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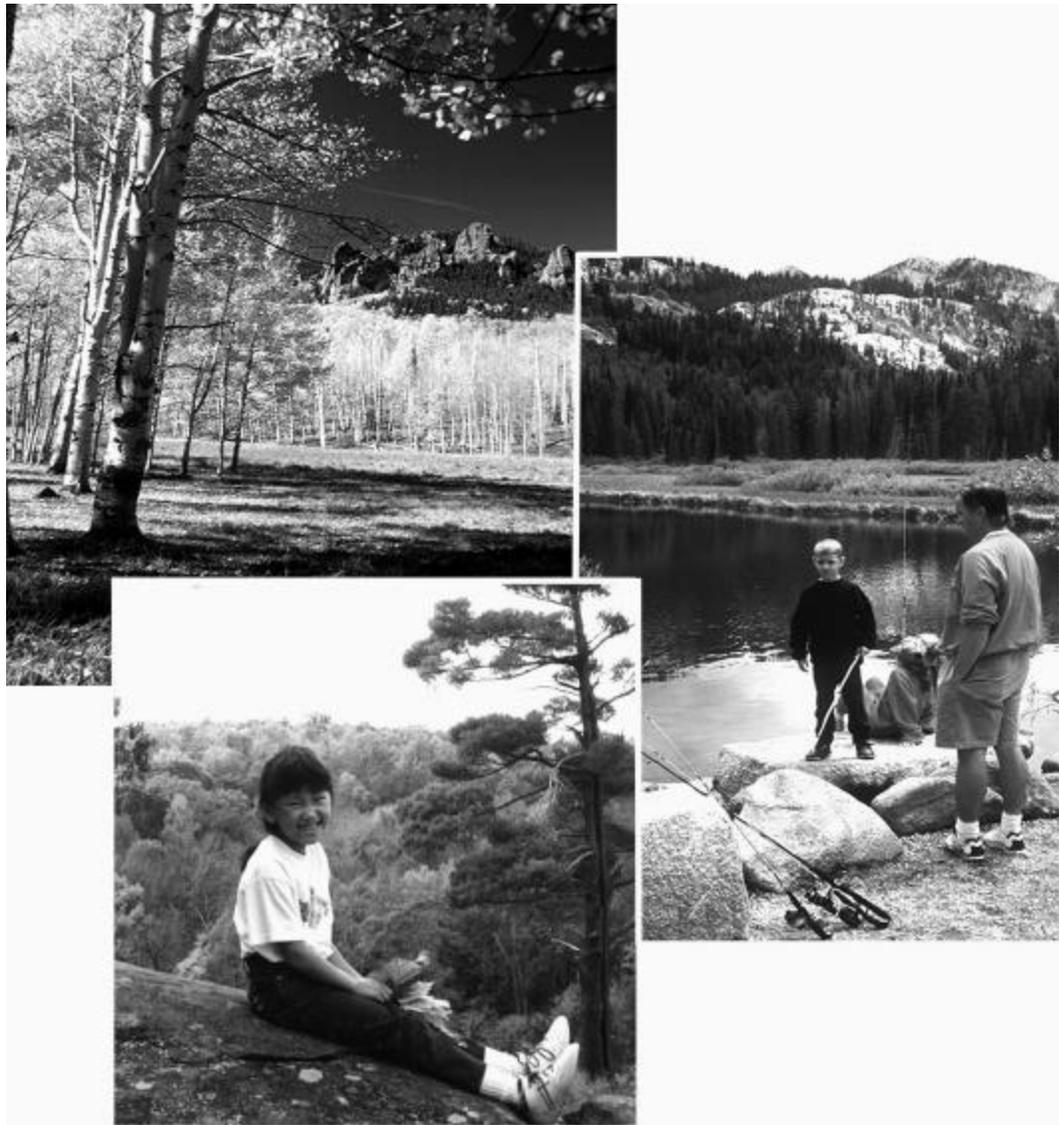
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November 2000

Forest Service Roadless Area Conservation

Final Environmental Impact Statement

Tongass Biological Resources Specialist Report



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Roadless Area Conservation
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Abstract

The Tongass Biological Resources Specialist Report provides background information and analysis used to describe the biological and ecological affected environment, and environmental consequences of the alternatives analyzed in detail for the Forest Service Roadless Area Conservation Final Environmental Impact Statement (FEIS), November 2000, as related to the Tongass National Forest. The analysis focuses on the four Tongass Alternatives: Tongass Not Exempt, Tongass Exempt, Tongass Deferred, and Tongass Selected Areas. Additionally, this report also considers the Tongass Not Exempt Alternative in conjunction with a mitigation that delays prohibitions on the Tongass until 2004. The analysis and evaluation of effects of the Roadless FEIS alternatives are based on the information and analyses in the TLMP FEIS (USDA Forest Service, 1997a), roadless area data compiled for this EIS (USDA Forest Service, 2000), and ecosystem characterizations found in “Terrestrial Ecoregions of North America: A Conservation Assessment” (Ricketts and others, 1999). The Roadless alternatives have been compared to Tongass FEIS alternatives that have similar management approaches. To the extent that roadless FEIS and TLMP FEIS alternatives contain similar management approaches, the effects and outcomes described for the TLMP FEIS alternatives were considered to be representative of the type of effects that could be expected for a Roadless Area alternative. Using this analysis approach, the Tongass Not Exempt Alternative presents less risk to biological and ecological resources than any of the other alternatives.

Changes Between Draft and Final EIS

DEIS Alternatives T1 and T4 have been renamed and carried forward into the FEIS without any substantive change. DEIS Alternative T1 has been renamed the **Tongass Exempt Alternative** in the FEIS. DEIS Alternative T4 has been renamed the **Tongass Selected Areas Alternative** in the FEIS. Because of the decision to incorporate the procedures into the final Planning Regulations, the other Tongass DEIS alternatives (T2 and T3) have been modified from their original form in the DEIS, combined, and re-described in the FEIS as the **Tongass Deferred Alternative**. In addition, a **Tongass Not Exempt Alternative** has been added to the FEIS to describe the decision-maker’s option of applying the selected prohibition alternative (1 through 4) to the Tongass without any modification. It is not a new alternative, but a clarified and reformatted description of one that was implicit in the DEIS (p. 2-10). In summary:

<u>DEIS Alternative</u>	Corresponds to:	<u>FEIS Alternative</u>
T1		Tongass Exempt
T2 and T3		Tongass Deferred
T4		Tongass Selected Areas
(No Exemptions)		Tongass Not Exempt

Additionally, discussions regarding the Tongass as it relates to the Pacific Northwest Ecoregion, unique karst features, and the Alaska Anadromous Fish Habitat Assessment (AFHA) have been added to this resource report between draft and the final. The

discussion on the role of science in the creation of the TLMP FEIS has been expanded in the final report.

Affected Environment

The Tongass Biological Resources Specialist Report provides the detailed background and information analysis for the affected environment and environmental consequences of the alternatives analyzed in detail for the Forest Service Roadless Area Conservation Final Environmental Impact Statement (FEIS), November 2000. It covers the data, analytical methods, resources, and the analysis of effects for biological resources on the Tongass National Forest that is summarized and disclosed in Chapter 3 of the FEIS. This analysis focuses on Tongass Not Exempt, Tongass Exempt, Tongass Deferred, and Tongass Selected Areas Alternatives.

Ecologically and biologically unique aspects of the Tongass National Forest

Encompassing approximately 17 million acres, the Tongass National Forest is the largest administrative unit in the National Forest System, in the nation's largest State. The Tongass is a naturally fragmented patchwork of temperate rainforest bordered by muskeg, alpine meadow, rock, water, and ice distributed across 22,000 islands and a narrow strip of mainland encompassing nearly all of Southeast Alaska.

Ecological Factors – Unlike many NFS lands in the contiguous 48 States, the Tongass National Forest does not have a long history of intense multiple-use management. Compared to other forests and regions, the Tongass has relatively few Threatened, Endangered, Proposed, and Sensitive (TEPS) species. Management activities that have affected overall ecosystem health are tied predominantly to intensive roading and timber harvest that has occurred within the past few decades.

The Tongass National Forest comprises the majority of the northern Pacific coast ecoregion. This ecoregion occupies a narrow (160 km wide) coastal band extending from the southern portion of the Alexander Archipelago to Prince William Sound and eastern Kodiak Island. Containing more than one fourth of the world's coastal temperate rainforests, this ecoregion is one of the most pristine temperate rainforest and shoreline ecosystems in the world (Ricketts and others 1999).

Limestone karst topography characterized by numerous sinkholes, caves, underground streams, and fractured bedrock is prominent in many locations on the Tongass (Ricketts and others 1999). Serving as a major influence on ecological function and productivity, the karst landscape on the Tongass is a three-dimensional system that includes productive forests and peat lands on top of karst, surface and sub-surface interactions, and ground waters originating from these systems. Within the last decade, the karst topography of the Tongass has gained national attention. Exploration of caves and karst terrain during this time has led to unique ecological, hydrological, and archaeological discoveries (Julin and Shaw 1999).

Unlike most of the forests in the contiguous United States, wind, rather than fire is the predominant natural disturbance element in the cool rain forest of Southeast Alaska. Therefore, there is neither need nor ecological basis for constructing or reconstructing roads into inventoried roadless areas to address fire risks.

Similarly, insect and disease infestations on the Tongass National Forest are not likely to require road construction, reconstruction, or vegetative treatments in inventoried roadless areas to maintain or restore ecological condition. Instead, insects and disease predominantly affect loss of timber value. In general, relatively few forest health vegetative treatment opportunities exist on the Tongass in comparison to forests in the lower 48 States.

Protection of stream and lake habitat for fish was identified as a key issue in the TLMP. At the direction of Congress, guidance for making timber harvest more compatible with aquatic habitat management was developed in the Alaska anadromous fisheries habitat assessment (AFHA) (USDA Forest Service 1997a). More than 50 scientists and managers participated in the development of AFHA (USDA Forest Service 1995). Recognizing AFHA as the most comprehensive and credible scientific review of measures needed to protect fish habitat on the Tongass, the TLMP incorporated all recommendations made in the AFHA report. The 1999 TLMP Record of Decision reduced timber harvest activity levels in various locations on the forest, further reducing risk to fisheries and riparian resources (USDA Forest Service 1999a).

In the naturally fragmented landscapes of Southeast Alaska, species interaction is often problematic, particularly for species that cannot disperse among islands (USDA 1997a). The insular distribution pattern of over 70 terrestrial mammal species among individual islands is indicative of the dispersal limitations on the Tongass (USDA 1997a). Southeast Alaska most likely supports ecotypes and locally adapted species on individual islands, especially the less mobile species such as small mammals, amphibians and many invertebrates that have yet to be thoroughly investigated or described (USDA 1997a)."

While the dispersal capabilities and population demographics of small, less mobile species are most likely to be affected, the island biogeography also effects large animals. For example, the Alexander Archipelago Wolf, is not found on three of the larger islands in the Tongass (Admiralty, Baranoff, and Chichagoff Islands). Its absence on the islands is thought to be the result of high brown bear density on those three islands as well as water barriers (USDA Forest Service, 1999a).

Relative to species in the contiguous United States, very little is known about many of the species on the Tongass, including both locally adapted species on individual islands and wide-ranging species such as the marbled murrelet. Although Southeast Alaska is considered the geographic center of murrelets in North America, very few nest sites are known in Alaska, and there are insufficient census data to either properly evaluate how many marbled murrelets reside in Southeast Alaska or define changes in population numbers over time (USDA Forest Service, 1999a). Comparatively little information exists even for species where recent attention has been focused, for example the Queen Charlotte goshawk (the U.S. Fish and Wildlife Service accepted a petition to list the Queen Charlotte goshawk as endangered, but following their review, decided listing was

not warranted). Approximately 35 active goshawk nests have been found on the Tongass. While good information has been generated from the studies of these nests, the number of nests and birds studied in Alaska is very low in comparison to goshawk studies in other locations in the contiguous United States.

Compared to other National Forest System (NFS) lands, the Tongass has relatively few TEPS species. The TEPS species on the Tongass are associated with the marine environment, riparian areas including lakes and streams, old growth forest, and distinct habitats such as wet meadow, beach, beach meadow, and alpine/sub-alpine areas. The majority of management activities on the Tongass that have been implemented specifically to restore or enhance habitat have targeted lake and stream habitats. Examples include lake fertilization and construction of fishways to make additional habitat available to anadromous salmonids. Unlike many areas in the country where managers are implementing vegetative treatments to create or restore habitat for TEPS species, for example the red-cockaded woodpecker, vegetative treatment needs are not generally identified in order to create or restore TEPS species habitats on the Tongass. Instead, the emphasis has been on maintaining existing habitat, and in particular riparian and old growth habitat, in sufficient quality, quantity and distribution to meet applicable laws and agency policy.

The Tongass is also unique because the majority of subsistence and game species, for example Sitka black-tailed deer, marten, wolf, brown bear, salmon, trout, and steelhead, are integrally linked to the habitat qualities, including intact old-growth and riparian habitats, often found in inventoried roadless areas. The dependence of terrestrial game and subsistence species on high quality old-growth and riparian habitats found in roadless areas on the Tongass contrasts sharply with many game species, for example upland game birds and white-tailed deer, that in other ecosystems depend on early and midseral habitats and respond favorably to human caused disturbances such as timber harvest.

The Tongass, unlike much of the contiguous United States, does not have a long history of intense multiple use management. While mining, and hydropower have occurred and still do exist on the Tongass, the effects of these activities are far less than the effects of these activities throughout the rest of the United States. Other activities occurring in the contiguous United States, such as grazing, have had not occurred at all on the Tongass. Management effects to species and their habitat on the Tongass are tied predominantly to roads and timber harvest that have occurred within the past few decades.

Ecological and biological conditions – implications for the importance of roadless areas.

Preserving roadless areas is recognized as often playing a key role in maintaining a high degree of ecological integrity (ecological integrity is considered the degree to which ecological factors and their interactions are reasonably complete and functioning for continued resilience, productivity, and renewal). Roadless areas help provide adequate quantity and quality of habitat, connectivity between habitats (where it naturally exists), and greater likelihood that populations will not be isolated from one another. Conditions on the Tongass are naturally such that the existence/persistence of metapopulations for some species is unlikely. Thus, loss of unroaded areas in landscapes such as the Tongass may greatly increase the likelihood that species occur in isolated populations rather than

metapopulations where individuals move freely among populations. Under these conditions, the likelihood of local extinctions may be increased (Wilcove et al. 1986). Clearly, the risk of range-wide extinctions may increase with higher risk of local extirpations, particularly if there are only a few local populations, or movement of individuals among populations is limited or cannot occur.

Because relatively little is known about the current status, needs and response to management activities for some species on the Tongass, conservative management approaches that emphasize retention of roadless areas may provide a necessary “buffer” to ensure higher likelihood of maintaining biodiversity and species viability.

Ecological and biological basis for vegetative treatments in roadless areas.

In forests within the contiguous United States, there has been considerable attention paid to forest health risks related to uncharacteristic wildfire effects, insect infestations, and disease. Unlike most of the Forests in the contiguous United States where fire is the predominant natural disturbance element that changes forested ecosystems, fires are rarely kindled in the cool rainforest of Southeast Alaska. Instead, wind is the principle natural disturbance element in the Tongass. Thus, there is no need for constructing or reconstructing roads into unroaded areas to address uncharacteristic wildfire risk.

With respect to insect infestations and disease, the Tongass Land Management Plan Revision Final Environmental Impact Statement (FEIS) indicates that in general, alternatives that favor low amounts of timber harvest will tend to perpetuate higher disease levels in old-growth forests and that ecological processes and wildlife habitat will be maximized (USDA Forest service, 1997a). The FEIS recognizes that excessive levels of diseases such as heart rot and dwarf mistletoe, can have important ecological consequences. However, the effects of insect and disease are predominantly a concern with respect to loss of timber value. Ecological or biological concerns regarding insect and disease have not risen to a level on the Tongass where roading and vegetative treatments have been prescribed in unroaded areas in order to maintain or restore properly functioning ecological condition of the landscape.

The scarcity of early successional forest, particularly in the southern United States, has been identified as a concern for some species that depend on this habitat. In these areas of the country, the need to build or reconstruct roads and vegetatively treat stands within unroaded areas to create or maintain early forest successional conditions is an issue. On the Tongass, however, habitat issues for game, non-game, and subsistence species are related almost exclusively to the abundance and quality of old-growth and riparian habitat commonly found in roadless areas. An ecological need to enter unroaded areas of the Tongass to maintain or change the composition of seral stages present within those areas has not been identified on the Tongass.

Abundance and distribution of roadless areas on the Tongass

Conservation of riparian and old-growth habitat and the effects of roading and timber harvest on both game and non-game species have been dominant issues on the Tongass. Thus, consideration of the amount and distribution of roadless areas figured prominently

in the FEIS analysis and the 1999 Record of Decision (ROD) for the Tongass Land and Resource Management Plan (TLMP) (USDA Forest Service, 1997b). An old-growth reserve strategy was incorporated in some of the TLMP FEIS alternatives, including the selected alternative (alternative 11) in the Regional Forester's 1997 Record of Decision. Also, viability panel assessment results were considered in the development of alternative 11 (alternative 11 was developed after completion of the viability panel assessments for alternatives 1-9). For example, all islands less than 1,000 acres were removed from the timber base and given complete protection under alternative 11 to reduce viability risk to small endemic mammals. In 1999, Undersecretary of Agriculture Jim Lyons issued a TLMP ROD in response to several appeals that included issues related to roadless qualities and species that benefit from roadless areas. The 1999 ROD administratively protected additional lands from road building and extended timber harvest rotation in some areas, thus slowing the rate of harvest in the old growth that remains in those land use development (LUD) prescriptions.

A comparison of inventoried roadless area in the Tongass National Forest to other Forest Service regions in some respects illustrates the prominent role that roadless areas have played in land management planning on the Tongass (the Tongass, because of its large size can be compared to other regions). The Tongass has more total estimated inventoried roadless area than any other region except Region 4 (USDA, 2000). In a comparison of estimated inventoried roadless area acres to gross acres, the Tongass has a higher percentage of roadless area than other Forest Service regions (USDA, 2000). Additionally, in a relative comparison of estimated inventoried roadless area where construction and reconstruction is not allowed to estimated inventoried roadless area, the Tongass has a higher estimated percentage of inventoried roadless area where road construction and reconstruction are not allowed than any other region (USDA, 2000).

The preceding comparisons illustrate the attention that has been placed on conserving roadless areas. The distribution of roadless areas on the Forest, lends additional insight into some of the ongoing discussion, debate, and controversy regarding roadless area management on the Tongass National Forest. The relevance of the disaggregated analysis and the controversy over roadless area management on the Tongass is tied to the heightened sensitivity to further fragmentation, as previously described. Within the Tongass, there are several areas (e.g. central and north Prince of Wales Island and northeast Chichagof Island) that have been intensively managed for timber production. Timber harvest on the Tongass has occurred almost exclusively using even-aged (clear-cut) harvest methods that includes extensive road building. The result has been a marked decline in the amount of productive old-growth in these areas, concern over habitat loss, and increased mortality rates to populations of some species due to increased human access. Species for which concerns regarding habitat loss or increased mortality from human access have arisen include brown bear, wolf, marten, Sitka black-tailed deer, goshawk, northern flying squirrel, and several fish species.

Assumptions, Information Used, and Methodology

The analysis and evaluation of effects of the Roadless FEIS alternatives is based on the information and analyses in the TLMP FEIS (USDA Forest Service, 1997a), roadless area data compiled for this EIS (USDA Forest Service, 2000), and ecosystem characterizations found in “Terrestrial Ecoregions of North America: A Conservation Assessment” (Ricketts and others, 1999). For analysis purposes, the Roadless alternatives have been compared to Tongass FEIS alternatives having similar management approaches. Specifically, the results and outcomes described for TLMP FEIS alternatives provided the context for describing the effects and outcomes of the Roadless FEIS alternatives. To the extent that roadless FEIS and TLMP FEIS alternatives contain similar management approaches, the effects and outcomes described for the TLMP FEIS alternatives were considered to be representative of the type of effects that could be expected for a Roadless Area alternative.

As part of the TLMP FEIS, panels composed of scientific experts were created to review potential outcomes for each alternative (USDA Forest Service, 1999b). The panels completed assessments for both terrestrial (wolf, marten, goshawk, brown bear, marbled murrelet, and small endemic and widely distributed mammals) and aquatic (Chinook, sockeye, pink, chum, coho, steelhead, cutthroat, and dolly varden) species for which viability concerns were identified. For all of these species, except some of the endemic and widely distributed mammals, consideration of the quality, quantity, and distribution of roadless areas (and/or habitat conditions commonly found in roadless areas) was key in predicting the likely outcomes of various alternatives. For example, considerations included: “the significant goshawk use of productive old growth forest and the little use or avoidance (relative to availability) of all other available habitat types;” “the strong association of marten with the high volume old growth forest strata, combined with past timber harvest that was concentrated in these highly productive stands;” and the effects of roads and human access on brown bears as well as resident and anadromous fish species (USDA Forest Service, 1997a).

The panels predicted likely outcomes for nine TLMP FEIS alternatives. A total of five outcomes were identified for panel members to consider as likely outcomes. The outcomes each described a different scenario regarding habitat quality, distribution and abundance, and the distribution of breeding populations. They range from conditions where habitat is of sufficient quality, distribution and abundance to allow the species to maintain well distributed, breeding populations across the Tongass (outcome I) to habitat conditions resulting in species extirpation from federal land (outcome V). Panel results are represented by the distribution of 100 total points among the five outcomes. It was possible for panelists to assign all 100 points to one outcome, but more commonly, points were distributed across several outcomes. The distribution of the points provides a measure of certainty of panel predictions for any given outcome.

The results of the panel assessments differ by species and alternative. However, based on the panel results, and discussion in the TLMP FEIS and administrative record, the following broad generalizations can be made:

- Most of the TLMP FEIS action alternatives generally resulted in higher likelihood for outcomes I and II (habitat to allow species to be “well distributed,” “adequately distributed,” or “distributed” across the Tongass).
- Among alternatives, as total miles of roads and acres of potential timber harvests increased, fewer likelihood points were assigned to outcomes I and II and more likelihood points were assigned to outcome III and in some cases outcomes IV and V.
- In comparisons among alternatives, the TLMP FEIS and 1997 ROD, generally ranked alternative 11 (the selected alternative in the 1997 ROD) as one of the alternatives that posed the least risk to the species considered in the panel assessments.
- The likelihood predictions of outcome I, particularly for some species, was noticeably higher for alternative 1 than all other alternatives, including alternative 11 (Alternative 1 emphasized high quality fish and wildlife habitats, unroaded areas, a wide range of recreation opportunities, and limited timber management to small-scale timber production using uneven-aged treatments to maintain forest structure, function, and dynamics similar to existing natural conditions).
- Disaggregated assessments of intensively managed areas and mostly natural areas that were done for some species highlight the ecological and biological concerns in intensively managed areas. For example, a panel assessment for brown bear on Admiralty Island, a Designated National Monument, resulted in 97 or more of the total 100 points distributed within outcomes I and II for all TLMP FEIS alternatives 1 through 9, indicating a very low risk to brown bears. The panel assessment for brown bear on Baranoff and Chichigoff Islands (that included intensively managed lands), however, indicated a much higher risk under most of the alternatives, including alternative 9 where only 19 of the 100 total points were distributed within outcomes I and II. Total points distributed among outcomes I and II for brown bears on Baranoff and Chichigoff Islands ranged from 19 to 65 among alternatives 2-9. For alternative 1, 82 of the total 100 points were distributed within outcomes I and II.

The 1999 ROD built upon TLMP FEIS alternative 11 by incorporating aspects of the other alternatives in order to improve subsistence opportunities, reduce risk to certain wildlife species, and reduce risk to old-growth ecosystem viability. The decision included extension of timber harvest rotation from 100 to 200 years on many intensively managed lands, and changed land use prescriptions from Development to Mostly Natural land use prescriptions in several special interest areas, thus retaining larger “blocks” of unfragmented, unroaded habitat. While the 1999 ROD does not provide the same emphasis or level of protection to species and their habitat as TLMP FEIS alternative 1, the 1999 decision is favorably comparable, and perhaps lower risk than the other TLMP FEIS alternatives that were ranked among the alternatives as having lower species risk ratings (e.g. alts 3, 4, and 5). Thus, it is reasonable to assume current risk level under the current TLMP ROD is similar to that predicted for TLMP FEIS alternatives 3, 4, and 5. A roadless area decision could further shift risk toward the outcomes predicted for TLMP FEIS alternative 1. The magnitude of the shift that may be predicted differs among the various roadless area alternatives.

Results and Conclusions

Tongass Not Exempt Alternative

Under this alternative, the prohibitions (alternatives 2 through 4) proposed for NFS lands in the lower 48 States would also apply to the Tongass National Forest. Exceptions under the final rule and decision would similarly apply to all NFS land including the Tongass.

For the Tongass National Forest, no relevant differences have been identified among prohibition Alternatives 2 through 4. Nearly identical outcomes are expected among these prohibition alternatives because:

- Regional data indicate a 95% decrease in timber volume from the inventoried roadless areas under a roads prohibition alone. Thus, the effects of a prohibition on road construction are not substantially different from the effects of a combined prohibition on road construction and timber harvest;
- Timber harvest on the Forest is designed and implemented primarily to provide timber to meet market demand and maximize growth and yield. Thus, the effects of a prohibition of timber harvest, except where designated for stewardship purposes, is unlikely to be substantially different from a prohibition of all timber harvest, particularly within the current planning cycle; and
- Initial estimates indicate that approximately 33% of the timber volume is scheduled to come from outside inventoried roadless areas. Under current management standards and guidelines, agency policy, and applicable law, it is unlikely that the Forest could substantially increase the amount of timber offered outside inventoried roadless areas above that which is currently predicted.

Alternatives 2 through 4, if applied to the Tongass, would eliminate an estimated 95% to 100% of the timber harvest scheduled to occur within inventoried roadless areas. Thus within inventoried roadless areas, very little additional fragmentation would occur. Since the scheduled timber offer in inventoried roadless area represents a significant portion of the scheduled timber offer for the Tongass (estimated at greater than 2/3 of the total harvest), prohibitions may noticeably decrease the likelihood of undesired outcomes associated with gaps in species distribution as compared to the no action. Prohibition alternatives may be very low risk to old-growth ecosystem integrity, species viability, and diversity and approach risk levels that are somewhat comparable to risk levels predicted for TLMP FEIS alternative 1 (USDA Forest Service, 1997a). The significance of these risk reductions under prohibitions may be greatest for species such as the northern flying squirrel that were rated with the highest viability concern and for species with greater scientific uncertainty with regard to abundance, habitat requirements, and response to human caused disturbance.

Tongass Exempt Alternative

Under this alternative, land management would continue as outlined in the 1999 ROD for the TLMP. Under the current TLMP over 500 MMBF of timber is scheduled for harvest

in inventoried roadless area in the next five years, more than twice that scheduled for the entire National Forest System. Based on the amount of harvest currently projected under the Tongass Exempt Alternative and the intense even-aged techniques that are used to harvest timber on the Tongass, forest fragmentation may be increased greatly in the areas where harvest is scheduled. Thus, there would be a higher likelihood for undesired outcomes relative to species viability as compared the Tongass Not Exempt Alternative. For instance gaps in historic species distribution on the Forest would be more likely to occur under the Tongass Exempt alternative and may be similar to the outcomes displayed in the panel assessments for TLMP FEIS alternatives 3, 4 and 5. Panel results for TLMP FEIS alternatives 3, 4 and 5 predicted moderate to high likelihood for outcomes where habitat is sufficient to allow species to be well distributed and lower likelihood of outcomes where significant and permanent gaps in historic distribution occur, or where habitat only allows species to exist in refugia, with strong limitations on interactions among local populations. Thus, although higher risk in comparison to other Roadless FEIS alternatives, the Tongass Exempt alternative is not a high risk alternative for species viability. (Note: there are species such as the northern flying squirrel, that even under TLMP FEIS alternative 1 that emphasized fish and wildlife values, high or moderate likelihoods that well distributed populations would persist across the Tongass were not predicted).

Tongass Deferred Alternative

This alternative defers a decision regarding prohibitions on the Tongass to the local level and to the 5-year Plan Review in 2004. At such time an evaluation of inventoried roadless areas on the Tongass would be completed to determine whether road construction and reconstruction should be prohibited in inventoried roadless areas of the Tongass. The responsible local deciding official would have responsibility for completing the analysis and making the decision on whether or not to apply prohibitions.

A substantial amount of timber harvest and roading (539 MMBF and 291 miles of road) is projected to occur in inventoried roadless areas of the Tongass in fiscal years 2000 to 2004. Under this alternative the beneficial effects of prohibitions applied immediately to the Tongass would be foregone for some ecological resources.

Predicting the outcome of the analysis and decision to be made as part of the 5-year Plan Review is very speculative. Issues and resources on the Tongass are managed in an extremely complex social, legal, and political context that is undergoing much change. The analyses and rationale for the current Plan would be reviewed in the context of the social, legal, and political climate on the Tongass in 2004. Because of this complex social, legal and political climate, the effects of the Plan Review in 2004 cannot be predicted with any accuracy. At best, it may be reasonable to project that after further review of all inventoried roadless areas on the Tongass prohibitions may be applied in some of the areas considered.

Currently, most of the vegetative treatment needs identified in the current planning cycle are likely to be even-aged treatments that maximize timber volume yield within roadless portions of the Forest. Where they are implemented such treatments are not likely to conserve roadless area characteristics or provide an overall benefit to Tongass species or their habitat.

A long-term shift toward vegetative treatments more consistent with broader stewardship and forest health concepts is possible, particularly with respect to second growth stands. However, the majority of these treatment opportunities will not be available for several planning cycles and will occur mainly within roaded portions of the Forest. Thus, most of the vegetative treatment needs that are likely to be identified into the next planning cycle are likely to be growth and yield treatments within unroaded portions of the forest.

Tongass Selected Areas Alternative

Under this alternative, prohibitions would be applied to inventoried roadless areas within Old-Growth, Semi-remote Recreation, Remote Recreation, and LUD II land use designations. Collectively, these four designations encompass approximately 7 million acres or 80% of the land within inventoried roadless areas

These four designations all emphasize maintenance of mostly natural settings rather than development. For the Roadless DEIS, they were categorized as inventoried roadless areas where roading is not allowed. However, on the Tongass, like other NFS lands, there are certain situations in which roading is allowed in inventoried roadless areas that have been characterized as not allowing roading. On the Tongass, there are perhaps a greater number of circumstances where allowances are made for roading within these areas than in other NFS lands. For example, the prescriptions for all four of these designations allow roads to be built to access adjacent lands for development purposes, if it is the only feasible option.

The amount of road building currently anticipated to occur under the 1999 ROD in inventoried roadless areas within Old-Growth, Semi-remote Recreation, Remote Recreation Land Use Designations (LUDs), and LUD II can be predicted based on the situations in which road building is permitted, the spatial distribution of the designations on the Forest, and total acres of each land use designation. Based on the considerations outlined below, higher amounts of road building may be anticipated to occur within the Semi-remote Recreation and Old Growth land use designations relative to the Remote Recreation and LUD II designations.

- The prescription for Old-Growth land use designation, like the other three prescriptions allows roading to access adjacent land use designations if roading through Old-Growth is the only feasible access option. These situations are more likely to occur in association with Old Growth land use designations because of the spatial distribution of Old Growth designations on the Forest. Old Growth designations are often much smaller in size, are more widely distributed, and often occur adjacent to and even as inclusions within moderate and intensive land use designations. In contrast, the other three land use designations tend to occur in larger contiguous blocks that sometimes encompass entire small islands.

- New roads are not explicitly stated as inconsistent with the goals, objectives, and desired condition of the Semi-remote Recreation land use prescription and an exception to allow roading to link existing roads is described within the transportation standards and guidelines for Semi-remote Recreation. In contrast, the desired condition for Remote Recreation is described as being characterized by extensive, unmodified natural environments, a goal to manage the LUD II areas in a roadless state is described, and the standards and guidelines for Old Growth describe roads as generally inconsistent with the objectives of the Old Growth prescription.

Despite the relative abundance of these designations on the Forest (approximately 7 million acres total), the amount of roading that is likely to occur within these four designations under the current TLMP is likely to be a very small percent of the total amount of roading that will occur on the Forest. Where roading does occur within these four designations it is likely to be minimal and to occur near the fringes of these otherwise unroaded areas. As with all projects, such road construction would require environmental analysis and mitigation, consistent with applicable law and agency policy. Most of the roading on the Forest is currently projected to occur in inventoried roadless areas with Moderate and Intensive Development designations that do not prohibit roading and timber harvest.

For purposes of analyzing the Tongass Selected Areas Alternative, the Alaska Region estimated the acres of Development land use designations that could be isolated if roading through inventoried roadless areas within these four prescriptions were prohibited (personal communication with the Alaska Region). The results are displayed below.

Designation	Acres Isolated	Percent of the Timber Base Isolated
LUD II	0	0
Old Growth	54,461	6
Semi-remote Recreation	11,528	1
Remote Recreation	540	0
Total	66,529	7

The analysis for Old Growth only considered large and medium sized reserves, since small reserves were not mapped on the 1999 TLMP ROD map. With respect to prohibitions in small reserves, the Region reported “in most projects currently in process, small reserves would preclude access to the suitable land base needed to achieve the ASQ.” The Alaska Region estimated that an additional 4% of suitable land base could be isolated if roading through inventoried roadless area in small old-growth reserves was prohibited. Thus, an estimated total of 7-11% of the suitable land base would likely be isolated if the prohibitions were applied to all old growth reserves. The short-term effect of this loss of roading capability is estimated to be a 291 MMBF decrease from the current ten year timber sale plan. Most of this decrease would occur in the first five years

(241 MMBF in the first five years as compared to 50 MMBF in the last half of the ten year period).

The projections did not include road miles required to access the acres identified as potentially isolated under this alternative. Based on the discussion of projections with the Region, the majority of roading needed for access among the four prescriptions analyzed in this alternative would involve Old-Growth LUDs. The Region estimated that there are thirteen instances where roading through large or medium reserves might be required to access adjacent development lands and a couple of those instances where the road segments required for access might be extensive.

Old-Growth designations were chosen for their high value to old-growth dependent and disturbance sensitive species. Thus, roading within reserves would likely affect ecological resources. Beneficial effects to old growth as well as old-growth and disturbance sensitive species could occur from a prohibition of roading in Old-Growth designations.

Old-Growth prescription was designated in a series of small, medium, and large reserves. Approximately 150 medium and large reserves were designated. Many small reserves are distributed throughout the Forest. Certainty, with respect to the value of these areas was higher for larger and medium reserves than the smaller reserves. The value of the smaller reserves is strongly related to site-specific information that was difficult to obtain at the Forest Plan level. A provision to adjust the location of the reserves was included in the Plan based upon further consideration of the site-specific characteristics of individual small reserves.

The effects to individual reserves, if roading occurs within the reserve would be dependent on the location of the road(s) and extent that effective mitigation measures could be developed and implemented. Even a limited amount of roading in isolated small reserves could compromise their value. Thus, for smaller reserves the ability to adjust Old-Growth boundaries to include old growth of equivalent or higher value would influence whether or not there are effects, and if so, the magnitude of the effects. A road that completely transects a larger roadless area might also compromise its biological value, although few such instances are expected to occur. Where roading through large and medium sized old-growth reserves may be necessary to access Development LUDs, the amount of road needed within the reserve is generally expected to be less than five miles.

Under this alternative, projected effects to the timber base include isolation of over 66,000 acres of suitable timber lands. In general, lands in the suitable timber base are often quality old-growth habitat. Retention of these lands in an unroaded, undisturbed condition would benefit ecological health by retaining more old-growth habitat and reducing fragmentation that would otherwise occur under the current Forest Plan. These effects may be short-term in nature and dependent upon the economics of the timber market in Southeast Alaska. For example, at some time in the future the value of the timber in some of the areas isolated by road access, could be high enough to support other harvest methods.

Based on the estimated frequency where roading needs in Old-Growth designations might arise (approximately 10% of the large and medium reserves as well as other small reserves), the ecological benefits of this alternative would not be expected to noticeably lower Forest-wide risks to species from that predicted under the current TLMP. Instead the ecological benefits of this alternative would likely be localized in nature. However, where these benefits occur at the local level, they could be quite meaningful and easily identified.

The beneficial effects to ecological resources as a result of prohibitions within the Semi-remote Recreation, Remote Recreation, and LUD II LUDs are likely to be much less than prohibitions within the Old-Growth designations since roading through Old-Growth designations under the current Forest Plan to reach Development LUDs is likely to occur much more commonly than in the Semi-remote Recreation, Remote Recreation, and LUD II LUDs.

Potential Exceptions and Mitigations

The Roadless Area Conservation FEIS identifies social and economic mitigation measures where roading or timber harvest in inventoried roadless areas may be authorized. A complete description of these exceptions is included in Chapter 2 of the Roadless FEIS. One of the mitigations that could be included under the Tongass Not Exempt Alternative would delay implementation of prohibitions on the Tongass until the 5-year Plan Review in 2004. The delay would allow roading and timber harvest in inventoried roadless areas to occur as currently projected under the 1999 Record of Decision through 2004 (USDA Forest Service, 1999a). Harvest would drop to approximately 50 MMBF total annual forest harvest when the prohibitions are applied in 2004. The delay would benefit local communities by providing them an opportunity to adjust to the 1999 TLMP Record of Decision and prepare for changes in 2004. Beneficial effects to ecological resources that could occur under prohibitions during that 5-year period would be foregone.

Other Indirect and Cumulative Effects on the Tongass National Forest

Roadless Rule in Local Context - In 1999, Under Secretary of Agriculture Jim Lyons signed a new Record of Decision for the Tongass National Forest Land and Resource Management Plan Revision (USDA Forest Service, 1999a). The 1999 Record of Decision modified the 1997 Regional Forester's decision by strengthening a standard and guideline, adding another standard and guideline, and changing land use designation for 18 areas of the Tongass National Forest. The change in land use designations from development to mostly natural for the 18 areas encompassed approximately 234,000 acres. The standard and guideline that was added increased the timber harvest rotation from 100 to 200 years in 42 separate Wildlife Analysis Areas broadly distributed throughout the Forest. Collectively, the changes made in the 1999 Record of Decision built on the old-growth strategy and species-specific management contained in the 1997 decision.

The Under Secretary's 1999 Record of Decision incrementally reduced risk to: 1) deer abundance for subsistence use, 2) the amount and distribution of old-growth forest, and

3) areas of special interest valued for old-growth ecosystem viability, species viability, roadless condition, subsistence use, recreational opportunities, scenic quality, and tourism development. His decision also reduced the allowable sale quantity of timber from an annual average of 267 MMBF in the 1997 Record of Decision to 187 MMBF in the 1999 Record of Decision.

Future effects to ecological resources on the Tongass depend on the Roadless alternative chosen. Over the long term, the Tongass Exempt Alternative, when considering the reasonably foreseeable increases in habitat fragmentation and loss of connectivity in adjacent landscapes, would pose a higher risk of adverse cumulative effects to biodiversity. In contrast, over the long term, the Tongass Not Exempt Alternative, the Tongass Deferred Alternative, and the Tongass Selected Areas Alternative would be more likely to result in measurable beneficial cumulative effects on the Forest's ecological resources. The Tongass Not Exempt Alternative, because it could apply prohibitions to all inventoried roadless areas, would likely have the greatest beneficial cumulative effects to biodiversity.

Roadless Rule in Southeast Alaska Context – The Tongass National Forest comprises the majority of the land in Southeast Alaska and the Northern Pacific Coast ecoregion, a globally significant ecoregion (Ricketts and others 1999). Because of its dominant status with respect to land ownership, the Tongass plays an important role in the cumulative effects occurring in Southeast Alaska and the Northern Pacific Coast ecoregion. Scattered throughout Southeast Alaska and adjacent to Tongass National Forest lands, Native Corporation lands comprise the second largest segment of the land base in Southeast Alaska. While Native Corporation lands comprise a smaller component of the land base, timber harvest outputs over the past decade on Native Corporation lands have been roughly the same as those from the Tongass National Forest.

The majority of species in the ecoregion are old-growth dependent or disturbance sensitive species, and the majority of habitat and strongholds supporting these species exists on NFS lands. Because the majority of lands in Southeast Alaska outside the Tongass have been intensively managed for timber harvest, the Tongass plays a critical role in conserving the biodiversity in Southeast Alaska and the Northern Pacific Coast ecoregion.

Roadless Rule in a National Context – Within this resource report, the Roadless FEIS and other literature cited, the ecological uniqueness of the Tongass National Forest has been noted, including the karst geology that underlies much of the Tongass and the island biogeography as it relates to forest fragmentation, metapopulations, and species endemism. Also unique is the quality and quantity of unroaded areas that contribute to the pristine character of the ecosystem and low numbers of federally TEP species on the Forest and in the Northern Pacific Coast ecoregion as a whole. The ecologically unique character of the Tongass and current high degree of ecosystem health are important nationally and globally when considered in the context of changing social values.

Past social values and scientific information led to natural resource management throughout the United States, on private and public lands alike, that greatly impacted biodiversity in many nationally and globally significant ecoregions. Currently, risk to

biodiversity in many North American ecoregions remains high because of direct, indirect, and cumulative impacts, resulting from multiple-use management across all land ownerships (Ricketts and others 1999). Scientific understanding of ecosystems and societal values are changing (Botkin et al, 2000). As a result, management approaches on Federal land are shifting from an emphasis that is primarily on sustainable resource outputs, to one where resource production outputs are often a consequence of management to achieve other ecologically oriented objectives (MacCleery and Le Master 1999). Current and reasonably foreseeable multiple-use management on Federal land is therefore, more likely to conserve or at least slow the loss of biodiversity within some ecoregions.

In most instances, the current shift in values and management is occurring after irretrievable loss of biodiversity has occurred, particularly in forest ecosystems (Ricketts and others 1999). Few opportunities remain to implement a management approach emphasizing resource production outputs as a consequence of ecological objectives that minimize incremental loss of habitat and species abundance in a largely pristine forest ecosystem. The Tongass, as the major land base within the Northern Pacific Coast ecoregion, presents such an opportunity.

Incremental loss of habitat and species abundance in various locations on the Tongass is expected to occur under the Tongass Exempt Alternative, without posing what is currently considered an unacceptable level of risk to biodiversity across the Tongass as a whole (USDA Forest Service, 1999a; USDA Forest Service, 1997a). Incremental loss, although less than losses expected under the Tongass Exempt Alternative, are also expected to occur under the Tongass Deferred and the Tongass Selected Areas Alternatives. In contrast, prohibitions could be applied immediately to the Tongass under the Tongass Not Exempt Alternative, greatly reducing much of the expected incremental loss of habitat and species abundance and posing very little risk to biodiversity.

The Tongass Not Exempt Alternative is somewhat similar to TLMP FEIS Alternative 1 (USDA Forest Service, 1997a), which limited timber harvest to small-scale timber production to maintain forest structure, function, and dynamics similar to existing natural conditions. Such a management approach is consistent with the fundamental shift in societal values held by a growing segment of the American public, and the ongoing shift in Federal land management to emphasize outputs resulting from managing to achieve other ecologically oriented objectives. The rare opportunity to apply this approach to a large, unique, and largely intact ecosystem, before further incremental compromises to the ecosystem occurs, is what makes the Tongass alternatives consequential at a national scale.

Summary of Tongass Roadless Alternatives

The **Tongass Not Exempt Alternative** provides less risk in all land use designations. It provides the greatest opportunity to reduce impacts to biological and ecological resources among the alternatives. The **Tongass Exempt Alternative** has the greatest risk to ecological resources, relative to all other alternatives, based upon potential road building and ground disturbance likely to occur under this alternative. It has the highest potential for increased fragmentation, loss of connectivity, habitat degradation and disruption, and least acres protected. The **Tongass Not Exempt With Mitigation To Delay Implementation Until 2004 Alternative** has comparable ecological resource risks to the Tongass Exempt Alternative until 2004, at which time prohibitions selected for the rest of the NFS lands will be applied to the Tongass. The **Tongass Deferred Alternative** has comparable ecological resource risks to the Tongass Exempt Alternative until 2004. Depending on local decisions made during the 5-year plan review, impacts to biological and ecological resources could be reduced after that date. The **Tongass Selected Areas Alternative** provides less risk to ecological resources in 4 LUDs. Within those 4 LUDs, risk is comparable to the Tongass Not Exempt Alternative.

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