

JOINT STATEMENT OF MEMBERS OF THE PEER REVIEW COMMITTEE  
CONCERNING THE INADEQUACY OF CONSERVATION MEASURES  
FOR VERTEBRATE SPECIES  
IN THE TONGASS NATIONAL FOREST  
LAND MANAGEMENT PLAN OF RECORD

Introduction and Summary

This statement concerns the measures adopted by the USDA Forest Service in its Tongass Land Management Plan Record of Decision to protect Old Growth habitat and to protect wildlife species associated with Old Growth forest on the Tongass National Forest. This is a Joint Statement submitted by Dr. Roger Powell, Dr. Russell Lande, Dr. Dale McCullough, Dr. William Lidicker, Jr., Dr. Craig Benkman, Dr. Andrew Hansen, Dr. Paul Paquet, Dr. John Ratti, Dr. Christopher Smith, Dr. Richard Taber and Dr. Robert Jarvis. We served together on the Peer Review Committee that the Pacific Northwest Research Station assembled in 1993. The Forest Service requested the formation of our committee to conduct an independent review of the conservation measures related to wildlife habitat then being considered by the Forest Service as it planned the land management for the Tongass National Forest. Together, we have many decades of research and management experience related to wildlife, ecology, population biology, and conservation biology. Our backgrounds and qualifications were more completely described in the Peer Review. We make this statement after a review of relevant portions of the Plan and Environmental Impact Statement, various panel assessments, conservation assessments and key supporting documents.

The Peer Review, completed in 1994, concluded that none of the Forest Service's strategies was adequate to preserve viable, well distributed populations of wildlife species that are dependent on Old Growth forests on the Tongass. The Peer Review made specific recommendations for habitat protection measures and recommended further research in identified areas. After conducting additional scientific reviews of key issues and species, which generally reaffirmed the advice of our Peer Review, the Forest Service prepared for public review in 1996 a Revised Supplement to the Draft Environmental Impact Statement (RSDEIS) for the Tongass Land Management Plan.

Concern that the wildlife measures in the Forest Service's proposal failed to respond effectively to scientific input led us to submit in the fall of 1996 a Joint Statement regarding the RSDEIS. That statement concluded that the Tongass Land Management Plan draft alternatives would not ensure the viability of populations of several wildlife species associated with Old Growth forests. The Joint Statement also recommended that the Forest Service develop new alternatives that would improve the Plan's strategy for Old Growth forests. As the Peer Review and other previous reviews had done, the Joint Statement made several specific recommendations, including 1) no logging on the remaining large blocks of Old Growth forest and on undeveloped watersheds and 2) adoption of single tree and small group selection logging techniques in the matrix between Old Growth blocks to mimic the dominant natural disturbance patterns on the Tongass.

In May 1997, the Forest Service released its Final Forest Plan and EIS (FEIS). Though the FEIS and supporting documents are improved by a fuller discussion of basic conservation planning concerns we and others have raised in the past, we are dismayed that the Forest Service has not considered any alternatives that differ substantially from those in the RSDEIS. Rather than substantively addressing the core criticisms and recommendations raised by previous scientific reviews, including the Peer Review and our Joint Statement, the selected alternative for the Tongass Land Management Plan, Alternative 11, differs only marginally from the alternatives presented in the RSDEIS. What changes were made do not address the fundamental problems with the Old Growth strategy raised consistently by the scientific community over the last several years. We believe that, like previous alternatives proposed by the Forest Service, the plan adopted in May 1997 will not ensure viable, well distributed populations of wildlife species adapted to Old Growth forest on the Tongass National Forest.

### The New Management Plan Does Not Correct Major Shortcomings of the Draft Plan

Our review of the 1996 RSDEIS found the preferred alternative, and all other alternatives the Forest Service formulated, except the no logging alternative, seriously inadequate in 4 areas. We concluded that none of these alternatives as proposed would ensure the continued viability of wildlife species on the Tongass National Forest. The 4 problem areas were: (1) habitat reserve size and design, (2) high-grading, (3) landscape connectivity and (4) clear-cutting. The new TLMP does not correct these problems, and no other new alternative, which might have, was included in the FEIS.

#### 1. Reserve Size and Design

The Forest Service has accepted, in principle, the need for habitat reserves as part of its strategy for conservation of wildlife on the Tongass. The agency continues, however, to rely on an inadequate reserve system. TLMP documents defend this approach in large measure by pointing to the absolute number of acres that will not be directly logged. This analysis ignores the adverse consequences of fragmenting habitat. Highly fragmented habitat may provide little or no benefit for many wildlife species.

Many terrestrial species are negatively affected by fragmentation of their natural habitat. As the 1993 V-POP report discussed, human-caused fragmentation of blocks, or patches, of wildlife habitat into smaller blocks threatens the persistence of species in, and often beyond, the fragmented area. Small patches make populations more susceptible to stochastic events and human disruption. Consequently, large blocks of habitat must be preserved to ensure overall species viability.

The edges of forest fragments provide poor habitat for species that are adapted to forest interiors. Such edges experience greater exposure to sunlight and wind, which disrupt microclimates and change vegetation. Increased edge also enhances access for predator and competitor species, and promotes invasion of exotic plants and animals. Some of these "edge effects" extend far into habitat fragments. The small sizes of patches in fragmented habitat

make them less suitable for species that depend on large areas of unfragmented habitat. Small patches of old growth habitat have low prey densities and reduced cover. Fragmented habitat also experiences high access by human beings and their vehicles, which also affects most wildlife adversely.

For these reasons, fragmented habitat may induce wildlife to abandon small fragments, to perish while ranging outside of the fragments in less favorable habitat, or to stay in a small fragment and experience high mortality and low reproductive success. When portions of a species' range become vacant as a result of these processes, population viability may be threatened. For most vertebrates, continuous occupancy of all suitable habitat is not required for a population's security. Temporary vacancy of suitable habitat, however, owing to random demographic changes for example, is common and such habitat is quickly recolonized. Such local extinction is very different from lost occupancy caused by human alteration of the landscape. When patches of suitable habitat are vacant, or will not reliably support successful reproduction, because they have been rendered unsuitable in the long term through human actions, the population's overall viability may be adversely affected. This is particularly likely in highly heterogenous landscapes and for species that have low mobility or low populations. In these instances, interaction among individuals may be restricted.

Fragmentation of forests due to management activities is of particular concern in Southeast Alaska for several reasons. Substantial barriers to wildlife dispersal already exist on the Tongass National Forest, including steep topography, highly dissected vegetation, and isolation of islands by water. Endemic species, many of which are found on the Tongass, often have small populations and are special risk as a result of human-caused disturbance. Many species use Old Growth forest on the Tongass National Forest, causing particular concern. Private as well as public lands in Southeast Alaska have experienced disproportionate logging of the so-called "high volume" stands. These stands are critically important as wildlife habitat. Because almost all Old Growth that has been logged has been clear-cut, and clear-cutting has led to labyrinths of roads, a profound contrast exists between altered (logged) and unaltered (Old Growth) habitat. Finally, because few wildlife species have received even rudimentary research attention, the probability is high that management practices that alter habitat will produce unanticipated adverse impacts. An example of an unanticipated research finding is the recent discovery suggesting that the Alexander archipelago brown bears may represent a unique taxon, probably at the species level.

Taken together, these factors make the size, design, and quality of habitat reserves critically important if well-distributed and viable populations of wildlife species -- including those for which we have few data -- are to be maintained on the Tongass National Forest. In reviewing the RSDEIS in 1996, we concluded that no alternative incorporated an adequate Old Growth reserve strategy. The most extensive reserve system (in alternative 3 and in the supervisor's "preferred" alternative) was, somewhat surprisingly, simply a version of the one the 1994 Peer Review found to be inadequate to ensure viability of all species. The new TLMP also bases its Old Growth reserves on that original V-POP strategy, and the criticisms we voiced in 1994 and again in 1996 still apply. In general, the reserves are not appropriately designed in size and

location, and do not preserve the remaining large blocks of high quality habitat on the Tongass.

The Forest Service has acknowledged the recommendation of the Peer Review, reiterated in other information from the scientific community, including our Joint Statement, that a significantly larger reserve system be established to protect the remaining large blocks of Old Growth on the Tongass. Unfortunately, the Final Plan, which the Forest Service claims responded to this advice, appears to us primarily to change only the descriptions of the reserve system without making the necessary substantive improvements.

The Forest Service's claim that it has substantially improved its reserve system rests largely, as we interpret the plan, on a redefinition of the reserve system. The Forest Service now describes an expanded system of reserves that includes not only the land in Old Growth habitat status (the former HCAs), but all land in non-developmental land use designations (LUDs). This land is included in the reserve system, regardless of its location or habitat value, simply by virtue of being in a non-developmental LUD (Appendix N-24).

This new justification of what is essentially the old plan is flawed for many reasons. First, the Forest Service mistakenly assumes this substantial reserve system was unaccounted for in the Peer Review and Joint Statement because these reviews addressed the HCA system in isolation. On the contrary, the V-POP recommendations, Peer Review, and following criticisms of the reserve system, including our Joint Statement in 1996, were all based on the understanding that not all lands outside HCAs would be logged, that some land was in wilderness or otherwise protected by law, that some land was managed by the Forest Service for uses other than logging, and that not all Old Growth in lands allocated to logging would be cut, particularly in the short term. The V-POP Final Review Draft itself repeatedly referenced legislatively protected areas, stream side and beach-front buffer zones, "unsuitable" timberlands, and forest stands difficult or impossible to log. The V-POP committee explained that its mapping of medium and large HCAs was adjusted to overlap as much as possible with these lands, and predicted that no more than 20% of the Old Growth needed for small HCAs would come from lands slated for logging. Indeed, over-attention to locating reserves in already protected areas -- at the expense of optimum reserve design -- was a major flaw identified by the Peer Review Committee. One of us (Lidicker) specifically noted that most HCAs located in logging zones did not meet minimum size standards (unlike those in areas unavailable for logging). It was with this understanding that the Peer Review and our Joint Statement criticized the proposed HCA system now adopted, and we recommended specific additional protection for remaining blocks of Old Growth and for the important high volume stands. Redefining what a reserve is does not respond to the fundamental issues raised by our Joint Statement and similar critiques.

More importantly, the actual changes from draft to Final Plan are only marginal improvements, even if all the non-development areas are treated as Old Growth reserves for wildlife. Comparisons between the draft and Final Plan in this regard are complicated by different ways of presenting the small HCAs in the 2 plans. As we understand it, both the draft and Final Plans include the small HCAs recommended by the original V-POP committee.

The small HCAs are identified and mapped in the Final Plan. By contrast, in the draft plan, the small HCAs were to be laid out in the future at the project level. Thus, the level of protection did not change with the addition of small HCAs in the Final Plan -- only the timing of the designation of the small HCAs. In the draft plan (Alternative 10), the Forest Service does not account for the small HCAs in its description of the acres in the development and non-development land designations; the Forest Service does include them in the Final Plan. This difference is significant. The small HCAs designated in the Final Plan total approximately 480,000 acres. Thus, the information in the FEIS exaggerates the improvement from draft to Final Plan. In addition, though small HCAs may provide limited benefits to some species, we question whether the small HCAs would be of much value to the larger reserve system for many species.

To estimate the actual change in protection between the draft and final, we relied on an analysis by Interrain Pacific (attached) which applied the mapped small HCAs to the draft plan and recalculated the number of acres in each category. Though only an estimate, it provides a better approximation of the relative difference between draft and final than does the FEIS. This analysis shows that the change between draft and Final Plan is small. Only about 180,000 acres are moved from the timber harvest designations to the natural setting LUDs. This is only a 1.3% increase in the broadly defined reserve system. More importantly, the number of acres of high volume Old Growth that changes from timber designation to natural setting is only about 13,000, less than a 1% improvement in the high volume Old Growth protected by the reserve system broadly defined. Thus, even if we take the newly defined reserve system in the plan at face value, the improvements over the draft are marginal and do not approach the kind of major change recommended by the Peer Review and our Joint Statement.

How small these changes are can be seen on a map prepared by Interrain Pacific (Interrain Pacific, Change in Land Use Designation, 9/7/1977) that shows changes in the designations of land from timber to natural setting and vice versa. Again excluding the small HCAs, modifications well distributed across the Tongass were made in both directions between the draft and Final Plan. Overall, we can discern no significant benefit to Old Growth dependent species. Some modifications are clearly beneficial, such as the protection afforded to the large Old Growth block on northern Chichagof Island. Others appear to remove protection for important blocks of habitat, such as the changes on Lynn Canal and eastern Baranof Island.

Looking more carefully at the changes on a forest-wide basis from the draft to the Final Plan, the small increase in "apparent" protection does not come from increases in the Old Growth reserve category. In fact, after adjusting for the small HCAs in the draft, overall the Old Growth (HCA) designation declines from draft to Final Plan by about 200,000 acres (or about 60,000 acres of high volume, a 21% drop). The greater level of protection afforded by the Final Plan comes instead from an increase in the semi-remote recreation category. This difference is important because Old Growth reserves and semi-remote recreation areas receive different levels of protection.

The semi-remote recreation designation is more liberal than the Old Growth designation in permitting salvage and associated green tree logging, road building and motorized use, and logging to enhance recreation opportunities. Moreover, not all forest-wide wildlife standards and guidelines apply in these areas. In addition, we are concerned that even the Old Growth designation (HCAs) remains open to road building and salvage logging under some circumstances. Although these practices are intended to be the exception rather than the rule, when salvage logging and road building do occur on Old Growth reserves, the impact on reserve quality could be substantial. With this in mind, the 1994 Peer Review advised the Forest Service "do not log or build roads" within HCAs. This problem is expanded, however, under the plan, in which more of the reserve system is in semi-remote recreation designation than in Old Growth (HCA) status.

Though the FEIS makes it difficult to evaluate the Forest Service's claim to have created improved, very large reserves in each of the 21 biogeographic provinces, this again appears to be more a matter of redefinition than improvement. The Forest Service describes these reserves as composed of contiguous lands in all of the nondevelopment LUDs, presumably including wilderness areas and other areas protected in the draft. As the above analysis demonstrates, small HCAs aside, the net changes from draft to final added only a small amount of habitat to the nontimber designations. This strongly suggests that no new very large reserves were created by removing large blocks of Old Growth from the timber base. This appears to be confirmed by the Interrain map showing changes from draft to final Plan. Finally, though the Forest Service argues that these reserves protect a significantly larger amount of Old Growth than recommended in the V-POP report, the comparison is misleading. First, the V-POP recommendations were made with knowledge of the larger areas of old growth protected outside of HCAs and, second, the volume in the newly described reserves is distributed over a much larger area and much of the area protected is not Old Growth. Overall, if, as it appears, these so-called very large reserves are composed largely of areas previously protected and now relabeled, we do not believe these reserves are responsive to the advice of the Peer Review and our previous Joint Statement.

Thus, no matter how one looks at the Forest Service's reserve system in the Final Plan, it represents little improvement from the draft plan.

Besides problems related to size, other problems of design still exist in the Final Plan. For example, with few exceptions, we see no evidence that topographic and biogeographic factors affecting animal movement have been considered. These factors include water, ice fields, mountainous terrain, differences between high and low elevation habitats, and other differences in vegetation.

Perhaps of greatest concern is the failure to protect the Forest's remaining pristine watersheds. We concluded in our 1996 Joint Statement that continued road building and logging in these watersheds could not be reconciled with the Forest Service's obligation to ensure the viability of all native vertebrate species.

Other evaluations of the needs of wildlife on the Tongass, in addition to ours in 1996, have focused on the need to preserve the forest's large blocks of Old Growth, especially high volume Old Growth. The 1994 Peer Review concluded that, to keep important landscape options open, the Tongass should "not further fragment existing large blocks of high volume Old Growth." The V-POP committee responded to the Peer Review by recommending that at least the three largest patches of Old Growth be protected in each ecological province. The Forest Service's brown bear assessment panel stated that the first priority should be to retain currently unroaded watersheds in a roadless condition.

TLMP, however, continues to fragment these critical habitat areas. A map prepared by Interrain Pacific (Interrain Pacific, Roadless areas and intact old-growth areas available for logging, 9/7/97) shows numerous roadless and intact Old Growth areas around the Tongass that remain available for logging. Analysis by the Forest Service itself of the protection given to interior blocks of Old Growth shows that few large blocks will remain unfragmented. Of the 14 ecological provinces with significant forestland, only 3 have their single largest interior Old Growth block protected from further fragmentation by logging. Moreover, two of the three that are fully protected are the smallest of the entire set of fourteen. (These figures exclude the 4 provinces that are legislatively protected, which, have never been the source of concerns about the Forest Service viability plan.)

This pattern of planned fragmentation extends to other large habitat blocks. Of the three largest such blocks in each province, only 9 of 42 are protected from further fragmentation. Of the largest five, only 19 out of 70 are protected. All others are available for logging to some degree.

Blocks of high volume Old Growth forest fare worse under the Final Plan than do the largest blocks of Old Growth. Of the Old Growth blocks in each province with the most high volume forest, only one of the 14 is fully protected. Looking at three in each province, only 9 out of 42 are fully protected. The numbers in these last 2 paragraphs do not change significantly if the analyses are done on blocks or patches that are only 90% protected, rather than fully protected.

Generally, substantial acreage in these blocks is protected from logging, though apparently not from the impacts of roads. Fragmentation can, however, have major effects even when relatively little habitat is altered directly. For precisely this reason, our recommendations, and those of other reviewers, have focused on eliminating further fragmentation of existing large blocks (rather than focusing on a total acreage). The Final Plan allows significant, major fragmentation of the remaining blocks of Old Growth forest.

## 2. High grading

The quality of habitat for wildlife varies widely across forest types found on the Tongass. In general, the more desirable timber classes correspond to habitat of high value to wildlife. The high "volume classes" provide a combination of large living and dead trees, multiple canopy layers, high-nutrient forage on the forest floor, good protection from snowfall, and

other important features leading to habitat of high quality for wildlife adapted to Old Growth. At the same time, these high volume classes have been, almost exclusively, the target for past logging in Southeast Alaska. As a result, the 1994 Peer Review concluded the Forest Service must preserve future management options to ensure the future viability of wildlife populations. An immediate action that would preserve future options is to protect low elevation, high volume Old Growth immediately via "low grading" to compensate for past, disproportionate logging. Under the Final Plan, not only will compensatory low grading not take place, but high grading will continue.

Those habitats that have the highest value for wildlife, and also are the most rare, were associated with the highest volume classes in the timber classification system that the Tongass has recently abandoned. The new system does not separately recognize these stands, formerly classified as volume classes 6 and 7. The new system, instead, includes former classes 6 and 7 in a broader "high volume" class that covers 43% of the productive Old Growth. Because volume classes 6 and 7 are not separately tracked any longer, it is not possible to predict their fate from reading the FEIS.

Unfortunately, there are reasons to presume that disproportionately heavy logging of the richest volume classes will resume. In last year's draft plan, much of the timber was to have been sold under a long term contract that, as we understand it, required the Forest Service to avoid high grading volume classes 6 and 7. New sales under that contract have since ended and the high grading prohibition expired with the contract. The Forest Service has not substituted a comparable legal constraint for any timber sales under the new Final Plan, despite the biological imperative for preserving these stands.

Even for the new, larger "high volume" classification, in which classes 6 and 7 are subsumed, we find no special measures to compensate for past high grading. Indeed, a high proportion of timber sales will, in the next few decades, log the most economic timber. Such an approach to sales strongly suggests that some form of high grading will continue. Composition of the habitat reserves does not guard against this, since their percent high volume is approximately equivalent to the percent in the Forest at large. Consequently, the percent of high volume Old Growth in the reserves must be much lower than what the forest-wide average was before recent logging of nearly a million acres of almost exclusively high volume stands on public and private lands combined.

### 3. Landscape Connectivity

In our 1996 Joint Statement, we concluded that connectivity among habitat reserves was a serious problem for all of the logging alternatives given in the RSDEIS. That problem has not been meaningfully addressed in the Final TLMP. In particular, robust corridors, wide enough to provide secure interior habitat and wide enough to survive windthrow and other disturbance events, and designed with topography in mind, have not been designated among reserves.

The FEIS and background documents point to additional riparian buffer strips included in the Final TLMP, arguing that they help remedy this problem. As we understand the new

riparian standards, however, they do not add buffers wide enough to accomplish this goal. The new buffers on headwater streams reach only to the banks of these small tributaries. They could not, therefore, be even as wide as the buffers provided for higher order streams in the RSDEIS, which we explained were too narrow to be adequate corridors for Old Growth associated species.

Mapping of the small Habitat Conservation Areas (HCAs) is also held out as providing connectivity. Small reserves may add to landscape connectivity by serving a "stepping stone" function for some species, but this has yet to be documented. Small HCAs, however, were already required in the RSDEIS we critiqued (and its predecessor V-POP strategy), though not mapped, and we presumed their existence.

TLMP documents state that the 1,000 foot beach fringe will link habitat reserves. As with the small HCAs, these may provide some connectivity. In our review of the RSDEIS, we found inadequate the alternative that included a 1,000 foot beach fringe (though the second 500 feet was available for small scale, ecologically based logging). Moreover, the beach fringes only connect areas between coastal habitat blocks, not those in the interiors of islands or the mainland. A 1,000 foot beach fringe is too narrow, subject to blowdown, and in at least some places is degraded by past logging. To provide secure wildlife movement among reserve areas (and to facilitate regular genetic interchange), corridor standards should at least be on the order of those described in Lande's contribution to the 1994 Peer Review: a no-cut zone of 2,000 feet in width.

#### 4. Clearcutting

The scientific reviews assembled by the Forest Service over the last three years have repeatedly called for a major change in logging methods on the Tongass. The 1994 Peer Review concluded that, consistent with generally accepted principles of ecosystem management, future logging should mimic the small-scale, natural disturbance patterns on the Tongass. Rather than adopt an ecologically-based approach, however, the selected alternative continues to rely heavily on the silvicultural method most destructive to Old Growth wildlife habitat: large-scale clear-cutting on short rotation. Continued large-scale clear-cutting, particularly on a short rotation as called for in the plan, is incompatible with ensuring adequate protection of wildlife and essential habitat.

The Forest Service has defended its selection of clear-cutting based on limited knowledge about the practical impacts on the timber program of the selection logging methods that mimic natural disturbance patterns. It is undisputed, however, that continued clear-cutting on anything resembling the current scale comes at a grave cost to wildlife species associated with Old Growth on the Tongass. Given the relative certainty of the adverse impacts of continued clearcutting and the current information that shows small scale disturbances are the dominant form of natural disturbance on the Tongass, the Forest Service must begin requiring some form of selection logging as the dominant logging method on the Tongass, even if some uncertainty exists about such logging methods. Otherwise, the Forest Service cannot ensure the viability

of many species of Tongass wildlife. Postponing this change until long term research is completed, as the plan proposes, ignores the need for an immediate transition.

The Final Plan justifies continued clearcutting in the name of “Adaptive Management.” The Forest Service misunderstands adaptive management to be maintenance of the status quo, with monitoring, until incontrovertible evidence shows that the status quo does not work. Under such a regimen, little can be done to protect populations of wildlife before perpetuating them becomes impossible. The Forest Service must use a true adaptive management approach: adopt management practices supported by the best scientific evidence to date; rethink those practices as new information becomes available; use new evidence to reconsider the costs of both Type I (the danger of changing management when present management is actually best) and Type II error (the danger of not changing management when the change would be for the better).

Finally, no evidence supports the suggestion in the FEIS that the proposed management will substitute for a matrix managed to duplicate natural disturbance patterns on the Tongass. Expanded beach fringes, increased riparian protection, restrictions on even age logging that may be imposed in certain areas for protection of martens and goshawks, and fragmented Old Growth remaining in the matrix simply cannot compensate for the extensive clearcut logging proposed in the Final Plan.

## Conclusion

The final Land Management Plan for the Tongass National Forest does not incorporate the recommendations of the Peer Review or other scientific input in fundamental ways. Consequently, we do not believe that this Plan will protect viable, well distributed populations of vertebrate species on the Tongass National Forest.

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Comparison of Acres of Land Use Designations between the Preferred Alternative (1996)  
and the TLMP Final EIS (1997)

Land Use Designation	Total Acres			%change
	1996 TLMP <sup>1</sup>	1997 TLMP	96-97 change	
Scenic Viewsheds	507,528	488,512	-19,016	-3.75
Modified Landscape	592,671	621,227	28,556	4.82
Timber Production	2,735,935	2,543,926	-192,009	-7.02
<b>All Dev. LUDs</b>	<b>3,836,135</b>	<b>3,653,665</b>	<b>-182,469</b>	<b>-4.76</b>
Old Growth	1,391,800	1,180,650	-211,151	-15.17
Wilderness	2,563,592	2,584,133	20,541	0.80
Wilderness Monument	2,981,352	2,905,570	-75,782	-2.54
Non-wilderness monument	163,377	167,449	4,072	2.49
Research natural area	26,612	25,906	-706	-2.65
Remote Recreation	2,210,468	2,129,809	-80,659	-3.65
Enacted Municipal Watersheds	9,765	45,853	36,088	369.58
Experimental Forests	17,333	17,271	-63	-0.36
Semi-Remote Recreation	2,462,869	2,829,575	366,705	14.89
WSR Rivers	89,768	123,546	33,778	37.63
1990 TTRA LUD II	689,559	690,888	1,329	0.19
Special Areas	173,980	179,212	5,232	3.01
Wilderness National Monument RNA	23,554	23,615	61	0.26
Wilderness Special Interest Areas	40,600	40,554	-46	-0.11
Wilderness National Monument SIA	18,654	79,553	60,899	326.47
LUDII RNA	9,755	9,853	98	1.00
Wilderness WSR Rivers	25,211	8,492	-16,719	-66.32
Wilderness National Monument WSR Rivers	80,824	99,177	18,352	22.71
LUDII WSR Rivers	22,883	22,925	42	0.18
LUDIII Special				
<b>All Non-Dev LUDs</b>	<b>13,001,958</b>	<b>13,164,032</b>	<b>162,074</b>	<b>1.25</b>
All USFS Lands	16,838,092	16,817,697	-20,396	-0.12
Non-national forest system lands	951,803	999,996	48,193	5.06
Totals	17,789,896	17,817,693	27,797	0.16

<sup>1</sup> The 1996 Plan with the addition of the small Habitat Conservation Areas as part of the Old Growth Reserves land use designation.

Comparison between Productive Old Growth Forests in the Preferred Alternative (1996)  
and the TLMP Final EIS (1997)

Land Use Designation	1996 TLMP <sup>1</sup>	1997 TLMP	96-97 change	% change
<b>Total Productive Old Growth</b>				
Scenic Viewsheds	251,137	249,563	-1,574	-0.63
Modified Landscape	267,533	306,554	39,021	14.59
Timber Production	1,164,668	1,097,082	-67,586	-5.80
<b>All Dev. LUDs</b>	<b>1,683,338</b>	<b>1,653,199</b>	<b>-30,139</b>	<b>-1.79</b>
Old Growth	720,916	589,130	-131,785	-18.28
Wilderness	533,192	535,200	2,008	0.38
Wilderness Monument	1,047,192	1,028,878	-18,314	-1.75
Non-wilderness monument	62,609	62,930	320	0.51
Research natural area	9,291	9,431	140	1.51
Remote Recreation	155,477	132,007	-23,470	-15.10
Enacted Municipal Watersheds	3,718	9,736	6,019	161.89
Experimental Forests	7,681	7,701	20	0.26
Semi-Remote Recreation	531,333	680,663	149,330	28.10
WSR Rivers	43,067	59,832	16,766	38.93
1990 TTRA LUD II	243,809	244,184	375	0.15
Special Areas	43,492	47,416	3,924	9.02
Wilderness National Monument RNA	11,669	11,689	20	0.17
Wilderness Special Interest Areas	901	881	-20	-2.22
Wilderness National Monument SIA	901	25,053	24,152	2680.86
LUDII RNA	5,559	5,737	178	3.20
Wilderness WSR Rivers	5,737	1,080	-4,657	-81.17
Wilderness National Monument WSR Rivers	1,080	31,815	30,735	2845.34
LUDII WSR Rivers	30,875	14,354	-16,522	-53.51
LUDIII Special	14,334		-14,334	-100.00
<b>All Non-Dev LUDs</b>	<b>3,472,833</b>	<b>3,497,718</b>	<b>24,885</b>	<b>0.72</b>
All USFS Lands	5,156,171	5,150,917	-5,254	-0.10
Non-national forest system lands	96,545	97,165.86	621	0.64
Totals	5,252,716	5,248,083	-4,633	-0.09

<sup>1</sup>The 1996 Plan with the addition of the small Habitat Conservation Areas as part of the Old Growth Reserves land use designation.

Comparison between High Volume Productive Old Growth in the Preferred Alternative (1996)  
and the TLMP Final EIS (1997)

Land Use Designation	Total High Volume Productive Old Growth			% change
	1996 TLMP <sup>1</sup>	1997 TLMP	96-97 change	
Scenic Viewsheds	105,312	103,743	-1,569	-1.49
Modified Landscape	110,462	129,584	19,122	17.31
Timber Production	484,404	453,966	-30,438	-6.28
<b>All Dev. LUDs</b>	<b>700,178</b>	<b>687,293</b>	<b>-12,885</b>	<b>-1.84</b>
Old Growth	300,081	237,417	-62,665	-20.88
Wilderness	237,651	238,132	482	0.20
Wilderness Monument	520,031	509,270	-10,761	-2.07
Non-wilderness monument	30,662	30,802	140	0.46
Research natural area	4,524	4,524	0	0.00
Remote Recreation	54,865	50,274	-4,591	-8.37
Enacted Municipal Watersheds	1,939	3,958	2,019	104.14
Experimental Forests	4,281	4,281	0	0.00
Semi-Remote Recreation	199,863	263,142	63,279	31.66
WSR Rivers	19,090	29,512	10,422	54.59
1990 TTRA LUD II	105,556	105,693	138	0.13
Special Areas	13,329	15,512	2,182	16.37
Wilderness National Monument RNA	5,715	5,735	20	0.35
Wilderness Special Interest Areas	621	601	-20	-3.23
Wilderness National Monument SIA	2,019	13,500	11,481	568.67
LUDII RNA	1,839	1,839	0	0.00
Wilderness WSR Rivers	540	540	0	0.00
Wilderness National Monument WSR Rivers	13,039	13,479	440	3.37
LUDII WSR Rivers	8,156	8,156	0	0.00
LUDIII Special				
<b>All Non-Dev LUDs</b>	<b>1,523,801</b>	<b>1,536,366</b>	<b>12,566</b>	<b>0.82</b>
All USFS Lands	2,223,978	2,223,659	-319	-0.01
Non-national forest system lands	44,684	45,104	420	0.94
Totals	2,268,662	2,268,763	101	0.00

<sup>1</sup> The 1996 Plan with the addition of the small Habitat Conservation Areas as part of the Old Growth Reserves land use designation.