conservation of fish and wildlife habitats. We suggest that an interagency assessment of the implications of such action on marten, goshawk, and other wildlife be undertaken as part of this effort. This cooperative assessment should also include an effort to identify areas where concentrated timber harvesting may occur.

4. Regardless of what S&Gs are ultimately adopted, there should be an assurance that trees retained for wildlife should not be logged commercially or for personal use over the life of the rotation. With each new forest plan revision, the need for and amount of wildlife habitat retention should be re-evaluated. Moreover, efforts should be made to locate old-growth retention in places where it is not susceptible to catastrophic blow-down. Where feasible, in instances where blowdown, landslides, or disease kills >75% of retention trees, we suggest harvesting the downed trees and designating an equivalent amount of old-growth for retention elsewhere in

Endemic Species. [4] A considerable amount of new information about island endemic animal species, including new wildlife taxa and distribution information, was presented during the April 2006 CSR Workshop. This information has significant management implications for maintaining sustainable populations of wildlife and should be summarized and included in the TLMP amendment. The plan should include considerations for adjusting timber harvest on islands as more information becomes available about the habitat associations and population status of endemic species.

Fish passage. The DEIS states that the culvert replacement program declined in 2006 due to funding reductions and is projected to continue to decline in future years (DEIS, page 3 –55). This is a concern to us and we suggest that the culvert replacement program be given a higher priority to increase the possibility of funding. Culvert replacement and maintenance will only

[4] Endemic species are those that are prevalent in or peculiar to particular isolated localities.

become a greater issue in the future as more culverts are put in place and existing culverts continue to age and deteriorate, thereby further restricting fish passage.

Fish and Wildlife Management in Research Natural Areas and Experimental Forests. We request that the final plan amendment clarify that Research Natural Areas and Experimental Forests will not preclude the State's management responsibilities for fish and wildlife, including use of various facilities, such as weirs or radio towers, necessary for state wildlife or fisheries management purposes. ADF&G is the primary manager of fish and resident wildlife in Alaska, regardless of land ownership. Approval from the Director of the Pacific Northwest Research Station should not be required to conduct routine management responsibilities in these areas. The USFS has recognized the State's authorities regarding fish and wildlife through the USFS-ADF&G Master Memorandum of Understanding (MOU), which was re-signed in 2004. In addition, a national-level MOU between the Association of Fish and Wildlife Agencies and the Forest Service/Bureau of Land Management spells out respective responsibilities for fish and wildlife management in designated Wilderness

Fish management in Wild, Scenic, and Recreational Rivers. In Alaska, USFS management of potential wild, scenic, and recreational river corridors applies only to uplands. Restrictions on public use are subject to the Alaska National Interest Lands Conservation Act (ANILCA), including Section 1110(a). However, the proposed management prescriptions for scenic and recreational rivers contain language that appears to restrict activities below the ordinary high water mark. For example, we question language in the management prescriptions discouraging weirs from potential scenic and recreational rivers. Most weirs do not impede stream flow or river traffic and are temporary structures that are removed at the end of the project or season. Nothing in ANILCA or the National Wild and Scenic Rivers Act prevents use of temporary structures in designated or potential wild and scenic river corridors. For potential wild and scenic rivers in designated Wilderness, Section 1315(b) of ANILCA allows for improvements and facilities such as fish weirs and other structures to restore or maintain fish production on national forests.

In November 1982, the Alaska Land Use Council approved "A Synopsis for Guiding Management of Wild, Scenic, and Recreational Rivers in Alaska" (Appendix 1). The Department of Agriculture, along with the State of Alaska and the Department of the Interior approved the guidelines. We suggest reviewing these guidelines and revising the "Management Prescriptions for Wild, Scenic, and Recreational Rivers" section, as appropriate, to ensure management prescriptions are consistent with these approved guidelines.

Off-highway Vehicle Access for Subsistence. The proposed plan amendment is not consistent with ANILCA provisions for off-highway vehicle (OHV) access. Under the plan, trails and routes for off-highway vehicle use will be "closed unless opened" through a District access and transportation plan. Additionally, in some land use areas, OHV trails may only be designated where documented local traditional use has occurred and the route is compatible with the land use designation objectives.

ANILCA provisions require that subsistence and other ANILCA protected access "shall" be allowed, subject to "reasonable regulation." This "open until closed" approach is a cornerstone

of ANILCA and the USFS cannot supersede this legislative intent by a national policy document. The Department of the Interior adopted regulations at 43 CFR Part 36 that outline a specific closure process that includes public notice and hearings. The State of Alaska advocates that the USFS adopt parallel regulations for ANILCA-protected access and address the discrepancies between the national policy and ANILCA. We remain available to assist the USFS in this effort.

Section 811 of ANILCA ensures that rural residents engaged in subsistence uses "shall" have reasonable access to subsistence resources on all federal public lands in Alaska by use of snowmobiles, motorboats, and other means of surface transportation traditionally employed for subsistence purposes. Such access includes off-highway vehicles where such methods were used generally in the area prior to ANILCA.

We urge the USFS to work with the State of Alaska and affected subsistence users in all districts on the Tongass National Forest to identify trails, routes, and areas where subsistence off-highway vehicle access occurs to ensure subsistence access is not inappropriately closed. Any closure or restriction of OHV use for subsistence purposes must use a regulatory process as addressed in Section 811(b). Please note that our comments should not be construed as categorical opposition to all OHV closures. We know there are several compelling reasons to seek OHV closures, such as public safety or to protect resources. This does not absolve the USFS from adhering to the required processes under ANILCA.

Status of Appendices. Our understanding is that sections of the 1997 TLMP that are not specifically revised by this amendment remain in effect, including Appendix K (Old-growth Habitat Reserve Criteria) and Appendix N (Additional Evaluation of Wildlife Habitat Conservation Measures). These appendices contain procedures that are integral to implementation of the Conservation Strategy. We request that they be retained in the FEIS and plan amendment except where explicitly changed during the amendment process. Please clarify the status of these appendices.

Information needs for the Conservation Strategy were addressed in Appendix B of the 1997 TLMP. The limitation of this appendix is that it was created as a static list of studies that were priorities at the time the Plan was developed. Funding for research and monitoring is limited and we need a dynamic, well-defined process to identify and prioritize information needs, and compare results against original hypotheses. ADF&G is working with the USFS and USFWS to develop such a process. When complete, this process should be included in Appendix B of the Plan amendment and FEIS. The new process will be more practical and achievable than the past focus on just Management Indicator Species (MIS), although future monitoring will continue to address at least some of the existing MIS. With new DNA (Taberlet and Luikart 1999; Mills et al. 2000; Lukacs and Burnham 2005) and modeling (MacKenzie et al. 2006) techniques and capabilities, wildlife monitoring can now more efficiently and cost-effectively provide useful information about population sizes and trends. We recommend these alternative approaches to monitoring be incorporated into future interagency discussions and funding allocations.

Scenery and recreation guidelines

Scenic Designations. Restrictions on harvest (such as requiring helicopter yarding, tree selection harvests and other partial cutting prescriptions) in the Scenic Viewshed and Modified Landscape LUDs greatly reduce the volume of economic timber that can be produced from areas so designated. In fact, it is often questionable whether a timber sale in these LUDs will be capable of meeting a reasonable economic test. Therefore, the State is concerned about how much economic timber these areas can actually contribute to a sustainable timber industry. The State therefore urges the USFS to immediately convene a joint federal-state process to identify areas that can be re-designated from Scenic Viewshed and Modified Landscape to Timber Production. This process should incorporate information from affected parties, such as the cruise industry and other recreation businesses. The State's expectation would be that underlying requirements of the Conservation Strategy, that restrict or prevent timber harvesting (such as OGRs) would remain intact in these areas.

Karst and Cave resources. The proposed plan allows "limited recreation development" on sites that have been identified as "highly-vulnerable karst lands." Recreation development should not be allowed on highly-vulnerable karst land.

Funds for pre-commercial thinning are limited. The USFS should prioritize thinning on second-growth areas that will be available for future harvesting and can benefit wildlife, rather than on karst areas where timber harvest is not allowed.

Recreation and Tourism. The most significant growth in tourism and recreation activities within the Tongass National Forest over the past decade has been in the volume of cruise passengers. Shore-side tours and recreation activities have grown in abundance and focus in several communities, most notably Hoonah. Commercial sport fishing ventures continue to be a substantial part of the local economy in many Southeast Alaska communities.

None of the proposed alternatives is likely to have a significant impact on tourism and recreation activities over the life of the Plan. The niche market for eco-tourism is likely to remain unaffected, since Wilderness and LUD II designations remain unchanged and the Plan, in all its alternatives, would continue to set aside vast acreages for remote and semi-remote recreation.

Only road-based recreation opportunities are constrained by the proposed amendment of the Forest Plan in any of its iterations. These opportunities could be expanded under Alternatives 4, 5, 6, and 7. Contrarily, Alternatives 1, 2 and 3 would likely not provide for significantly expanded road-based recreation opportunities.

Recreation Opportunity Spectrum and Encounter Rates. It is unclear whether encounter rates set out under the proposed forest plan are a hard-line indicator of public use, where management action would be taken to reduce use if rates are exceeded, or if they are meant as guidelines for visitor expectations within a given land designation. We encourage the USFS to use encounters as guidelines for public expectations and not as firm indicators for measuring the satisfaction of recreation experiences.

Land management agencies often use encounter rates to measure solitude and visitor satisfaction. However, in many cases, solitude is not an important factor in determining satisfaction. Instead, surveyed users often cite other factors such as the weather or mosquitoes as more important factors in visitor studies. In addition, blanket encounter rates often do not take into account variability of terrain and vegetation. In areas of dense undergrowth, an encounter rate of three groups per day may cause a greater negative reaction from some users than in open terrain areas.

Economic diversity

Mining. Some alternatives would have a direct negative effect on future mineral development opportunities within Southeast Alaska. We note the following specifics gleaned from the DEIS pages 3-269 – 280.

1. Fifty-two areas totaling 589,000 acres within the Tongass contain identified mineral resources. Of these, 25% are in areas withdrawn from entry. Under the current Plan, 29% of the open areas are in Land Use Designations (LUDs) that result in higher cost of entry if these resources were to be developed. Under Alternatives 1-3 this percentage increases, with Alternative 1 being the highest at 41%; under Alternative 6 it would remain the same; and under Alternatives 4 and 7 it would decrease to 23% and 22%, respectively.

2. Of the identified mineral tracts, 377,000 acres are considered Rank 1, having a "high potential" for being developed. Fifteen percent of the area in Rank 1 tracts is withdrawn from entry. Of the acres open to mineral entry, the current Plan places 30% in LUDs that result in higher cost of entry. Under Alternatives 1-3 and 6, this percentage would increase. Under Alternative 4, it would decrease to 24%, and under Alternative 7 it would decrease to 22%.

3. There are 6.6 million acres of potential, but undiscovered mineral resources within the Tongass. Of these, 989,000 acres are estimated to have a high or moderate likelihood of yielding a mineral resource that could be developed. Thirty-eight percent of this acreage is withdrawn from entry. Of the lands that are open to entry, the current Plan allocates 39% to LUDs that result in higher cost of entry. Only Alternatives 4 and 7 would reduce the percentage significantly (to 28% and 26%, respectively), while Alternative 6 would reduce it slightly (to 38%). Under Alternative 3 it would remain unchanged from the current Plan, under Alternative 1 it would increase to 51%, and under Alternative 2 it would increase to 46%.

Some of these changes are likely to prove to be a disincentive for companies considering new mineral exploration and development investments in Alaska and are therefore of concern to the State of Alaska. Mineral exploration, development, and production can be a critical component of a vibrant economy in Southeast Alaska, as it is in other parts of the State. Mineral activity can also be done in an environmentally sound manner, as is the case at Greens Creek and in other parts of the State. The TLMP should encourage responsible mineral investment in Southeast, and the final alternative should minimize the amount of land with a higher cost of entry.

Community impacts. The DEIS section in Chapter 3 that covers effects on each community fails to mention the Icy Straits Lumber Company sawmill and its role in the economy of Hoonah (pp. 3-520 to 3-524). Please add this to the FEIS.

Impacts to state land

The State believes that the impacts to State lands under all of the alternatives have been adequately addressed in the DEIS. In addition, the State believes that the potential cumulative impacts to State lands have been adequately identified and discussed in the draft DEIS.

Sealaska Entitlement

The DEIS, particularly in Appendix C but reflected in several other sections, misrepresents Sealaska's ANCSA land entitlement and out of withdrawal selection proposal by exaggerating potential negative effects of the proposal and largely ignoring the benefits. The State believes that fulfilling the entitlement will yield overall net benefits for the Southeast economy, environment, and culture, and the potential adverse effects are not significant.

The State believes that Appendix C should recognize that completing conveyances of land to Sealaska in a sustainable configuration is an entitlement under ANCSA and a priority for stabilizing Tongass National Forest management as well as the broader Southeast Alaska economy. The Appendix should not treat Sealaska's land entitlement and adjustment proposal as a negative encumbrance on the USFS or the public interest.

APPENDICES

Appendix A - Industry needs for bridge timber
Appendix B - Changes in the Tongass National Forest Suitable Land Base through Project-level Changes since 1997
Appendix C - Species-specific comments on wildlife
Appendix D – Citations

Appendix A -- Industry Needs for Bridge Timber

This table was prepared by the Bridge Timber Committee of the Tongass Futures Roundtable. The TFR never adopted the Bridge Timber Committee report. This work was done at the committee level and presented at a work session in Juneau on July 12-13, 2006. Some Roundtable members do not agree with the report's finding concerning mill capacity, which is a controversial subject. The mention of the TFR is not meant to imply an endorsement of this statement, but rather cites the source that accomplished the work.

	Total Volume Needs (MMBF) for bridge timber at 66% of mill capacity 1/	Total Volume Needs (MMBF) for bridge timber at full mill capacity 1/	Survival Volume Needs 3/ (MMBF)
Sawmills			
Viking Lumber Company	53.0	80.0	25.0
Pacific Log and Lumber	22.0	33.6	22.0
Silver Bay Logging Company	43.0	65.0	25.0
Icy Strait Lumber Company	13.0	20.0	5.0
Small Sales	5.0	7.0	5.0
Micro Sales	1.5	1.5	1.5
Veneer Mill			
Ketchikan Veneer Mill 2/	30.0	30.0	25.0
Total	167.5	237.1	108.5

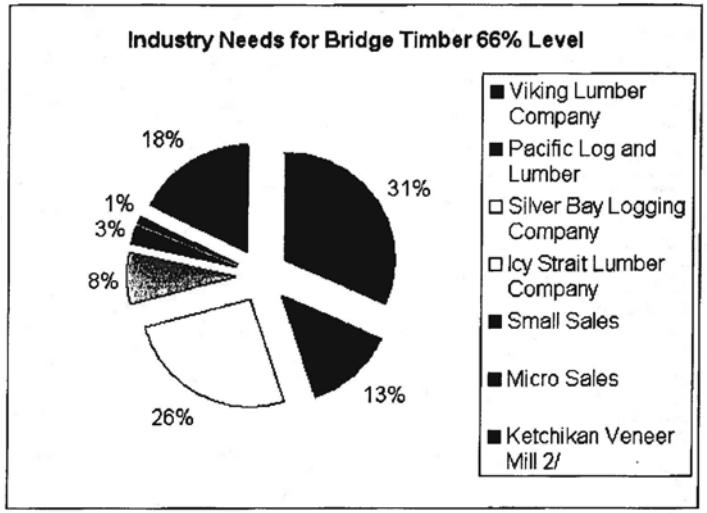
1/ Mill capacity needs from Juneau Economic Development Council (Dan Parrent).
See chart on following page.

2/ Estimate of need. Gateway Forest Products did not operate sufficiently to establish capacity.
3/ Milll survival capacity needs from phone conversations with mill owners 8/06 (C. Maisch)

Existing mills in operation can operate on a yearly flow of volume noted. Mills like Silver Bay (currently being considered for sale with no USFS timber under contract) and the Ketchikan Veneer Mill will need to acquire volume under contract prior to start-up operations. This volume is critical in order to obtain operating capital from lending institutions. Without volume under contract, mills will not be sold and can be expected to be dismantled to recoup some of current mill owner investment.

8/06 Notes: Volume for mills must be economical volume and is not considered the most efficient operating level by mill owners. For example, Viking Lumber would operate at a two shift level if volume was available and the veneer mill would run two shifts. Veneer mill would add a second shift approximately 3 months after resuming operations. The most efficient operating level for all mills is a 2 shift or higher basis.

Appendix A, cont.



Appendix B -- Changes in the Tongass Suitable Land Base through Project-Level Modifications of Old Growth Reserves since 1997[5,6]

Project Name	Non-developable area changed to suitable (acres)	Suitable area changed to non-developable (acres)	Net change in suitable area (acres, decreases in <brackets>)
Crystal Creek EIS 1998	481	1,152	<671>
Todahl Backline EA 1998	2	363	<361>
Nemo Loop EA 1998	177	932	<755>
Control Lake EIS 1998	446	142	304
Chasina EIS 1998	0	78	<78>
Canal Hoya EIS 1998	0	151	<151>
Sea Level EIS 1999	185	500	<315>
Kuakan EIS 2000	416	542	<126>
Doughnut EIS 2000	0	19	<19>
Luck Lake EIS 2000	257	794	<537>
Salty EA 2000	99	126	<27>
Polk Small Sales EA 2000	0	153	<153>
Fire Cove Salvage EA 2002	186	633	<447>
Woodpecker EIS 2003	180	130	50
Cholmondeley EIS 2003	894	6,873	<5,979>
Finger Mountain EIS 2003	0	593	<593>
Madan EIS 2003	377	1,501	<1,124>
Threemile EIS 2004	458	826	<368>
Kensington Gold EIS 2004	0	1,615	<1,615>
Couverden EIS 2005	0	790	<790>
Scott Peak EIS 2006	1,089	1,962	<873>
Overlook EA 2006	354	578	<224>
Tuxekan EIS 2006	431	1,614	<1,183>
Scratchings EIS 2007	460	1,519	<1,059>
Totals	6,492	23,586	**<17,094>**

[5] Prepared by Dept. of Commerce, Community, and Economic Development based on information provided by the USFS, including published accounts in project-level decision documents.

[6] The Cholmondeley project modified both a small and a medium OGR. All other changes affected small OGRs only.

Appendix C – Species-Specific Comments on Wildlife

Queen Charlotte Goshawk

Environment & Effect: We suggest that the USFS revise some of the background information, as portions of the species summary are inaccurate (DEIS, page 3-161). As currently portrayed in the proposed Plan, the understanding of the relationship between goshawk habitat and forest management is less now than when the 1997 plan was developed. However, the opposite is true Both in Southeast Alaska and across their range, knowledge of goshawks and forest managemen has increased. The use of available literature in the DEIS, both unpublished and in journals, is poor or missing. None of the annual or final Southeast Alaska specific reports produced by ADF&G are referenced (e.g., Flatten et al. 2001) and none of the diet studies published by Lewis and colleagues (2006) are referenced. It is also unfortunate that none of the numerous and relevant goshawk studies published over the past decade were used in the plan amendment, particularly those from the Pacific Northwest.

Examples of mis-portrayed information include statements such as: "The northern goshawk inhabits forested lands throughout North America . . ." This statement is not accurate as many eastern forested lands do not have goshawks. In the next sentence, the background information notes that the Queen Charlotte goshawk is a distinct subspecies and cites Iverson et al. (1996) as the reference. Rather than citing Iverson et al. (1996), the document should list the primary references where the subspecies is described or its taxonomy is accepted (e.g., Taverner1940, AOU 1957, Whaley and White 1994).

The USFS should consider the habitat associations of key goshawk prey as a tool for sustaining goshawks (Reynolds et al. 1992, Reynolds et al. 2006). The first step in this process should be to use diet data from Lewis et al. (2006) and determine the habitat associations of key prey (for examples, see Reynolds et al. 1992, and Drennan 2006).

While some available information suggests that important goshawk prey species (e.g., grouse, red squirrels) can be negatively impacted by even-aged silvicultural practices (Doerr et al. 1984, Carey 1995, Russell 1999), there is a lack of information on how these practices specifically affect sooty (formerly known as blue) and spruce grouse, red squirrels, medium to large forest passerines (e.g., varied thrushes, Steller's jays), and woodpeckers. We recommend that studies of these prey species in Southeast Alaska focus on how alteration of forest structure and landscape patterns specifically affect their abundance and availability to goshawks. For goshawks, management should focus on their habitat needs and accompanying prey base for long-term viability and sustainability on the Tongass.

The paragraph starting on page 3-161 and ending on page 3-162 of the DEIS implies that findings from the analysis of goshawk telemetry data in Southeast Alaska produced similar results to those observed in the southwestern United States (Boyce et al. 2006, Reynolds et al. 2006). It is specifically stated that when mature forest habitats are not available, goshawks will nest in younger forests or in smaller patches of trees and forage in young forests as well as along edges and in openings (Boyce et al. 2006, Reynolds et al. 2006). However, this has not been observed with great frequency in Southeast Alaska. A few nests have been found in older

second-growth (~80-100 year old stands) and use of this type of habitat is known to have occurred in other areas (Squires and Kennedy 2006). Telemetry data from radio-tagged birds has been analyzed a number of times and consistently suggests strong selection for old-growth forest habitat. Past interagency attempts to evaluate habitat selection relative to edge have resulted in no detectable patterns, noting that the Tongass GIS layers are probably not well suited for such an analysis for goshawks.

Based on research conducted on the Tongass and multiple peer reviews related to the 1997 forest plan, we believe that conversion of mature forests to even-aged second-growth will negatively affect goshawks. Not only do dense second-growth habitats keep goshawks from entering them to hunt (affecting availability of prey to goshawks), but they likely affect the abundance of goshawk prey as well. For example, there is no information about goshawk numbers on Prince of Wales Island prior to the large-scale logging that took place in the last half of the 20th century; however, very few goshawks are now found on that island and nest failure has been documented there. This is likely due to an inability of goshawk pairs to capture and deliver sufficient food to their young (Lewis et al. 2006).

The USFWS is soon to rule on the remand of their decision not to list the Queen Charlotte Goshawk, and will be issuing a new 12-month finding. The goshawk is also listed as a threatened species in British Columbia. Given these conditions, the USFS should consider retaining all conservation guidelines for goshawks in the final TLMP amendment. The initial decision to not list the Queen Charlotte Goshawk was based on the conservation measures included for goshawks in the existing TLMP. ADF&G has consistently noted over the past decade that the science does not support listing the goshawk in Southeast Alaska. If the conservation measures are changed, it leaves open the possibility that any decision by the USFWS could again be remanded. Reference could be made to the results of the genetic study of goshawk relatedness in the west-coastal region of North America (Talbot 2006).

Standards and Guidelines: Most of our comments below suffer from not having a draft appendix to evaluate the context of the proposed S&G changes. We request that the USFS complete such a science-based management document for the proposed goshawk changes. All proposed S&G changes for goshawks have been discussed in an interagency context for at least the past three to four years.

K. 1. b. page 4-98 It is unclear why "alternate" is added and "inactive" is deleted. By definition, a nest that is an alternate in any given year, is an inactive nest. We have information from the Tongass and elsewhere indicating that some alternate nests are used in subsequent years.

K. Deletion of monitoring requirement. We support removal of the need to "monitor" known goshawk nests because of the extensive time and money needed to do so. However, the effect of this is confusing because of the word change from "alternate" to "inactive" as described above. We suggest the continuation of USFS inventories to determine the presence of nesting goshawks in proposed project areas unless and until an alternative approach is developed and described. We further suggest using the most current inventory protocols developed in cooperation with the appropriate State and Federal agencies (Woodbridge and Hargis 2006). We encourage the USFS to describe their approach for monitoring goshawks in the FEIS.

K. 1. d. page 4-98 The Goshawk S&G regarding nesting sites appears to be based on the USFS's need to incorporate flexibility into the S&Gs for goshawk nest sites. We agree that flexibility is useful for land managers; however, moving the decisions to a landscape assessment or some other mid-scale analysis process is vague. As mentioned above, the operating rules for this flexibility and the science behind the decisions and alternatives need to be defined in an appendix to the FEIS, rather than as part of a future planning effort. This appendix should include the variety of conditions that would bring about the "alternate management" of goshawk nest sites.

K. 1. e. As mentioned above, we request the inclusion of an appendix where these science-based management details are described. We recognize that flexibility regarding goshawk nests located in contracted timber sale areas is warranted. The loss of such nest areas is probably not critical to goshawk viability, depending on how many times this situation occurs. Unfortunately, the plan does not mention the fact that as monitoring declines, there is an ever increasing probability that active and inactive goshawk nest trees will be harvested. Even when pre-timber sale monitoring occurs, there is a high likelihood that active goshawks nesting areas will be missed. Therefore, finding goshawk nests in areas already under sale or contract, or proposed for sale, will decrease as monitoring decreases.

Forest Birds

The S&G entitled "Endemic Terrestrial Mammals" (TLMP, page 4-129) should be expanded and re-titled "Endemic Terrestrial Wildlife." It should include surveys for rare and endemic birds, as well as amphibians and insects that may represent unique populations with restricted ranges.

Surveys for other nesting raptors in proposed management areas should include forest owls, specifically western screech-owls, barred owls, and northern saw-whet owls.

Deer and Wolves (General Comments)

The TLMP amendment DEIS does not take into account scientific findings available after 1997. We request that it be revised to incorporate recent research based on a thorough literature review.

The deer Habitat Suitability Index (HSI) model presented on page 3-165 purports to estimate carrying capacity for deer during an average snow winter. However, this does not provide protection in the event of severe snow conditions. Severe winters may drive deer and predator-prey dynamics long after an event has occurred. For example, in Game Management Unit (Unit) 3 (i.e., Mitkof, Kupreanof, Etolin and Zarembo islands), the severe winters of 1969 and 1971 resulted in a major crash in the deer population. It has taken over 30 years for that population to recover, largely because predation retarded recovery long after the severe winters. Planning for severe winter events is the best policy when considering protection of winter habitat for deer. The deer HSI model fails to do this. Further, climate change predictions for Southeast Alaska indicate the likelihood of extremes of warm and cold during future winters, along with much greater precipitation. That may mean occasional extreme snowfalls, not unlike what was experienced during the 2006-2007 winter. It would be wise, therefore, to emphasize the need to

retain winter habitat for deer and calculate HSI under the assumption that all areas are at risk of deep snow. This would result in more scientifically credible evaluations.

Wolves (specific comments)

Page 3-169, first paragraph: The discussion of habitat use by wolves needs to refer to and summarize Person (2001), otherwise it is out of date.

Page 3-169, second paragraph: This information is incorrect and needs to be updated. Wolf numbers are limited by prey availability, not social interactions. This section should refer to and summarize the appropriate sections in Mech et al. (1998) and Fuller et al. (2003). The density limit of 10 wolves/ mi^2 is incorrect. For example, Isle Royale has had densities of wolves that substantially exceeded that limit.

Page 3-169, fourth paragraph: Units 2 and 3 support modest wolf densities compared to other areas where wolves prey on deer rather than moose, caribou, bison, and other larger prey. While wolf densities are high in Units 2 and 3 compared to the rest of Alaska (where deer are absent), they are not high when compared to other areas where deer are the principle prey (i.e., northern Minnesota, southeastern Ontario, and coastal British Columbia). More information on this is available in Person et al. (1996, 2001). The wolf population in Unit 2 is currently healthy but that does not imply it will be in the future when more of the landscape is in stem-exclusion forest. Current populations are not indicators of the future. Reference should be made to the concept of "succession debt," described by Person (2001).

The statement referring to a harvest objective of 39 wolves in Unit 2 is incorrect, and should actually be about 90 wolves, depending on available population estimates.

Page 3-170, first paragraph: The road density guideline in the TLMP amendment was purported to be based on analyses described in Person et al. (1996); however, the guideline has never been implemented in a manner consistent with Person et al. (1996). The 0.7 mi/mi^2 is to account for all open, closed, or overgrown roads in areas below 370 meters elevation, not simply open roads. This approach has been used because we have found it impossible to distinguish between open and closed roads, and further, the definition of what constitutes "open" versus "closed" roads is vague (i.e., some roads may be passable with snowmachines or ORVs). Even roads that are overgrown are used as hiking trails, providing easier access for wolf trapping and snaring. Additionally, the denominator should be land area below 370 meters because the vast majority of wolf activity occurs in this area (Person et al. 1996, Person 2001). The road density guideline should be applied at a scale equal to an average wolf pack home range (300 km^2) (Person et al. 1996). The incorrect use of the guideline has been brought up in numerous interagency meetings since 1997, but has never been corrected. We again recommend using the guideline described by Person et al. (1996).

The den buffer guideline has not been supported by scientific data. Information presented during the CSR Workshop indicated that the guideline needs revision. The guideline for roads is the most important because roads facilitate chronic disturbances long after timber harvesting activities are completed. Suitable areas for dens would only have a 45% probability of selection by wolves if a road was within 600 feet of the den (Person in prep, Conservation Strategy

Review Workshop). Moreover, as presented during the CSR Workshop, dens may be unused for up to 5 years before being used again.

Page 3-170, second paragraph: This paragraph implies that there is no established link between habitat changes and wolf populations. This is incorrect based on research findings (Person and Bowyer 1997, Person 2001, Mech et al. 1998, Fuller et al. 2003, and Fuller 1989). Wolf populations will increase and decline in response to changes in prey populations, and any habitat changes that affect prey will affect wolves. This has been modeled and presented in Person (2001) and Person and Bowyer (1997), along with projected effects of habitat change on wolves and deer in Unit 2. Additionally, Farmer et al. (2006) provide information on habitat features that influence predation. We recommend revising this paragraph to include information from the published literature identified in our list of references (see Appendix D).

Page 3-207, first paragraph under Alexander Archipelago wolf: Deer are not required for wolf persistence if other ungulate prey are present (i.e., moose, goats, or sheep). However, their densities will be much lower and home ranges much larger. Details on this are presented in Person et al. (2001) and other works such as Mech et al. (1998), Fuller et al. (2003), and Fuller (1989). Gaps in wolf distribution may occur, particularly on islands where deer numbers decline substantially, but the likelihood is that home ranges will get larger and wolf densities lower rather than experiencing local extirpations. That said, as deer numbers decline, there will likely be increased pressure from subsistence users to reduce wolves in an effort to protect deer. Under that circumstance, poorly managed hunting and trapping seasons and illegal killing could result in local extirpations. The implications of this are compounded because wolves in Southeast Alaska have low genetic diversity (e.g., the population in Unit 2 shares 1 mtDNA haplotype (Weckworth et al. 2005)). Lowering densities may therefore result in further reductions to genetic diversity. This would be especially true in small populations that are isolated on islands.

Page 3-207, second paragraph under Alexander Archipelago wolves: This section should be revised after referring to Person (2001). Specifically, reference should be made to the consequences of the non-linear density-dependent shape of change in deer populations in relation to carrying capacity (K) and how predation will affect deer numbers as K is reduced due to timber harvesting. This will lead to a better understanding and appreciation for how habitat changes will likely affect predator-prey dynamics. This is published in Bowyer et al. (2005), Person (2001), and Person et al. (1997), and much of it was presented during the CSR Workshop.

Pages 3-207 and 3-208: No mention is made of results from Person (2001) or Person and Bowyer (1997) concerning population viability and TLMP alternatives. That work provides insight concerning how the new alternatives might affect wolf-deer predator-prey dynamics. Results from wolf Population Viability Analysis (PVA) for Prince of Wales (POW) Island indicated that a substantial reduction of wolves and deer is likely under the current forest plan (Person 2001, Person et al. 1997). Any alternative that increases road development or logging from the current plan is likely to reduce the wolf population to very low levels. Add to that the higher risk of hunting and trapping mortality (legal and illegal) due to the perception that wolves are competing with hunters for deer, and the viability of wolf populations on POW could be compromised. Further, there is no mention of information provided at the CSR Workshop showing the relationship of undeveloped land with the ratio of recruitment to mortality of

wolves. Information presented during the workshop indicated that the ratio of recruitment to mortality approaches 1 for wolf packs occupying home ranges with < 44,000 undeveloped acres. That finding should be compared with existing OGRs to see how many may actually have a high probability of supporting source populations of wolves.

Page 4-127, TLMP: The new information provided at the CSR Workshop, along with findings published since 1997 have not been included in the S&Gs. The road guideline is still implemented incorrectly and the denning guideline is not consistent with available information. Given the noted disparity between the existing S&Gs and existing supporting scientific materials, we encourage the USFS, in consultation with the State, to consider revising the S&Gs in the Plan amendment or future Plan revisions.

Deer (specific comments)

Page 3-164, second paragraph under deer, fourth sentence: This sentence should read "The quantity, quality, distribution, and arrangement of winter habitat are considered the most important limiting factors for deer."

Page 3-165, first paragraph: It is unclear whether the USFS is using the deer HSI model correctly. The 1997 description of the model and its application was incorrect with respect to the deer multiplier. The highest HSI value (whether it is scaled to 1.0 or 1.3) should correspond to a density of 100 deer/mi^2.

Page 3-165, second paragraph: The first sentence states that the deer HSI model provides a tool for risk assessment. This is not true. There are no probabilities associated with the HSI index so it cannot be used to assess relative risk, only relative HSI values. For example, we do not know how much risk is associated with a difference in an HSI of 0.1. Further, as Bowyer et al. (2005), Person (2001), and Person et al. (1997) showed, an increment change in deer carrying capacity (which is what HSI supposedly represents) could lead to a much larger increment change in deer numbers due to the non-linear dynamics associated with predation. Therefore, there is no quantifiable risk associated with HSI values.

The paragraph describes the "FRESH" deer model but fails to include any mention of the other deer models presented at the CSR Workshop. The FRESH model cannot be extended from a stand level analysis to a landscape scale. It does not predict availability to deer due to patch size, location on the landscape, risk of predation, fragmentation, or connectivity. All of those features have a significant, if not primary, role in predicting habitat quality for deer (see Farmer et al. 2006, Kie et al. 2002). By itself, the FRESH model will be of very limited value as a replacement for the current deer HSI model.

Page 3-165, third paragraph: The statement on sources of predation should be clarified. Neonate fawns were not captured on Mitkof Island and bears were therefore not identified as a significant source of mortality to study animals. If neonates had been collared, the results would likely have shown substantial predation by black bears. Given their paucity on Heceta Island, black bears are not a major predator on fawns. However, on POW Island, where black bears are abundant, we observed significant black bear predation on neonate study animals (ADF&G, unpub. data).

We suggest deleting the last sentence in the paragraph because of its inaccurate context. That is, citing statistics for the Tongass as a whole (a forest of islands) is misleading given local differences in impacts. The amount of old-growth habitat remaining on POW Island, for example, will be substantially less than elsewhere on the forest and will thereby have more severe localized implications for wildlife and associated users.

Page 3-192, first paragraph under Sitka Black-Tailed Deer: It is inaccurate to say that the difference in magnitude of the HSI values when using the size-density forest classification versus the original classification is unimportant because only relative values are compared between alternatives. That is true only when the model is used to compare changes in HSI between alternatives. It is not true when applying the deer guidelines for wolves and subsistence. In those applications the magnitude of deer habitat capability is very important.

Page 3-194, third paragraph: This paragraph should discuss the effect of lowering K on deer populations exposed to wolf predation. Deer numbers likely will be reduced much more than predicted by changes in HSI because of the non-linear relation between K, deer recruitment, and predation. Please refer to Bowyer et al. (2005), Person (2001), and Person et al. (1997).

Page 3-194, last paragraph: The first sentence in this paragraph should note that there is great uncertainty about the effects of second-growth management on the availability of forage to deer. The value of treatments, the scale of treatment effects, and the potential of treatments to be implemented at scales meaningful to deer populations is unknown at this time. This paragraph makes no mention of Farmer et al. (2006). In that study, a positive relation was observed between risk of death of fawns and pre-commercial thinning. Also, Farmer et al. (2006) demonstrated that landscape level features play a large role in determining risks of death for deer. TWYGS and other studies do not address the scale, distribution, and arrangement of treatments on the landscape. Those factors will be as or more important than the amount of forage produced.

Elk

Page 3-179, fourth paragraph: Although a radio collared cow elk was located on Farm Island, at the mouth of the Stikine River, there is no evidence of any collared elk migrating up the Stikine River drainage (ADF&G, unpub. data).

Marbled Murrelets

The marbled murrelet should be identified as a Sensitive Species on the Tongass. We believe that the USFS would be remiss in not listing this species as part of the TLMP amendment given that they are known to be old-growth dependent for their nesting. Sensitive Species are defined as "those plant and animal species for which population viability is a concern on National Forest System (NFS) lands within the region. Either a significant current or predicted downward trend in population numbers or density, or a significant current or predicted downward trend in habitat capability that would reduce a species' existing distribution indicates a viability concern." The best available information suggests that marbled murrelets have declined by nearly 80% in Southeast Alaska since the early 1990s (Piatt et al. 2007).

The referenced literature on marbled murrelet ecology in Southeast Alaska should be updated. Cotter and Kirchhoff (2007) and Piatt et al. (2007) summarize existing data on marbled murrelets in Southeast Alaska, including new information on population status and trends, distribution, and habitat relationships.

The TLMP amendment should display the effects logging will have on marbled murrelet habitat under each of the alternatives. Preferred nesting habitat for marbled murrelets includes older trees, larger trees, and trees on steeper slopes (Schoen and Dovichin 2007, Appendix B). Habitat capability for marbled murrelets has declined significantly from past logging (Piatt et al. 2007), and will decrease further under the new Plan. These effects should be displayed in the FEIS.

Page 3-174: The Plan should show how much marbled murrelet habitat is protected by the OGR system. The Plan references the forest-wide system of OGRs as helping meet the conservation needs for marbled murrelets. Although any retention of old-age trees helps, a quantitative assessment of how effective these old-growth reserves might be is needed.

Page 3-174: "Uneven-aged management" should be specifically defined. Uneven-aged management "in many areas" is cited as mitigation for loss of marbled murrelet nesting habitat, yet the term is not specifically defined. To judge the effectiveness of this prescription for marbled murrelets, information on gap sizes and interspersion of individual trees or patches in the cutting units should be provided.

Page 4-128: Providing 600' buffer zones around discovered marbled murrelet nests (XVI. B.) provides no effective benefit. Marbled murrelet nests are extremely difficult to find because most are high up in old-growth trees, the birds are quiet on the nest, and they travel to and from nests in the dark. The fact that it was the last species in North America to have its nest discovered underscores the futility of an S&G that requires finding nests. We suggest dropping this S&G and re-establishing past murrelet surveys.

It is unclear what USFS supported marbled murrelet research and monitoring is ongoing. Appendix B (page B-11) lists a number of information needs for marbled murrelets (items 8, 13, and 15), and indicates the USFS is currently funding marbled murrelet studies. ADF&G has signed a cooperative agreement with the Juneau Ranger District to work together as opportunities present themselves. Beyond this, however, we are unaware of any USFS related marbled murrelet studies on the Tongass.

The USFS commitment to doing marbled murrelet surveys is unclear. In the early 1990s, the Ranger Districts across the Tongass embarked on rigorous training for doing at-sea surveys, and established numerous transect routes across the region (Piatt et al. 2007, Appendix M). Unfortunately, the surveys were not continued. This represents a big loss because it now appears from limited data that marbled murrelets are in serious decline. It is not clear whether identifying this as an "information need" in Appendix B constitutes a commitment to resume the surveys or not. We request that surveys be reinstated.

Martens

New information presented at the CSR Workshop indicated that two genetic lineages of martens occur on the Tongass NF (Cook et al. 2006). Based on genetic research, these authors suspect that the two lineages of marten found in Southeast Alaska actually represent two distinct species; *Martes americana* and *M. caurina*. If so, *M. caurina* has an extremely limited distribution in Southeast Alaska (Kuiu and Admiralty islands only) and globally (from northern California to Admiralty Island). Because of the limited distribution of *M. caurina*, these populations should be given special management consideration. Furthermore, given Flynn et al.'s (2004) finding of low marten populations on Kuiu Island, we encourage further research of marten on that island to better assess implications of forest practices and possible management measures (i.e., state and federal trapping seasons, federal habitat management).

Page 3-167. We suggest adding text (underlined) to the statement about marten habitat: The larger-sized, old-growth forest habitats have the highest value for marten.

In order to clarify the marten harvest for Kuiu Island, that island's harvest should be separated from harvests for the rest of Unit 3.

Page 3-168, last sentence. This statement needs clarification. We contend that the lack of any "clear correlation" between marten population trends and habitat changes reflects a lack of effort to study this dynamic rather than indicating no relationship. Determinations of population trends require long-term data sets, and these have not been collected. Consequently, modeling habitat changes is the best that can be done at this time.

Brown Bears

Substantial new information is available on the importance of riparian habitats for maintaining sustainable and high brown bear populations (Flynn et al. 2007). This new information is consistent with and further supports maintaining no-cut buffers along salmon spawning streams. The implementation of the current brown bear buffer was left to field reviews without easily measurable criteria. Recent research results indicate that field evaluations for identifying important brown bear feeding areas may be difficult to complete and will yield ambiguous results. Given the lack of mapping for lands buffered for brown bear foraging, it is difficult to evaluate the effects of implementing the current S&G.

Based on current information, the following recommendations are made regarding no-cut, riparian buffers for brown bears:

Page 4-124, TLMP, IX Bear Habitat Management: We suggest modifying the brown bear S&G to provide for no-cut buffers along all salmon spawning streams based on work conducted by Flynn et al. (2007) and presented at the CSR Workshop. This could be incorporated into section IX. B., as follows (replacement text is underlined):

> B. Provide for additional protection of important brown bear foraging sites in addition to the buffers already provided by the Riparian and Beach & Estuary Fringe Forest-wide Standards and Guidelines, and the old-growth Habitat and other natural setting Land Use Designations. Establish no-cut forested buffers, where available, of at least 500 feet from the stream at sites where additional protective measures are needed to provide cover among brown bears while feeding, or between brown bears and humans. This no-cut buffer should be applied more broadly than the current S&G which is unclear in application. In high density brown bear areas (e.g., ABC islands), all segments that support spawning salmon are important for foraging during the late summer and these need careful evaluation for protection. On the mainland, where brown bear numbers are lower and patchy in distribution, the no-cut buffers may be particularly important.

Page 3-168. We suggest revising this section to more accurately describe the distribution of brown bears north of Frederick Sound. For example, while it is true that brown bears occur on islands north of Frederick Sound, this is not all-inclusive (i.e., Douglas, Lincoln, Shelter islands do not currently support brown bears).

Reference is made to brown bear hunting being allowed in Unit 4. However, this statement needs to be expanded to reflect the fact that brown bear hunting is allowed throughout other parts of Southeast Alaska. Additionally, we suggest adding a statement or two about guide/outfitter uses of brown bears on the Tongass as well as available viewing opportunities (i.e., Pack Creek, Anan Creek).

The section suggests that the late summer season is the most critical time period for brown bears. No references are provided despite many available publications by ADF&G (i.e., Titus, Flynn, others), USFS researchers (i.e., Gende) and others (i.e., Ben-David). Some of these publications along with recent ADF&G experience suggest that spring is also a critical time for brown bears across Southeast Alaska. The estuarine beach and certain riparian habitats are key for providing certain sedges and grasses as the first food of the season for bears. Therefore, conservation of the beach buffer remains an important attribute of the forest plan for this species.

Preliminary results from an interagency, cooperative mainland brown bear study suggest differences between brown bear ecology on the mainland (e.g., Misty Fjords, Bradfield Canal) versus the very high density populations that have been well-studied in Admiralty and Chichagof islands. We suggest that the less abundant and patchy distribution of estuarine and salmon spawning habitat in the mainland may be very important for maintaining sustainable brown bear populations in these areas. ADF&G staff will work with USFS staff to help interpret results from this ongoing work for better, long-term management of mainland brown bears.

Fish

Page 3-56: The information used to characterize sport fisheries and the data used to describe fishing effort and demand appears to be rather dated. We recommend that the most recent information available from the ADF&G Statewide Harvest Survey (SWHS) be used.

Page 3-52: The table of fish species important for sport, subsistence, and commercial fisheries does not include Dolly Varden char and cutthroat trout as being important for subsistence (Table 3.6-1). These should be included here.

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Alaska State Legislature

Representative Peggy Wilson
House District 2
Putting Alaska's Families First

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March 26, 2007

Forrest Cole
Forest Supervisor
Tongass National Forest
Attn: Forest Plan Adjustment
648 Mission Street
Ketchikan, AK 99901

Dear Mr. Cole,

The 1997 TLMP Revision is hurting the communities of Southeast Alaska. Since the revision, Wrangell, my hometown, has suffered a 20 percent decline in population due to the suppression the timber industry has faced. The residents who have chosen to stay in Wrangell have faced layoffs and serious financial hardship because the resource that they have depended upon for their livelihood has been taken away from them.

The industry decline is due primarily to the drastic restriction of the timber supply from the Tongass. The markets for lumber have been very good over most of the last decade, and the timber production has never once exceeded the market demand.

The timber supply constraints take two forms:

1. Not enough timber volume is planned and prepared and,
2. Most of the timber sale volume that has been prepared is too costly to be profitable despite the good markets the industry has experienced.

The industry has studied their timber volume needs and reaffirmed those estimates with independent economists. The consensus is that about 360 million board feet of timber is needed from the Tongass to support a sustainable, fully-integrated manufacturing industry.

I have discovered four elements of the 1997 TLMP conservation strategy that are causing most of the high cost:

1. The old-growth reserve strategy, which sets-aside the lowest cost, highest value timber in every harvest area

Jan-May, Juneau: State Capitol • Juneau, AK 99801-1121 • *ph:* (907) 465-3824 • *fax:* (907) 465-3175
June-Dec, Wrangell: PO Box 109 • Wrangell, AK 99929 • *ph:* (907) 874-3088 • *fax:* (907) 874-3055
Rep.Peggy.Wilson@legis.state.ak.us • http://www.akrepublicans.org/wilson/ • 1-800-686-3824

2. The marten and goshawk Standard and Guidelines which require that we leave 30% to 50% of the timber standing in every harvest unit in most of the previously developed areas
3. The beach-fringe buffers which were increased from 500-feet to 1,000-feet in 1997
4. The blanket application of class-3 (non-fish) stream buffers

Alternative 7 for the TLMP Amendment is the option that makes the most sense, and I urge you to adopt it. It is the only option that supplies the necessary volume and incorporates a conservation strategy that does not have the devastating economic consequences of the 1997 conservation strategy.

Sincerely,

Peggy Wilson

Representative Peggy Wilson
Alaska House District 2

CC:

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Undersecretary for Natural Resources
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4-16-07

John Harris
Speaker of the House

Tongass National Forest
Attention: Forest Plan Adjustment
648 Mission Street
Ketchikan, AK 99901

I am writing to express my concerns and provide comment on the Tongass Land Management Plan Amendment Draft EIS. There are several issues regarding the Tongass National Forest that are important to Alaska and her citizens that I wish to address in the following comments.

The timber industry was once a vital economic engine for the State of Alaska and Southeast Alaska in particular. It is no longer the predominant factor it once was, but due to a variety of circumstances, it is our concern in the Alaska Legislature that we explore all possible avenues as we move forward with our efforts to diversify Alaska's economy. A rejuvenated forest products industry in Southeast Alaska could play a significant role in our efforts along those lines.

In searching for a meaningful proposal to invigorate the timber industry within the Tongass, it is important to note that we do not endorse any reduction in the effort to maintain a viable and healthy forest for the many other uses engaged in by the citizens of Alaska, or of the rest of the nation. We encourage the Forest Service to continue important protections for fish and wildlife habitat, as well as the recreational opportunities those resources supply.

With the above general thoughts and points in mind, I would like to highlight a few more specific, salient points that I believe should be considered as this process moves forward. First, I would like to say that the Tongass Futures Roundtable discussions hosted by the Nature Conservancy and the National Forest Foundation should be allowed to move forward with some assurance that the solutions they are able to conceive may be incorporated into this plan. Although the comment period is ending it seems that a stipulation allowing for further adjustments would be in order considering the level of community participation in the Roundtable.

The current allowable sales quantity (ASQ) appears to be sufficient considering the amount being accessed by existing timber operations. However, it would seem prudent to build some flexibility into the plan. It should be imperative to provide an alternative that has the greatest opportunity for the Forest Service to react to changing conditions. It may be for the time being that an ASQ of 200 to 300 mmbf is adequate, but if market conditions are such that a greater volume is necessary, then the plan ought to be open to increases in market demands.

Careful consideration must also accompany strategies that are based on less than sound science. If there is incontrovertible evidence that conservation imperatives are necessary to sustain species within the forest then accommodations should be made for those strategies that will provide viable options for sustaining and recovering such species. However, the Forest Service and the Congress should seek legislative and regulatory parameters that bar the use of strategies that hamper sound economic and recreational uses by those who oppose multiple uses of our forest for philosophical reasons.

It appears there are recognized conservation needs resulting from some uses practiced in the past. It is my understanding that there may be cases where corrective measures to restore habitat to functionally productive states provides alternative economic opportunities for contractors. If that is the case, the plan should make use of those companies that are actively engaged in the forest products industry to provide man power and machinery to such recovery efforts. Such a strategy would enhance the economic viability of our existing logging companies.

I realize this is a major planning process with many intricate relationships between the forest itself and the various user groups among the public. That being the case, it seems the best interests of most people would be accommodated with a plan that supplied an adequate supply of timber to maintain current operations while holding the door open for changing market demands which may increase or decrease. The plan should carefully structure any use or activity so as to provide the best options to sustain the forest habitat and associated fish and wildlife populations. Last of all, the plan should accommodate reasonable economic and recreational activities as closely as possible to a multiple use framework.

I would like to thank the Forest Service for this opportunity to express my views on this important subject to Alaska. I hope my comments offer some constructive views as you work toward formulating an acceptable working plan for the Tongass. If you have any questions or would like to discuss further any of the comments reflected in this letter, please do not hesitate to contact my office.

Sincerely,

John Harris
Speaker of the House

ALASKA STATE LEGISLATURE

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Senator_Bert_Stedman@legis.state.ak.us

INTERIM
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SENATOR BERT K. STEDMAN

April 30, 2007

Mr. Forrest Cole
Forest Supervisor
Tongass National Forest
Federal Building
Ketchikan, AK 99901

Dear Supervisor Cole:

I appreciate the opportunity to comment on the draft Tongass National Forest Plan Adjustment.

It's obvious that your team put a great deal of work into this adjustment to bring it into compliance with recent court orders. I have comments I would like you to consider in finalizing the plan.

For over a century, the United States Forest Service has managed our national forests and grasslands to provide for multiple uses. The Tongass National Forest provides recreational, mining, logging, hunting, and tourism opportunities, as well as providing the spawning grounds for one of the best fisheries in the country. It is important that all of these uses receive equal consideration under the new management plan.

In recent years, timber has not received this equal consideration. Since long before statehood, timber has been a mainstay of the Southeast economy, providing steady, well-paying and, most importantly, year-round jobs to many residents. In addition to the good jobs, communities benefited from the shared revenue generated by timber sales.

There are a dozen sawmills operating in Southeast employing over 150 residents and providing significant stimulus to the region's economy.

DISTRICT A
Ketchikan • Sitka • Petersburg • Wrangell
Pelican • Elfin Cove • Port Alexander • Saxman • Myers Chuck • Thorne Bay • Coffman Cove • Hollis

However, they are woefully under capacity. In order for these mills to survive and compete effectively on the world market, a stable and sufficient timber supply is vital.

I realize that you must balance many interests as you move carefully towards an acceptable management plan. I firmly believe that timber harvesting can coexist with other activities in the Tongass and ask that you recognize the great benefits of a healthy wood products industry in Southeast when setting the final timber harvest levels.

Best regards,

Bert K. Stedman

Bert Stedman

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STATE OF ALASKA

SARAH PALIN, GOVERNOR

DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

P.O. BOX 112506
6860 GLACIER HIGHWAY
JUNEAU, AK 99801-7999

SOUTHEAST REGION

PHONE: (907) 465-1763
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COPY

RECEIVED
APR 30 2007
Ron
4-30-07

April 25, 2007

Tongass National Forest
Attn: Forest Plan Adjustment
648 Mission Street
Ketchikan, AK 99901

RE: Corridor Omissions from the Tongass Land and Resource Management Plan

Dear Plan Preparers,

The Draft Environmental Impact Statement for the Tongass Land and Resource Management Plan is incomplete. It does not include eight Essential State Transportation and Utility Corridors listed in the Southeast Alaska Transportation Plan. Omitting these corridors is not an acceptable outcome to the State of Alaska.

Background

In 2004, the Southeast Alaska Transportation Plan was adopted as a component of the Alaska Statewide Transportation Plan. It identifies a total of 34 Essential Transportation and Utility Corridors that must be reserved and protected to meet future transportation needs. The Executive Summary of the plan specifically requests that the Forest Service incorporate each corridor into the Tongass Land and Resource Management Plan.

Affected Environment discussion

The text of pages 3-229 and 3-230 fails to explain how only a subset of the 34 corridors were incorporated into the Tongass Land and Resource Management Plan. Apparently, the Forest Service is confused because a subsequent Memorandum of Understanding did not include all 34 corridors.

Remedy

Revise the Tongass Land and Resource Management Plan so that the management prescription includes the Transportation and Utility overlay for each of the 34 corridors. Depict all 34 corridors on alternative maps. Revise the discussion of Affected

25A-T34LH

Environment to specify the preeminence of the entire set of 34 corridors with respect to the subsequent Memorandum of Understanding.

In conclusion, please revise the Tongass Land and Resource Management Plan per the above.

Thank you for the opportunity to comment.

Sincerely,
DOT&PF Southeast Region

Malcolm A. Menzies, P.E., L.S.
Regional Director

cc: Andy Hughes, Regional Planning Chief

APPENDIX A. ESSENTIAL STATE TRANSPORTATION AND UTILITY CORRIDORS

Essential Transportation and Utility Corridors

The Southeast Alaska Transportation Plan (SATP) identifies 34 essential highway and utility corridors to be reserved and protected to meet future transportation needs. These corridors are required to connect communities to the regional transportation system and to establish a regional power grid. The state requests that the Forest Service incorporate all of these highway and utility corridors into the Tongass Land Management Plan and reserve and protect these corridors for these purposes. Adoption of this plan is an official expression of state policy that no other action by any other party should be taken (such as designations of wilderness areas) that would interfere with public use of any of the mapped corridors. In addition, the state requests that the Forest Service contribute to state efforts by improving and connecting forest roads that are located within essential road corridors identified by the state. Corridors of particular interest are Kake - Petersburg, Kake - Totem Bay, and North Prince of Wales Island Road - Red Bay.

In a region as rugged as Southeast Alaska, valleys and mountain passes represent invaluable corridors for highway routes and utility transmission lines. Maps 16 to 23 identify the transportation and utility corridors considered essential to the state. These corridors are identified below.

Corridor Descriptions

Lynn Canal Corridors — Juneau to Haines and Skagway

1. From Echo Cove northerly along the shore of Berners Bay and Lynn Canal to Skagway with a ferry terminal near the mouth of the Katzhin River.
2. From Skagway southerly along Taiya Inlet to Taiya Point, then northwesterly along Lutak Inlet to Haines.
3. From Haines across the Chilkat River/Inlet at or above Pyramid Island, then southerly along the west shore of Lynn Canal to a suitable ferry terminal site on William Henry Bay.

Taku River Corridors

4. From Thane Road southeasterly along Gastineau Channel to Bishop Point, then northeasterly along Taku Inlet to a suitable bridge crossing at Grizzly Bar.
5. From Jaw Point northeasterly along the southeast shore of Taku Inlet and River to the Canada border to provide ferry crossing options.

Mansfield Peninsula Crossing, Admiralty Island, Corridor

6. From Young Bay to Greens Creek, Hawk Inlet.

Chichagof Island Corridors

7. From a suitable ferry terminal site on Whitestone Harbor to Hoonah.
8. From Hoonah to a suitable ferry terminal site on Tenakee Inlet.
9. Pelican cut-off road from Tenakee Inlet Road to Pelican.
10. Kadashan Road from a suitable ferry terminal site on Tenakee Inlet southeasterly along the Kadashan River to a suitable ferry terminal site on the north shore of Peril Strait across from Rodman Bay.

Baranof Island Corridors

11. From the end of Halibut Point Road to a suitable ferry terminal site on Rodman Bay.
12. From the end of Sawmill Creek Road to a suitable ferry terminal site on Warm Springs Bay.

Kuiu Island Corridor

13. From a suitable ferry terminal site on Security Bay to a suitable ferry terminal site on Reid Bay for crossing Sumner Strait to Labouchere Bay on Prince of Wales Island.

Kupreanof Island Corridors

14. From Kake to a suitable ferry terminal site in Kupreanof for crossing the Wrangell Narrows.
15. From Kake to a suitable ferry terminal site in Totem Bay for crossing Sumner Strait to Red Bay on Prince of Wales Island.

Prince of Wales Island Corridors

16. North Prince of Wales Island Road from the intersection with Coffman Cove Road to a suitable ferry terminal site in the vicinity of Red Bay on Sumner Strait.

17. Neck Lake Road from North Prince of Wales Island Road easterly along Neck Lake to Wale Pass.
18. Cavern Lake Road from Wale Pass westerly to North Prince of Wales Island Road.
19. Caulder Road from North Prince of Wales Island Road near El Capitan northwesterly to a suitable ferry terminal site on Labouchere Bay.
20. North Prince of Wales Island Road north, then west from Cavern Lake Road to a suitable ferry terminal location on Labouchere Bay.
21. Sandy Beach Road from Thorne Bay north to Ratz Harbor, then along the east shore of Prince of Wales Island to Coffman Cove.

Mid-Region Access Corridors

22. Stikine Delta Causeway to South Mitkof Island to Rynda Island to Kadin Island to mainland, near Green Point, then along the eastern side of Eastern Passage to a bridge crossing point at "the Narrows."
23. Stikine River Corridor (according to the Alaska National Interest Lands Conservation Act [ANILCA], Section 1113).
24. A bridge crossing Eastern Passage at the Narrows between Wrangell Island and the mainland.
25. East side of Eastern Passage from the Narrows south to Bradfield Canal, then east along the north side of Bradfield Canal to the Bradfield River at the head of the Bradfield Canal.
26. Bradfield Road from the head of the Bradfield Canal along the North Fork of the Bradfield River to the Canada border at the Craig River.
27. From the head of Bradfield Canal along the south side of the Bradfield Canal west to Duck Point (or other suitable ferry terminal site on the Bradfield Canal).

Wrangell Island Corridors

28. From Zimovia Highway easterly along McCormack Creek, to Eastern Passage, then southerly to a suitable ferry terminal site on Fools Inlet.
29. From Zimovia Highway easterly along McCormack Creek to Eastern Passage, then to the Narrows bridge crossing site.

Cleveland Peninsula Corridors

30. Upper Cleveland Peninsula crossing from Bradfield Canal southeasterly along Eagle River to Point Lees to a suitable ferry terminal on the Behm Canal.

Lower Cleveland Peninsula crossings:

31. From a suitable ferry terminal site on Santa Anna Bay southeasterly to a suitable ferry terminal site on Spacious Bay.

32. From a suitable ferry terminal site on Frosty Bay south to Santa Anna Bay, then southeasterly to Spacious Bay, then south to Port Stewart and along the southwest shore of Port Stewart to a suitable ferry terminal site on Helm Bay.

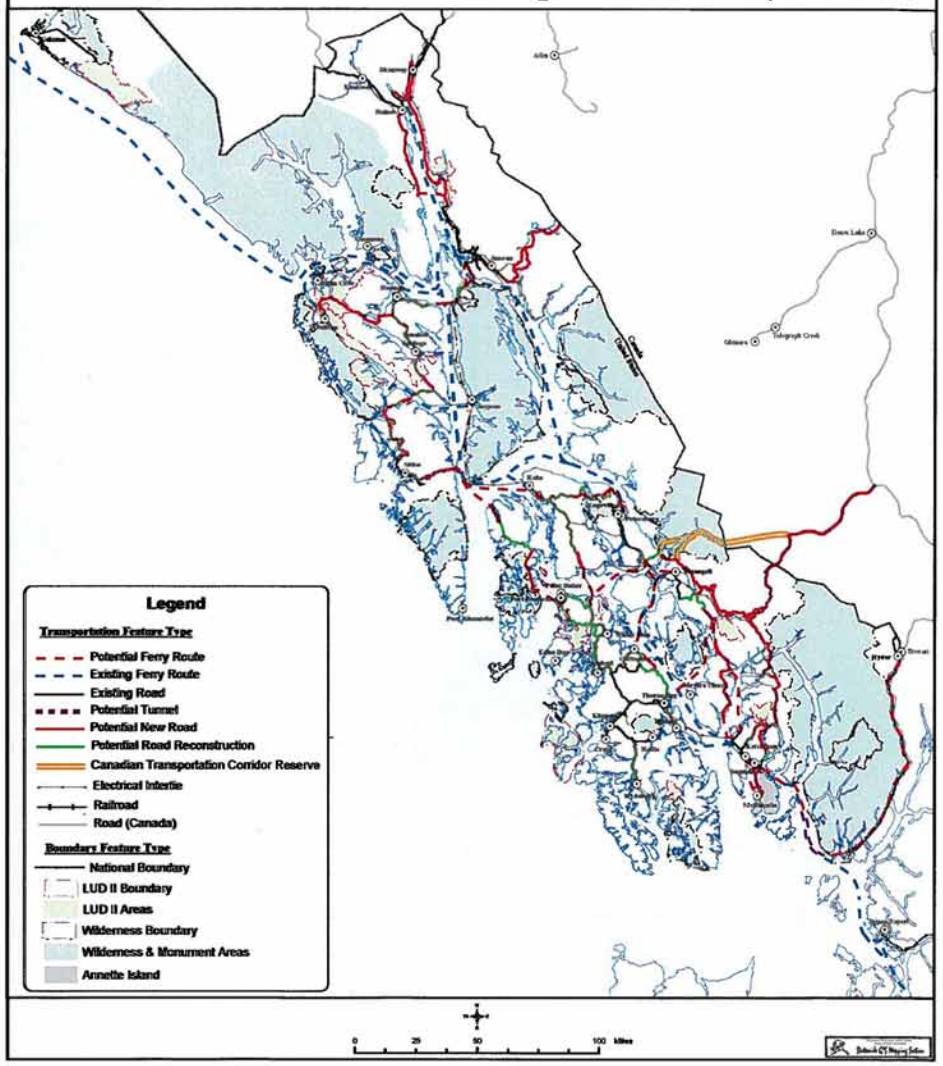
Revillagigedo Island Corridors

33. From a suitable ferry terminal site at or near Claude Point, then southwesterly via Benrer and Klam creeks to Shrimp Bay, then easterly to Cedar Lake and Orchard Creek, then southeasterly along Orchard Creek to a south branch extending toward Carroll Creek, then south to Carroll Inlet, then south along the west shore of Carroll Inlet to Shelter Cove, then westerly to the head of George Inlet to Ward Lake Road.

34. From the head of George Inlet south along the west shore of George Inlet to the end of South Tongass Highway.

Southeast Alaska Transportation Plan: an approved component of the Alaska Statewide Transportation Plan, August 14, 2004

Map 7
Essential State Land and Marine Transportation & Utility Corridors



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TONGASS NATIONAL FOREST
2007 DRAFT ENVIRONMENTAL IMPACT STATEMENT
AND
TONGASS LAND AND RESOURCE MANAGEMENT PLAN AMENDMENT

COMMENTS SUBMITTED BY ALASKA ENERGY AUTHORITY

1. INTRODUCTION

A Ninth Circuit Court ruling in 2005 and the January 2005 "5 Year Plan Review" set the stage for the amendment to the 1997 Tongass National Forest Land and Resource Management Plan. The Draft Environmental Impact Statement (DEIS) responds to the 2005 Court decision[1] and adjustments recommended during the recent 5-Year Review of the Forest Plan. A companion document, Proposed Land and Resource Management Plan represents the complete Forest Plan including all proposed amendments. Land and Resource Management Plans are required by the National Forest Management Act (NFMA) of 1976.

The Alaska Energy Authority (AEA) is pleased to provide comments on the DEIS and Proposed Tongass Land and Resource Management Plan (Tongass Land Management Plan or TLMP) dated January 2007.

The AEA, created by in 1976 by the Alaska Legislature, is a public corporation of the state of Alaska with a separate and independent legal existence. The agency is responsible for the administration of various state power projects and programs.

AEA Mission: Reduce the cost of energy in Alaska.

"AEA projects and programs support its mission by 1) providing for the operation and maintenance of existing Authority-owned projects with maximum utility control, 2) assisting in the development of safe, reliable, and efficient energy systems throughout Alaska, which are sustainable and environmentally sound, 3) reducing the cost of electricity for residential customers and community facilities in rural Alaska, and 4) responding quickly and effectively to electrical emergencies." (Emphasis added)

AEA Interest in the DEIS and Tongass Land Management Plan

The 16.8-million acre Tongass National Forest is the largest forest in the National Forest System (NFS) and remains for the most part wild and undeveloped. Approximately 71,000 people live in 32 communities and other areas located on islands or on the mainland coast. Developed areas cover about 1.50 million acres, or about 9% of the Forest. Only 8 of the 32 communities have populations greater than 1,000 persons. The economies of SE Alaskan communities rely on the Tongass National Forest to provide natural resources to support local sustainable economies: fishing, timber harvesting, recreation, tourism, mining, and subsistence activities.

[1] Ninth Circuit Court's decision in *Natural Resources Defense Council vs. U.S. Forest Service* (421 F.3d 797, August 5, 2005)

Most of the communities in Southeast (SE) Alaska are dependent on isolated sources of electricity; only Haines and Skagway, Petersburg and Wrangell, and several communities on Prince of Wales Island enjoy electric transmission interconnections.

Most existing and proposed transmission lines in SE Alaska are and/or would be located on lands within the Tongass National Forest, thereby requiring federal approval to site, construct, and operate proposed facilities. Exceptions include line segments located in the Metlakatla Indian Community on Annette Island, a federal reservation, and certain lands that have been conveyed to the state of Alaska and Native Alaska Corporations.

Since July 2006 AEA is participating actively with communities and electric utilities in SE Alaska through the AK-BC Intertie Steering Committee, Work Group, and Technical Group (AK-BC Intertie Committee/Groups) to conduct investigations and develop information in support of the proposed southern SE Alaska Intertie Plan, including the export line to British Columbia. An overarching goal of the interconnected electric transmission system is to provide least cost alternatives to diesel-generated electricity and to allow communities to remain economically sustainable, resulting in jobs for Alaskans.

In November 2006 AEA contracted with Hatch Acres Corporation to evaluate engineering, economic and political factors for development of a transmission interconnection from SE Alaska to British Columbia (AK-BC Intertie).

Several meetings were held in Ketchikan, Anchorage, and Juneau with the AK-BC Intertie Work Committee/Groups for the purpose of discussing potential future scenarios for an interconnected system within southern SE Alaska and the viability of the proposed AK-BC Intertie. Consultations have been ongoing with the Forest Service during development of the proposed system and AEA expresses its appreciation for the information provided by Forest Service staff throughout preparation of reports.

On April 6, 2007, AEA issued the Draft Final Report of the Alaska-British Columbia (AK-BC) Feasibility Study prepared by Hatch Acres Corporation under contract to AEA (2007 AK-BC Intertie Draft Final Report). AEA expects to issue the final report in June 2007.

The purpose of the AK-BC Intertie Project is twofold:

- To facilitate the development of the Southeast Alaska Electrical Intertie System[2] to interconnect communities, encourage development of new renewable electricity generating facilities, and through interconnections reduce the current level of diesel generation and reduce emissions that affect air quality and contribute to climate change. Providing access to low-cost renewable electric power to currently isolated communities solely reliant on diesel generated power will reduce emissions and allow communities to remain economically sustainable.
- To facilitate development of the AK-BC Intertie and encourage new renewable electricity generation facilities for energy export. The proposed interconnection

[2] The concept of the Southeast Alaska Electrical Intertie System is set forth in Report #97-01 prepared by Acres International Corporation for the Southeast Conference. This Report is incorporated by reference in these comments on the DEIS and Proposed Land and Resource Management Plan.

with British Columbia will provide enhanced reliability to the Southeast Alaska Electrical Intertie System and provide additional revenue to SE Alaska through sales of Alaskan-generated power.

Currently several communities are served with clean renewable energy from existing hydro projects. In addition to encouraging new projects, the completion of an interconnected electric transmission system within SE Alaska would encourage upgrades to existing hydro facilities.

Energy export could lead to the development of a number of new renewable[3] electricity generating facilities in Southeast Alaska meeting domestic power needs and providing a surplus for export.

AEA requests that transmission corridors identified in the ongoing AK-BC Intertie Feasibility Study and corridors identified in an earlier comprehensive evaluation of an interconnected system for SE Alaska, the Southeast Alaska Electrical Intertie System Plan, Report #97-01, prepared by Acres International Corporation for the Southeast Conference dated January 1998 (1998 SE Alaska Intertie System Plan), be included on maps included in the DEIS and the Tongass Land Management Plan.

AEA requests the Forest Service to incorporate by reference the 2007 AK-BC Intertie Draft Final Report and a companion report, 1998 SE Alaska Intertie Plan. These reports are available on the AEA website www.akenergyauthority.org/AlcanProjectPage.

AEA has reviewed the DEIS and Tongass Land Management Plan and understands that the Proposed Action alternative (Alternative 6) and related management prescriptions appear to allow implementation of the proposed electric transmission interconnections as included in the 2007 AK-BC Intertie Draft Final Report and the 1998 SE Alaska Intertie Plan. The following sections of AEA's comments provide detailed information regarding AEA's interests in assuring that these essential electric connections among communities in SE Alaska are considered in the DEIS and the Tongass Land Management Plan.

AEA has reviewed the map included in Alternative 6 Draft EIS and notes that two proposed segments are not currently identified: a line from Coffman Cove to the Four Dam Pool Power Agency (FDPPA) transmission line between the Tyee Lake Project and Wrangell/Petersburg. These line segments are shown on Figure 1 Additional Transmission Line Segments is provided in Section 6 of these comments.

[3] Renewable electricity generating facilities includes hydro, tidal energy, geothermal, and wind.

2. STATE OF ALASKA EXPLANATORY STATEMENT

2.1 Importance of Utility System Corridors

Electricity is the universal energy form. Virtually every home, institution, office, business, and industry in the nation use electricity and all are directly affected by its price and availability. Utility rates and services affect the quality of life for residents, influence economic development in communities within the study area, and shape future opportunities in all sectors of the economy. Significant disparities in the cost of power for SE Alaska communities exist today.

Most electric systems in SE Alaska are community-based and serve isolated load centers. With the exception of the below-listed existing transmission lines, there are no interconnections to import or export power among the communities and electric utilities.

- Haines to Skagway - transmits hydropower generated near Skagway – Alaska Power & Telephone (AP&T)
- Tyee to Petersburg and Wrangell - Four Dam Pool Power Agency (FDPPA) line delivers power from the Tyee Lake Hydroelectric Plant
- Line linking several communities on Prince of Wales Island (POW) to the Black Bear Lake and South Forks Hydroelectric projects – AP&T

Lacking transmission interconnections to other electric systems, each utility must plan independently to provide full power requirements to meet customer needs. This results in many communities reliance on higher cost diesel-generated power and related emissions adversely affecting ambient air quality and contributing to global warming in SE Alaska. As noted above, with few exceptions, most existing and proposed new transmission lines are/would be constructed on lands within the Tongass National Forest.

AEA notes that the Forest Service includes "the social and economic well-being of the communities of Southeast Alaska" as one of the public issues considered in the 2003 Supplemental EIS. AEA does not see this concern brought forward as one of "The Three Focus Issues" in the 2007 DEIS. However, AEA notes that the social and economic well being in SE Alaska is woven into some of the discussion in the DEIS.

AEA notes that Land Use Designations (LUDs) specify ways of managing areas and resources within the forest. LUD's are assigned, or allocated, to specific areas of land and given areas have one LUD assigned. Transportation and Utility System LUDs are defined as "overlay LUDs and can apply to a given piece of ground when and if...transportation/utility systems are to be developed on that piece of ground." With certain exceptions, transportation and utility systems are allowed throughout the Tongass as directed by Title XI of the Alaska National Interest Lands Conservation Act of 1980 (ANILCA).

AEA notes that the Draft Proposed Tongass Forest Plan at Section 4 Standards & Guidelines does not include a section on Utility Systems. See specific comments and recommendations at sections 4 and 5 of these comments.

The following proposed transmission segments would fall within the definition of Transportation and Utility System LUDs. Many of the line segments currently under consideration are included in the list of Power Transmission Lines in the DEIS (page 3-233). The following list presents the complete list of line segments under consideration. These line segments are also depicted on the Maps at Section 6 within these comments.

Proposed Transmission Segments within SE Alaska

Proposed connections in process at this date include:

- Juneau to Hoonah (the Juneau to Greens Creek portion is completed) - Kwaan Electric Transmission Intertie Cooperative, Inc. (KWETICO)
- Swan-Tyee Intertie (STI) that would interconnect Petersburg/Wrangell with Ketchikan and serve Ketchikan with current excess available energy at the Tyee Lake Hydroelectric Plant. – FDPPA
- Thayer Creek to Angoon - Kootzoowoo Inc., a Native village cooperative, proposed line from a new hydro project

Future proposed transmission segments and connections include:

- Juneau to Skagway
- Lake Dorothy to Juneau (AEL&P)
- Otter Creek to Skagway (AP&T)
- Hoonah to Tenakee Springs
- Tenakee Springs to Angoon
- Angoon to Sitka
- Takatz Lake to Kake
- Kake-Petersburg Transmission Intertie (KPTI)
- Sunrise Lake to Wrangell
- Metlakatla to Ketchikan – Metlakatla Power & Light Prince of Wales (POW) Island – segment to connect Coffman Cove and Naukati to southern POW communities. (not included in the list on page 3-223)
- Prince of Wales Island to FDPPA line near Wrangell – AP&T (not included in the list on page 3-233. This is an alternative to the line between Thorne Bay and Ketchikan included on the list)
- Thomas Bay to FDPPA line near Petersburg (not included in the list on page 3-233)

Proposed International Interconnection

- AK-BC Intertie

2.2 Benefits to the State and to Southeast Alaska

SE Alaska decision-makers have an opportunity to engage in joint planning to develop an interconnected electric transmission system within SE Alaska and the potential to expand that concept to include an interconnection with BC. AEA requests that the Forest Service include the identified transmission segments in the DEIS and Tongass Land Management Plan (see Map – Figure 1 Additional Transmission Line Segments in Section 6 of these comments)

Implementation of joint planning and system operation are proposed in the AK-BC Intertie Draft Final Report and the 1998 Southeast Alaska Electric Intertie System Plan and will facilitate open access to regional system facilities at just and reasonable non-discriminatory rates. An interconnected electric transmission system will facilitate joint planning and shared use of existing and proposed new renewable electric generation projects.

Significant disparities in cost of power in SE exist today, in part related to availability of low-cost hydropower. Many isolated load centers are currently served by diesel generation.

SE Alaska communities have experienced slow population growth for decades. The economy is in transition from a commodity resource-based economy to one where the economy is mixed, with increasing development in service-oriented businesses including government services, recreation and tourism.

Completion of the STI and development of proposed transmission lines to interconnect submarkets, and a future interconnection with BC, will encourage new sustainable economic development in currently isolated load centers and improve quality of life for residents currently encumbered with high cost energy from diesel generation.

2.3 Benefits to the Tongass National Forest

Completion of an interconnected electric transmission system will reduce reliance on diesel generation in SE Alaska and facilitate switching from fuel oil to electric heat for residential, government, and commercial customers. Reduced diesel generation and fuel oil use in SE Alaska will result in reduced adverse environmental effects that occur with transport, storage, and end-use of diesel and fuel oil.

AEA presents in the following section detailed information regarding avoided emissions that could result when individual load centers and systems are interconnected in southern SE Alaska, including completion of the Swan-Tyee Intertie and connections between Kake and Petersburg and Metlakatla and Ketchikan. Similar results can be anticipated in other areas throughout SE Alaska as transmission line segments are completed.

The United States Environmental Protection Agency (EPA) is mainly concerned with emissions which are or could be harmful to people. EPA calls this set of principal air pollutants, criteria pollutants. The criteria pollutants are carbon monoxide (CO), lead (Pb), nitrogen dioxide(NO_2), ozone (O_3), particulate matter (PM), and sulfur dioxide (SO_2).

Four of the criteria pollutants related to diesel generation and household oil-fired furnaces with/without interconnections were examined in this analysis – CO2, SOx, CO, and NOx.

With completion of the STI in 2010, conversion of a portion of oil fired furnace load could reduce CO2 and SOx emissions by 795,155 and 5,074 tons or some 47.7% and 45.5% respectively over the period from 2007 to 2046 or 485,996 and 3,150 tons or some

53.3% and 51.5% respectively over the period from 2007 to 2031 when compared with the isolated case without conversion. Over the period from 2007 to 2046, emissions of CO and NOx would be increased by 348 and 1673 tons or about 9.2% and 10.2% respectively due to the corresponding high emission factors of diesel engines.

Detailed information is presented in the following section in response to the DEIS.

3. SPECIFIC COMMENTS - DEIS

3.1 Climate and Air (pages 3-11 – 3-15

One of the goals common to all alternatives stated in the DEIS is: "Air. Maintain the current air resource condition to protect the Forest's ecosystems from on- and off- Forest air emission sources." (Page 2-7 DEIS)

Section 3 of the DEIS includes a description of the affected environment and related environmental effects. AEA notes several references to diesel power plants as a source of air pollution. The proposed interconnected electric transmission system presented in the recently issued AK-BC Intertie Feasibility Study Draft Final Report would result in decreased diesel generation in southern SE Alaska and would facilitate switching from fuel oil to electric heat in several communities.

AEA requested Hatch Energy to perform an analysis of avoided emissions that could result when individual load centers and systems are interconnected in southern SE Alaska. The following section "Estimated Avoided Emissions" of AEA's comments presents the results of that analysis as it would relate to the goal staed in Chapter 2 of the Draft Proposed Tongass Forest Plan: *"Maintain the current air resource condition to protect the Forest's ecosystems from on- and off- Forest air emission sources."* And the related objective: *"Attain national and state-ambient air quality standards forest-wide."*

ESTIMATED AVOIDED EMISSIONS

Two load growth scenarios were investigated:

- Include conversion of a portion of heating supplied by oil fired heating furnaces to loads supplied by electrical heaters (case with conversion)
- Consider that heating would continue to be supplied by oil fired heating furnaces (case without or no conversion).

In the case with conversion of oil fired heating furnaces, the annual expected displaced oil consumption of these furnaces was estimated and the expected amount is discussed in this section.

For each of the two load growth scenarios, the generation for three system development cases was determined in order to calculate the avoided emissions. These cases are::

1) Isolated --	Swan-Tyee Intertie is not implemented and both Kake and Metlakatla remain isolated;
2) Isolated With STI --	Swan-Tyee Intertie is commissioned in 2010 but both Kate and Metlakatla remain isolated;
3) Interconnected With STI --	Swan-Tyee Intertie is commissioned in 2010, Kate is interconnected with Petersburg and Metlakatla is interconnected with Ketchikan.

Emission Factors

Four emission pollutants - CO2, SOx, CO and NOx - were examined in this study. The emission factors used were obtained from AP 42, Volume I, Fifth Edition published by the Environmental Protection Agency (EPA) of the USA in 1995. These factors are summarized as follows:

Pollutant	Diesel Engine	Furnace
Emission Factors in Pounds Per Horsepower-Hour (lb/hp-hr)		
CO2	1.16	
SOx	0.00809	
CO	0.0055	
NOx	0.024	
Emission Factors in Pounds Per Thousand Gallons of Fuel (lb/1000-gal)		
CO2	22,548	22,300
SOx	157	144
CO	107	5
NOx	467	18

It is important to note that the emission factors in lb/hp-hr for diesel engines shown in the table above are the average values for large diesel engines (greater than 600 hp). The factors in lb/1000-gal for the diesel engines are calculated based on the values in lb/hp-hr, heat rate of 7,000 Btu/hp-hr, diesel heating value of 19,300 Btu/lb and diesel density 7.05 lb/gal. It is also assumed that the diesel used contains 1% of sulfur.

It can be seen from these emission factors that for the same amount of liquid fuel consumed by the diesel engines and furnaces, the two types of facilities emit similar amounts of CO2 and SOx but diesel engines emit much more CO and NOx than furnaces. CO and NOx emissions from diesel engines are about 21 times and 26 times of those from furnaces.

2 Electricity Required for Conversion of Oil Fired Heating Furnaces

In this analysis, five load centers were considered - Ketchikan, Metlakatla, Wrangell, Petersburg and Kake. The estimated additional annual electrical energy required to supply the loads that would be converted from oil fired heating furnaces assumed as well as the displaced oil consumption in the case with conversion are summarized as follows:

Year	Additional Electricity Required (MWh)	Displaced Oil Consumption (US Gallon)
2007	2,759	108,375
2008	5,433	213,377
2009	8,016	314,846
2010	11,728	453,163
2011	18,962	707,095
2012	28,600	1,039,909
2013	30,889	1,129,792
2014	39,194	1,417,705
2015	41,449	1,506,298
2016	43,641	1,592,398
2017	45,765	1,675,796
2018	47,841	1,757,324
2019	49,874	1,837,193
2020	51,891	1,916,396
2021	53,860	1,993,728
2022	55,781	2,069,190
2023	57,660	2,142,990
2024	59,492	2,214,920
2025	61,286	2,285,395
2026	63,058	2,354,991
2027	64,793	2,423,133
2028	66,496	2,490,028
2029	68,168	2,555,676
2030	69,802	2,619,869
2031	71,425	2,683,600
Total	**1,117,863**	**41,503,183**

With conversion of each MWh of furnace load to electrical load, about 37 gallons of heating oil can be displaced. Based on a heat rate 7,000 Btu/hp-hr, a heating value of 19,300 Btu/lb and a density of 7.05 lb/gal as mentioned earlier, diesel engines would use about 69 gallons of diesel to generate one MWh. This implies that diesel engines have lower efficiency than heating furnaces. If the additional load for heating was produced by diesel engines, there would be more oil consumption and more pollution than in the case of supply from heating furnaces. I important to note that most of the additional or displaced heating furnace load is expected to be produced by unused hydro generation.

3 Estimated Avoided Emissions

The following tables present total and avoided emissions over the periods from 2007 to 2041 and from 2007 to 2031. Tables showing detailed information from which these summary tables were developed is attached at the end of this section of the comments.

Summary Table - Total Emissions

Theme	Case	CO2 (ton)	SOx (ton)	CO (ton)	NOx (ton)
2007-2046					
No-Conversion	Isolated	1,667,754	11,160	3,790	16,381
	Isolated-STI	1,485,993	9,892	2,928	12,620
	IC-STI	1,383,714	9,179	2,443	10,504
Conversion	Isolated	1,424,535	9,935	6,754	29,473
	Isolated-STI	956,242	6,669	4,534	19,784
	IC-STI	872,599	6,086	4,137	18,054
2007-2031					
No-Conversion	Isolated	912,198	6,123	2,235	9,672
	Isolated-STI	829,041	5,543	1,840	7,952
	IC-STI	770,639	5,135	1,564	6,743
Conversion	Isolated	754,157	5,260	3,576	15,603
	Isolated-STI	471,672	3,290	2,236	9,759
	IC-STI	426,202	2,972	2,021	8,818

It can be seen from the above table that in the interconnected case with the Swan-Tyee interconnection commissioned in 2010, conversion of a portion of oil fired furnace load could reduce CO2 and SOx emissions by 795,155 and 5,074 tons or some 47.7% and 45.5% respectively over the period from 2007 to 2046 or 485,996 and 3,150 tons or some 53.3% and 51.5% respectively over the period from 2007 to 2031 when compared with the isolated case without conversion. Over the period from 2007 to 2046, emissions of CO and NOx would be increased by 348 and 1673 tons or about 9.2% and 10.2% respectively and this is due to the corresponding high emission factors of diesel engines.

Summary Table - Avoided Emissions

Theme	Case	CO2 (ton)	SOx (ton)	CO (ton)	NOx (ton)
2007-2046					
No-Conversion	Isolated	--	--	--	--
	Isolated-STI	181,762	1,268	862	3,761
	IC-STI	284,040	1,981	1,347	5,877
Conversion	Isolated	243,219	1,225	-2,965	-13,093
	Isolated-STI	711,513	4,491	-744	-3,404
	IC-STI	795,155	5,074	-348	-1,673
2007-2031					
No-Conversion	Isolated	--	--	--	--
	Isolated-STI	83,156	580	394	1,720
	IC-STI	141,559	987	671	2,929
Conversion	Isolated	158,041	863	-1,341	-5,931
	Isolated-STI	440,525	2,833	-2	-87
	IC-STI	485,996	3,150	214	854

The following Tables 1 and 2 present detailed information regarding the estimated annual emissions in short tons (2000lb/short ton) for each of the two load growths studied.

Table 1: Estimated Emissions for Cases Without Conversion of Oil Fired Heating Furnaces

Isolated Case					Isolated Case With STI					Interconnected Case With STI				
Year	CO2 (ton)	SOx (ton)	CO (ton)	NOx (ton)	Year	CO2 (ton)	SOx (ton)	CO (ton)	NOx (ton)	Year	CO2 (ton)	SOx (ton)	CO (ton)	NOx (ton)
2007	28,036	195	127	556	2007	28,036	195	127	556	2007	28,036	195	127	556
2008	31,890	221	140	612	2008	31,890	221	140	612	2008	31,890	221	140	612
2009	34,217	237	146	638	2009	34,217	237	146	638	2009	34,217	237	146	638
2010	26,217	180	101	442	2010	13,592	92	42	181	2010	13,592	92	42	181
2011	18,520	125	52	226	2011	17,134	115	46	198	2011	15,153	102	36	157
2012	22,891	154	56	243	2012	22,221	149	53	229	2012	20,228	135	44	188
2013	24,458	164	59	256	2013	23,907	160	56	244	2013	21,715	145	46	199
2014	28,625	191	64	278	2014	28,900	193	66	284	2014	23,336	155	39	169
2015	30,262	202	68	292	2015	27,377	182	54	232	2015	24,900	165	42	181
2016	31,898	213	71	307	2016	28,969	193	57	246	2016	26,431	175	45	194
2017	33,551	224	75	323	2017	30,532	203	60	260	2017	27,930	185	48	206
2018	35,193	235	78	339	2018	32,075	214	64	274	2018	29,548	196	52	222
2019	36,829	246	82	355	2019	33,606	224	67	288	2019	31,402	208	56	242
2020	38,466	257	86	371	2020	35,377	236	71	307	2020	33,416	222	62	267
2021	40,087	268	90	387	2021	37,279	249	76	329	2021	35,414	235	67	291
2022	40,288	269	87	375	2022	37,777	252	75	323	2022	37,396	249	73	315
2023	41,910	280	91	392	2023	39,664	264	80	346	2023	35,394	234	60	257
2024	43,693	292	96	413	2024	41,528	277	85	368	2024	37,314	247	65	281
2025	42,179	281	85	366	2025	43,375	289	91	391	2025	39,230	260	71	305
2026	43,638	291	88	381	2026	36,848	243	56	240	2026	33,952	223	42	180
2027	45,128	301	92	397	2027	38,154	252	59	252	2027	35,250	232	45	192
2028	46,731	312	96	415	2028	39,488	261	62	265	2028	36,568	241	48	205
2029	48,418	323	101	435	2029	40,935	271	65	280	2029	38,014	250	52	220
2030	48,704	325	99	427	2030	42,365	280	69	296	2030	39,443	260	55	235
2031	50,370	336	104	447	2031	43,797	290	72	311	2031	40,872	270	59	251
Total	**912,198**	**6,123**	**2,235**	**9,672**	**Total**	**829,041**	**5,543**	**1,840**	**7,952**	**Total**	**770,639**	**5,135**	**1,564**	**6,743**

Table 2: Estimated Emissions for Cases With Conversion of Oil Fired Heating Furnaces

Isolated Case					Isolated Case With STI					Interconnected Case With STI				
Year	CO2 (ton)	SOx (ton)	CO (ton)	NOx (ton)	Year	CO2 (ton)	SOx (ton)	CO (ton)	NOx (ton)	Year	CO2 (ton)	SOx (ton)	CO (ton)	NOx (ton)
2007	27,962	195	133	579	2007	27,962	195	133	579	2007	27,962	195	133	579
2008	31,980	223	152	662	2008	31,980	223	152	662	2008	31,980	223	152	662
2009	34,618	241	164	716	2009	34,618	241	164	716	2009	34,618	241	164	716
2010	25,086	175	119	519	2010	7,369	51	35	152	2010	7,369	51	35	152
2011	14,202	99	67	294	2011	8,514	59	40	176	2011	6,616	46	31	137
2012	18,331	128	87	379	2012	10,939	76	52	226	2012	9,168	64	43	190
2013	19,657	137	93	407	2013	12,161	85	58	252	2013	9,885	69	47	205
2014	23,868	166	113	494	2014	9,154	64	43	189	2014	6,120	43	29	127
2015	22,343	156	106	462	2015	10,102	70	48	209	2015	6,867	48	33	142
2016	23,893	167	113	494	2016	11,068	77	52	229	2016	8,080	56	38	167
2017	25,625	179	121	530	2017	12,432	87	59	257	2017	9,653	67	46	200
2018	27,362	191	130	566	2018	12,006	84	57	248	2018	9,026	63	43	187
2019	29,106	203	138	602	2019	13,646	95	65	282	2019	10,590	74	50	219
2020	29,481	206	140	610	2020	15,383	107	73	318	2020	12,175	85	58	252
2021	31,215	218	148	646	2021	17,112	119	81	354	2021	13,789	96	65	285
2022	29,803	208	141	617	2022	15,702	110	74	325	2022	15,595	109	74	323
2023	31,323	218	149	648	2023	17,233	120	82	357	2023	17,571	123	83	364
2024	32,858	229	156	680	2024	18,999	133	90	393	2024	19,542	136	93	404
2025	34,413	240	163	712	2025	20,824	145	99	431	2025	21,505	150	102	445
2026	35,980	251	171	744	2026	22,680	158	108	469	2026	19,778	138	94	409
2027	37,540	262	178	777	2027	24,551	171	116	508	2027	21,701	151	103	449
2028	39,127	273	186	810	2028	26,418	184	125	547	2028	23,648	165	112	489
2029	40,906	285	194	846	2029	28,310	197	134	586	2029	25,615	179	121	530
2030	42,787	298	203	885	2030	30,207	211	143	625	2030	27,588	192	131	571
2031	44,692	312	212	925	2031	32,305	225	153	668	2031	29,760	208	141	616
Total	**754,157**	**5,260**	**3,576**	**15,603**	**Total**	**471,672**	**3,290**	**2,236**	**9,759**	**Total**	**426,202**	**2,972**	**2,021**	**8,818**

3.2 Human Uses and Land Management (pages 3-219 – 3-403

Transportation and Utilities

Power Transmission Lines

Page 3-233 – paragraph should include the following segments:

Proposed Transmission Segments within SE Alaska

Proposed connections in process at this date include:

- Juneau to Hoonah (the Juneau to Greens Creek portion is completed) - Kwaan Electric Transmission Intertie Cooperative, Inc. (KWETICO)
- Swan-Tyee Intertie (STI) that would interconnect Petersburg/Wrangell with Ketchikan and serve Ketchikan with current excess available energy at the Tyee Lake Hydroelectric Plant. – FDPPA
- Thayer Creek to Angoon - Kootzoowoo Inc., a Native village cooperative, proposed line from a new hydro project

Future proposed transmission segments and connections include:

- Juneau to Skagway
- Lake Dorothy to Juneau (AEL&P)
- Otter Creek to Skagway (AP&T)
- Hoonah to Tenakee Springs
- Tenakee Springs to Angoon
- Angoon to Sitka
- Takatz Lake to Kake
- Kake-Petersburg Transmission Intertie (KPTI)
- Sunrise Lake to Wrangell
- Metlakatla to Ketchikan – Metlakatla Power & Light (not included in the list on page 3-223
- Prince of Wales (POW) Island – segment to connect Coffman Cove and Naukati to southern POW communities. (not included in the list on page 3-223)
- Prince of Wales Island to FDPPA line near Wrangell – AP&T (not included in the list on page 3-233. This is an alternative to the line between Thorne Bay and Ketchikan included on the list)
- Thomas Bay to FDPPA line near Petersburg (not included in the list on page 3-233)

Proposed International Interconnection

- AK-BC Intertie

Economic and Social Environment

Introduction (page 3-403)

Note that the Tongass National Forest is the primary land-owner in SE Alaska. DEIS states that "Appropriate management of the Tongass' natural resources, is, therefore, extremely important for local communities and the overall regional economy."

Adequate infrastructure is an essential element of a healthy economic and social environment. As noted earlier in these comments, electricity is an essential service and electric transmission infrastructure is the delivery system. The introduction section should recognize the importance of this element.

Cumulative Effects (page 3-470)

"Other reasonably foreseeable actions include transportation and utility developments." While paragraph includes "utility developments", text solely relates to roads. Section should include reference to electric transmission line segments identified above under "Power Transmission Lines."

4. SPECIFIC COMMENTS – Proposed Land and Resource Management Plan

Chapter 2 Goals and Objectives

Forest-wide Multiple-use Goals and Objectives (pages 2-2 through2-5)

Resource	Goal Statement from Plan	Objective Statement from Plan	AEA Comments
Air	*"Maintain the current air resource condition to protect the Forest's ecosystems from on- and off- Forest air emission sources."*	*"Attain national and state-ambient air quality standards forest-wide."*	Implementation of the proposed SE Alaska Electrical Intertie System will reduce current levels of emissions associated with diesel-generation (transportation & delivery, storage, end-use) and potential for spill. Reduction of current level of heating oil and associated emissions and potential for spill will occur as conversion to electric heat becomes an option.
Local and Regional Economies	*"Provide a diversity of opportunities for resource uses that contribute to the local and regional economies of Southeast Alaska."*	*"Work with local communities to identify rural community assistance opportunities and provide technical assistance in their implementation. Support a wide range of natural-resource employment opportunities within Southeast Alaska's communities."*	Implementation of the proposed SE Alaska Electrical Intertie System will provide access to lower cost electricity from renewable electricity generating facilities to currently isolated communities solely dependent on diesel-generated electricity. Access to lower cost power will enhance the ability of communities to attain economic sustainability and increase employment opportunities in isolated rural communities.
Transportation	*"Develop and manage roads and utility systems to support resource management activities; recognize the potential for future development of major Transportation ~~and Utility Systems~~."*	*"Provide access for forest users. In support of forest resource management activities, design and construct up to an average of 61 miles of roads annually. Manage and maintain roads to protect water, soil, fish, and wildlife resources."*	AEA notes that this section includes Utility Systems, however the Objectives solely relate to Transportation. AEA recommends a separate section "Utility Systems" be included in the Final TLMP Plan at page 2-5. See next section of this table.
Utility Systems (new resource category)	AEA recommended goal: "Develop and manage utility systems to support resource management activities; recognize the potential for future development of Utility Systems, including the proposed SE Alaska Electrical Intertie System."	AEA recommended objectives: "Provide access to the Forest for purposes of constructing and operating electric transmission lines and related facilities to reduce current levels of air emissions associated with diesel generation and provide communities with access to low-cost power to facilitate economically sustainable communities."	AEA recommendation for addition to current list of Resources and related Goals and Objectives. Page 2-5 Draft TLMP Plan.

Management Prescriptions 3

Transportation and Utility System
Land Use Designation TUS

See page 3-144: AEA requests that the Table "Transportation and Utility Systems Land Use Designation add a row below Transportation to include "Utility Systems" and that the Forest-wide Standards & Guidelines in Chapter 4 be expanded to include "Utility Systems."

See page 3-148: AEA requests that the list of LUD Standards and Guidelines include reference to "Utility Systems." Currently the text refers to Utility Systems, however the title is restricted to "TRANSPORTATION Transportation Operations: TRAN1.

Standards & Guidelines 4

LANDS
Forest-wide Standards & Guidelines

See page 4-32: VII. Right-of-Way Grants, D. States applicability of standards and guidelines to Transportation and Utility Systems. Note that powerlines may be installed to operate above 66kV, but in some instances are initially operated at 34.5kV. Some line segments (e.g. line from Metlakatla to Ketchikan) will be constructed at 34.5kV. These line segments play an important role in the overall plan to electrically interconnect SE Alaska and should be included within eligible facilities in the Transportation and Utility System (TUS) Land Designation (LUD).

See pages 4-110 through 4-117 TRANSPORTATION Forest-wide Standards and Guidelines. AEA notes that this section is referred to as the Forest-wide Standards and Guidelines for Transmission and Utility Systems. However, the current Draft Proposed Tongass Forest Plan does not include Standards and Guidelines applicable to Utility Systems.

5. RECOMMENDATIONS

This section of AEA's comments provides recommendations for the Final EIS and Final Proposed Tongass Forest Plan. These recommendations are discussed in the preceding sections of these comments and are compiled within this section 5 to facilitate Forest Service consideration and response in the Final EIS and Final Proposed Tongass Forest Plan. The above sections of these comments provide the background and basis for these recommendations.

5.1 DRAFT EIS

1. Purpose and Need

Add the social and economic well-being of the communities of Southeast Alaska as a Key Issue in the Final EIS. (Page 1-6 The Three Focus Issues – Key Issues) Presently the social and economic well-being relates solely to timber management. AEA notes that the electric transmission infrastructure that will occupy National Forest lands is a critical element to future social and economic well-being in the region.

3. Environment and Effects

Transportation and Utilities

Power Transmission Lines (Page 3-233)

Power Transmission Lines

Page 3-233 – paragraph should include the following segments:

Proposed Transmission Segments within SE Alaska

Proposed connections in process at this date include:

- Juneau to Hoonah (the Juneau to Greens Creek portion is completed) - Kwaan Electric Transmission Intertie Cooperative, Inc. (KWETICO)
- Swan-Tyee Intertie (STI) that would interconnect Petersburg/Wrangell with Ketchikan and serve Ketchikan with current excess available energy at the Tyee Lake Hydroelectric Plant. – FDPPA
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Future proposed transmission segments and connections include:

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- Takatz Lake to Kake

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Economic and Social Environment

Introduction (page 3-403)

Note that the Tongass National Forest is the primary land-owner in SE Alaska. DEIS states that "Appropriate management of the Tongass' natural resources, is, therefore, extremely important for local communities and the overall regional economy."

Adequate infrastructure is an essential element of a healthy economic and social environment. As noted earlier in these comments, electricity is an essential service and electric transmission infrastructure is the delivery system. The introduction section should recognize the importance of this element.

Cumulative Effects (page 3-470)

"Other reasonably foreseeable actions include transportation and utility developments." While paragraph includes "utility developments", text solely relates to roads. Section should include reference to electric transmission line segments identified above under "Power Transmission Lines."

Alternative 6 Draft EIS Map

Add the following segments:

- Prince of Wales Island to FDPPA line near Wrangell – AP&T (not included in the list on page 3-233. This is an alternative to the line between Thorne Bay and Ketchikan included on the list)
- Thomas Bay to FDPPA line near Petersburg (not included in the list on page 3-233)

Map showing location of these segments is included in Section 6. Maps of these comments.

5.2 Draft Proposed Tongass Forest Plan

Chapter 2 Goals and Objectives

Table - Forest-wide Multiple-use Goals and Objectives (pages 2-2 through 2-5)

Resource category "Transportation" includes reference to utility systems in the goal statement, however the objectives relate solely to roads.

AEA recommends that the table include a new resource category "Utility Systems":

Resource	Goal Statement from Plan	Objective Statement from Plan	AEA recommendation
Utility Systems (new resource category)	AEA recommended goal: "Develop and manage utility systems to support resource management activities; recognize the potential for future development of Utility Systems, including the proposed SE Alaska Electrical Intertie System."	AEA recommended objectives: "Provide access to the Forest for purposes of constructing and operating electric transmission lines and related facilities to reduce current levels of air emissions associated with diesel generation and provide communities with access to low-cost power to facilitate economically sustainable communities."	AEA recommendation for addition to current list of Resources and related Goals and Objectives. Page 2-5 Draft TLMP Plan.

Management Prescriptions 3

Transportation and Utility System
Land Use Designation TUS

See page 3-144: AEA requests that the Table "Transportation and Utility Systems Land Use Designation add a row below Transportation to include "Utility Systems" and that the Forest-wide Standards & Guidelines in Chapter 4 be expanded to include "Utility Systems."

See page 3-148: AEA requests that the list of LUD Standards and Guidelines include reference to "Utility Systems." Currently the text refers to Utility Systems, however the title is restricted to "TRANSPORTATION Transportation Operations: TRAN1.

Standards & Guidelines 4

LANDS
Forest-wide Standards & Guidelines

See page 4-32: VII. Right-of-Way Grants, D. States applicability of standards and guidelines to Transportation and Utility Systems. Note that powerlines may be installed to operate above 66kV, but in some instances are initially operated at 34.5kV. Some line

segments (e.g. line from Metlakatla to Ketchikan) will be constructed at 34.5kV. These line segments play an important role in the overall plan to electrically interconnect SE Alaska and should be included within eligible facilities in the Transportation and Utility System (TUS) Land Designation (LUD).

See pages 4-110 through 4-117 TRANSPORTATION Forest-wide Standards and Guidelines. AEA notes that this section is referred to as the Forest-wide Standards and Guidelines for Transmission and Utility Systems. However, the current Draft Proposed Tongass Forest Plan does not include Standards and Guidelines applicable to Utility Systems. AEA recommends that an additional category UTILITY SYSTEMS be prepared and provided in the Final Proposed Tongass Forest Plan.

This new section could contain information relating to the coordination of federal agency approvals for electric transmission established in the August 8, 2006 "Memorandum of Understanding on Early Coordination of Federal Authorizations and Related Environmental Reviews Required in Order to Site Electric Transmission Facilities" (MOU)[4] signed. by the departments of Energy (DOE), Agriculture (USDA – includes the Forest Service), Defense (DOD – includes the Corps of Engineers (COE)), Interior (DOI – includes the Fish and Wildlife Service (FWS)), Commerce (includes the National Marine Fisheries Service (NMFS)); and the Federal Energy Regulatory Commission (FERC), the Environmental Protection Agency (EPA), the Council on Environmental Quality (CEQ), and the Advisory Council of Historic Preservation with the commitment to work together to meet each Agency's obligations. The purpose of the MOU is to establish a framework for early cooperation and participation that will enhance coordination of all applicable land use authorizations, related environmental, cultural, and historic preservation reviews, and any other approvals that may be required under Federal law in order to site an electric transmission facility. Central to this MOU is compliance with NEPA and preparation of related environmental documents, including the EA or EIS.

[4] The MOU was developed in response to requirements of the Energy Policy Act of 2005 that amended the Federal Power Act; codified at USC 824p.

6. MAPS

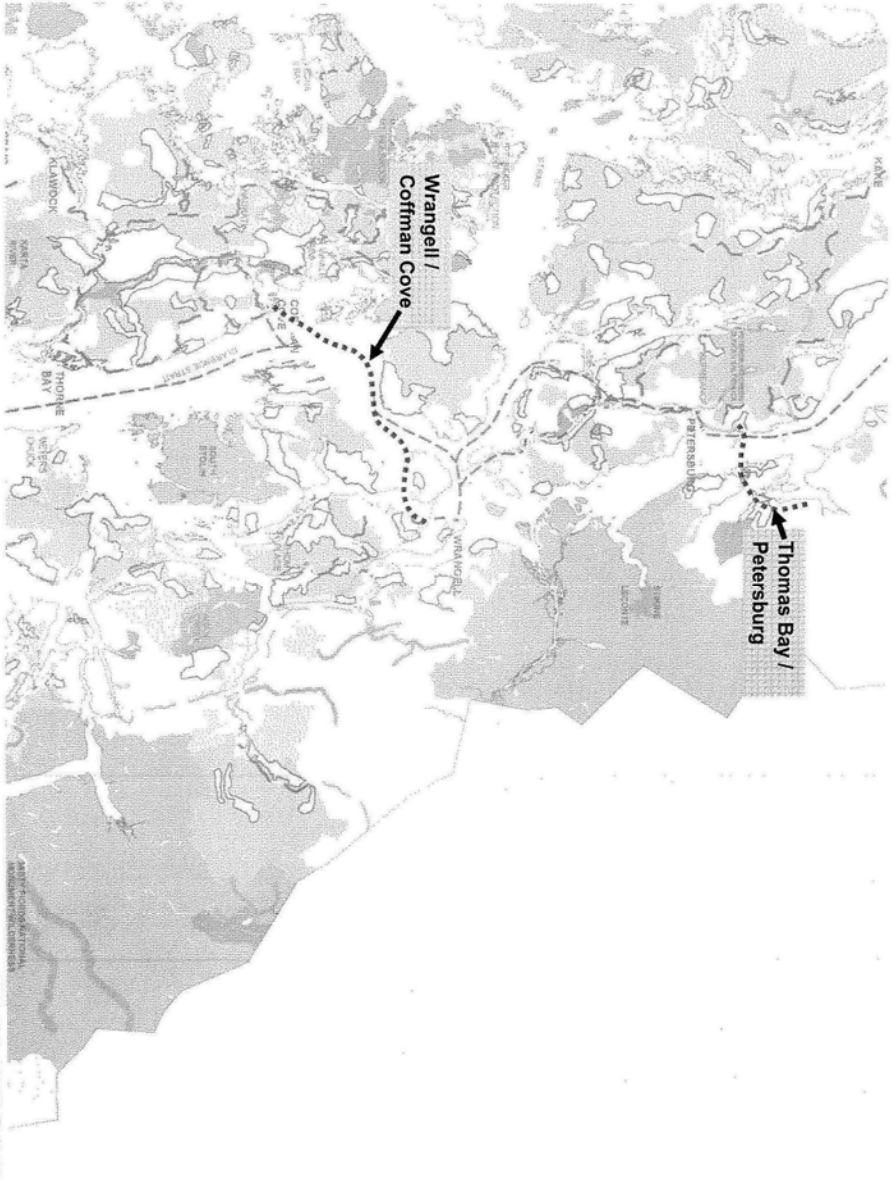

Figure 1

Additional Transmission Line Segments

Central Council
Tlingit and Haida
Indian Tribes of Alaska

CENTRAL COUNCIL
tlingit and haida indian tribes of alaska
ANDREW P. HOPE BUILDING
320 West Willoughby Avenue • Suite 300
Juneau, Alaska 99801-9983

997

April 27, 2007

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4-30-07

Forrest Cole, Supervisor
Tongass National Forest
648 Mission Street
Ketchikan, AK 99901

Dear Mr. Cole,

On behalf of Central Council Tlingit & Haida Indian Tribes of Alaska (CCTHITA) and our 26,000 members worldwide, we are submitting the following comments on the Tongass Land Management Plan (TLMP) Amendment Draft Environmental Impact Statement (DEIS) 2007.

Our stewardship concerns are for our entire tribal membership but more specifically for those 13,500 living in direct proximity to the Tongass National Forest in Southeast Alaska. As part of the responsibility to our members, we are compelled to address the issues regarding the forest. The interests of tribal members and governments extend beyond mere use of forest resources. We have additional responsibilities as *stewards of the air, land, and sea* to ensure a balance is maintained in the use of natural resources.

After much deliberation on defining the balance between sustainable use and conservation of available resources we support, in principle, **Alternative 5** as proposed by the US Forest Service. Through our participation in groups (Tongass Futures Roundtable and Southeast Conference) working on the same forest related issues in the Tongass, we have come to the conclusion that prudent use as well as prudent conservation of forest resources is necessary even in economically challenging times. Short-term gain at the expense of long-term stability is careless choice.

It is for this reason that we support Alternative 5 with the inclusion of our concerns that any development of forest resources take into account: 1) Protection of Native Sacred Sites within the forest, 2) Protection of intact watersheds of importance to habitat, fisheries, and subsistence, 3) Promotion and funding of a forest and riparian restoration program, 4) Provision of sufficient forest resources to support a sustainable level of economic activity in forest related industries, 5) Slow and controlled transition from old growth to second growth in limited areas.

In addressing the conditional support of Alternative 5, the protection of Native Sacred Sites should be paramount in any decision about the development of Tongass resources.

TEL. 907/586-1432 www.tlingit-haida.org FAX 907/586-...

Native Alaskan peoples have been in the forest for longer than recorded history. The preservation of sacred sites is essential. The disruption or destruction of any of these sites without explicit approval of proper tribal authorities is not acceptable.

Concern two in our support of Alternative 5 reflects the importance of the whole ecosystem to Native Alaskans. The very existence of many tribal members depends on the quality, quantity, and distribution of wildlife and fishery resources. Subsistence resources are of extreme importance to our culture and well being. Disruption, destruction, and/or contamination of these resources are of intense concern to us in any changes to the forest ecosystem. All proposed changes in areas, methods, and levels of resource development should reflect this concern.

Concern number three is a need for a substantive program put in place to promote, support, and fund a riparian and forest restoration program. Resource development in Tongass ecosystem over the past decades has had noticeable impact. Past and future development can be ameliorated through such a program. This program will be most successful with a dedicated funding source such as a federal trust fund. A program without a dedicated funding source is too unreliable.

Concern four addresses the actual use of Tongass Forest resources. Forest resources should be viewed in light of sustaining and preserving not stripping and abandoning. As stewards of the forest, we believe in the thoughtful use of its resources. The balancing of sustaining the forest and economic development is a tentative but essential one. A long term plan for value-added use of forest resources is much preferred to one on stripping and selling the resource at its lowest value point. In other words, use of forest resources should be vertically integrated on a local level in Southeast Alaska as to provide the largest positive economic impact for the resource being used. Federal policies dedicated toward these ends should be pursued. These policies allow for sufficient access to renewable forest resources to sustain local vertically integrated value added forest product industries. Access to non-renewable forest resources should be limited and closely controlled.

And finally, concern number five, transition from old growth to new growth is a natural cycle of life. To the best ability of the forest management team, this transition should take place in an orderly least disruptive process. Destruction of entire portions of the Tongass ecosystem as a method of harvesting should be considered a last resort not a preferred practice. Forest stewardship should be based on sustainable forestry practices and not extractive resource practices. The environmental and lost opportunity costs should be included in the overall economic feasibility evaluations of opening any new areas to resource development.

In conclusion, we understand that the review process for the TLMP is a long and sometimes contentious time for Southeast Alaska. At CCTHITA, we choose the path of sharing our concerns and support with you as your review process comes to another milestone. We felt it was more valuable to share with you our reasons based in our traditional values. If there is anything we can do to support your efforts as they address our concerns, please feel free to call on us.

Best regards,

William E. Martin
President

ADOPTED this 27th day of April 2007, by the Executive Council of the Central Council of Tlingit and Haida Indian Tribes of Alaska, by a vote of 6 yeas, 0 nays, 0 abstentions and 0 absence(s).

CERTIFY

President William E. Martin

ATTEST

Tribal Secretary Dana Leask Ruaro

CC: Alaska Regional Forester, Danny Bschor
Alaska Governor, Sarah Palin
US Senator, Ted Stevens
US Senator, Lisa Murkowski
US Congressman, Don Young
USFS Chief, Gail Kimbell
USDA, Under-secretary Mark Rey

1387

Central Council Tlingit and Haida Indian Tribes of Alaska

CENTRAL COUNCIL
tlingit and haida indian tribes of alaska
ANDREW P. HOPE BUILDING
320 West Willoughby Avenue • Suite 300
Juneau, Alaska 99801-1726

April 30, 2007

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Regional Forester's Office

Mr. Denny Bschor
Alaska Regional Forester
US Forest Service
P.O. Box 21628
Juneau, AK 99802-1628

Dear Mr. Bschor,

Enclosed, please find a copy of the comments submitted by Central Council Tlingit & Haida Indian Tribes of Alaska as part of the Tongass Land Management Plan review.

The policy statement was developed as a cooperative effort of our Business & Economic Development and Native Lands & Resources Departments. Our efforts are in support of a policy of sustainable development of one of the most valuable cultural and economic assets in the United States. We believe ours is a sound and sensible approach to preservation and development of this resource for all citizens.

Thank you for your efforts on behalf of the residents of Alaska.

Best regards,

Andrei Chakine
Manager
achakine@ccthita.org
(907) 463-7121

Steve Wade
Economic Development Specialist
swade@ccthita.org
(907) 463-7724

Enclosures: 1

Central Council
Tlingit and Haida
Indian Tribes of Alaska

CENTRAL COUNCIL
tlingit and haida indian tribes of alaska
ANDREW P. HOPE BUILDING
320 West Willoughby Avenue • Suite 300
Juneau, Alaska 99801-9983

April 27, 20

Forrest Cole, Supervisor
Tongass National Forest
648 Mission Street
Ketchikan, AK 99901

Dear Mr. Cole,

On behalf of Central Council Tlingit & Haida Indian Tribes of Alaska (CCTHITA) ar our 26,000 members worldwide, we are submitting the following comments on tl Tongass Land Management Plan (TLMP) Amendment Draft Environmental Impa Statement (DEIS) 2007.

Our stewardship concerns are for our entire tribal membership but more specifically fo those 13,500 living in direct proximity to the Tongass National Forest in Southea Alaska. As part of the responsibility to our members, we are compelled to address th issues regarding the forest. The interests of tribal members and governments exten beyond mere use of forest resources. We have additional responsibilities as *stewards* o *the air, land, and sea* to ensure a balance is maintained in the use of natural resources.

After much deliberation on defining the balance between sustainable use an conservation of available resources we support, in principle, **Alternative 5** as propose by the US Forest Service. Through our participation in groups (Tongass Future Roundtable and Southeast Conference) working on the same forest related issues in th Tongass, we have come to the conclusion that prudent use as well as pruder conservation of forest resources is necessary even in economically challenging times Short-term gain at the expense of long-term stability is careless choice.

It is for this reason that we support Alternative 5 with the inclusion of our concerns tha any development of forest resources take into account: 1) Protection of Native Sacre Sites within the forest, 2) Protection of intact watersheds of importance to habita fisheries, and subsistence, 3) Promotion and funding of a forest and riparian restoratio program, 4) Provision of sufficient forest resources to support a sustainable level o economic activity in forest related industries, 5) Slow and controlled transition from ol growth to second growth in limited areas.

In addressing the conditional support of Alternative 5, the protection of Native Sacre Sites should be paramount in any decision about the development of Tongass resources

TEL. 907/586-1432 www.tlingit-haida.org FAX 9

Native Alaskan peoples have been in the forest for longer than recorded history. The preservation of sacred sites is essential. The disruption or destruction of any of these sites without explicit approval of proper tribal authorities is not acceptable.

Concern two in our support of Alternative 5 reflects the importance of the whole ecosystem to Native Alaskans. The very existence of many tribal members depends on the quality, quantity, and distribution of wildlife and fishery resources. Subsistence resources are of extreme importance to our culture and well being. Disruption, destruction, and/or contamination of these resources are of intense concern to us in any changes to the forest ecosystem. All proposed changes in areas, methods, and levels of resource development should reflect this concern.

Concern number three is a need for a substantive program put in place to promote, support, and fund a riparian and forest restoration program. Resource development in Tongass ecosystem over the past decades has had noticeable impact. Past and future development can be ameliorated through such a program. This program will be most successful with a dedicated funding source such as a federal trust fund. A program without a dedicated funding source is too unreliable.

Concern four addresses the actual use of Tongass Forest resources. Forest resources should be viewed in light of sustaining and preserving not stripping and abandoning. As stewards of the forest, we believe in the thoughtful use of its resources. The balancing of sustaining the forest and economic development is a tentative but essential one. A long term plan for value-added use of forest resources is much preferred to one on stripping and selling the resource at its lowest value point. In other words, use of forest resources should be vertically integrated on a local level in Southeast Alaska as to provide the largest positive economic impact for the resource being used. Federal policies dedicated toward these ends should be pursued. These policies allow for sufficient access to renewable forest resources to sustain local vertically integrated value added forest product industries. Access to non-renewable forest resources should be limited and closely controlled.

And finally, concern number five, transition from old growth to new growth is a natural cycle of life. To the best ability of the forest management team, this transition should take place in an orderly least disruptive process. Destruction of entire portions of the Tongass ecosystem as a method of harvesting should be considered a last resort not a preferred practice. Forest stewardship should be based on sustainable forestry practices and not extractive resource practices. The environmental and lost opportunity costs should be included in the overall economic feasibility evaluations of opening any new areas to resource development.

In conclusion, we understand that the review process for the TLMP is a long and sometimes contentious time for Southeast Alaska. At CCTHITA, we choose the path of sharing our concerns and support with you as your review process comes to another milestone. We felt it was more valuable to share with you our reasons based in our traditional values. If there is anything we can do to support your efforts as they address our concerns, please feel free to call on us.

Best regards,

William E. Martin
President

ADOPTED this 27th day of April 2007, by the Executive Council of the Central Council of Tlingit and Haida Indian Tribes of Alaska, by a vote of 6 yeas, 0 nays, 0 abstentions and 0 absence(s).

CERTIFY

President William E. Martin

ATTEST

Tribal Secretary Dana Leask Ruaro

CC: Alaska Regional Forester, Danny Bschor
Alaska Governor, Sarah Palin
US Senator, Ted Stevens
US Senator, Lisa Murkowski
US Congressman, Don Young
USFS Chief, Gail Kimbell
USDA, Under-secretary Mark Rey

1389

Douglas Indian Association
Tribal Government
1107 West 8th St. #3 Juneau, Alaska 99801-1802
Phone: (907) 364-2916 Fax (907) 364-2917

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MAY - 4 2007
11 MS

April 29, 2007

USDA FS Tongass NF
Federal Building
648 Mission Street
Ketchikan, Alaska 99901

To Whom It May Concern,
We would like to thank Peter Griffin, Juneau Ranger District for taking the time to meet with Douglas Indian Association staff members Scott Sloane and myself to discuss the 7 Alternatives of the Draft Tongass land and Resource Management Plan (Forest Plans) as they pertained to the Douglas Indian Association and its Tribal members Traditional Lands.

Douglas Indian Association is a federally recognized tribal government established under the authority of the Indian Reorganization Act (IRA) of 1934 and we have a government to government relationship with all federal agencies of the United States of America. As a federally recognized tribal government it is very important that we relay to you our concerns about the 7 Alternatives and their impacts to our people and their Traditional lands.

It is very important to understand that we are always strongly advocating for the protection of the fisheries and game and the land for both commercial and subsistence use and that we request that our comments be seriously considered when it comes to any impacts that will occur to these resources as your organization continues to manage land usage within the Tongass National Forest. We have concerns for impacts to fish habitat, wildlife habitat, subsistence, timber harvests near fish and wildlife habitat and the need to be able to sustain jobs while not harming the environment which we depend on daily to sustain ourselves and our way of life.

We recognize that when addressing impacts to the Tongass National Forest we are also addressing the Economic well-being of our Southeast Alaskan communities, us included and we do so responsibly and respectfully.

The TLUMP Amendment overview that was provided showed, when speaking of the Traditional lands of the Douglas Indian Association members, that the impacts that were going to occur under;

Alternatives 1 thru 3: Represent basically a status quo usage of the land and waters around Juneau, from the northern shores of Berners Bay south to Snettisham and the Admiralty Island National Monument lands eastern shores from Young Bay to Point Gardner.

Alternative 4: We have a concern that there is a more "moderate" to "intense" approach to timber harvesting in the area north and south of the Taku River an along the southeastern shores of Stephens Passage toward Snettisham plus th southwestern shores of Douglas Island. We request as this process evolves th our government to government consultations occur and that we be kept informe as your organization develops these programs.

Alternative 5: The plan is that this is a No-Action alternative, representing a continuation of the current forest plan and would result in a mix of national fore uses and activities.

Alternative 6: Indications are that timber harvest is no longer shown on the southwestern shores of Douglas Island and that more "moderate" to "intense" timber harvest are to occur from The Taku River to Snettisham we request that our government to government consultation to occur and that we be kept informed as your organization develops these programs.

Alternative 7: Indications are that a "moderate" approach to timber harvest is to occur on the Southwestern shore of Douglas Island and that a "moderate" to "intense" approach to timber harvest will occur from the Take River to Snettish and we request as this process evolves that our government to government consultation to occur and that we be kept informed as your organization develo these programs.

We also note that there are no telecommunication systems site plans listed for the Tongass National Forest, are there any proposed?

On behalf of Douglas Indian Association thank you for considering our comme on the TLUMP Amendment and we do look forward to your response.

Respectfully,

Floyd M. Kookesh
Tribal Administrator
Douglas Indian Association

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APR 30 2007

Hydaburg Cooperative Association
P.O. Box 349
Hydaburg AK, 99922
PH#907-285-3666
FX#907-285-3541

4/25/07

Tongass National Forest
Attn: Forest Plan Adjustment
648 Mission Street
Ketchikan, AK 99901

RE: Comments on the Tongass Land and Resource Management Plan Amendment Draft EIS

To Whom It May Concern:

The Hydaburg Cooperative Association (IRA) is a federally recognized tribe organized pursuant to the authority of Section 16 of the Act of Congress June 18, 1934 (48 Statute 984) as amended by act of Congress, May 1, 1936. Hydaburg Cooperative Association Tribal Council is the governing body of the Hydaburg Tribe in accordance with its Constitution, and by-laws, including "the protection of the Haida Nation membership.

The Hydaburg Cooperative Association has the authority to consult on behalf of its membership with the Federal Government for the well being of the tribe.

The commonality of the customary and traditional use of land, sea, and natural resources is what binds the Haida Nation together. The customary and traditional use of each Village is inseparable from the language, tradition, and ceremonies of the Haida People. This dependency on the surrounding resources is what drives our tribe to protect the resources that surround us.

The Hydaburg Cooperative Association Tribal Council passed Resolution 2007-20 that speaks to the areas of importance and their cultural significance to the Haida people.

The HCA is very concerned about certain alternatives within the TLMP Draft revision document. Specifically, Alternative 4, 5, 6, and 7 propose large scale logging activities within a 15 mile radius of the community of Hydaburg. Key subsistence watersheds will be drastically impacted. Couple these alternatives with the current private timber harvest activities in the same area, we will be faced with a decimated landscape as well as lasting impacts to our most crucial subsistence resources (the natural inhabitants of healthy watersheds and their estuaries).

Most of the areas(Sukkwaan Island, Keete Inlet , Kassa Inlet, and Mable Bay) proposed in Alt. 4 thru 7 are currently road-less. We would like them to maintain the protections from road building and large scale timber harvest. The areas are adjacent to a current LUD II and a Wilderness area. Keeping this area in tact would serve to protect the biodiversity of Cordova Bay for future generations to enjoy. The area is also one of the last untouched surfaces in our traditional territories that we can access for subsistence uses.

Lastly, the cultural significance of the timber itself (namely western red cedar) is of high concern to the Haida People. The Haida people have always had a direct reliance on red cedar to maintain its cultural identity. The current timber market is focused on this specific resource, of which is only available in high quantities in our traditional areas. We are concerned that this critical resource will be targeted and depleted under Alternates 4 thru 7. We see no protections that certify future generations will be afforded the inherent rights to utilize old growth western red cedar to perpetuate our culture into the future.

Thank you for your consideration of our comments and Resolution 2007-20

Respectfully;

Anthony Christianson
Environmental Planner

Attachment:
Resolution 2007-20 Resolution to Protect Important Areas According to the Customary and Traditional Uses of the Haida People

HYDABURG COOPERATIVE ASSOCIATION
Resolution No. 2007- 20
A RESOLUTION TO PROTECT IMPORTANT AREAS ACCORDING TO THE TRADITIONAL AND CUSTOMARY USES OF THE HAIDA PEOPLE

WHEREAS, the Hydaburg Cooperative Association (IRA) is a federally recognized tribe organized pursuant to the authority of Section 16 of the Act of Congress June 18, 1934 (48 Statute 984) as amended by act of Congress, May 1, 1936; and,

WHEREAS the Hydaburg Cooperative Association Tribal Council is the governing body of the Hydaburg Tribe in accordance with its Constitution, and by-laws, including "the protection of the Haida Nation membership; and,

WHEREAS, The Hydaburg Cooperative Association has the authority to establish and enter into contract for the well being of the tribe; and,

WHEREAS, the commonality of the customary and traditional use of land, sea, and natural resources is what binds the Haida Nation together, and the customary and traditional use of each Village is inseparable from the language, tradition, ceremony of the Haida People; and,

WHEREAS, we hold these truths to be self-evident since time immemorial; and,

WHEREAS, the Forest Service is legally obligated to meaningfully consult and collaborate with tribal governments in the development of Federal policies that have tribal implications, as directed by Executive Order 13175; and,

WHEREAS, the Proposed Action of the 1997 Tongass Land Management Plan will have far reaching and profound impacts on tribal communities throughout Southeast Alaska; and,

WHEREAS, the Proposed Action chosen by the Forest fails to adequately protect or respect the customary and traditional uses of Haida traditional use areas. The Proposed Alternatives plan intensive logging activities in some of the last remaining customary and traditional use areas such as Kassa, Keete, Moira, and Mabel Bay, and the 90 documented Haida traditional use sites (and there are more); and,

WHEREAS, the Forest Service's Proposed Action fails to adequately recognize the value of providing lasting protection to important customary and traditional use areas of the Tongass, the history of previous protections, including the 1999 Tongass Land Management Plan Record of Decision, and the 1989 House passed version of the Tongass Timber Reform Act, and community concerns; and,

WHEREAS, the Proposed Action fails to restore important salmon and deer habitat in traditional and community use areas of the people of Hydaburg; and,

WHEREAS, the Forest Service states that "roads pose the greatest threat to fish resources," and that the Haida people have depended on salmon since time immemorial, the Proposed Action almost doubles the number of roads within the Tongass; and,

WHEREAS, areas including Hydaburg, Long Island, Northwest Dall Island, Sukkwaan, Keete, Kassa, Mable Bay, Moira Sound, and other areas that are traditional use areas of the Haida People of Southeast Alaska contain highly valuable watersheds important for subsistence, tourism, fish and wildlife habitat;

NOW, THEREFORE, BE IT RESOLVED, that the Hydaburg Cooperative Association request that the customary and traditional areas Sukkwaan, Dall Island, Keete, Kassa, Mabel Bay, Moira Sound, and other areas within Haida country be removed from the timber base in order to best protect the customary and traditional activities of the Haida People; and,

BE IT FURTHER RESOLVED, that the Hydaburg Cooperative Association urges the Forest Service to heed the request of communities, tribes, and individuals to protect important traditional and customary areas for the good of future generations.

This resolution was duly adopted at the Tribal Council of the Hydaburg Cooperative Association at their regular or special meeting held on this 24th day of April 2007 by a quorum of 5 Yes and 0 No and 0 Abstentions.

President

ATTEST: Viola Burgess
Tribal Secretary

Organized Village of Kake
P.O. Box 316
Kake, Alaska 99830-0316
Telephone 907-785-6471
Fax 907-785-4902 / email KeexKwaan@ KakeFirstNation.org
(Federally Recognized Tribal Government serving the Kake, Alaska area)

April 30, 2007

Forrest Cole, Forest Supervisor
2007 Tongass Forest Plan
Tongass National Forest
Federal Building
648 Mission Street
Ketchikan, AK 99901

Fax: 907-228-6215

Dear Mr. Cole:

The Organized Village of Kake (OVK) is a duly constituted Indian Tribe organized pursuant to the authority of the Federal Indian Reorganization Acts of 1934 & 1936 with the IRA Council as the duly elected governing body formed under its Constitution & By-Laws. OVK functions as a Federally recognized tribal government to provide services to its membership and, by its Constitution, which includes…"the protection of the tribal membership." The OVK membership has in the ancient past, present and future, used Kuiu Island, Kupreanof Island, parts of Admiralty and Baranof Islands for the customary and traditional use of the plants, animal, fish, land, water and air. The customary and traditional uses of these areas are inseparable from the language, tradition and ceremonies of the OVK Tribe. Kake is located on Kupreanof Island in the Tongass National Forest is home to an annual population of 600 people, with OVK's tribal enrollment comprising approximately 65% of the community.

This letter serves as our Tribe's comment on the updated Tongass Forest Plan. The seven alternatives presented in the Draft Environmental Impact Statement (DEIS) call for annual logging amounts ranging from current levels of approximately 52 million board feet in Alternative 1 to a five-fold increase in Alternative 6, the Proposed Action, to even more in Alternative 7. This Tongass Forest Plan amendment gives the Forest Service the opportunity to respond to changing demands for forest resources. Your decision will impact commercial fisheries from Metlakatla to Yakutat.

The Organized Village of Kake would like to select Alternative One as our preferred Alternative. OVK would suggest the US Forest Service take it's planned dollars that will be used to subsidize road building and logging and redirect it to rural villages that have been affected by the two large 50-year contracts for the Sitka and Ketchikan Pulp Mills and the Ketchikan and Wrangell Saw Mills. The USFS can redirect most of its time and money to work with the Southeast Alaska Hydro-electric Intertie to provide cheaper power to rural communities.

Other issues we want to point out:

- ?? Customary and Traditional Gathering by OVK Tribal Membership: The salmon-producing watersheds on Kuiu, Kupreanof, Baranof and Admiralty are vital to Kake's livelihood and customary and traditional gathering (aka, subsistence use). We support long-term funding for salmon habitat restoration and enhancement projects.
- ?? We support the development of a forest-wide restoration strategy for degraded watersheds that include salmon habitat restoration and forestry enhancement projects such as tree thinning and tree planting.

- ?? Because of past and anticipated clearcutting and road building in the region, 75% of Southeast Alaska communities could face a significant restriction to their deer hunting. Some community use areas could lose 50% or more of critical deer winter habitat, depending on which alternative the Forest Service selects. We propose that the USFS not log the areas that provide corridors for the deer. Areas that are critically over-logged need to be restored. Thinning projects could provide valuable employment to residents in rural communities.
- ?? We support no logging roads in undeveloped salmon-producing watersheds on these areas. Roughly 72 percent of all salmon in Southeast Alaska come from unroaded watersheds. The draft Forest Plan states that roads "pose the greatest risk to fish resources." Despite the risks, all alternatives increase road miles on the Tongass between 37 to 127 percent. Instead of fixing the 1,322 culverts that block fish passage on existing roads, the Forest Service wants to spend even more tax-dollars to build more roads. The USFS needs to fix existing problems before you go on to create even more.
- ?? We request that the Forest Service evaluate human disturbances to watersheds at the *very* beginning of timber sale planning by completing a comprehensive watershed analysis.

The USFS needs to re-prioritize for the 21st century. For decades, the Forest Service spent tens of millions of our tax-dollars every year subsidizing logging and building roads on the Tongass. Industries such as recreation, tourism, commercial and sport fishing, and hunting bring in millions of dollars annually to the regional economy. These industries provide more jobs than the Tongass timber industry—without massive taxpayer subsidies. In Kake, Customary and Traditional Gathering is not just important spiritually and culturally, it is an important economic factor. We do not have the luxury of shopping at a Fred Meyer's or similar grocery stores. Our 'bread basket' includes the streams and watersheds that provide homes to the sea life and wild life that we gather.

Thank you for the opportunity to comment on the 2007 Tongass Forest Plan. Please call, write or email our OVK staff, Mike Jackson, Edna Jackson or Teresa Gaudette if you need more information.

Regards,

Lincoln A. Bean
OVK Vice-President

Cc: Chris Savage, Petersburg Ranger
SEACC

Klawock Cooperative Association, Tribe

310 Bayview Blvd.
P.O. Box 430
Klawock, Alaska 99925

Phone: 907-755-2265
Fax: 907-755-8800

April 10, 2007

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4-19-07

Tongass National Forest
Attn: Forest Plan Adjustment
Federal Building
648 Mission Street
Ketchikan, Alaska 99901

Dear Madam or Sir:

The Klawock Cooperative Association, Tribe Council has met on April 10, 2007 at their Regular Council Meeting, and passed resolution 07-32. The Council would like this to be part of the official record for the 2007 Tongass Plan Adjustment as the comments of the Klawock Cooperative Association, Tribe and look forward to working with the Forest Service as they develop a Tongass Land Management Plan for the 21st Century.

If you shall need to contact me, you can reach me at the phone number or address above. Thank you!

Sincerely,

Helen Jackson
Treasurer

Klawock Cooperative Association, Tribe

310 Bayview Blvd.
P.O. Box 430
Klawock, Alaska 99925

Phone: 907-755-
Fax: 907-755-

RESOLUTION NO. 07-32

TITLE: A Resolution To Protect Important Areas According To The Traditional And Customary Uses Of The Klawock People.

WHEREAS: The Klawock Cooperative Association, (hereafter "Tribe"), is a duly constituted Indian Tribe organized pursuant to the authority of Section 16 of the Act of Congress of June 18, 1934 (48 Stat. 984), amended May 1, 1936 (49 Stat. 1250), and

WHEREAS: The Klawock Cooperative Association Tribal Council is a duly elected governing body of the Tribe, authorized to act by and on behalf of its members, and

WHEREAS: The commonality of the customary and traditional use of land, sea, and natural resources is what binds the Tlingit Nation together, and the customary and traditional use of each village is inseparable from the language, tradition, ceremony of the KCA Tribal Members, and

WHEREAS: We hold these truths to be self-evident since time immemorial, and

WHEREAS: The Forest Service is legally obligated to meaningfully consult and collaborate with tribal governments in the development of Federal policies that have tribal implications, as directed by Executive Order 13175, and

WHEREAS: The Proposed Action of the 1997 Tongass Land Management Plan will have far reaching and profound impacts on tribal communities throughout Southeast Alaska, and

WHEREAS: The Proposed Action chosen by the forest fails to adequately protect or respect the customary and traditional use of Tlingit traditional use areas. The Proposed Alternative plans intensive logging activities in some of the last remaining customary and traditional use areas such as Port Estrella, Port Dolores, Port Santa Cruz - Sumez, San Juan Batista – St. Johns, Point Amargura – Fern Pt. – San Fernando Is. And Fish Egg Island, and

WHEREAS: The Forest Service's Proposed Action fails to adequately recognize the value of providing lasting protection to important customary and traditional use areas of the Tongass, the history of previous protection, including the 1999 Tongass Land Management Plan Record of Decision, and the 1989 House passed version of the Tongass Timber Reform Act, and community concerns, and

WHEREAS: The Proposed Action fails to restore important salmon and deer habitat in traditional and community use areas of the people of Klawock, and

WHEREAS: The Forest Service states that "roads pose the greatest threat to fish resources," and that the Tlingit people have depended on salmon since time immemorial, the Proposed Action almost doubles the number of roads within the Tongass, and

WHEREAS: Areas including Klawock, Port Estrella, Port Dolores, Port Santa Cruz – Sumez, San Juan Batista – St. Johns, Point Amargura – Fern Pt. – San Fernando Is., and Fish Egg Is., and other areas that are traditional use areas of the Tlingit People of Southeast Alaska contain highly valuable watersheds important for subsistence, fish and wildlife habitat, and

THEREFORE, LET IT BE RESOLVED: That Klawock Cooperative Association Tribal Council request that the customary and traditional areas Port Estrella, Port Dolores, Port Santa Cruz – Sumez, San Juan Batista – St. Johns, Point Amargura – Fern Pt. – San Fernando Is., and Fish Egg Is., and other areas within Tlingit Country be removed from the timber base in order to best protect the customary and traditional activities of the Tlingit People, and

NOW THEREFORE, BE IT RESOLVED: That the Klawock Cooperative Association Tribal Council urges the Forest Service to heed the request of communities, tribes, and individuals to protect important traditional and customary areas for the good of future generations.

CERTIFICATION

FAXED By: Date: 4-11-07

This resolution was duly adopted at a regularly held meeting this 10th day of April, 2007, by a quorum vote of:

5 Yes 0 No

~~President~~ Treasurer ~~Secretary~~

Kuiu Thlingit Nation

The Kuye'di of Kuiu Island, Alaska
PO Box 8302
Ketchikan, Alaska 99901
email kuiunation@kpunet.net

A First Nations Traditional Government -- Indigenous Original Holders of Allodial Title

The Council of the Kuiu Kwáan are members of The first House of The Kuiu Kwáan and the Shakan Kwaan

Notice of Flawed Process of the Office of Subsistence Management
Notice of Deficiencies and Violations of Tribal Law
Notice of Violations of International Law

Re: **Rural Review Process Office of Subsistence Management**
Date: ~~**September 25, 2006**~~ march 13, 2007 ↔ D.A.J.J.
Location: **Saxman Village**

Jurisdiction

The Office of Subsistence Management purports to manage access to the traditional lands, waters and resources of Alaska's First Peoples. It wrongfully assumes a management responsibility for resources integral to the continuation of the Indigenous Peoples. When the Thlingit Peoples first arrived in South East Alaska there were no people here before us. The Thlingits displaced no one! We are the First People. We enjoy our Inherent Rights and Status.

The Federal government, the state of Alaska, and the Office of Subsistence Management do not exercise jurisdiction over the Indigenous Nations and Indigenous Peoples resident in region of Alaska, and have no power to deny us our traditional lifestyle, customary use and trade and traditional way of making a living and culture and a way of life that has been labeled by the newcomers as "subsistence" – an arrogant and demeaning term.

As Sovereigns, Indigenous Peoples have equal status to other nations of the world including the United States. Tribal identity must be preserved and the continuation of the First Peoples of the Americas must be insured. The United States has ratified the Covenant on Civil and Political Rights of the United Nations.

The Kuiu Thlingit Nation (aka the Kuye'di Tribe and Kuiu Kwáan) has existed since time immemorial. Its citizens are a permanent population sharing a specific history and territory; a common ancestry and lineage, tribal and ethnic background; religious, linguistic and cultural tradition. The Kuius have never relinquished rights, lands, waters, resources or liberties of any kind to any foreign power. The governing council safeguards the International Statehood and authority of the Nation and implements tribal law as sovereign. Tribal members are entitled to all ancestral rights and titles including those existing prior to contact with any Foreign Peoples including Tsarist Russia, Spain or the United States of America.

Deficiencies of the Current and Proposed Plan

Special Measures:

The current "plan" is deficient in that it contains no Special Measures recognizing or making provision for the special rights of tribes as indigenous peoples – rights that are mandated by international law, and United Nations covenants, agreements and accords and certain laws of th United States of America.

Dr. Y.N. Kly, Director of the International Human Rights Association of American Minorities (IHRAAM) Specialist in International Human Rights Law, states, "failure to provide priority rights or what is called Special Measures in International Law to the Indian Nations, leading to their extinction would be a grave violation of International Criminal Law, particularly as it relates to the Genocide Convention, to which the US is also a party. On all occasions the majority decision called for non-discrimination to include the requirement of special measures, special rights and self-determination in situations where they were warranted." The right to remedy under law is well established.

The actions of the Office of Subsistence Management and its parent governments and agencies are in violation of the Human Rights of the Indigenous Peoples. Those actions are illegitimate and actionable especially with regard to the state-wide corruption that has resulted in the theft o enormous amounts of resources.

ANCSA is supposed to add, not take away from, what we own. ANCSA, as great as it seems, i less than a meek offer by the United States and is actually a tear drop in the ocean of our huge assets we already have. ANCSA was written without our input regarding lands, waters, and resources, which cannot be taken away unless we give our consent.

Subsistence Award to Non-Natives:

By awarding subsistence to non-natives in Alaska, the state of Alaska has attempted to lump all persons, Indigenous and non-Indigenous alike into the same category, denying Indigenous Nations and Peoples their proper sovereign political status. This action has caused devastating impact on small streams and rivers, which have sustained Indigenous villages for thousands of years. Although the criteria utilized by the Office of Subsistence Management in assigning persons subsistence may be appropriate for non-Indigenous persons, it should be brought before the proper tribal authorities for approval and disposition on a Tribe by Tribe basis. The representatives of the federal and state agencies must come to a realization that each Tribe is properly and legally represented by their respective Traditional Tribal Elders and/or Village Councils. Corporations and entities created and funded by the various federal agencies, ostensibly for Indigenous benefit, are merely extensions of the federal agencies. An award of subsistence should in no way diminish tribal sovereignty or tribal rights or be utilized as a tool t exclude a portion of Indigenous peoples from their rights and titles based upon residence or oth irrelevant criteria.

Rural/Nonrural Designations not Applicable to Indigenous Peoples:

The criteria utilized for award of "subsistence" ignores the Indigenous Nations and Peoples of Alaska and their unique political status under International Law, the Constitution of the United States of America, and even the Alaska statehood Act and the Alaska State Constitution.

It is criminal to deny any First Peoples, due to physical residence, access to the resources that insure their health, ability to practice their culture and spirituality, and that guarantee their continuation as a distinct people. As noted to the Office of Subsistence Management in previous communications, our tribal members continue to practice their culture and way of life wherever they may reside.

"Subsistence" as defined by the Plan Not Applicable to Indigenous Peoples:

We prefer to use the words "traditional lifestyle" as "subsistence" is a non-Indigenous designation that we view as demeaning and arrogant.

Far more than simply supporting life, our traditional lifestyle speaks to the very heart and soul of the Thlingit Peoples. It speaks of respect for and our deep, spiritual ties to Mother Earth and our animal brothers and sisters. It speaks of Thlingits as caretakers, curators and protectors of all the resources of our Great Land.

The Traditional Lifestyle has always been and remains directly related to the spiritual, cultural and historical aspects of the Thlingit Peoples. Traditional foods and materials provide a bond and continuity to our forefathers. We are tied, in the form of respect, to the lands, waters, animals, fishes and fowl.

An Elder once compared the relationship between the Thlingit and our world to the closely interwoven fibers of the Chilkat blankets. Together they are durable and strong. Separating one from the other means the destruction of all. Indeed, the People cannot be true Thlingit unless we adhere to and practice our Traditional Thlingit Subsistence Lifestyle. Subsistence does not mean a tiny measured taste of traditional foods or only what we can carry away in our bellies. It means much more than supplying only immediate requirements. Products from the lands, waters and skies are employed for innumerable uses, such as providing foods, medicines, materials for shelter, waterborne vessels of transportation, clothing, furniture, and ceremonial and ornamental objects of art and providing and generating revenue.

Large quantities of natural resources from our region were utilized on a sustained yield basis. They were traditionally harvested, processed and stored. Portions of the harvest were commercially bartered, traded or sold to gather and accumulate wealth for days when families, Clans or Tribes would be required to assist in times of want or tragedy. When a Clan laid up goods, those goods served as a form of insurance for retirement and old age. A large portion of the first harvest was traditionally given to the elderly or incapacitated. The People commercially

sold and bartered any or all of these items to secure by trade or purchase other goods that we di not manufacture or produce by our own efforts.

Our traditional lifestyle means the right to full, unrestricted utilization of the elements of our environment within the spiritual traditions, cultural traditions and customs of the Kwáan. These resources include:

Fishing. The Kuiu Kwáan have always utilized all resources located in both the fresh water and salt water systems for home and Tribal use, for barter and trade, or selling commercially whatever we chose, and what is available.

These water resources include, but are not limited to, all species of salmon that travel or pasture in our waters, bottom fish, trout, herring roe on kelp, all shellfish and crustaceans, various land, seabed vegetation and plants, and whatever is touched by the salt and freshwater systems.

Hunting. Traditional Subsistence has also includes utilizing all land mammals such as deer, moose, mountain goat, Mountain Sheep, brown bear, black bear, wolves, all fur-bearing mammals and virtually every animal that inhabits the region of the Kuiu Kwáan. All birds are utilized for food or ornamental use.

Forest and Land Products: All species of trees and vegetation are utilized for medicines, clothin shelter and to enhance the quality of Subsistence Lifestyle.
Spirituality, Happiness and Well-being: The Thlingit People cannot be Thlingit without access the lands, waters and resources that have been available to them from Tribal Lands for thousan of years.[1]

Traditional Economic Systems:

Traditional Economic Systems refers to the organized production and distribution of goods and services of a People, which enables them to live, subsist and continue as a people off the resources available to them. These systems include all the goods and services necessary to maintain all aspects of the culture to increase the survivability potential of the human being anc his family, Clan and Kwáan.

In Southeast Alaska, Subsistence Economic Systems have their basis with the Traditional Thlingit Kwáans that hold allodial title to their bioregional, kinship related regions. They are dependent upon distribution within Tribal systems that are based upon cooperation and need (rather than competition and greed).

This requires an inventory of the resources available within the Kwáan or Village structure, prioritizing these resources by their relative importance and abundance, and designation of the surplus resources to be used in the transfer or trade to other individuals, groups or nations.

The Kwáan Council (The Government of the Kuye'di) protects the Tribal Member's human rights and economic rights to resources. All Kwáan Members have a Trust Responsibility to respect, protect and nurture the resources. To do otherwise is *Thlickaws*. *Thlickaws* is an act of disrespect and ignorance or an act that breaks the Great Treaty. The perpetrators of such acts unleash negative forces upon themselves and their People. It is the same as asking for bad luck. It can result in grave consequences such as resources no longer being available.

Finally, The Indigenous Peoples, Tribes and Nations, have first priority to utilize all the resources of their respective regions. The immigrant peoples with their various entities, corporations and structures, may then utilize, only with agreement with each Tribe, the surplus as identified by the Indigenous Leadership.

Signed:

What Shaw George A. James Jr

Marvin Charles SR

Ben James Sr.

Melvin A. Charles

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Resolution No. 07-11

BY THE COUNCIL ANNETTE ISLANDS RESERVE

METLAKATLA INDIAN COMMUNITY

***WHEREAS**, the Metlakatla Indian Community Council is the governing body of the Metlakatla Indian Community, Annette Islands Reserve, Alaska by the authority of the Constitution and By-laws of the Metlakatla Indian Community as approved on August 23, 1944 by the Secretary of the Interior; and*

***WHEREAS**, the Metlakatla Indian Community is an Indian Tribe organized under the provisions of Section 16 of the Indian Reorganization Act. 25, U.S.C. Section 476; and*

***WHEREAS,** the Metlakatla Indian Community, for centuries, has utilized all the natural resources of the land and waters in its traditional homeland for cultural activities, subsistence, gathering and general wellbeing, which lands include much of what is now the Tongass National Forest that are subject to the jurisdiction of the United States Forest Service; and*

***WHEREAS,** the Metlakatla Indian Community, also has enjoyed the benefits of commercial logging and the sales of lumber products for its economic wellbeing and has opposed the shutdown of the Tongass National Forest as a source of raw materials for the Community's timber related industries; and*

***WHEREAS,** the Metlakatla Indian Community, as a result of its multiple uses of the lands and waters within its homeland for cultural, subsistence and economic wellbeing, recognizes the need to balance the commercial use of resources from the forests with the need to protect vital fish and wildlife habitat, subsistence hunting and gathering areas and cultural sites; and*

***WHEREAS,** the Metlakatla Indian Community, has carefully considered the foregoing balance regarding the uses of Gravina Island and recognizes that the island is far more valuable as a place where traditional uses are promoted, wilderness values preserved and wildlife habitat protected rather than as a place for commercial activities.*

***NOW THEREFORE BE IT RESOLVED,** the Metlakatla Indian Community Council hereby request that, in its efforts to modify the Tongass Land Management Plan to comply with law, the Forest Service designates all federal land on Gravina Island to be wilderness or wilderness monuments or such other designation that will ensure that no further development takes place on the island and that it is preserved as a place where traditional cultural and subsistence activities can be pursued for all generation to come.*

Signed and dated this 6th day of March 2007 at Metlakatla, Alaska

METLAKATLA INDIAN COMMUNITY

Victor C. Wellington, Sr., Mayor

ATTEST:

Judith A. Eaton, Executive Secretary

CERTIFICATION

I hereby certify that the foregoing Resolution was duly approved at a meeting of the Tribal Council Executives held on March 6, 2007 at which a quorum was present by a vote of 7 FOR and -0- AGAINST.

Signed:

Judith A. Eaton, Executive Secretary

ORGANIZED VILLAGE OF SAXMAN
Saxman I.R.A. Council
Phone (907) 247-2502 Fax (907) 247-2504
Route 2 Box 2 – Saxman; Ketchikan, Alaska 99901

RESOLUTION # 02-02-01

A RESOLUTION BY THE SAXMAN IRA COUNCIL, WHO IS THE TRIBAL GOVERNING BODY OF THE ORGANIZED VILLAGE OF SAXMAN OBJECTS TO ANY TIMBER CUTTING ON GRAVINA ISLAND.

WHEREAS, The Organized Village of Saxman (O.V.S.) is a duly constituted Indian Tribe, organized pursuant to the authority of Congress by the Indian Reorganization Act and such Legislation of June 18, 1934 and May 1936; and

WHEREAS, The Saxman IRA Council is authorized by the Organized Village of Saxman Constitution and By-laws approved on October 18, 1940 by the Secretary of Interior, and ratified on January 14, 1994 as the Tribe's governing body; and

WHEREAS, The Organized Village of Saxman is the Federally Recognized Tribe, governed by the Saxman IRA Council, who has the authority to represent and act in all matters that concern the health, education, and welfare of the Native people who reside in the Village of Saxman; and

WHEREAS, The United States Forest Service is proposing a timber cut on Gravina Island which has been our Tribal members food locker for hundreds of years; and

WHEREAS, Gravina Island is within the Tongass National Forest and is within the Timber Land Management Plan, and

WHEREAS, The Organized Village of Saxman has not participated in the development of the Timber Land Management Plan; and

WHEREAS, It is the opinion of the Organized Village of Saxman that TLMP is obsolete for today's plan because of many things that has happened since the plan has been approved without Tribal consent or input; and

WHEREAS, Gravina Island has been feeding our Tribal Members by way of hunting of the deer, and many different kinds of sea food, and the gathering of berries which provides for our food pantry for the Village of Saxman; and

WHEREAS, It is the Organized Village of Saxman belief that once cutting of timber on Gravina Island it will be easier to do in the future; and

WHEREAS, the cutting of timber will disrupt the food supply that has been feeding our Tribal Members for hundreds of years, and

WHEREAS, The Organized Village of Saxman has met with officials from the Forest Service on number of occasions and relayed this message, No Timber Cutting on Gravina Island, and

NOW THEREFORE BE IT RESOLVED the Organized Village of Saxman objects to any timber cutting on Gravina Island

CERTIFICATION:
Passed and Approved by a duly constituted quorum of the Saxman IRA Council.

Joe Williams 2/19/02
Joe Williams, II President Date

ATTESTED: Nora DeWitt 2/19/02
Nora DeWitt, Saxman IRA Council Secretary Date

668

ORGANIZED VILLAGE OF SAXMAN
Saxman I.R.A. Council
Route 2, Box 2 – Saxman; Ketchikan, Alaska 99901
Phone 907-247-2502 / Fax 907-247-2504

RESOLUTION #07-06-94

A RESOLUTION FOR THE ORGANIZED VILLAGE OF SAXMAN BY THE SAXMAN I.R.A. COUNCIL TO STRONGLY REQUEST THE U.S. FOREST SERVICE TO PROTECT AND PRESERVE ALL WATER SHEDS THAT FEED INTO BOSTWICK INLET, AND TO REASSIGN THE U.S. FOREST SERVICE LAND USE DESIGNATION VALUE COMPARISON UNIT (VCU) 7630 FROM TIMBER PRODUCTION TO SEMI-REMOTE RECREATION.

WHEREAS, The Organized Village of Saxman is a duly constituted Indian Tribe organized pursuant to the authority of the United States Congress by the Indian Reorganization Act, and such legislation of June 8, 1934; and

WHEREAS, the Saxman I.R.A. Council is authorized by the Organized Village of Saxman Constitution and Bylaws approved on October 18, 1940 by the Secretary of Interior, and ratified on January 14, 1941, as the Organized Village of Saxman governing body; and

WHEREAS, the Organized Village of Saxman is the federally recognized tribe governed by the Saxman I.R.A. Council, who has the authority to represent and act in all matters that concern the health, education, and welfare of the Native people who reside in the Village of Saxman; and

WHEREAS, the Organized Village of Saxman is a federally recognized Tribe with all powers and responsibilities inherent in a sovereign government; and

WHEREAS, since time immemorial the economy, culture, spiritual tradition, and way of life of tribal citizens has been centered around fishing, hunting, and gathering natural resources, and the lands and waters in and around Bostwick Inlet are a natural food pantry ensuring a manner to sustain ourselves, for our grandchildren, and for seven generations and beyond; and

WHEREAS, all natural resources will suffer greatly if timber production occurs during any years to any water sheds feeding into the Bostwick Inlet Bay as timber production will adversely affect fishing, gathering, and hunting causing substantial harm to tribal citizens and the surrounding tribal communities; and

WHEREAS, these detrimental changes will impact our tribal sovereignty and a heartbreaking loss to the practice of customary and traditional harvesting of food for a tribal community dependent upon Bostwick Inlet; and

WHEREAS, it is particularly significant and critical to continue to fish, hunt, harvest, and gather in an accessible customary and traditional site for the revitalization and continuity of tribal Native culture and to carry on our traditions in Bostwick Inlet; and

WHEREAS, significant harm will afflict tribal natural and cultural resources from the creation and dissemination of large volumes of timber production creating other forms of pollution across the lands and watersheds feeding into Bostwick Bay; and

WHEREAS, salmon, other fish, wildlife, plants, other natural resources and cultural resources are important parts of our culture, economy, spiritualism, and way of life, and any harm to these harms us; and

WHEREAS, timber production execution in VCU 7630 will displace tribal citizens and have a direct economic and social impact creating a loss of assets or access to assets adversely impacting the tribal citizens' means to a livelihood; and

WHEREAS, scientific findings are not conclusive to the extent or impact timber production will have on the waters and lands at the conclusion of timber harvest and seven generations henceforth; and

WHEREAS, local tribal citizens are unable to devote countless hours to learn about, discuss, and debate land management options, but are aware of the sacredness and significance of Bostwick Inlet's food pantry provisions, and

WHEREAS, the U.S. Forest Service seeks out the promotion of a "collaborative approach" between agencies, partners, tribes, and local public (including tribal citizens) as a strategy on the use of forest lands and the Saxman I.R.A. Council believes its communication by resolution is a part of this approach; and

WHEREAS, the Saxman I.R.A. Council urges the U.S. Forest Service not to marginalize the social, economic, cultural identities of the tribal citizens of the Organized Village of Saxman by further timber harvest and to take positive action to safeguard the watersheds feeding into Bostwick Inlet.

NOW THEREFORE BE IT RESOLVED, the Organized Village of Saxman, Saxman I.R.A. Council hereby requests that the U.S. Forest Service and its officers deem the highest degree of protection for the watersheds feeding into Bostwick Inlet; and

BE IT FURTHER RESOLVED, the Organized Village of Saxman, Saxman I.R.A. Council requests the U.S. Forest Service and its officers to eliminate timber harvest in VCU 7630 and minimize risks to jeopardizing a means of livelihood to tribal citizens; and

BE IT FINALLY RESOLVED, the Organized Village of Saxman, Saxman I.R.A. Council vigorously requests the U.S. Forest Service to protect and preserve all water sheds that feed into Bostwick Inlet, and to re-assign the Value Comparison Unit (VCU) 7630 from Timber Production to Semi-Remote Recreation.

CERTIFICATION:
PASSED and **APPROVED** by a duly constituted quorum of the Saxman I.R.A. Council on the 18th day of July 2006 in Saxman, Alaska by a vote of 3 For, 0 Against, 0 Abstentions and 2 Absent.

ATTESTED:

Lee Wallace 7/18/2006
Lee Wallace, Saxman I.R.A. Council President Date

Sylvia Banie 7-18-06
Sylvia Banie, Saxman I.R.A. Council Vice President Date

ORGANIZED VILLAGE OF SAXMAN
Saxman I.R.A. Council
Route 2, Box 2; Ketchikan, Alaska 99901
Phone 907-247-2502 / FAX 907-247-2504

RECEIVED
APR 23 2007
Ketchikan-Misty Fiords
Ranger District

April 18, 2007

Denny Bschor
Regional Forester
Alaska Regional Office – Tongass National Forest
P.O. Box 21628
Juneau, Alaska 99802-1628

Dear Denny Bschor,

The Saxman I.R.A. Council is submitting the enclosed official resolution which was approved at the March 20, 2007 Organized Village of Saxman, Saxman I.R.A. Council Meeting. Please let our resolution serve as the official position on the *Forest Plan Adjustment.* The Saxman I.R.A. Council is pleased to sign this resolution with a strong recommendation to protect and preserve significant cultural/spiritual/life-giving/healthy ecosystems within the Tongass National Forest.

I appreciate the opportunity to provide our tribal resolution for Bostwick Inlet, Yes Bay, Cat Island, and Duke Island. Thank you for defending critical areas of the *Tongass* – and for your commitment and hard work.

Sincerely,

Lee Wallace
President

copy: Saxman I.R.A. Council
Lynn Kolund, District Ranger
Forrest Cole, Forest Supervisor
Lee Kramer, Project Team Leader

ORGANIZED VILLAGE OF SAXMAN
Saxman I.R.A. Council
Rt. 2, Box 2 (Saxman); Ketchikan, Alaska 99901
Phone 907-247-2502 / Fax 907-247-2504

RESOLUTION #03-07-104

A RESOLUTION FOR THE ORGANIZED VILLAGE OF SAXMAN, SAXMAN I.R.A. COUNCIL URGING THE U.S. FOREST SERVICE ALASKA REGION TO PROTECT HIGH VALUE AREAS OF BOSTWICK INLET, YES BAY, CAT ISLAND, AND DUKE ISLAND AS IT IMPROVES THE REVISION OF LAND AND RESOURCE MANAGEMENT PLANS (FOREST PLANS) FOR EACH OF THE NATIONAL FORESTS IN THE NATIONAL FOREST SYSTEM.

WHEREAS, the Organized Village of Saxman is a duly constituted Indian Tribe organized pursuant to the authority of the United States Congress by the Indian Reorganization Act, and such legislation of June 8, 1934; and

WHEREAS, the Saxman I.R.A. Council is authorized by the Organized Village of Saxman Constitution and Bylaws approved on October 18, 1940 by the Secretary of Interior, and ratified on January 14, 1941, as the Organized Village of Saxman governing body; and

WHEREAS, the Organized Village of Saxman (OVS) is the federally recognized tribe governed by the Saxman I.R.A. Council, who has the authority to represent and act in all matters that concern the health, education, and welfare of the Native people who reside in the Village of Saxman; and

WHEREAS, the Organized Village of Saxman is a federally recognized Tribe with all powers and responsibilities inherent in a sovereign government; and

WHEREAS, in August 2005, the U.S. Circuit of Appeals for the Ninth Circuit issued a decision in *Natural Resources Defense Council, et al., United States Forest Service, et al., 421 F.3d797 (9th Cir. 2005)* that found deficiencies and inadequacies in the process used to develop the 1997 Forest Plan revision; and

WHEREAS, the U.S. Circuit of Appeals for the Ninth Circuit specifically found deficiencies and inadequacies related to timber demand, the range of alternatives considered relative to timber demand and potential effects on roadless areas, and cumulative effects from activities conducted on non-National Forest System lands; and

WHEREAS, the U. S. Forest Service has specified that a 5 Year Plan Review (completed in January 2005) indicates a need to amend the current Tongass National Forest Land and Resource Management Plan; and

WHEREAS, the Organized Village of Saxman, Saxman I.R.A. Council seeks to preserve and afford protection of biodiversity and healthy ecosystems, wildlife habitat, sea life and fish habitat of Bostwick Inlet, Yes Bay, Cat Island, and Duke Island ensuring seven generations forthcoming will inherit and benefit from these high value areas; and

WHEREAS, the Organized Village of Saxman, Saxman I.R.A. Council strongly supports protection of the biodiversity and healthy ecosystems, wildlife habitat, and sea life and fish habitat of the Tongass National Forest lands and waters, and discourages the present and future environmental threat by timber harvest to the areas of Bostwick Inlet, Yes Bay, and Cat Island; and

WHEREAS, the Organized Village of Saxman, Saxman I.R.A. Council is strongly against continued mineral exploration on Duke Island and firmly maintains that Duke Island be

withdrawn from any further mining claims for the present and future protection of Duke Island because it is an ideal site for numerous migratory birds including geese, and because Duke Island is a significance high use *"crossroads"* area for the Tlingit, Haida, and Tsimshian nations for salmon and bottom fish harvesting, and it possesses a historical link and cultural connection to past ancestors, and lastly the Draft E.I.S. Tongass Land and Resource Management Plan (January 2007) on page 3-280 states: *"Alernatives 4 – 7 would have a somewhat greater, but unknown, potential to contribute to cumulative effects associated with mineral activity."*; and

WHEREAS, the Draft E.I.S. Tongass Land and Resource Management Plan (January 2007) explains that the alternatives are constructed using the LUD allocations defined in the 1997 Tongass Forest Plan as the base, and the Organized Village of Saxman objects to the manner of using the 1997 Tongass Forest Plan as a base for constructing LUD allocations knowing that in 1997 and years prior to 1997, the Forest Service did not engage or establish consultation or cooperation with tribal officials of Saxman when the undertaking and formulation and implementation of the 1997 Tongass Forest Plan was developed; and

WHEREAS, in OVS Resolution 02-02-01 and OVS Resolution 07-06-94 from the Organized Village of Saxman, these resolutions attest to tribal and community member's use and harvest of a significant food supply and life giving nutrition from lands and water of Bostwick Inlet on Gravina Island.

NOW THEREFORE BE IT RESOLVED, that the Organized Village of Saxman urges the U.S. Forest Service to lessen and prevent irreversible harm to Bostwick Inlet, Yes Bay, Cat Island, and Duke Island by eliminating timber harvest and mineral exploration, and for the U. S. Forest Service to ensure a standard and guideline limiting timber harvest and mineral exploration activities that will assure exemplary stewardship for Bostwick Inlet, Yes Bay, Cat Island, and Duke Island for seven generations beyond the present; and

THEREFORE BE IT RESOLVED, the Organized Village of Saxman vehemently requests the U.S. Forest Alaska Region to protect, safeguard, and defend high value areas of Bostwick Inlet, Yes Bay, Cat Island, and Duke Island as it improves the revision of land and resource management plans (Forest Plans) for each of the national forests in the National Forest System.

CERTIFICATION:
PASSED and **APPROVED** by a duly constituted quorum of the Saxman I.R.A. Council on the 16th day of April, 2007 in Saxman, Alaska by a vote of 5 **For**, 0 **Against**, and 0 **Abstentions.**

Lee Wallace 4/18/20
Lee Wallace, Saxman I.R.A. Council President Date

ATTESTED:
Ginger M. Fox 04 1907
Ginger M. Fox, Saxman I.R.A. Council Secretary Date

Sitka Tribe of Alaska

Tribal Government for Sitka, Alaska

April 12, 2007

RECEIVED APR 19 2007 Ra 4-19-07

Mr. Forrest Cole, Forest Supervisor
US Forest Service
Alaska Region, Tongass National Forest
648 Mission St.
Ketchikan, AK 99901

RE: Draft Environmental Impact Statement & Draft Proposed Land and Resource Management Plan

Dear Mr. Cole:

The Sitka Tribe of Alaska (STA) is a federally recognized tribal government, and represents over 4,084 tribal citizens based in Sitka. STA is responsible to protect the health, safety, welfare, and culture of our citizens. With this responsibility, Sitka Tribe is reviewing and commenting on your Tongass Land and Resource Management Plan Amendment.

Sitka Tribe of Alaska's customary and traditional territory reflects the lands and waters historically and presently of the Sheet'ka Kwaan, and as such is composed of the western side of Baranof Island, the greater reaches of Peril Strait, southwestern portions of Chichagof Island, and the myriad of islands as well as the waters between these locations.

Sitka Tribe is wary of supporting any of the proposed alternatives listed in the Environmental Impact Statement for the Tongass Land and Resource Management Plan. All of the alternatives contain a Right-of-Way for the Rodman Bay road, which Sitka Tribe strongly opposes. As one tribal member adamantly stated "I am disgusted with the road proposal." There are many in the Tribe who would prefer no option, no development because any development would affect our Customary and Traditional hunting, gathering and fishing sites.

If forced to support an alternative, after reviewing the options Sitka Tribe supports Alternative 1 with the exception of the Right-of-Way for the Rodman Bay road. This alternative would have the least impact on our Customary & Traditional resources and our cultural and sacred sites.

Sitka Tribe would like to address the following areas that are impacted by this plan. Sitka Tribe will not address each alternative and their potential impact because it is understood with each alternative, other than Alternative 1, will substantially affect subsistence, biodiversity, and environmental health. Alternatives 4 through 7 will have devastating impacts on Baranof Island and Sitka Tribe strongly opposes these alternatives.

456 Katlian Street • Sitka, Alaska 99835 • (907) 747-3207 • Fax (907) 747-4915

Land Use Development

Sitka Tribe recognizes the need for economic development, and wants to see economic development that will provide employment or contracting opportunities for our Tribal Citizens. Alternative 1 offers the least disruptive amount of timber harvesting; balancing between moderate and intensive harvesting the total harvest would be 52 million board feet, affecting 1.2 million acres. On Baranof Island deer habitat would receive significant reductions under all alternatives. deer habitat would receive substantial reductions under all alternatives, other than Alternative 1. The magnitude of effect is concentrated particularly on Baranof Island in Alternatives 4 through 7. Under all plans, the harvest on Baranof affects areas that are primary Customary and Traditional hunting and gathering sites.

The Forest Service needs to increase their efforts to manage these stands on Baranof to increase biodiversity. Currently there are four (4) areas on Baranof where the harvest of Sitka deer exceeds 10% of the estimated habitat capability. Without question, any further development will affect the habitat in a negative manner.

Sitka Tribe propose the impact be mitigated by treating the pre-commercial and young growth forest that has developed on the island through past clear cutting by thinning, chipping, and burning slag in place. Thinning is an activity that not only encourages local hire but also will increase the biodiversity of the stands- improving scenic quality, concentrating growth in the fewer larger trees, and improving wildlife habitat.

Steps must be made to remove logging slash that has scarred the habitat on Baranof for decades and rehabilitate the acreage through treatment or reseeding. Sitka Tribe of Alaska encourages the Forest Service to form partnerships with private and public organizations utilizing such organizations such as the Ketchikan Wood Technology Center and other Forest Service Science Centers to address and correct this specific issue. Grants such as Woody Biomass Grants, FS Tribal Granting programs can be utilized in solving the problem of how to utilize low valued material removed from the habitat. Sitka Tribe would commit itself in collaborating with the Forest Service in addressing the forest slash and pre-commercial and young forest growth to improving this environmental and working toward a healthy biodiversity habitat. One Tribal Member in recommending effective slash treatment stated, "In Washington and Oregon the logging companies are required to treat before they wave the logging site, and treating means they burn and spread the ashes of large stumps. The material that can be chipped is spread around once processed, so no piles of debris are left scattered everywhere. These suggestions are a better solution rather than removing the slabs."

Tribal Citizen John Nielsen stated at an STA Cultural Committee meeting, "I've been a resident of Sitka for seventy-seven years. The damage that the Forest Service has done to this country has been devastating. The harvest areas that were clear-cut thirty or forty years ago have been damaged and are subject to mudslides. All the alternatives have the proposed road, and I don't want the road put in place. If the road is put in place, there will be no regulations on vehicles and this would damage the area more. The Tribe should say 'NO' to the proposed road. The previous damage to the habitat ruined fish streams at Nakwasina, Fish Bay, Ushk Bay, Poison Cove, and Fick Cove. Now they want to farm fish and that is not the way to go since it doesn't

make good dry fish. I don't want to see no more clear cutting and no more new roads being built. There should be a way to figure out how to put fish back in the streams."

Trails and Road Development

Sitka Tribe of Alaska was very concerned when the Sitka Access issue came up a few years ago, and Sitka Tribe held a Tribal Citizens' meeting with members of our cultural committee, Customary and Traditional Committee, Herring Committee, and Native Allotment owners, among others. After gathering input from this meeting, Sitka Tribe **opposed** the Rodman Bay alternative. Sitka Tribe supported the Warm Springs route is the least invasive of the roads proposed for "improving" ferry service.

Sitka Tribe is very concerned that *all of the alternatives* contain a Right of Way for the Rodman Bay road. Sitka Tribe is *strongly opposed* to a Right of Way for the Rodman Bay road. Sitka Tribe of Alaska stands opposed to any further road development Again the Tribe reiterates that Sitka Tribe are mandated to protect the hunting, gathering and fishing habitat of our tribal members.

Sitka Tribe is wary of new trails, and would like to be informed of all proposed trails. All trails and roads will impact traditional hunting, gathering and fishing sites, historical and sacred sites to varying degrees. Any trail and road development will increase access to these sites. Increase in access will amplify the impact on the biodiversity of the areas cited for development. A large percentage of the trails and roads proposed will utilize old logging trails that initiated environmental damage to the habitat in the 50s and 60s. Should any development occur, Sitka Tribe propose that in addition to upgrading the trails and roads, funds be utilized for habitat restoration. Examples of habitat restoration Sitka Tribe would like to see include clearing the slags, stumps, rehabilitating the habitat through thinning and other means. Sitka Tribe encourage the Forest Service to develop whatever means possible to restore the clear-cut areas to enhance the biodiversity of the habitat.

Native Allotments:

The land use development plan as well as the trails and roads affect our current and pending allotments. Since time immemorial, Tlingits have utilized this country for settlements, for both summer and winter harvesting campsites. It was not until the middle of the 20th century that an Alaska Native was even allowed to own property. From the beginning of our relationship with the federal government, aboriginal title has been largely ignored until the discovery of oil on the North Slope brought about an immediate need for settlement of aboriginal title. The Allotment Act was instituted but never implemented until "Pence vs. Kleppe" forced BLM to reopen allotment applications that were closed without due process. Due process difficulties have exponentially been made more complicated by time, loss of witnesses, Forest Service removing substandard cabins, etc. Only a fraction of camps will be returned to their rightful owners in the Sheet'ka Kwaan territory.

Many of the allotments awarded have been damaged by clear-cutting and other means. By its definition, allotment land is federal property and as such is the responsibility of the United States Government to protect. The Forest Service by definition is a part of the United States Government. Allotments have been damaged in part due to the misfeasance of the Forest Service. The Forest Service, not unlike the Sitka Tribe of Alaska, the Bureau of Indian Affairs, Park Service and the

Bureau of Land Management, has a responsibility to ensure the protection of the rights of the allottees to enjoy their allotments and realize the full benefits intended in the title.

Native allotments are situated in prime subsistence habitats. All trails, roads, land use development plans will impact some if not all of the allotments (with the possible exception of the Warm Springs road plan). **The Forest Service needs to take affirmative action not only to correct past wrongs but also to prevent future damage to allotments.** Sitka Tribe of Alaska encourages the Forest Service to enjoin a partnership with us to ensure the protection of the allotments and develop sound management to ensure future use to the maximum extent possible.

Sacred Sites:
Sitka Tribe greatly appreciates the efforts of the Forest Service, and specifically John Autrey, to work with the Tribe on drawing up a sacred sites policy. Sitka Tribe is very pleased to see this as part of the Forest Plan. The Forest Service needs to continue acting with continued due diligence in regard to acknowledging and recording sacred sites. The Forest Service will actively ensure that all Forest Service Officers and Line Officers require all employees: 1) Protect tribal cultural and historical information, 2) Consult with Tribes on matters that may affect tribal rights and interests, 3) Work with the Tribes in providing research, transfer of technology, and technical assistance where needed or agreed to concerning cultural and historical information, 4) Ensure that repatriation of Native American human remains and associated funerary objects is done in accordance with the requirements of the Native American Graves Protection and Repatriation Act.

Scientific evidence now embraces the fact that Tlingit have inhabited the Tongass for at least 10,000 years. Baranof Island has been the home to Tlingit since time immemorial. In recent history, Katlian's battle of 1804 has been marked in history as the last armed battle of aboriginal natives of North America against Europeans. It also marked the end of the expansion of the Russians in North America. Ad infinitum, this battle marks the determination and will of all Tlingit to protect their home and its infinite blessings the Tongass gives to its people. Land use development, trails, and roads will not only affect the biodiversity of the habitat but also will directly traverse Native allotments, historical and sacred sites including Katlian's retreat. Any development will require the due diligence and care by the Forest Service in working with the Sitka tribe in identifying and protecting these, sites, camps, villages and trails.

Tribal citizen Duck Didrickson stated at an STA Cultural committee meeting, "This is sacred land. There are many sacred places and the proposed road needs to be opposed now. The previous clear cuts have scarred the land, and people were told that in fifty years the land would be back to normal, which hasn't happened… There should be a plan established for the timber harvest and it should be presented to the Tribe how it's going to be done. There are many sacred places on the proposed road that should be protected. They should use helicopters rather than build a road on the land that the Tlingits have used for thousands of years. If there is timber cut in the proposed areas, the sacred lands will be gone."

In conclusion, Sitka Tribe can support only Alternative 1 *without the Rodman Bay road Right-of-Way*. Sitka Tribe also encourages the Forest Service to emphasize the rehabilitation of areas clear-cut in the Sitka area. Restorative measures need to be emphasized. Sitka Tribe of Alaska needs to be a party in any plan the Forest Service adopts. Sitka Tribe encourage the Forest

Service to adopt local hire and utilize Native hire in its practices that has been exercised in Angoon and Hoonah for maintenance and rehabilitation in the development of trails and roads, cabins and other recreational sites the Forest Service develops. The labor force for the logging and wood products sector in southeast Alaska is comprised of 35% nonresidents. One Tribal member stated "In previous instances, they have hired from down south and met the knowledge of local culture requirement by accepting the statement that they can learn the Native culture. The local and Native hiring policy should be more concrete than a puff of smoke." Sitka Tribe asks that the Forest Service to work cooperatively with the Sitka Tribe and the city of Sitka in reducing the nonresident work force in the logging and wood products industry on Baranof Island to the single digits.

The Tongass Land and Resource Management Plan Amendment while comprehensive is not conducive to thorough review of the developments and or plans that may impact Tribal Customary and Traditional Country. For example in Land Use Designations for timber harvests for each alternative the presentation is on a forest wide harvest. Sitka Tribe would like to see the alternative plans be identified into more specific areas such as Baranof Island where Tribal citizens can have easy access to and discern where the timber production would be, the allowable sale quantity and quality, and the impact designation for Baranof Island through each alternative plan.

In closing, thank you for this opportunity to comment. Sitka Tribe wishes to emphasize the importance of our Customary & Traditional [subsistence] resources and the importance in our cultural sites in *any* alternative considered. If you have any questions, please do not hesitate to contact Helen Dangel Lorrigan, Resource Protection Director for Sitka Tribe at (907) 747-3207.

Sincerely,

Lawrence Widmark
Tribal Council Chairman

CC: Sitka District Ranger Carol Goularte

99C

YAKUTAT TLINGIT TRIBE

P.O. BOX 418
YAKUTAT, ALASKA 99689
PHONE (907) 784-3238 FAX (907) 784-3595

May 7, 2007

Tongass National Forest
Attention: Forest Plan Adjustment
648 Mission Street
Ketchikan, AK 99901

This letter serves as the Yakutat Tlingit Tribe's official public comment regarding the draft Tongass Land Management Plan (TLMP). The Yakutat Tlingit Tribe has thoroughly evaluated all the Alternatives as well as the Standards and Guidelines, but limited our comments as they apply to the Yakutat Ranger District. We respect other Tribe's and communities opinions with respect to their preferred Alternatives and draft EIS as a whole.

The Yakutat Tlingit Tribe has chosen to modify Alternative 2, in particular the LUD boundaries and designations, to fit with our tribal members' and communities desire for only small timber sales in the Yakutat District. "Just under two-third of residents (61%) also support or strongly support small timber sales" according to the Yakutat Community Opinion Survey: An Analysis of Planning and Development Issues in Yakutat (October 2005, prepared by Sheinberg and Associates for the City and Borough of Yakutat).

You will find an attached map representing the Tribe's wishes to eliminate industrial logging within the Yakutat Ranger District but fulfill small local sawmill and personal use needs by changing the LUD along FS 10 from Timber Production to Modified Landscape designation. All other land outside of this designation have been converted to Semi-Remote LUD.

The boundaries of this LUD were moved outside of the Greater Situk Watershed as significant timber harvest and salvage sales have occurred in this very important area. The Yakutat Tlingit Tribe wishes to protect the Greater Situk Watershed from further timber harvest and salvage in order to sustain a critically important commercial salmon fishery and a world-class sport fishery until it the watershed has been restored. The eastern boundary was lengthened along FS 10 to offer more acres of small timber sales in roaded areas easily accessed by local small sawmill owners. This boundary and LUD change will allow provide approximately 8,984 acres of National Forest for sustainable harvest

Within the Scenic Viewshed and Modified Landscape LUDS we recommend the following changes to TLMP for the Yakutat Ranger District:

1.) Support 200-year rotation with pre-commercial and commercial thinning at logical intervals when needed.

Conversations with local sawmill owners and USFS studies indicate that 200 years is a minimum time span for harvested units to begin producing saw log quality trees and protecting many species (Hanley et al. 2005).

2.) Support selected harvest and small 1-2 acre "patch cuts"

This style of harvest is possible in Yakutat due to the flat topography. Small patch cuts do not open the forest canopy as readily to the wind as does large clear cutting methods. Selected harvest, when done correctly, provides for continuing forest function and remains useful for wildlife, watershed health and the public

3.) Support small sales to meet community needs and create small timber base for value-added wood industry (wood toys, instrument wood, molding, beams, etc.)

The Yakutat Community Opinion Survey conducted in 2005 indicated that 61% of the community is in favor of a small sales program. Only 17% of the community was opposed to this level of logging.

4.) Require research into windthrow patterns for use in harvest planning

On page 3-33 of the West Forelands Landscape Assessment (YRD 2005) the Forest Service, in regard to blowdown damage, states: ***"Almost half the stands adjacent to previous harvest openings had more then 50 percent canopy damage. Over 90 percent of the most severe damage occurred in stands adjacent to harvest openings and about 87 percent of the least damaged stands were in isolated patches".*** Since past management of the USFS has already opened up the Yakutat Foreland Forests to increased blow down intensity, the FS should be responsible for stabilizing the existing unites through research and action.

5.) Require above grade/overlay on all constructed logging roads. Establish a BMP for temporary road construction that prohibits altering the natural seasonal flow of surface or groundwater.

Often logging roads are cut below grade resulting in diverted surface and groundwater. Many streams intersect these below grade roads leading to fry dying when the below grade road surface water dries. To avoid this, roads must be planned with annual flooding in mind.

6.) Require funds generated from sale of timber be set aside for post harvest thinning treatments, silvicultural research, and restoration work.

When problems arise due to management actions by the Forest Service it should be incumbent that money is set aside for mitigation in a timely manner.

7.) Increase stream buffers from 200 to 500 feet depending on channel type and width. The 500 foot buffer was suggested in the USFS report entitled Scientific Information and the Tongass Land Management Plan: Key Findings from the scientific literature, species assessment, resource analysis, workshop, and workshop risk assessment panels. (1996)

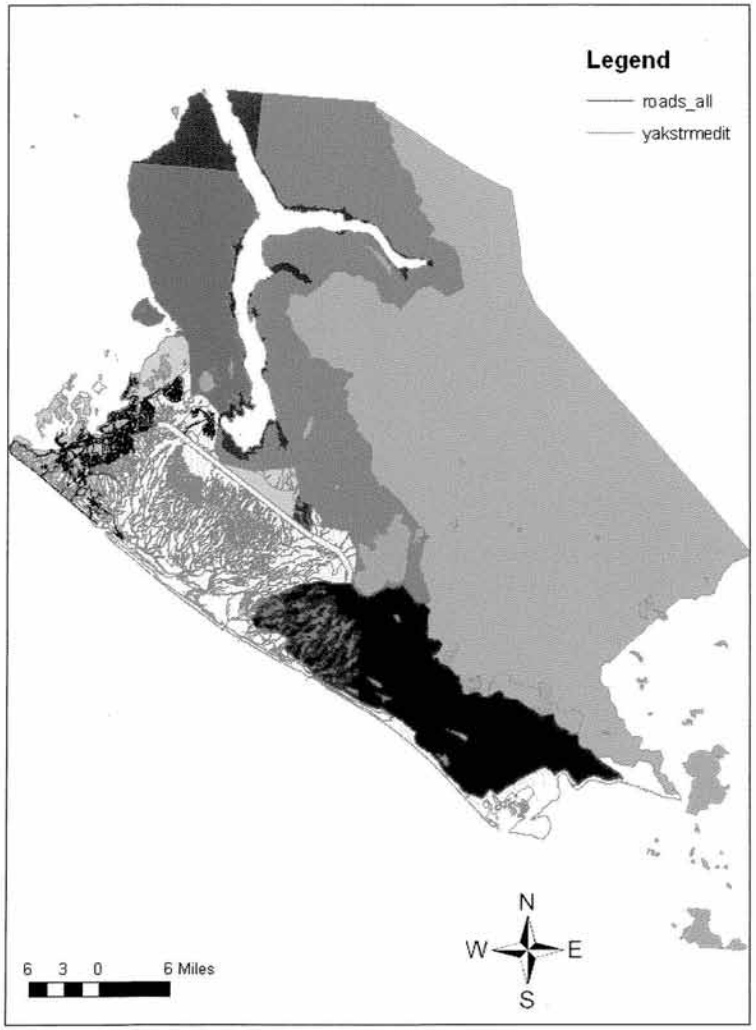
The Yakutat Tlingit Tribe would like the lands surrounding Yakutat to be managed to provide fish and wildlife habitat to support our subsistence foods, tourism, and commercial fishing, sustainably harvest and locally-used lumber and firewood without risking significant damage to our forest and habitat, and a healthy forests for future generations.

Sincerely,

Victoria L. Demmert
President

644

Alternative 2 Modification



City of Coffman Cove
Resolution 07-14

A RESOLUTION IN SUPPORT OF ALTERNATIVE 7 OF THE DRAFT LAND RESOURCE MANAGEMENT PLAN FOR THE TONGASS NATIONAL FOREST

WHEREAS, Coffman Cove is located in the Tongass National Forest, and

WHEREAS, the residents of Coffman Cove have an abiding respect for the forest, lakes, rivers and wildlife, and

WHEREAS, the need to have a diversified economy with year round jobs with benefits is essential, and

WHEREAS, the Tongass National Forest can support resource development and recreation while maintaining the integrity of the forest for wildlife and fish habitat, and

WHEREAS, the timber industry should be maintained at a level to provide quality jobs and encouraging development of new markets and industry, and

WHEREAS, a stable timber is essential to maintain a timber industry, and

WHEREAS, at the current level of 300 million board feet the Forest Service is only able to supply less than 60 million board feet of timber per yard due to lawsuits and injunctions, and

WHEREAS, 60 million board feet is not adequate to encourage development or maintain a good job market.

NOW THEREFORE IT BE RESOLVED the City of Coffman Cove supports alternative 7 for the revised Tongass Land Management Plan.

ATTEST:

Sara Yockey, City Clerk

Mikael Ashe, Mayor

Absent
Russ Holbrook, Seat A

Willy Johnson, Seat B

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Elaine Price, Seat C

Carolyn Duncan, Seat F

Randy Wright, Seat D

Kevin Moore, Seat G

CITY OF CRAIG ALASKA

April 6, 2007

RECEIVED APR 18 2007 4-18-07

Mr. Forest Cole
Forest Supervisor
Tongass National Forest
648 Mission Street
Ketchikan, AK 99901

Dear Mr. Cole:

The City of Craig supports Alternative 7 of the proposed draft Land and Resource Management Plan for the Tongass National Forest. This alternative alone provides a balance of recreational, industrial, environmental, and cultural uses of the forest. Alternative 7 meets this balance by providing 5.9 million acres of wilderness areas, 5.8 million acres of natural setting, 1.7 million acres of moderate development, and 3.4 million acres designated as intensive development.

Prince of Wales Island is an excellent example of how the forest can be managed to accommodate all users. The island supports: the timber, sport fishing, trapping, and tourism industries; recreational users of the forest; a strong commercial fishing industry; facilities that provide clean and renewable hydroelectricity; an extensive public road system; a healthy and flourishing population of terrestrial fauna; municipal watersheds; and other resources. The island also contains approximately 147,000 acres of wilderness, 169,000 acres of LUD II set-aside areas, miles of river corridor reserves, and twelve distinct communities. These wide ranging activities demonstrate the compatibility of many uses within the forest.

The City of Craig believes that one goal of the new TLMP should be to seek a more diverse economy in Southeast through the restoration of a healthy timber industry. In order to accomplish that goal, it is imperative that an adequate, reliable supply of economic saw log-quality timber be provided from the Tongass Forest. Only Alternative #7 approaches the needed annual timber supply needed for the industry.

The Tongass Forest has a biological potential of providing an annual timber harvest of 1.3 billion board feet. Only about 1.5 million acres from the 5.7 million acres of commercial timberland on the Tongass must be managed for multiple-use in order to sustain a 360 million board foot timber supply. Since the 1.5 million multiple-use acres can include most of the existing 2nd-growth acreage, about 75% of the Tongass old-growth will be untouched in perpetuity. This modest harvest from the National Forest needs to be clearly pointed out in the FEIS and reflected in the final amended plan.

In addition, based on updated science and a decade of field implementation experience with the 1997 TLMP, the current conservation measures that should be excluded from the final amended plan are:

(907) 826-3275 • Fax (907) 826-3278 P.O. Box 725, Craig, Alaska 99921

1. The marten and goshawk standards.
2. The 100-foot buffers on each side of all Class III, non-fish streams.
3. The large, medium, and small Habitat Conservation Areas (HCA) and the old-growth reserve strategy.
4. The 1000-foot beach and estuary buffers (reduce to 500-feet, except in 2nd growth areas where the buffer would be 100-feet).

In addition to the above four problematic conservation measures contained in the 1997 plan, the proposed addition of a Legacy Forest Structure guideline in the amendment calling for the retention of old growth timber stand characteristics within all harvest units should be excluded. This requirement would further hamper the economics of timber sales, would create safety hazards during harvest, would leave large trees subject to future wind damage and would increase the costs of sale planning and layout.

Once the planning is completed and these changes are in place, I would ask the US Forest Service to immediately begin preparing sufficient timber sales to allow for the investment necessary to sustain a fully integrated manufacturing industry.

As you are aware the US Forest Service has worked recently with the Nature Conservancy on what are commonly called restoration projects on Prince of Wales Island. The City of Craig supports these efforts and asks the US Forest Service to continue a program of restoration work here, and if possible continue its cooperative relationship with the Nature Conservancy on these projects.

The forest offers many resources to the public. As it decides which forest plan alternative to adopt, the Forest Service should attempt above all else to provide access to all the various resources in the forest. While this approach will likely mean that no one user group gets a development plan that suits its needs only, such a result is not a reasonable expectation for any one group to hold. In the final analysis the Forest Service should adopt the alternative that provides meaningful access to all user groups within the 17 million acre Tongass National Forest, and Alternative 7 meets that test.

Sincerely,

Mayor Dennis Watson | Michael Douville, Craig City Council | Greg Head, Craig City Council | Don Pierce, Craig City Council

Wanda Rice, Craig City Council | Jim See, Craig City Council | A. Millie Stevens, Craig City Council

1113

OFFICE OF THE MUNICIPAL CLERK/
ELECTION OFFICIAL

155 S. Seward St., Room 202
Phone: (907)586-5278 Fax: (907)586-4552
eMail: Laurie_Sica@ci.juneau.ak.us
www.junueau.org

April 26, 2007

Tongass National Forest
Attn: Forest Plan Adjustment
648 Mission Street
Ketchikan, AK 99901

Subject: Draft EIS for the Tongass Forest Plan amendment

Greetings!

The Assembly of the City and Borough of Juneau adopted attached Resolution 2408(b), A Resolution Expressing Assembly Support of the Tongass Futures Roundtable, at its meeting of Wednesday, April 25, 2007.

The resolution expresses the CBJ Assembly's strong support for the forest industry as an important component of the Southeast Alaska Economy. The Assembly commends to the Forest Service the principles adopted by the Tongass Futures Roundtable, and supports the efforts of the Tongass Futures Roundtable to achieve through consensus a "long-term balance of healthy and diverse communities, vibrant economies, responsible use of resources – including timber, while maintaining the natural values and ecological integrity of the forest."

This comment and the attached resolution were e-mailed to:
r10_tongass_juneau_rd_plan_adjustment@fs.fed.us on Thursday, April 26, 2007.

Thank you for the opportunity to comment.

Sincerely,

Laurie Sica, CMC
Municipal Clerk
City and Borough of Juneau, Alaska

Presented by: Mayor Botelho
Introduced: 04/25/2007
Drafted by: J.W. Hartle

RESOLUTION OF THE CITY AND BOROUGH OF JUNEAU, ALASKA

Serial No. 2408(b)

A Resolution Expressing Assembly Support of the Tongass Futures Roundtable.

WHEREAS, Southeastern Alaska provides the setting for the Tongass National Forest, the nation's largest national forest at nearly 17 million acres. A 500 mile long archipelago of fjords, glaciers, ridges, jagged peaks, forests, and wetlands, the Tongass forest comprises much of the largest temperate rainforest remaining on Earth; and

WHEREAS, the Forest Service is an agency of the U.S. Department of Agriculture and manages public lands in national forests and grasslands through management plans; and

WHEREAS, the Forest Service originally adopted the current Tongass Forest Plan in 1997 and it has been amended many times since then; and

WHEREAS, additional adjustments and updates of the Forest Plan (officially called a Forest Plan Amendment) are intended to comply with an August 2005 Ninth Circuit Court of Appeals decision and to respond to the findings of the recently completed Tongass Forest Plan 5 Year Review; and

WHEREAS, the Assembly believes that a diverse economy in Southeast Alaska includes a healthy timber industry; and

WHEREAS, the Assembly has supported efforts of the Tongass Futures Roundtable a diverse group of stakeholders, including members of the forest industry, long involved in the Tongass to discuss how to incorporate Southeast Alaska's economic, cultural and ecological values in public policy issues throughout the region; and

WHEREAS, the Tongass Futures Roundtable has identified the following five principles as areas of significant common interest regarding the Tongass Land Management Plan amendments:

1. Protect intact watersheds with important values;
2. Manage timber lands to provide a steady, reliable, and predictable supply of timber to the industry;
3. Transition from old growth to second growth;
4. Promote, support and fund a forest and riparian restoration program; and
5. Provide sufficient, economic timber to support an integrated manufacturing industry.

NOW, THEREFORE, BE IT RESOLVED BY THE ASSEMBLY OF THE CITY AND BOROUGH OF JUNEAU, ALASKA:

Section 1. The Assembly of the City and Borough of Juneau expresses its strong support for the forest industry as an important component of the Southeast Alaska economy.

Section 2. That the Assembly commends to the Forest Service the principles adopted by the Tongass Futures Roundtable.

Section 3. That the Assembly supports the efforts of the Tongass Futures Roundtable to achieve through consensus a "long-term balance of healthy and diverse communities, vibrant economies, responsible use of resources - including timber, while maintaining the natural values and ecological integrity of the forest."

Section 4. Effective Date. This resolution shall be effective immediately upon adoption.

Adopted this 25th day of April, 2007.

Merrill R. Sanford for
Bruce Botelho, Mayor

Attest:

Laurie J. Sica
Laurie J. Sica, Clerk

642

KETCHIKAN GATEWAY BOROUGH

344 FRONT STREET • KETCHIKAN, ALASKA 99901

Office of the Borough Manager, Manager Roy Eckert • roy.eckert@borough.ketchikan.ak.us
907/228-6625 • Fax 907/247-6625

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April 3, 2007

Mr. Forrest Cole, Forest Supervisor
USDA Forest Service
Tongass National Forest
Federal Building
Ketchikan, AK 99901

Dear Mr. Cole,

Reference is made to the Tongass Land and Resource Management Plan Amendment DEIS January 2007.

The following are the Ketchikan Gateway Borough's concerns relating to this plan amendment:

As you are aware the Ketchikan Borough experienced a serious loss of yearlong family wage jobs with the closure of the pulp mill and then the veneer plant in Ward Cove. One of the key reasons for these closures was lack of an available timber supply along with market conditions and related business decisions. We have pursued an operator for several years for the veneer plant and we believe the new owners will reopen the veneer plant. They have completed a test run of the veneer plant with positive results. Full production of the mill will require a wood supply from the Tongass National Forest. Absence of an adequate timber supply for the veneer plant and other mills in SE Alaska will be devastating to our already fragile economy, and will result in hundreds of jobs leaving the community.

The Forest Service controls 92.9 % of the land within Tongass National Forest; with only 1% being private lands - with the balance of land being owned by the state, local governments, or native corporations. Clearly only a balanced multiple use management plan for the Tongass National Forest lands will provide for the economic health and well being of SE Alaska communities.

A 2000 report by the McDowell Group stated "*Since 1990, volume of timber harvested from the Tongass National Forest has dropped from 470 million board feet to 120 million board feet annually, a 75 percent decline. Timber industry employment is at its lowest point in over 30 years, now directly accounting for only about 670 jobs. At its peak, in the 1970s, the Tongass generated 4,000 timber industry jobs in Southeast Alaska.*" Further on the report states "*Total employment and payroll in Ketchikan are down by 12 percent since 1995. The community has suffered a net decline of 950 jobs and $30 million in annual payroll. Real payroll (adjusted for inflation) has dropped 16% since 1995.*"

Since the 2000 report, the timber harvested on the Tongass has declined another 60%. The few remaining sawmills are struggling to secure enough timber to maintain at least a single-shift operation so they can stay in business and maintain some key employees until an adequate timber supply is restored.

In 2000, Congress passed the Secure Rural Schools Act. This Act provided a safety-net of payments in lieu of the boroughs and unorganized areas of Southeast Alaska's share of timber receipts from the

Tongass. That legislation expired in 2006 and, unless the Act is reauthorized, the boroughs and local governments in Southeast Alaska will again be reliant on the stumpage receipts. At current harvest levels, the loss to Southeast Alaska communities will be about $9 million per year. This amounts to approximately $400,000 that the Ketchikan Gateway Borough relies upon to help fund our borough school system. This is in addition to the lost jobs and lost economic activity from the timber sale program. This loss of funding will mean the local governments will need to raise local taxes to provide funding for schools and roads at current service levels.

The Ketchikan Gateway Borough supports the restoration of the timber industry in Southeast Alaska. The industry, the Southeast Conference, the State of Alaska, the Alaska Congressional Delegation and many others envision a fully integrated timber manufacturing industry in Southeast Alaska. The experts agree that about 360 million board feet of economically harvestable timber is the minimum volume that is needed to enable that vision to become a reality. Since alternative #7 in the Draft Environmental Impact Statement for the Tongass Plan Amendment is the only alternative that seems to satisfy that minimum requirement, we recommend that alternative #7, or one that provides a similar timber supply, be adopted in the final forest plan.

We are also concerned about the issue of timber sale economics on the Tongass. Our understanding is that several of the management prescriptions that were developed for the 1997 land management plan are the primary reason that over half of the timber sales prepared in recent years have been uneconomic, in other words, the cost of accessing, harvesting and processing the timber exceeds the value of the products produced. This situation is even more troubling when one recognizes that wood product prices have been at very high levels in recent years.

Access and Harvest Costs

Both the timber industry and Forest Service District timber sale planners blame most of the high construction and logging costs on four of the 1997 management prescriptions:

1. Mandatory buffer strips on non-fish streams. The Alaska Forest Practices Act requires 100-foot buffers on each side of all anadromous fish streams and high-value resident fish streams whereas the 1997 land management plan requires the 100-foot buffers on all anadromous and resident fish streams and all Class-3 non-fish streams. The requirement to maintain these 200-foot wide strips on the abundant non-fish streams is terribly costly and of questionable value. We agree with the industry that these non-fish stream buffers should be required on a case by case basis and only when absolutely necessary.

2. 1,000-foot no-cut buffers on all beach fringes. The State Forest Practices Act does not require these buffers and prior to the 1997 plan, only 500-foot buffers were required. Consequently, we support much smaller beach fringe buffers such as called for in alternative #7. Also, since the beach fringe buffers were added for old-growth habitat, we support using a much smaller buffer in existing 2nd-growth areas. Managing as much of the existing 2nd-growth as possible for timber production will lessen the need to harvest old-growth timber in other areas.

3. The old-growth reserve strategy sets aside about a million acres of large, medium and small tracts of the highest volume, lowest harvest cost timber stands. Too often the remaining timber stands in each area have such low volumes and high harvest cost that they are not operable once the old-growth parcels are removed. The old-growth reserve strategy is unnecessary because only 1.5 million acres of commercial timberland are needed to sustain the 360 million board foot harvest level. That leaves about 4.2 million acres of old-growth timber on commercial

4. timberland well distributed across the Tongass. Surely leaving ¾ of the old-growth timber untouched in perpetuity is adequate without the imposition of the old-growth reserve strategy.

5. Marten and Goshawk partial cuts. Requiring partial cutting on cable harvesting units is both dangerous and extremely costly. It is also unnecessary for a region that has more than ¾ of its commercial timberland preserved in an old-growth timber status. Furthermore, the guidelines fc protection of these wildlife species are not well founded in science.

The high operating costs associated with the four above guidelines would be further exacerbated if the Legacy Forest Structure guideline as proposed in alternatives #1-6 were adopted. It calls for maintenance of old growth forest structure in all harvest units. Such practices would increase sale design, layout and harvest costs, while creating additional safety hazards. We oppose the inclusion of the above mentioned standards in any of the alternatives.

Manufacturing costs

The cost of manufacturing forest products is higher than necessary because the timber supply has been so severely constrained for so long. The few remaining mills cannot make the necessary investments to remain optimally competitive when they are struggling to maintain a single-shift operation. Further, the sawmill operators are compelled to saw many logs that would more appropriately go to a veneer plant, a fiberboard plant or some other type of processing facility. Sawing these unsuitable logs lowers both the productivity in the mills and the value of the lumber that the mills produce. As a consequence the manufacturing cost is higher than necessary.

Many of the Borough's citizens depend upon subsistence of fish and wildlife resources for their families The Borough does not believe the harvesting and growing of timber under Alternative #7 will be detrimental to the fish and wildlife resources. In fact, we believe species such as deer can and will be more plentiful if Alternative 7 is selected and indeed implemented.

This DEIS is in response to a Ninth Circuit court ruling. Three key issues have been identified: 1) protecting high-value roadless areas, 2) providing a sufficient timber supply to meet market demand and maintain a vibrant economy, 3) protecting wildlife habitat and biodiversity. The Ketchikan Gateway Borough fully believes that Alternative 7 with suggested changes will completely meet and fulfill these key issues.

Summary

The Ketchikan Gateway Borough urges you to adopt an alternative like #7 with whatever changes are needed to insure a suitable land base of 1.5 million acres that provides at least 360 million board feet of economic timber sales offered for sale every year. The industry needs a reliable supply of timber and the 360 million board foot operating level can be provided from a small portion of the Tongass.

These comments were approved by vote of the Ketchikan Gateway Borough Assembly on April 2, 2007

Sincerely,

Joe Williams
Mayor

Copy:

Mark Rey
Department of Agriculture
Undersecretary for Natural Resources
1400 Independence Ave. SW
Stop Code 0108, Wash. DC 20250

Governor Sarah Palin
PO Box 110001
Juneau, AK 99811

Senator Ted Stevens
522 Hart Building
Washington D.C. 20510

Senator Lisa Murkowski
709 Hart Building
Washington D.C. 20510

Congressman Don Young
2111 Rayburn Building
Washington D.C. 20515

Dennis Bschor, Regional Forester
Alaska Region
PO Box 21628
Juneau, Alaska 99802-1628

http://www.borough.ketchikan.ak.us

City of Ketchikan

April 10, 2007

Tongass National Forest
ATTN: Forest Plan Adjustment
648 Mission Street
Ketchikan, AK 99901

To Whom It May Concern:

At its regular meeting of April 5, 2007, the Ketchikan City Council unanimously approved Resolution No. 07-2190 supporting a sustainable annual economical timber harvest in Southeast Alaska. This resolution reaffirms the position the City Council has strongly supported for several years: the timber industry is essential to the economic health of Southeast Alaska, and a key component of a healthy and diversified economy in Ketchikan.

The Ketchikan City Council continues to believe that the Tongass National Forest should be managed through the Tongass Land Management Plan and local forest planning efforts. Please consider this resolution as part of the comment record regarding this issue.

Sincerely,

Bob Weinstein
Mayor

CC: Congressional Delegation
Governor Sarah Palin
Senator Bert Stedman
Representative Kyle Johansen

Weinstein/Forest Service – timber harvest

334 Front Street / Ketchikan, AK 99901 / PH: 907-225-3111 / FX: 907-225-5075

CITY OF KETCHIKAN, ALASKA

RESOLUTION NO. 07-2190

A RESOLUTION OF THE CITY OF KETCHIKAN, ALASKA SUPPORTING A SUSTAINABLE ANNUAL ECONOMICAL TIMBER HARVEST; RECOGNIZING THE IMPORTANCE OF THE TIMBER INDUSTRY TO SOUTHEAST ALASKA; AND ESTABLISHING AN EFFECTIVE DATE

WHEREAS, the USDA Forest Service is requesting public comment on the Draft Environmental Impact Statement (DEIS) and the proposed Tongass Land Management Plan (TLMP) Amendment; and

WHEREAS, 5.7 million acres of the ten million acre Tongass National Forest are classified as "productive timberland;" and

WHEREAS, approximately 1.5 million acres, inclusive of those areas previously logged, are necessary to sustain a viable economical timber supply in Southeast Alaska; and

WHEREAS, the timber industry in Southeast Alaska has long been a cornerstone of many local economies throughout the region; and

WHEREAS, sustainable timber harvest is consistent and compatible with Ketchikan's interests and goals related to a healthy and diversified economy.

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Ketchikan, Alaska as follows:

Section 1: The Council of the City of Ketchikan, Alaska expresses support for the public comment process relative to the Draft Environmental Impact Statement (DEIS) and the proposed Tongass Land Management Plan (TLMP) Amendment.

Section 2: The Council of the City of Ketchikan affirms that there are approximately 10 million forested acres in the Tongass National Forest and of that, only 5.7 million acres are currently classified as "productive timberland."

Section 3: Of the 5.7 million acres that are currently classified as "commercial timberland," the Council of the City of Ketchikan urges the USDA Forest Service approve a Tongass Land Use Management Plan (TLMP) Amendment that makes available 1.5 million productive forested acres, inclusive of those acres previously logged, to sustain a viable economical timber supply in Southeast Alaska.

Section 4: The Council of the City of Ketchikan affirms its support of a sustainable economical timber harvest as a component of healthy local and regional economies within Southeast Alaska.

Section 5: This resolution shall become effective immediately upon adoption.

1132

CITY OF KUPREANOF
P.O. BOX 50
PETERSBURG, ALASKA 99833

April 23, 2007

To: Chris Savage, Acting Petersburg District Manager

Subject: Forest Plan Revision, Tongass National Forest

Dear Mr. Savage,

Please enter into public comments Resolution #05-1 from the City of Kupreanof regarding Land Use Designations for the acquired land parcel known as the Petersburg Creek Land Acquisition. This property adjoins the City of Kupreanof and the Petersburg Creek Duncan Salt Chuck Wilderness. A copy of this Resolution is attached.

When the Forest Service makes a decision regarding the Forest Plan Revision and the Petersburg Creek Land Use Designation the City of Kupreanof wishes to restate its strong community desire that the "Tongass National Forest use WILDERNESS designation on all lands within the Petersburg Creek water shed and the remaining lands within the Petersburg Land Acquisition be designated as REMOTE RECREATION".

Thank you for your consideration,

Robert Dolan

Mayor, Robert Dolan

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APR 30 2007
FOREST SERVICE

RESOLUTION #05-1

A RESOLUTION OF THE CITY OF KUPREANOF, ALASKA REQUESTING THAT THE PETERSBURG RANGER DISTRICT, TONGASS NATIONAL FOREST USE A COMBINATION OF WILDERNESS AND REMOTE RECREATION AS THE LAND USE DESIGNATION FOR THE ACQUIRED LAND PARCEL KNOWN AS THE PETERSBURG CREEK LAND ACQUISITION.

WHEREAS, this acquired property is either adjacent to or contained within the City boundaries of the City of Kupreanof and/or borders the Petersburg Creek/Duncan Salt Chuck Wilderness; and

WHEREAS, the entire Petersburg Creek drainage, except these lands, is already designated wilderness; and

WHEREAS, the Kupreanof Policy Plan has a stated goal to "Preserve a roadless community"; and

WHEREAS, the Kupreanof Policy Plan has a policy that states "The City of Kupreanof shall oppose all road construction within its boundaries"; and

WHEREAS, Remote Recreation and Wilderness designations would best protect the purity of potable water sources for Kupreanof residents; and

WHEREAS, it is contained in the City of Kupreanof City Code of Ordinances, Ordinance 76-2 Section 1, "All motorized land vehicles will be prohibited within city limits except on private property". Remote Recreation designation would best support the City of Kupreanof's use policies and the character of the surrounding lands.

THEREFORE, BE IT RESOLVED THAT THE City of Kupreanof strongly requests that the Petersburg Ranger District, Tongass National Forest use WILDERNESS designation on all lands within the Petersburg Creek water shed and the remaining lands within the Petersburg Creek Land Acquisition be designated as REMOTE RECREATION.

Passed and approved by the duly constituted quorum of the City Council of the City of Kupreanof, Alaska on this 10th day of April, 2005.

SIGNED _____
Richard E. Sprague, Mayor

Attest _____
Judy R. Reinarts, City Clerk

1380

City of Pelica

BOX 737 • PELICAN, ALASKA 99832 - PHONE: 735-2202/2203 - FAX: 735-2258 - E-MAIL: cityhall@pelicancity.net - WEBSITE: www.pelicancity.

CITY OF PELICAN
RESOLUTION 2007-7

A RESOLUTION FOR THE CITY OF PELICAN, ALASKA URGING THE UNITED STATES FOREST SERVICE TO MANAGE TONGASS FOREST RESOURCES IN A SUSTAINABLE AND BALANCED MANNER.

WHEREAS, the residents of the community of Pelican, Alaska are heavily dependent on the resources of the Tongass National Forest for our food, health, livelihoods, and lifestyles; and

WHEREAS, Pelican's economy is inextricably linked to the health of the fisheries resource; and

WHEREAS, Pelican residents rely heavily on subsistence foods; and

WHEREAS, road building, according to the Draft Environmental Impact Statement, poses the "greatest risk to fish resources; and

WHEREAS, the projected market demand in all the proposed alternatives greatly exceeds current market demand; and

WHEREAS, the City of Pelican supports small mills and their sustainable and value-added operations in the Tongass; and

WHEREAS, none of the alternatives provided adequately address climate change and global warming issues nor provide for adequate game corridors; and

WHEREAS, it is in Pelican's best interest that old growth watersheds remain intact to provide habitat, subsistence, fishing, hunting, recreation, and tourism opportunities.

NOW, THEREFORE BE IT RESOLVED that the City Council of Pelican, Alaska urges the Forest Service to provide funding for restoration of damaged culverts that block fish passage on existing roads; and

RECEIVED APR 30 2007 4-30-07

BE IT FURTHER RESOLVED that the Forest Service manage, rehabilitate and offer sales in second-growth forests to meet the needs of small mill operators and set harvest levels consistent with recent market demands; and

BE IT FURTHER RESOLVED that the City Council of Pelican, Alaska urges the Forest Service to manage the forest in a sustainable manner that will provide for varied and healthy ecosystems and an economy that allows sustainable use of subsistence, fisheries, timber, and tourism resources.

PASSED, APPROVED AND ADOPTED THIS 30th DAY OF APRIL, 2007.

Signed: Patricia Phillips
Patricia Phillips, Mayor

Attest: Carol Seymour
Carol Seymour, Assistant Clerk

767

CITY OF PORT ALEXANDER

P.O. Box 8068 Port Alexander, AK 99836-8068 907/568-2211 Fax 907/568-2211

RECEIVED APR 25 2007 Ra 4-25-07

RESOLUTION 07-02

WHERE AS the residents of Port Alexander are heavily dependent upon the Tongass Forest for our water, health, livelihoods and lifestyles, and

WHERE AS the days of slash clearcutting have gone the way to be replaced to a large degree by a value added forest products mentality, and

WHERE AS most of these products have evolved into a potential second growth sourced manufacturing process, and

WHERE AS so many of the other industries of the Tongass base, such as fisheries, tourism, fishing and hunting charter operations, personal recreation and scenic majesty have also evolved into a multifaceted shared resource. Therefore,

BE IT RESOLVED the City of Port Alexander would recommend that the Forest Service take steps to finally eliminate the utilization of the old growth forests for the timber industry; that the Forest Service take steps to assist the current level of forest product manufacturers in transitioning from the old growth to the second growth primary resources.

ADOPTED this 16th day of April, 2007 at a Port Alexander City council meeting

Ptarmica McConnell

Ptarmica McConnell, mayor pro-tem

ATTEST:

Linda Lawson

Linda Lawson, city clerk

1877

RECEIVED APR 23 2007 Regional Forester's Office

RESOLUTION 07-04-17-03
CITY OF THORNE BAY

A RESOLUTION OF THE CITY COUNCIL FOR THE CITY OF THORNE BAY, ALASKA; SUPPORTING ALTERNATIVE 7 OF THE TONGASS NATIONAL FOREST LAND AND RESOURCE MANAGEMENT PLAN

WHEREAS, the City Council is the governing body for the City of Thorne Bay, Alaska; and

WHEREAS, Alternative 7 of the Tongass National Forest Land and Resource Management Plan provides a balance of recreational, industrial, environmental, and cultural uses of the forest; and

WHEREAS, Alternative 7 meets this balance providing 5.9 million acres of wilderness areas, 5.8 million acres of natural setting, 1.7 million acres of moderate development, and 3.4 million acres designated as intensive development; and

WHEREAS, the Prince of Wales Island supports the timber, sport fishing, trapping, and tourism industries; recreational users of the forest; a strong commercial fishing industry; facilities that provide clean and renewable hydroelectricity; and extensive public road system; a healthy and flourishing population of terrestrial fauna; municipal watersheds; and other resources; and

WHEREAS, Alternative 7 approaches the needed annual timber supply needed for the industry.

NOW, THEREFORE, BE IT RESOLVED the Thorne Bay City Council supports Alternative #7 of the Tongass National Forest Land and Resource Management Plan.

PASSED AND APPROVED April 17, 2007

Jim Gould, Mayor

ATTEST:

Teri Gould

Teri Gould, City Clerk/Treasurer

RECEIVED APR 30 2007 4-30-07

795

CITY OF WRANGELL
INCORPORATED JUNE 15, 1903

P.O. BOX 531 (907)-874-2381
Wrangell, AK 99929 FAX (907)-874-3952

April 11, 2007

RECEIVED
APR 16 2007
4-16-07

Forrest Cole
Forest Supervisor
Tongass National Forest
648 Mission Street
Ketchikan, AK 99901

RE: City of Wrangell comments on TLMP/DEIS

Dear Supervisor Cole:

The City of Wrangell would like to offer the following comments on the Tongass Land Management Plan Amendment and Draft Environmental Impact Statement.

Wrangell fully supports the restoration of a healthy timber industry to improve the economy of Southeast Alaska and our own community. In order to accomplish this, it is imperative that an adequate, reliable supply of economic timber be provided from the Tongass National Forest.

As you are aware, the City of Wrangell experienced a serious loss of direct yearlong family wage jobs when the mill closed and the subsequent loss of population. Over ten years later, Wrangell is still feeling the decline in the economy due to continued loss of population and the economic staying power to help build businesses and encourage support and service industries. Full production of the Wrangell sawmill will require an economically viable wood supply from the Tongass National Forest. The absence of an adequate timber supply will devastate the large and small mills in SE Alaska and further impact our already fragile economy, resulting in hundreds of additional jobs leaving the region and the less than 75 direct jobs Wrangell has now employed in the timber industry, not to mention other businesses and jobs relying on the employees of the industry for their direct and indirect income.

The US Forest Service controls 92.9% of the land within the Tongass National Forest with only 1% being private lands and the balance of land being owned by state, local governments or native corporations. A balanced *multiple use* management plan for the Tongass National Forest, that includes timber harvesting, can provide economic health and well being for Southeast Communities. It appears that optimistic or unrealistic assumptions were used previously when defining the ability of the state and private lands to annually supply timber. The vast majority of commercial timberland in southeast Alaska is within the National Forest. Much of the non-federal timberland is now in 2nd-growth timber that will not be mature and again commercially harvestable for about another 30-40 years. Thus, the timber supply must come from the Tongass National Forest.

To assure that the Tongass Land Management Plan provides sustained employment for the region, Wrangell offers the following comments:

- The management of the Tongass National Forest must be based on a balanced multiple use plan that provides the employment, goods and services needed by SE Alaska communities both in the short and long term. Economies of SE Alaska must be weighed heavily during consideration.

- When calculating and analyzing economic impacts, examine the impacts on a community-by-community basis and do not claim that the benefits from a growing community that does not depend on the timber industry somehow offset the negative impacts on communities that do depend on the timber industry.

- The areas scheduled for harvest should be concentrated in intensive management blocks so that fewer roadless and high value areas will be impacted.

- Four of the conservation management measures that were developed for the 1997 TLMP are the primary reason that over half of the timber sales prepared in recent years have been uneconomically viable, in other words, the cost of accessing, harvesting and processing the timber exceeds the value of the products produced. This situation is even more troubling when one recognizes that wood product prices have been at very high levels in recent years. Harvests should be designed and managed so that all of the usable wood is taken and used in some form of value-added manner.

  1. Mandatory buffer strips on non-fish streams. The Alaska Forest Practices Act requires 100-foot buffers on each side of all anadromous fish streams and high-value resident fish streams whereas the 1997 land management plan requires the 100-foot buffers on all anadromous and resident fish streams ***and*** all Class-3 non-fish streams. The requirement to maintain these 200-foot wide strips on the abundant non-fish streams is terribly costly and of questionable value. We agree with the industry that these non-fish stream buffers should be required on a case by case basis and only when absolutely necessary.
  2. 1,000-foot no-cut buffers on all beach fringes. The State Forest Practices Act does not require these buffers and prior to the 1997 plan, the buffers were not required. Smaller beach fringe buffers could be possible on a case by case basis. The all encompassing beach fringe buffers were added for old-growth habitat, but smaller buffers in existing 2nd-growth areas could be permitted for future sustainable harvest areas. Managing as much of the existing 2nd-growth as possible for timber production will lessen the need to harvest old-growth timber in other areas.

3. The old-growth reserve strategy sets aside about a million acres of large, medium and small tracts of the highest volume, lowest harvest cost timber stands. Often the remaining timber stands in each area have such low volumes and high harvest cost that they are not operable once the old-growth parcels are removed. In stead of the old-growth reserve strategy, if the USFS could identify 1.5 million acres of commercial timberland needed to sustain a healthy industry managed for second growth harvesting, that leaves about 4.2 million acres of old-growth timber on commercial timberland that would not be harvested well distributed across the Tongass. Surely leaving ¾ of the old-growth timber untouched in perpetuity is adequate without the imposition of the old-growth reserve strategy.
4. Marten and goshawk partial cuts. Requiring partial cutting on cable harvesting units is both dangerous and extremely costly and would be unnecessary for a region that has more than ¾ of its commercial timberland preserved in an old-growth timber status.

- Establish sale design on the basis of the resources needing protection and otherwise try to maximize production.

- Provide sufficient, economic timber to support an integrated manufacturing industry and do so at an economy of scale that allows the Southeast Alaska timber industry to harvest and process timber competitively with other regions in the world.

- Manage the forest for multiple uses, one of them being timber harvest. Expanding already developed areas, extending existing roads, and staying out of other higher value areas can concentrate harvest to select areas. But some of the standards and guides would need to be relaxed to allow more harvesting in these already developed areas and road extensions. Enough land for a long term sustainable 2nd growth forest could be developed.

In summary, the City of Wrangell urges the Forest Service to fairly evaluate all portions of the alternatives and select a preferred alternative that allows an annual harvest level to maintain full employment and use of the existing mills as well as permit job growth and manufacturing growth opportunity in the wood manufacturing component. The City also urges the Forest Service to provide flexibility with the conservation management measures in order to more intensely manage harvest areas for timber harvesting.

Once the planning is completed and these changes are in place, we would like the U.S. Forest Service of the Tongass National Forest to immediately begin preparing sufficient timber sales to allow for the investment necessary to restore a fully integrated timber manufacturing industry and healthy economies.

Sincerely,

Valery McCandless, serving as Mayor

Valery McCandless, serving as Mayor

Councilmember Ronald Rice

Councilmember Paul Southland

Councilmember Wilma Stokes

Councilmember Ernest Christian

Councilmember Tom Sims

Councilmember James Stough

City Manager Robert Prunella

1379

CITY OF WRANGELL, ALASKA

RESOLUTION NO. 04-07-1081

A RESOLUTION OF THE COUNCIL OF THE CITY OF WRANGELL, ALASKA, COMMENTING ON THE TONGASS LAND MANAGEMENT PLAN AMENDMENT AND DRAFT ENVIRONMENTAL IMPACT STATEMENT AND SUPPORTING A SUSTAINABLE TIMBER HARVEST

WHEREAS, the City of Wrangell fully supports the restoration of a healthy timber industry to improve the economy of Southeast Alaska and our own community; and

WHEREAS, the City of Wrangell has continued to see a decline in the local economy due to the loss of jobs directly related to the timber industry and indirectly from the continued loss of support and service industry jobs to the community from the declining population; and

WHEREAS, the Southeast Conference has been analyzing the Draft Environmental Impact Statement (DEIS) and proposed Tongass Land Management Plan (TLMP) Amendment and made initial comments to the US Forest Service; and

WHEREAS, unless the problematic conservation measures are adequately addressed and sufficient acres are dedicated to intensive timber management as SEC recommends, there will not be an adequate, reliable supply of economically harvestable timber available to restore an integrated industry and support the many timber dependent communities in Southeast.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF WRANGELL, ALASKA, is on record supporting the Southeast Conference's comments on the 2007 Tongass Land Management Plan Amendment and Draft Environmental Impact Statement and encourages the U.S. Forest Service to work with communities and Southeast Conference to seek solutions in achieving economic diversification and social well-being of Southeast Alaska by developing a sustainable timber harvest within the Tongass National Forest.

ADOPTED April 10, 2007

Valery McCandless, serving as Mayor
Valery McCandless, Mayor

ATTEST: Christie L. Jamieson
Christie L. Jamieson, City Clerk

CITY & BOROUGH of YAKUTAT
P.O. Box 160
Yakutat, Alaska 99689
Phone (907) 784-3323
Fax (907) 784-3281

RECEIVED
APR 30 2007
4-30-07

April 25, 2007

To: Tongass National Forest
Attention: Forest Plan Adjustment
648 Mission Street
Ketchikan, AK 99901

The following letter is submitted by the City and Borough of Yakutat Assembly as official public comment regarding the upcoming adjustments to the Tongass Land Management Plan (TLMP). The attached map illustrates the desires of the community of Yakutat regarding land use designations on National Forest within our borough boundaries. This map has been endorsed by the Yakutat Tlingit Tribe, the Yakutat Salmon Board and The Yakutat Planning and Zoning Commission.

We have modified Alternative 2 in regards to Intensive Development, Modified Landscape, Scenic Viewshed and Semi-Remote Recreation Land Use Designations (LUDS).

We have eliminated all intensive development LUD acreage and converted 4,798 acres to modified landscape to allow small timber sales and free-use while encouraging select harvest and small one to two acre "patch cuts". We have reduced the Scenic Viewshed LUD along forest highway 10 to 4,197 acres. The reduction of the Scenic Viewshed LUD is based on its proximity to the Situk River on the Western end of FH10 and the low grade cottonwood/spruce forest on the Eastern end. This alteration will allow for sustainable harvest on 8, 984 acres of National Forest Land.

All remaining lands outside of these designations have been converted to Semi-Remote Recreation LUD. The one exception, which appears to be a FS clerical oversight, is the redesignation of the LUD surrounding Tanis Lake in the Brabazons. This should be redesignated as remote recreation in place of semi remote recreation to match the surrounding LUD. The former timber harvest LUDS redesignated for semi-remote recreation includes the clearcuts along Tawah Creek and the Lost River and the entirety of the federally owned portions of the West Fork Situk, Upper Situk and Old Situk HUC3 Watersheds. Harvest in these watersheds has exceeded sustainable levels. Furthermore, the two major growth industries in Yakutat remain commercial fishing and tourism. We

feel that by increasing acreage managed for recreation and subsistence, the USFS will restructure the focus of their budgets by funding tourism infrastructure and planning, and research of fisheries and wildlife resources that community depends on.

Below are specific recommendations for alterations to the TLMP. These comments are made for the geographical area of Yakutat only. However, some of these recommendations may be applicable to the Tongass National Forest as a whole.

Within the Scenic Viewshed and Modified Landscape LUDS we recommend the following changes to TLMP for the Yakutat Ranger District:

1.) Support 200 year rotation with precommercial and commercial thinning at logical intervals when needed.

Conversations with local sawmill owners indicate that 200 years is a minimum time span for harvested units to begin producing saw log quality trees.

2.) Support selected harvest and small 1-2 acre "patch cuts"

This style of harvest is possible in Yakutat due to the flat topography. Small patch cuts do not open the forest canopy as readily to the wind as does large clear cutting methods. Selected harvest, when done correctly, provides for continuing forest function and remains useful for wildlife, watershed health and the public

3.) Support annual small sale program to meet community needs and create small timber base for value added wood industry (wood toys, instrument wood, molding, beams, etc.)

A community survey conducted in 2005 indicated that 61% of the community is in favor of a small sales program. Only 17% of the community was opposed to this level of logging.

4.) Require research into windthrow patterns for use in harvest planning

On page 3-33 of the West Forelands Landscape Assessment (YRD 2005) the Forest Service, in regard to blowdown damage, states:***" Almost half the stands adjacent to previous harvest openings had more then 50 percent canopy damage. Over 90 percent of the most severe damage occurred in stands adjacent to harvest openings and about 87 percent of the least damaged stands were in isolated patches".*** Since past management of the USFS has already opened up the Yakutat Foreland Forests to increased blow down intensity, the FS should be responsible for stabilizing the existing unites through research and action.

5.) Require all logging roads be constructed above grade. Establish a BMP for temporary road construction that prohibits altering the natural seasonal flow of surface or groundwater.

The attached photos illustrate how roads divert surface and groundwater. To avoid this, roads must be planned with annual flooding in mind.

6.) Require funds generated from sale of timber be set aside for post harvest thinning treatments, silvicultural research, and restoration work.

When problems arise due to management actions by the FS it should be incumbent that money is set aside for mitigation in a timely manner.

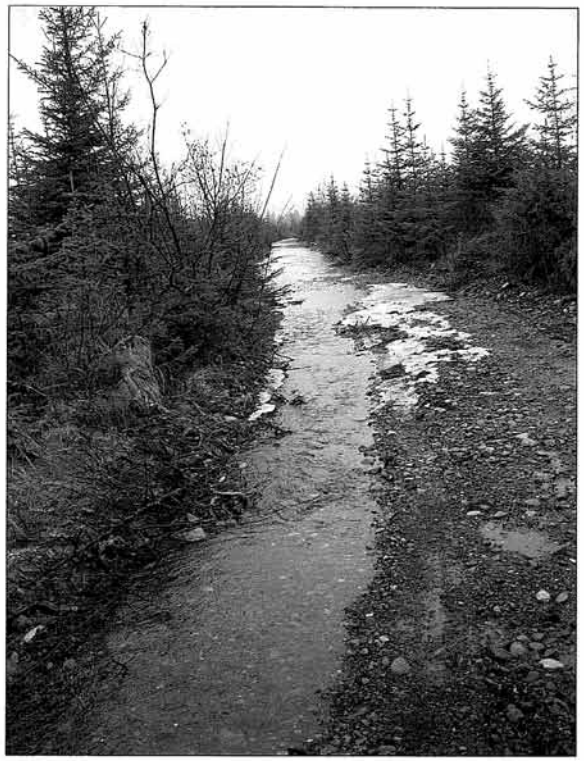
7.) Increase stream buffers from 200 to 500 feet depending on channel type and width. The 500 foot buffer was suggested in the USFS report entitled Scientific Information and the Tongass Land Management Plan: Key Findings from the scientific literature, species assessment, resource analysis, workshop, and workshop risk assessment panels. (1996)

The attached photo shows a riparian buffer failure off the end of a USFS 2000 acre clearcut. This buffer was 300 feet wide.

What the majority of Yakutat Residents want is to have, in essence, a community woodlot that is managed sustainably and at low intensity. We want the timber lands managed so that they can be used by all residents for lumber and firewood, provide habitat for wildlife and fish, a place to hunt and trap, and a landscape that shows visitors good stewardship practices. The rest of the non-timber National Forest land is presently providing well managed commercial fishing, guiding, and subsistence opportunities for Yakutat's citizens and the public of the United States. We commend this management and encourage the Forest Service to focus on these activities as the planning team rewrites TLMP.

Sincerely,

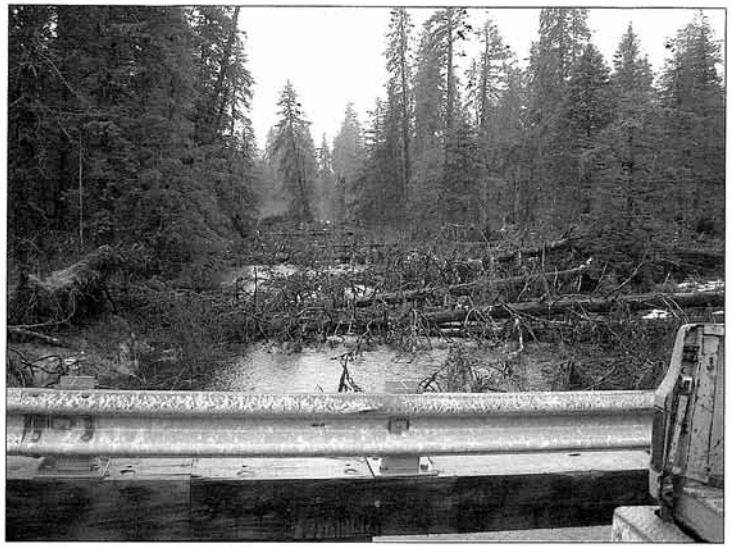
Dave Stone, Mayor



February 2005 Yakutat Salvage Sale II Road

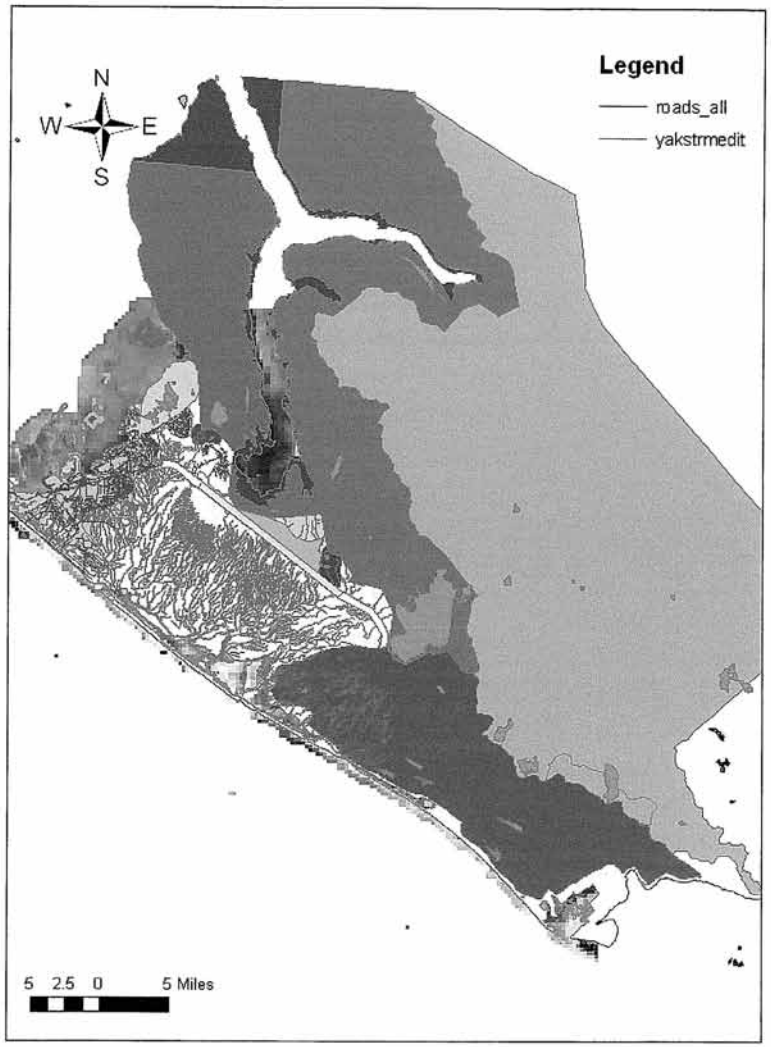
May 2004 – blowdown harvest road on private land adjacent to National Forest

First logging road constructed for Yakutat Salvage Sale 1 (2004)



Upper Riparian Buffer failure on the West Fork of the Situk River Buffer failure extends for several hundred yards downstream (2005)

Alternative 2 Modification



Land Use Designations

WILDERNESS AND NATIONAL MONUMENT

- Wilderness and Wilderness National Monument- Preserve essentially unmodified areas to provide opportunities for solitude and primitive recreation. Limit motorized access.
- Non-Wilderness National Monument - Facilitate the development of mineral resources in a manner compatible with the National Monument purposes.

MOSTLY NATURAL SETTING

- LUD II - Maintain the wildland characteristics of these congressionally-designated unroaded areas. Permit fish and wildlife improvements and primitive recreation facilities.
- Old-Growth Habitat - Maintain old-growth forests in a natural or near-natural condition for wildlife and fish habitat.
- Research Natural Area - Manage areas for research and education and/or to maintain natural diversity on National Forest System Lands.
- Semi-Remote Recreation - Provide for recreation and tourism in natural-appearing settings where opportunities for solitude and self-reliance are moderate to high.
- Remote Recreation - Provide for recreation in remote natural settings outside Wilderness, where opportunities for solitude and self-reliance are high.
- Municipal Watershed - Manage municipal watersheds to meet State water quality standards for domestic water supply.
- Special Interest Area - Preserve areas with unique archaeological, historical, scenic, geological, botanical, or zoological values.
- Wild, Scenic, or Recreational River - Maintain and enhance the outstandingly remarkable values of river segments which qualify the river to be classified as a Wild, Scenic, or Recreational River.

MODERATE DEVELOPMENT

- Scenic Viewshed - Maintain scenic quality in areas viewed from popular land and marine travel routes and recreation areas, while permitting timber harvest.
- Modified Landscape - Provide for natural-appearing landscapes while allowing timber harvest.
- Experimental Forest - Provide opportunities for forest practices research and demonstration.

INTENSIVE DEVELOPMENT

- Timber Production - Manage the area for industrial wood production. Promote conditions favorable for the timber resource and for maximum long-term timber production.
- Minerals - Encourage mineral exploration and development of areas with high mineral potential.

CRAIG COMMUNITY ASSOCIATION

P.O. Box 828
Craig, Alaska 99921
Phone: 907-826-5125
Fax: 907-826-3997
Email: whalehouse@hotmail.com

Date: 4 April 2007
To: USFS
From: Craig Community Association
Environmental Protection Division
Re: Tongass Land Management
Plan (TLMP) Comment

Greetings U.S. Forest Service,

Thank you for your time. Craig Community Association is a federally recognized Tribe; with 672 qualified and enrolled Tribal members.

This letter is in regards to the comment that is requested for the Tongass Land Management Plan (TLMP). As a federally recognized Tribe, we support "Alternative 1".

"Alternative 1" takes a lot of economic stress that our forest might not be able to handle anymore. The 20th Century was "The easy way out". In the end, our lands are paying for our mistakes. We must protect and preserve our precious forest. Keeping our logging to a minimum is crucial to the survival of the 21st Century. Southeast Alaska is nothing without our forest.

Alternative 1 will provide a mix of National Forest uses and activities, but would give much additional emphasis to maintaining inventoried roadless areas, associated fish and wildlife values, and unroaded recreation, tourism, and subsistence opportunities, relative to the current Forest Plan. Timber would be managed primarily within the roaded land base and the vast majority of inventoried roadless areas would remain in a natural condition. A total of 1.2 million acres of the Tongass would be in Development LUDs and 15.6 million acres would be in Non-development LUDs.

The 21st Century is full of opportunity- capitalize. We need to get our 20th Century thought and applications out of the stream and start to apply 21st Century consequences with our future actions. We must not make the same mistake again.

The data presented in your EIS shows a decline in the amount of timber being harvested within the TNF; as well as an increase in recreational and subsistence activities. The data presented should be considered in making your decision. We are suggesting that recreation, subsistence and "sacred sites" be put in the front, and set timber sales to a gradual halt.

We understand that up to 450 employees in Southeast Alaska depend on the timber industry (5%). Please take into consideration how many other employees that can be implemented to a National Forest that supports recreation, tourism, and subsistence; not to mention how much wildlife will be enhanced (62% natural resource based). More employees will benefit this "New Horizon", with the interagency protection of our "Sacred Sites".

More areas of great concern are the protection of our subsistence rights, and the conservation and monitoring of our "sacred sites" that are located within the TNF. Sacred Sites are valuable to indigenous people of the TNF. These areas should be protected and monitored under Tribal/USFS interagency supervision. These sacred areas need special attention and will require sensitive monitoring from both governmental agencies. This action will provide balance- a much needed ingredient in today's economy.

Tourism has spiked since the 1990's and will continue to grow. Tourists will not travel to come and see a land that "Once thrived". Tourists are eager to see the true meaning of "The Last Frontier".

Our environment- this is the largest concern in our Draft EIS for the Tongass Land Management Plan. With the increase in the Industrial Age and in global population, a lot of weight is being put on natural resources. Once again, balance is the key ingredient missing in this recipe.

The introduction of noxious or invasive animal and plant species in our forests is drawing more concern with each new initiation. They present no natural predators to control this silent outbreak. Interagency attack is an effective "first-step" to remediation. The Forest Service and Tribes must work together.

Global climate change has scientific based proof that Alaska's overall temperature is increasing faster than any area in the world. Our trees and plants have the balancing effect to help neutralize such worldwide events from happening. We must protect our future today.

We thank you for your time and consideration.

Respectfully,

Dennis Nickerson
Environmental Coordinator
Craig Community Association

Date

PRINCE OF WALES COMMUNITY ADVISORY COUNCIL

Chairman: Jon Bolling, Craig
Vice Chairman: Art King, Naukati
Secretary/
Treasurer: Elaine Price, Coffman Cove

PO Box 725
Craig, AK 99921
(907) 826-3275
(907) 828-3380
FAX: (907) 826-3278

April 17, 2007

RECEIVED
APR 18 2007
RCS
4-18-07

Mr. Forest Cole
Forest Supervisor
Tongass National Forest
648 Mission Street
Ketchikan, AK 99901

Dear Mr. Cole:

The Prince of Wales Community Advisory Council supports Alternative 7 of the proposed draft Land and Resource Management Plan for the Tongass National Forest. This alternative alone provides a balance of recreational, industrial, environmental, and cultural uses of the forest. Alternative 7 meets this balance by providing 5.9 million acres of wilderness areas, 5.8 million acres of natural setting, 1.7 million acres of moderate development, and 3.4 million acres designated as intensive development.

POWCAC is an association of communities on Prince of Wales Island (POW) dedicated to improving the quality of life on Prince of Wales. POWCAC achieves this goal by acting in an advisory capacity to State and Federal agencies concerning issues that affect Prince of Wales communities.

Prince of Wales Island is an excellent example of how the forest can be managed to accommodate all users. The island supports: the timber, sport fishing, trapping, and tourism industries; recreational users of the forest; a strong commercial fishing industry; facilities that provide clean and renewable hydroelectricity; an extensive public road system; a healthy and flourishing population of terrestrial fauna; municipal watersheds; and other resources. The island also contains approximately 147,000 acres of wilderness, 169,000 acres of LUD II set-aside areas, miles of river corridor reserves, and twelve distinct communities. These wide ranging activities demonstrate the compatibility of many uses within the forest.

POWCAC believes that one goal of the new TLMP should be to seek a more diverse economy in Southeast through the restoration of a healthy timber industry. In order to accomplish that goal, it is imperative that an adequate, reliable supply of economic timber be provided from the Tongass Forest. Only Alternative #7 approaches the needed annual timber supply needed for the industry.

PARTICIPATING COMMUNITIES:
Coffman Cove, Craig, Hollis, Hydaburg, Kasaan, Klawock, Naukati, Thorne Bay, Whale Pass

The Tongass Forest has a biological potential of providing an annual timber harvest of 1.3 billion board feet. Only about 1.5 million acres from the 5.7 million acres of commercial timberland on the Tongass must be managed for multiple-use in order to sustain a 360 million board foot timber supply. Since the 1.5 million multiple-use acres can include most of the existing second growth acreage, about 75% of the Tongass old growth will be untouched in perpetuity. This modest harvest from the National Forest needs to be clearly pointed out in the FEIS and reflected in the final amended plan.

In addition, based on updated science and a decade of field implementation experience with the 1997 TLMP, the current conservation measures that should be excluded from the final amended plan are:

1. The marten and goshawk standards.
2. The 100-foot buffers on each side of all Class III, non-fish streams.
3. The large, medium, and small Habitat Conservation Areas (HCA) and the old growth reserve strategy.
4. The 1000-foot beach and estuary buffers (reduce to 500-feet, except in 2nd growth areas where the buffer would be 100-feet).

In addition to the above four problematic conservation measures contained in the 1997 plan, the proposed addition of a Legacy Forest Structure guideline in the amendment calling for the retention of old growth timber stand characteristics within all harvest units should be excluded. This requirement would further hamper the economics of timber sales, would create safety hazards during harvest, would leave large trees subject to future wind damage and would increase the costs of sale planning and layout.

Once the planning is completed and these changes are in place, the US Forest Service should begin immediately preparing sufficient timber sales to allow for the investment necessary to sustain a fully integrated manufacturing industry.

As you are aware the US Forest Service has recently worked with the Nature Conservancy on what are commonly called restoration projects on Prince of Wales Island. POWCAC supports these efforts and asks the US Forest Service to continue a program of restoration work here, and if possible continue its cooperative relationship with the Nature Conservancy on these projects.

The forest offers many resources to the public. As it decides which forest plan alternative to adopt, the Forest Service should attempt above all else to provide access to all the various resources in the forest. While this approach will likely mean that no one user group gets a development plan that suits its needs only, such a result is not a reasonable expectation for any one group to hold. In the final analysis the Forest Service should adopt the alternative that provides meaningful access to all user groups within the 17 million acre Tongass National Forest. Alternative 7 meets that test.

Thank you for considering our comments.

Sincerely,

Jon Bolling
POWCAC Chairman

PARTICIPATING COMMUNITIES:
Coffman Cove, Craig, Hollis, Hydaburg, Kasaan, Klawock, Naukati, Thorne Bay, Whale Pass

999

Southeast Alaska Regional Advisory Council

Bertrand Adams Sr., Chair

P. O. Box 349
Yakutat, AK 99689
907 784 3357
kadashan@ptialaska.net

April 27, 2007

RECE
APR 27 2007

U.S.D.A Forest Service, Region 10
P.O. Box 21628
709 W. 9th Street
Juneau, Alaska, 99802-1628

Dear sirs,

The Southeast Regional Advisory Council (SERAC) met in Kake, Feb. 26 through Mar. 1, 2007. SERAC represents all southeast subsistence communities including Yakutat. The Council is authorized by the Alaska National Interest Lands Conservation Act (ANILCA) and chartered under the Federal Advisory Committee Act to provide recommendations to the Federal Subsistence Board concerning regulatory and land management actions that may affect subsistence uses of fish and wildlife. ANILCA and the charter also recognizes the Council's authority to "initiate, review and evaluate proposals for regulations, policies, management plans, and other matters related to subsistence uses of fish and wildlife on public lands within the region" and to "provide a forum for the expression of opinions and recommendations.....(on) any matter related to the subsistence uses of fish and wildlife on public lands within the region." Our 13 Council members come from 11 Southeast Alaska communities. They are very well informed concerning the effects of timber management in the region. The Council provided comments on the Tongass Land Management Plan Revision on Nov. 11, 1997 (appended); many of our comments at made at that time remain valid today.

At our recent meeting, Council members reviewed the Tongass Land and Resources Management Plan Amendment, Draft Environmental Impact Statement (DEIS). The Council wishes to acknowledge the attention paid to the review of this plan by Council members Bangs, Hawkins, Hernandez, and Wallace. The following are the Council review comments. Overall, the Council is concerned that the DEIS does not adequately recognize the importance of the subsistence use taking place in the Tongass National Forest, that it does not provide sufficient protections for this use, and that it does not provide enough information to evaluate the foreseeable effects of proposed timber

management, increased levels of tourism and non-subsistence consumptive use, and of global warming on subsistence uses.

1. **Purpose and need**. The Council questions the treatment of the DEIS of market demand. While the Tongass Timber Reform Act may direct Forest Service to meet market demand, Forest Service may have interpreted "market demand" incorrectly. The best indicator of market demand is current and past harvest levels actually achieved. Over the past decade, actual harvests from Federal public land have generally been under 100 mmbf per year. This recent recorded harvest provides an accurate metric for "market demand." The Council believes that the DEIS should use this figure or a slightly higher figure allowing for incremental growth of existing harvesting businesses as the basis for market demand.

   The Council strongly objects to setting market demand to meet the possible demand from industries or businesses that may one day choose to operate in Southeast Alaska. We do not believe that Forest Service needs to meet the fictional demand of businesses that exist only as ideas or proposals. Should viable industrial plans to use Tongass NF timber come close to implementation in the future, the plan may be amended to accommodate these new uses.

2. **A Revision or an Amendment**? The Council is unclear why Forest Service has chosen to undertake an amendment rather than a plan revision. We believe that the ecological situation on the Tongass NF has changed sufficiently, human uses and demands put on the forest have changed, global warming is upon us, and that new management perspectives have emerged since the plan was first approved. This argues for a full plan revision and not an amendment. The main changes we note are:

   a. Virtual collapse of the large scale industrial timber industry in the region. Presently, small producers are the main timber harvesters. Note that the Council supports these local Alaskan business endeavors.
   b. Tourism has grown exponentially since the plan was approved. The charter fishing industry is part of this growth and impacts subsistence directly.
   c. Management perspectives identifying the critical need to restore and rehabilitate clear cut areas of the Tongass NF have come to the fore.
   d. The consensus from scientific and Traditional Econological Knowledge is that the Tongass NF is being and will be profoundly affected by climate change. This effect on the forest and on subsistence uses needs to be fully evaluated in a new forest plan.

3. **Subsistence land use designation**. The Council continues to be concerned about the lack of an appropriate land designation for subsistence. In 1997 we wrote, "Although the Plan included 19 land use designations for purposes such as logging, recreation, research, and municipal watersheds, it included no

designations to protect the most important subsistence use areas of rural communities." To the extent that the DEIS considers subsistence at all, it looks at the effect of other uses on subsistence. We believe that subsistence is a prime use of Tongass NF natural resources and that it should be designated as such. The DEIS must plan **FOR** subsistence rather than merely see the effect of plan activities upon subsistence uses.

4. **Subsistence studies**. The original TLMP identified the need to conduct periodic harvest assessments and other studies of subsistence to provide the data needed by management and to assess whether ANILCA Sec. 810 protections were insuring a continuance of subsistence uses. The Council notes that this provision appears to have been dropped from the DEIS.

   The Council believes that periodic assessment of subsistence harvests and other documentation of subsistence characteristics needs to take place. Projects conducted through the Federal Subsistence Program have led to development of tribal and community capacity to successfully undertake management studies of this type.

5. **Conservation strategy**. Council members reviewed the joint statement of peer review committee members concerning the adequacy of conservation measures proposed for wildlife in the DEIS. The Council agrees with the conclusions that:

   a. The habitat reserves identified are inadequate to provide for viability of wildlife species on the Tongass NF.
   b. There is not enough connectivity between old growth reserves. Key areas for connectivity are:
      i. Cleveland Peninsula
      ii. Bay of Pillars-Port Camden-Three mile arm to Tebenkof Wilderness area on Kuiu Island
      iii. Whale Pass and Honker Divide on Prince of Wales Island
      iv. Hoonah Sound-Port Frederick-Tenakee Inlet on Chichagof Island
      v. Portage Bay-Duncan Salt Chuck on Kupreanof Island.
   c. There is too much fragmentation of wildlife habitat.
   d. In areas where there are wolves, fragmentation results in increased wolf predation and increased pressure on deer.

6. **Viability as a standard**. The DEIS emphasizes species viability and distribution as a standard that needs to be met. In the Council's view mere viability is not an appropriate standard. Subsistence users need to be able to harvest the wildlife and fish they need for subsistence within their normal community hunting and fishing areas, generally those areas where they have recognized customary and traditional use of the species in question. A better standard would be "sustainable and normally distributed" if this were taken to mean that fish and wildlife populations would be maintained in sufficient abundance and in locations where subsistence

harvests may take place.

7. **Habitat rehabilitation and restoration (R&R)**. Some restoration and rehabilitation projects aimed at recovering the original biological productivity of clear cut areas have been begun on Prince of Wales Island. The DEIS needs to greatly expand the scale and scope of R&R to address all clear cut and second growth areas on the Tongass NF. The stewardship responsibility of the Forest Service for areas that have had active timber management includes planning to restore areas to their natural condition.

8. **Impacts on fish and fisheries**. The Council believes that the DEIS inadequately reviews the impact on the region's fish populations and fisheries. Is it really plausible that there is ***no effect*** anywhere from the aggressive timber harvesting program pursued on public lands over that past 30 years? The Council would like more thorough discussion of effects on stream flow, stream temperature, transport of nutrients and feed from headwaters to fish rearing habitat, and the influence of large wood and beaver dams on fish productivity.

   The Council is concerned that known problems with culverts obstructing fish passage, with siltation from forest roads, and with detritus at log transfer facilities are not competently addressed. We need to know when and how these problems will be remedied.

   Steelhead should be listed as a species of concern .

9. **Competition for resources**. The DEIS needs to address the effects of competiton on subsistence uses. Increased road building for timber production would lead to more competition for fish and wildlife resources. Trout and steelhead are particularly vulnerable to over exploitation when there is road access to streams. Subsistence use areas on Gravina Island, Prince of Wales island, Kupreanof island, Wrangell island, Mitkof island, Baranof island, and Chichagof island all have ferry access, making them prone to competition from non subsistence hunters and fishers.

   An increase in timber production would require more logging camps in remote areas. This would greatly increase competition in some presently used subsistence areas.

10. **Climate change**. The DEIS needs a much fuller discussion of climate change and how the DEIS will respond to our best prediction of what lies ahead. Climate change and it's effects on the health of the forest ecosystem essential to wildlife and fish habitat is of great concern to the Council. The Council believes that maintaining diversity of forest flora is very important in a changing climate. Large scale changes to the landscape as a result of intensive logging minimizes diversity. Climate change as stated in the draft report will result in more severe weather which will cause more blowdowns, landslides, and siltation, impacting

streams. Summers could also be hotter and drier. Resulting insect infestation leading to loss of forest could effect stream temperatures. Cedar decline as a result of climate change is also resulting in loss of tree cover for winter range and stream shading.

11. **Maintenance of cultural practices**. In addition to cultural values mentioned in the draft report, the Council also believes that maintaining remote areas where subsistence activities take place is important. A certain amount of solitude is a valuable aspect of the subsistence way of life.

12. **Community assessments**. The council disagrees with the draft plan's blanket conclusion that their will be no impacts to subsistence fisheries for any communities in the Tongass forest. The Council notes that the community assessments do list many impacts to subsistence deer hunting. Given the importance to the rural economy of subsistence hunting, we think impacts on subsistence should be heavily weighted when deciding on an alternative.

13. **ANILCA Sec.** 810. Most or all of the alternatives proposed "may significantly restrict subsistence uses." The DEIS needs to show the relative level of impact from the different alternatives proposed. The alternatives directing large timber harvests have decidedly greater restrictions on subsistence uses than alternatives that direct less calamitously large harvests. Timber harvests in areas documented to be particularly important to subsistence users will have more effect than timber harvests that are less productive for subsistence harvesters.

    The Council understands that, "No withdrawal, reservation, lease, permit, or other use, occupancy or disposition of such lands which would significantly restrict subsistence uses shall be effected until the head of such Federal agency--:

    1) Gives notice to the appropriate State agency and the appropriate local committees and regional councils established pursuant to section 805;
    2) Gives notice of, and holds, a hearing in the vicinity of the area involved; and
    3) Determines that (A) such a significant restriction of subsistence uses is necessary, consistent with sound management principles for the utilization of the public lands; (B) the proposed activity will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition, and (C) reasonable steps will be taken to minimize adverse impacts upon subsistence uses and resources resulting from such actions.

    The Council is primarily concerned with 3) above. We do not believe that the DEIS has demonstrated that the restrictions on subsistence uses that would occur from timber harvest levels above those of the past 10 years is "necessary" as intended in Sec. 810. Such excessive harvest would not be consistent with sound management of the Tongass NF. Further, the Council is not convinced that the

DEIS has demonstrated that the proposed actions would involve the minimum amount of land necessary. The DEIS also has not demonstrated specifically how adverse impacts to subsistence uses and resources would be minimized.

Please address any questions with this letter either directly to me or through Dr. Robert Schroeder, Subsistence Management Coordinator, U. S. Forest Service, Alaska Region, Box 21628, Juneau, AK 99802-1628, 1 800 586 7895, fax 907 586 7860, rschroeder@fs.fed.us.

Sincerely,

/S/

Bertrand Adams Sr.
SERAC Chair

cc. Council Members:
Michael Bangs, Petersburg Nick Davis, Kake Mike Douville, Craig
Merle Hawkins, Ketchikan Donald Hernandez, Pt. Baker/Petersburg
Joe Hotch, Klukwan Floyd Kookesh, Angoon Harvey Kitka, Sitka Patricia
Phillips, Pelican Dick Stokes, Wrangell Lee Wallace, Saxman
Frank Wright Jr., Hoonah

Denny Bschor, Regional Forester, USDA Forest Service
Steve Kessler, USDA Forest Service
Dr. Winifred Kessler, WFEW, USDA Forest Service
Pete Probasco, Office of Subsistence Management
Don Rivard, OSM, Division Chief, FWS

SOUTHEAST ALASKA FEDERAL
SUBSISTENCE
REGIONAL ADVISORY COUNCIL

c/o Subsistence Program
Box 21628
Juneau, Alaska 99802-1628

Voice: 1-800-586-7895, or 907-586-8890
FAX: 907-586-7860

Dr. Michael P. Dombeck, Chief of the Forest Service
USDA Forest Service
PO Box 96090
Washington, DC 20090-6090

11/17/97

Dear Chief Dombeck;

The Southeast Alaska Federal Subsistence Regional Advisory Council (the Council) is a FACA chartered committee that has responsibility under Title VIII of the Alaska National Interest Lands Conservation Act (ANILCA) to make recommendations concerning issues and actions that may impact subsistence uses of wild renewable resources in the Region. The Council is comprised of citizens from across the Region, both Native and non-Native people selected for their extensive experience and knowledge concerning subsistence and non-subsistence resources and their uses. The members are appointed jointly by the Secretaries of the Interior and Agriculture.

At their recent public meeting in Yakutat (September 30 - October 2, 1997), the Council considered many issues, including the potential impacts of the Tongass Land Management Plan (TLMP). The Council is concerned about the reduction of subsistence opportunities that will occur as a result of the TLMP and unanimously passed a motion to write this letter in support of the Appeal to TLMP submitted to you by five Federally recognized Tribes in Southeast Alaska.

Five major Tlingit Indian Tribes of Southeast Alaska appealed the Revision of the TLMP, arguing that the Plan fails to protect customary and traditional uses of wild fish and game resources for subsistence purposes, as required by section 810 of ANILCA. The appellants are the federally recognized Indian Tribes from the four largest primarily Tlingit villages in the region: Hoonah, Angoon, Kake, and Klawock. The fifth appellant is the Tribal government for Sitka, the largest community in Southeast Alaska defined as "rural" under Title VIII of ANILCA. The Tribes make the following points in their appeal:

- Customary and Traditional uses of fish and game retain vital importance to these villages. Economically, they provide a substantial portion of the villages' food supply. Even more importantly, however, traditional harvest of wild fish and game is the foundation of Native culture.
- Clearcut logging of Tongass old growth harms subsistence uses primarily by destroying essential winter deer habitat. The Forest Service admits that implementation of the Plan will significantly restrict subsistence uses of deer. The agency projects that the areas of the Forest most heavily used for subsistence by rural communities will lose up to half of their deer habitat capability.
- This restriction to subsistence uses is not "necessary," as required by ANILCA section 810. There are no legal or contractual requirements that compel the Forest Service to take actions that restrict subsistence uses.
- The Forest Service illegally concluded that clearcut logging approved as part of a general "multiple use" balancing process justified any restrictions to subsistence uses. Congress enacted ANILCA section 810 specifically because the agencies were not adequately protecting subsistence uses under existing authorities such as "multiple use." Congress intended heightened protection for subsistence uses, not reduced opportunity.
- Although the Plan included 19 land use designations for purposes such as logging, recreation, research, and municipal watersheds, it included no designations to protect the most important subsistence use areas of rural communities.
- None of the standards and guidelines in the Plan provide meaningful protection for subsistence uses, but rather place a priority on timber production. The agency dropped the only standard that could have protected deer habitat in the most heavily use subsistence areas, falsely claiming that it would be "difficult to administer."

The Southeast Alaska Federal Subsistence Regional Advisory Council agrees with the Tribes' points outlined above and offers this letter in support of their appeal.

Sincerely,

Mim McConnell for William C. Thomas

Chairman **William C. Thomas**, Ketchikan

and *the other Council members*:

John Vale, *Yakutat*
Gabriel George, *Angoon*
Herman Kitka, *Sitka*
John Feller, *Wrangell*
Mary Rudolph, *Hoonah*
Patricia Phillips, *Pelican*
Mim McConnell, *Auke Bay*
Lonnie Anderson, *Kake*
Marilyn Wilson, *Haines*
Jeff Nickerson, *Klawock*
Vicki LeCornu, *Hydaburg*
Dolly Garza, *Sitka*

cc Tom Waldo, Earthjustice Legal Defense Fund
Michael Jude Pate, Sitka Tribe of Alaska

1003

Yakutat Salmon Board
City & Borough of Yakutat
P.O. Box 160
Yakutat, Alaska 99689

Phone 907-784-3329
Fax 907-784-3281

RECEIVED MAY 2007

30 April, 2007

To: Tongass National Forest

Re: TLMP Adjustments

This letter is submitted on behalf of the Yakutat Salmon Board. The Yakutat Salmon Board is an advisory committee to the City and Borough of Yakutat. These comments are only reflective of Yakutat Salmon Board staff and should not be construed as City & Borough of Yakutat comments except when referenced.

We have a lot of experience with the timber aspect of TLMP in Yakutat. Over 1 billion board feet have been exported from East Yakutat. In addition, all economical timber in West Yakutat has been harvested and the timber operations are leaving this year. Given that Sitka Spruce Forests grow slowly in the North Tongass it is likely that we won't see large scale timber production in our borough for at least another 100 years. In 1903 large tracts of land were harvested for railroad, fish plant and housing construction. The regrowth of this 104 year old forest averages around 10-12 inch dbh which is unsuitable for saw log production. Our community is in favor of small sales. The proposed map includes all small sale units proposed by the Yakutat District. 1

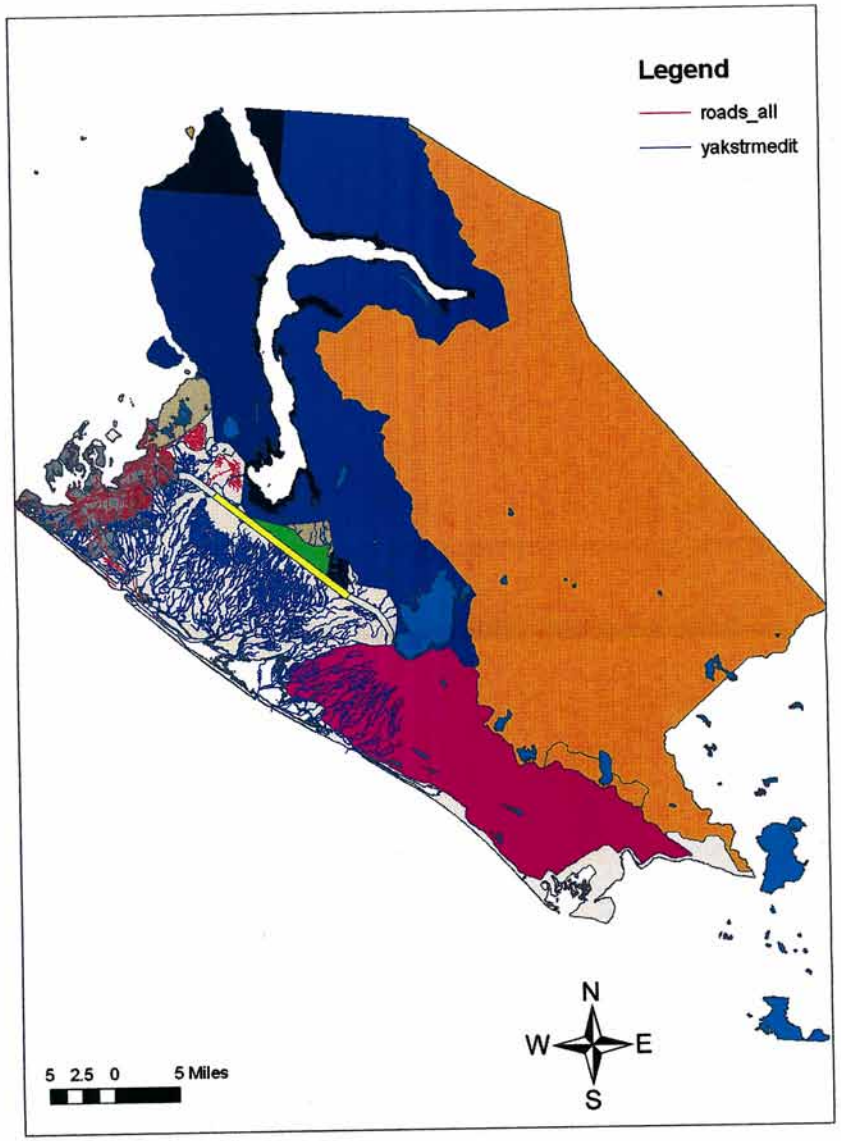
Our community relies on recreation and commercial fishing for the bulk of its economy. I feel the proposed land use changes illustrated by the enclosed map reflect the economic reality of our town. I also believe that non-local U.S. citizens using the Tongass in Yakutat would agree that fishing, hunting and wildlife viewing is the best use of this public land. If there is a demonstrated need to prove this we can apply for survey money to statistically back this claim. 2

I strongly encourage the USFS to accept our proposed modifications to alternative 2, which were passed unanimously by the Yakutat Tlingit Tribal Council, The Yakutat Salmon Board, The Yakutat Planning and Zoning Commission and the City and Borough of Yakutat Assembly. I would like to see an increase in spending for Fisheries, Wildlife and Recreation projects on the district.

Sincerely,

Bill Lucey
Director, Yakutat Salmon Board

Alternative 2 Modification



Yakutat
Community Opinion Survey

An Analysis of Planning and Development Issues in Yakutat

prepared for the

City and Borough of Yakutat
P.O. Box 160
Yakutat, Alaska 99869

prepared by
Sheinberg Associates
204 N. Franklin St, Ste 1
Juneau, Alaska 99801
bsheinberg@gci.net

October 2005

H-A109

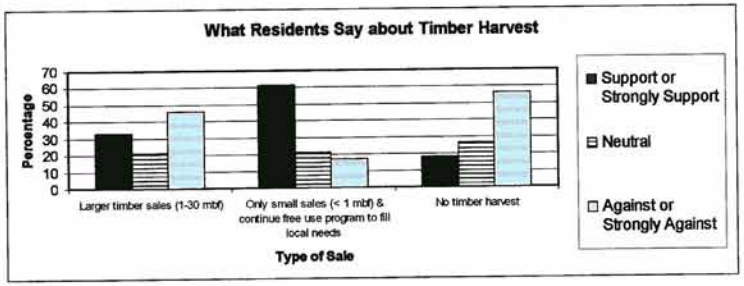
9.0 Timber

3

Residents were asked how much they supported future timber harvest activities in Yakutat, which could occur on Forest Service, State, or Borough lands or a combination.

This question generated some controversy because the question told residents to assume that all timber harvest could stimulate local value added production and local jobs, that timber harvest would meet State and Federal environmental regulations, and that it could be designed to attempt to stabilize stands from future wind throw. Some suggested this wording was misleading because in their judgment it is the inability of timber sales to achieve these matters that has led to recent controversy and legal action. Residents answered the question as it was written and results indicate:

- Just under two-third (61%) of residents support or strongly support small timber sales.
- 18% support no timber harvesting while over half (56%) do not agree with this option.
- Just under half (46%) are against large timber sales, while one-third (33%) support them.
- 21-26% are neutral on all timber harvest options.



	Net support	Strongly support	Support	Neutral	Against	Strongly against	Net against
Larger timber sales (1- 30 million board feet).	33%	15%	18%	21%	18%	28%	46%
Only small sales (less than 1 million board feet) and continuation of the free use program to fill local needs.	61%	23%	38%	21%	5%	12%	17%
No timber harvest at all.	18%	11%	7%	26%	26%	30%	56%

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Photograph taken looking northeast with Lindenberg Peninsula on Kupreanof Island and the mouth of Petersburg Creek (front cover) in the foreground, Petersburg Mountain (front cover) in the middleground, and Frederick Sound and the mainland in the background.