United States Department of Agriculture

Forest Service

Tongass National Forest
Forest Plan Interdisciplinary Team
8465 Old Dairy Road
Juneau, Alaska 99801
(907) 586-6700

Reply To: **RS-G-10-b** **Date: May 7, 1997**

Subject: **Summary of the 1997 Alexander Archipelago Wolf Risk Assessment Panel**

To: **Tongass Land Management Plan (TLMP) Planning File**

From: **Chris Iverson, TLMP IDT Panel Facilitator**

I. INTRODUCTION

A panel of wolf experts was reconvened on March 27 and 28, 1997 in Juneau, Alaska to assess the likelihood that TLMP Revision alternatives would provide habitat sufficient to support persistent and well distributed wolf populations across their historical range on the Tongass National Forest after 100 years of full implementation of each alternative. The panel was reconvened primarily to examine Alternatives 10 (REDEIS Preferred Alternative) and 11 (FEIS Preferred Alternative) that were not previously paneled.

The same wolf experts that participated in the previous wolf risk assessment panel in November, 1995 participated in this effort. Panel evaluators integrated their personal experience and knowledge of wolf ecology with technical information presented on local wolf and deer ecology and details concerning design elements of TLMP alternatives. Using this information, they developed professional judgments about likely outcomes related to the habitat sufficient to support persistence and well distributed of wolf populations on the Tongass National Forest. Panel evaluators were reminded that they were to consider habitat sufficient to support wolf population viability, distribution, and persistence and not sustainability of current wolf or deer harvest. A list of panel evaluators, materials provided to evaluators, and individuals involved in the panel process are listed in Appendix 1.

This summary provides an analysis of factors that evolved as important elements considered and debated among panel evaluators that influenced their assignment of likelihood points to various outcomes by alternative. An analysis and comparison of ratings by alternative is presented. Important elements and likelihood outcome scores are compared between this and the 1995 panel assessment. Finally, panel evaluators were asked to complete an "Appraisal of Contribution of Alternative Features to Maintaining Wildlife Habitat." Results from this form also were considered in interpreting panel results.

A complete set of notes made by a scribe during the 2-day session are available in the TLMP Planning Record. This information is not repeated here except for important factors affecting the assessment of alternatives. Panel evaluators assignment of likelihood points to five possible outcomes and the appraisal of alternative features are attached in Appendix 2.

II. IMPORTANT ASSESSMENT FACTORS

Deer Habitat Capability

Panel evaluators considered deer populations as the single most significant factor that affected their ratings and it represented the most significant component of the overall panel discussion, as it was in the first panel. Deer are the primary prey of wolves in southeast Alaska; as such, the panel again had significant discussion about predator/prey interactions

based upon the panel evaluators' varied experience with diverse wolf populations. The general conclusion drawn from this discussion was that wolf persistence is directly linked to deer populations and ultimately to deer habitat capability. Individual features of alternatives that contributed to greater deer habitat capability were considered superior to those that provided less deer habitat: similarly, alternatives that provide relatively more deer habitat capability scored higher than alternatives providing less deer habitat capability.

Discussion about the deer habitat capability model noted that it only estimates longterm average deer carrying capacity based upon habitat features and average snow conditions (winter snow conditions are considered the limiting factor in the deer model). An important limitation of the model noted by panel evaluators was its inability to provide estimated habitat capability during periodic severe winters (or other stochastic events) that may represent a once in 20 years or so bottleneck in wolf/deer predator prey relationships. Additional limitations in the model noted by panel evaluators were its inability to factor in habitat juxtaposition and potential effects of fragmentation.

Estimated deer habitat capability by Wildlife Analysis Area (WAA, N = 141 forestwide) and biogeographic provinces (N = 21 forestwide) for 1954, 1995, and projections for 2095 with full implementation of each alternative was provided to panel evaluators. The deer resource specialist added that as a result of interagency meetings and review of coefficients and outputs, revisions have been made to the model since the panel last met, including factoring in a 36% reduction to account for wolf predation and increasing K (carrying capacity) from 75 to 125 deer/square mile where Habitat Suitability Index values = 1.0 (highest quality habitat).

The wolf resource specialist offered that the key issue is not theoretical habitat capability, but rather actual deer populations to sustain wolves and, importantly, the deer population that would survive the most severe winters. Furthermore, all modeling conducted in the Wolf Conservation Assessment[1/] was predicated upon actual deer populations, not deer habitat capability. The wolf resource specialist also suggested that K in the current model (125 deer/square mile) was too high and recommended 100 deer/square mile based upon his preliminary analyses of deer pellet group data. Further discussion revealed that if this lower estimated K multiplier was used, then current deer harvest rates in some regions may approach 50% of estimated carrying capacity, suggesting that either model predictions or deer harvest statistics may be in question. It was agreed that reliable estimates of actual 1997 deer density are lacking.

The conclusion of this discussion was that net deer habitat capability in the tables provided by WAA and province would be underestimated by 8% if one added back in the 36% reduction to remove the effect of wolf predation and reduce K to 100 deer/square mile. Furthermore, panel evaluators agreed that their assignment of likelihood points would not change if deer numbers were reduced by the same amount in all alternatives, suggesting that the deer model provided relative magnitudes suitable for comparison among alternatives (as originally intended), but not a source of absolute population estimates. Panel evaluators added that if severe winters were factored in, then outputs may change by alternative and thus affect their ratings.

[1/] The Alexander Archipelago Wolf, A Conservation Assessment. 1996. Person, 0. K., Kirchhoff, M., VanBallenberhe, V.V., Iverson, G.C., and Grossman, E. USDA Forest Service, Pacific Northwest Research Station, Gen. Tech. Rep. 384. 42pp.

Distribution

The concepts of well distributed wolf populations and gaps in their distribution were again an important topic discussed at length relative to the five outcomes to which likelihood points were assigned. Wolf dispersal capabilities were an important element in this dialogue as wolves are capable of dispersing across several hundred miles. Panel evaluators reconsidered and again adopted their conclusion from the first panel that, for discussion purposes, a gap in wolf distribution would be approximately 100 square miles -- or the estimated size of a wolf pack territory on Prince of Wales Island. Only ephemeral, dispersing individuals may occasionally occur in the formerly occupied range within such a gap, but habitat therein is insufficient to sustain enough deer to support a reproductively successful pack. Gaps (vacant wolf territories) also could be created through intensive hunting and trapping, but such gaps are much less permanent and could be recolonized. In either case, interaction within the population would continue with only slight and insignificant limitation due to the gap.

Panel evaluators came to a strong conclusion that the concept of a well distributed population was more restrictive or limiting than overall population viability and that wolf populations may not necessarily be well-distributed, but could remain viable. Considering Prince of Wales Island, some panel evaluators agreed that a gap of even one vacant wolf territory might not represent a well-distributed populations, but that such a population would still be viable. The upper threshold of what size of a gap and how many gaps constituted a nonviable population was debated without reaching agreement. At one extreme, some panel evaluators believed that all wolves on Prince of Wales Island could be eliminated (certainly not well distributed), but the resulting wolf population in southeast Alaska could remain viable.

This conceptual discussion of gaps and distribution was then directly related to the assignment of points to the five likelihood outcomes. Panel evaluators agreed that Outcomes I and II were clearly both within the concepts of well-distributed and viable. Outcome IV was clearly not well distributed due to populations existing in refugia with little interaction. Outcome III was where debate centered relative to whether a population was well distributed and a clear continuum existed within this category. Some panel evaluators believed that outcome III represented gaps and not well distributed but that the gaps were insignificant due to continued interaction. Other panel evaluators considered outcome III to represent well distributed populations due to continued interaction within the population. However, there was agreement that Outcome III likely still represented a viable population.

Wolf Mortality

Unlike the first panel, there was little discussion about wolf mortality relative to the more important factors of deer habitat capability, population distribution, and interaction with respect to gaps. Most panel evaluators considered this element to be a human (social perception) management factor. They were not surprised by the findings presented in the Wolf Conservation Assessment indicating a correlation between miles of roads on Prince of Wales Island and reported wolf mortality. The real issue was human accessibility and attitudes, rather than miles of road or road density.

The wolf management standard and guideline in the Proposed Revised TLMP was presented for discussion. It was developed in large part based upon discussions by the first panel which recognized value in managing human-related wolf mortality through a working partnership between the Forest Service (manage road access) and the Alaska Department of Fish and Game (manage seasons and bag limits). The earlier panel advised against strict road density thresholds. In this panel, some panel evaluators expressed doubt about the likely effectiveness of this proposed management approach given the Forest Service's track record with road access management. Upon reviewing the current proposed standard and guideline, panel evaluators also commented that successful implementation required

knowledge of population size to determine what levels of wolf harvest were sustainable and what levels were not.

Panel evaluators' conclusions related to mortality included:

- Roads generally are not a significant threat to wolves.
- The proposed standard and guideline is useful and panel evaluators assumed reasonable implementation by the Forest Service in their assignment of likelihood points to outcomes.
- Panel evaluators believed that the reproductive capacity of wolves was capable of supporting a 25-40% annual mortality (assuming availability of sufficient prey populations), but that this level of mortality was highly unlikely through incidental shooting (if all other forms of legal harvest were eliminated).
- Importantly, given the uncertainty regarding road access management, future human perceptions about wolves, and the importance of deer habitat capability, the concept of habitat reserves was very important to the panel evaluators' appraisal of features important to wolf persistence.

Genetic Information

This panel did not discuss wolf taxonomy to the extent done in the first panel. As indicated above, the focus was on the degree of population interaction among islands and the mainland relative to population distribution. Genetic studies have not. detected genetic differences among populations in southeast Alaska, suggesting at least some degree of genetic interchange. The question of demographic interchange among population segments was considered important relative to the discussion of gaps, distribution, and population interaction.

Alternative Features

Panel evaluators were asked to consider individual alternative design elements and note if any specific features were particularly important to their assignment of likelihood points to outcome ratings. Their evaluation of these features is expressed in the Appraisal of the Contribution of Alternative Features table (Appendix 2). Virtually all features in the Old-growth Strategy were considered to be important features (+), except for Small Reserves and Small Island Protection. All panel evaluators considered Large Reserves to be a critical feature (++), whereas two considered Legislated Conservation Areas to be critical and two as important, and two considered the Deer Standard and Guideline to be critical and two as important. These appraisals were generally consistent with the discussion indicating that reserves were important for providing deer habitat capability and secondarily for controlling human access and that any features that provided for greater deer habitat capability were important.

Appraisals for the Management of Matrix Lands also were consistent with the discussion in that features that maintained deer habitat capability were considered to be important. Thus, all panel evaluators considered Acres of Old Growth Harvested (reduction in deer habitat capability) as a detrimental feature. Conversely, they considered Percent of the Old Growth Retained as a critical feature, the more retained the better for deer habitat capability. Longer rotations also were viewed as having greater value in providing deer habitat than shorter rotations.

Ill. COMPARISON OF ALTERNATIVES

As with the previous panels and summary analyses, the 'after' likelihood outcome ratings are used to compare and contrast alternatives since these evaluations benefit from professional interaction and likely represent a greater understanding of both gross and subtle differences among features in alternatives. As with the previous panel, the average scores among all panel evaluators is used, rather than focusing on differences among individual evaluators. Furthermore, when considering the likelihood of maintaining habitat sufficient to support

viable and well distributed populations, a range is provided. This range is the sum of mean scores for Outcome I + II to the sum of mean scores for Outcome I + ll + Ill. Data are presented in this manner because the discussion indicated that well distributed populations occur along a continuum from Outcomes II to III. Expression of data as a range also illustrates the uncertainty and variability in the issue and avoids expressing a single absolute value that might suggest a level of precision that does not exist in this risk assessment process. Outcome Ill generally was considered viable (in addition to Outcomes I + II) for wolves in southeast Alaska.

Comparison Between 1995 and 1997 Panels

Direct comparisons can be made with the 1995 panel results through analysis of alternatives that were identical between the two panels ––alternatives 1 and 9'. Indirect comparisons also can be made by using results from alternatives 2 and 5 as features of these alternatives remained identical except that the acres of Productive Old Growth (POG) scheduled for harvest over 100 years of full plan implementation was reduced by 253,000 and 109,000, respectively. The 'historical' condition also was rated to examine both the effect of 40 years of forest management as well as the background or "natural risk" to wolves. Table 1 summarizes these results.

Alternative 1 -- essentially a 'no-action' alternative ––was rated identical in the 1995 and 1997 panels with a well distributed/viable likelihood range of 94-97. The likelihood scores for alternative 9' increased from 34-82 in 1995 to 48-92 in 1997. Thus, one might consider a range of scores from 0-14 to represent inherent variability in the process. Similarly, ratings for alternative 2 increased slightly from 60-90 in 1995 to 63-97 in 1997, likely due to a reduction of nearly 253,000 acres of old growth harvested. Alternative 5 scores were nearly identical, despite a 109,000 acre reduction in old growth harvest.

Comparison Among 1997 Alternatives

The likely effect of 40 years of management activity on the Tongass can be evaluated by considering alternative 1 and the historical condition. These two scenarios are virtually identical relative to the likelihood of maintaining habitat sufficient to support well distributed and viable populations with scores of 94-97 and 97-98, respectively. Thus, based upon these ratings, panel evaluators concluded that after the next 100 years, the past 40 years of timber harvesting activity will have had little effect on longterm wolf persistence.

As with the previous panel, panel evaluators concluded that there is virtually no chance of extirpation of the wolf from the Tongass National Forest as a result of implementation of any alternative for 100 years. Most alternatives received an almost negligible rating of 1 for Outcome V (extirpation from the planning area), with alternatives 9 and 9' having the highest rating of only 3 (Table 1).

Panel evaluators considered the likelihood of wolf populations existing in isolated refugia to be very low with Outcome IV scores ranging from 1 (historical) to 3 (alternatives 1, 2, 5, 10, and 11). Even in alternatives 9 and 9', which have a relatively high level of acres harvested and thus anticipated significant regional reductions in deer habitat capability, had Outcome IV ratings of 6. Clearly, if Outcome IV represents a level where wolf populations are no longer viable, then the likelihood of obtaining this outcome after 100 years under any alternative is relatively low. Thus, in all alternatives there is a relatively high likelihood that after full implementation for 100 years, wolves will persist across their range on the forest in some distributional status considerably more dense than refugia.

Among the action alternatives evaluated, alternatives 5 and 11 provide similarly high likelihoods of maintaining habitat sufficient to support viable and well distributed populations with scores of 84-97 and 83-97, respectively. The acres of productive old growth projected

Among the action alternatives evaluated, alternatives 5 and 11 provide similarly high likelihoods of maintaining habitat sufficient to support viable and well distributed populations with scores of 84-97 and 83-97, respectively. The acres of productive old growth projected to be harvested after 100 years of full implementation only vary by 12,000 acres between these alternatives, whereas overall management strategies represent two very different approaches. Alternative 11 uses short rotation (100 years) even-aged management with a reserve based strategy of mapped small, medium, and large reserves well distributed across the forest. In contrast, alternative 5 has a 200-year harvest rotation, forestwide application of two-aged timber management, application of the deer standard and guideline, and reserves in only 4 biogeographic provinces. Both have a 1000' beach fringe, Legislated Conservation Areas, and essentially the same semi-remote recreation areas. These ratings may be somewhat inconsistent in one respect relative to the panel evaluators' consideration that reserves were an important alternative feature. Under this premise, one might think that alternative 11 should have rated somewhat higher with its more thorough application of habitat reserves. Application of the deer standard and guideline only in alternative 5, another feature that was considered to be important by panel evaluators, may explain this difference.

Alternative 10 was rated slightly lower than alternatives 5 and 11, with a range of 80-96. While alternative 10 has a system of large, medium, and small reserves, the small reserves are not mapped. Also, there is only a 500' beach fringe, no deer standard and guideline, very little two-aged management, and nearly 200,000 more acres of old growth are scheduled for harvest -- all factors that lead to reduced deer habitat capability.

Alternatives 9 and 9' were rated identical with likelihood scores of 48-92 of maintaining habitat sufficient to support viable and well distributed populations. These ratings suggest that at some high level of acres harvested (e.g. greater than 1,000,000), additional cutting matters little since nearly 350,000 more acres of old growth would be harvested in Alternative 9'. Both alternatives had the highest relative risk among all alternatives rated: however, the overall likelihood of maintaining at least viable wolf populations under these alternatives (Outcome Ill) remained relatively high with a score of 92.

Table 1. Likelihood outcome scores for the Alexander Archipelago wolf by evaluators on the wolf assessment panel. Ratings for Before discussion among evaluators relative to features of the alternatives and After discussion are provided. Ratings from the 1995 panel also are shown for alternatives common to both panel rating periods. Alternatives 1 and 9' are identical in features and acres of productive old-growth (POG) harvested. Alternatives 2 and 5 are identical in features but with fewer acres of POG scheduled for harvest in the 1997 panels. A range for all alternatives is also provided for all alternatives for the likelihood of maintaining habitat to support viable and well distributed wolf populations. The -414,000 value for POG harvest under Historic represents the acreage harvested since 1954.

1997 Panel

	Alternative 1		Alternative 2		Alternative 5		Alternative 9		Alternative 9'		Alternative 10		Alternative 11		Historical	
Outcomes	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
I	88	88	28	20	56	55	24	18	24	18	54	54	60	58	89	89
II	8	6	46	43	35	29	25	30	25	30	19	26	29	25	6	8
III	1	3	19	34	10	13	33	44	33	44	20	16	9	14	3	1
IV	3	3	4	3	1	3	10	6	10	6	4	3	1	3	1	1
V	1	1	4	1	1	1	9	3	9	3	4	1	1	1	1	1
POG Harvested (Acres)	0		853,270		462,880		1,042,428		1,402,800		670,270		475,000		-414,000	
(Productive Old Growth)																

1995 Panel

POG Harvested (Acres)	0		1,106,670		572,300				1,402,800							
	Alternative 1		Alternative 2		Alternative 5				Alternative 9'							
Outcomes	Before	After	Before	After	Before	After			Before	After						
I	80	80	35	35	55	48			18	3						
II	14	14	28	25	30	34			24	31						
III	3	3	28	30	13	16			43	48						
IV	2	2	9	9	1	1			15	18						
V	1	1	1	1	1	1			1	1						

Likelihood of maintaining habitat to support viable and well distributed wolf populations (Range = Outcomes I + II to Outcomes I + II + III).

PANEL YEA	Alternative 1		Alternative 2		Alternative 5		Alternative 9		Alternative 9'		Alternative 10		Alternative 11		Historical	
1997		>94, <97		>63, <97		>84, <97		>48, <92		>48, <92		>80, <96		>83, <97		>97, <98
1995		>94, <97		>60, <90		>82, <98				>34, <82						

* 1995 panel scores are combined for purposes of comparision with 1997 scores only. These combinations do not infer any conclusions on behalf of the 1995 panel because they did not specifically discuss viable and well distributed populations relative to the specific outcomes.

Appendix 1. List of panel evaluators and addresses as well as the facilitator, resource specialists, scribe, and silent observer and affiliation. Also listed are materials provided to panel evaluators for use in panel deliberations.

Panel evaluators:

Layne Adams, National Biological Service
David Mech, National Biological Service
Bob Stevenson, Alaska Department of Fish and Game
Mark McNay, Alaska Department of Fish and Game.

Facilitator: Chris Iverson, TLMP IDT, Forest Service
Wolf Resource Specialist: Dave Person, Univ. Alaska, Fairbanks
Deer Resource Specialist: Gene DeGayner, TLMP IDT
Deer Resource Specialist: Matt Kirchhoff, Alaska Department of Fish and Game
Scribe: Peg Robertson, Forest Service
Silent Observer: Chris LeMasters, Forest Service

Panel evaluators were presented the following information:

- Overview video of forest planning: Bruce Rene', TLMP.
- Overview presentation of alternatives; Chris Iverson: TLMP (including the handout copy of overheads used "Tongass Land Management Plan Framework for Alternative, Panel Assessments, Spring, 1997").
- Presentation on the deer habitat capability model and the TLMP Geographic Information System. Gene DeGayner, TLMP.
- Tongass maps illustrating 7 alternatives and land use designations (1, 2, 5, 9, 9', 10 and 11); 1954 productive old growth: 1995 productive old growth abundance and distribution and second growth; anticipated old growth condition in 2095 for all alternatives.
- Copies of the following materials were also provided:
    1. Scientific information and the Tongass Land Management Plan: Key Findings From the Scientific Literature, Species Assessments, Resource Analyses, Workshops, and Risk Assessment Panels. PNW GTR # 386.
    2. Summary of the Revised Supplement to the Draft Environmental Impact Statement.
    3. National Forest Management Act regulations concerning wildlife viability.
    4. Interagency Viable Population Committee VPOP) report (Suring et al. 1993) Executive Summary.
    5. Summary of PNW Review of the VPOP Report by Kiester and Eckhardt (1994).
    6. Extinction Rates in Archipelagos: Implications for Populations in Fragmented Habitats (Burkey 1995).
    7. Tongass National Forest Land and Resource Management Plan -- goals and objectives, wildlife related standards and guidelines, information needs, and riparian information.
    8. Final Environmental Impact Statement for the Tongass National Forest Land Management Plan Revision; wildlife related components of the effects analysis.
    9. Controlling Stability Characteristics of Steep Terrain with Discussion of Needed Standardization of Mass Movement Hazard Indexing: A Resource Assessment of Land Use Impacts on Channel Condition. Publication in Earth Surface Processes and Landforms by Woodsmith.
    10. Old-growth Forest Habitat Conservation Strategy, Alexander Archipelago Wolf and Queen Charlotte Goshawk Analyses. (Iverson and DeGayner, 1997)
    11. Evaluation of the Use of Scientific Information in Developing the Final Alternative for the Tongass Land management Plan (Everest et al. 1997)
    12. Conceptual Approaches for Maintaining Well-Distributed, Viable Wildlife Populations: A Resource Assessment (Iverson and Rene 1997 in GTR # 392).

13. Dynamics of under-story biomass in Stika spruce-western hemlock forests of southeast Alaska (Alaback 1982)
14. Risk Assessment Panels as a component of the TLMP Revision Process: information on the process.
15. Final TLMP Plan Wolf Forestwide Standards and Guidelines.
16. Planned acres of productive old growth harvested by alternative by 2095.
17. Deer habitat capability by Wildlife Analysis Area and Ecological Province.
18. Alexander Archipelago Wolf, A Conservation Assessment (Person et al. 1996) PNW GTR # 364.
19. Tables of wolf and deer harvest statistics from the Alaska Department of Fish and Game.
20. Five tables summary data by biogeographic province.

Appendix 2. Individual panel evaluators assignment of likelihood outcome scores and appraisal of contribution to alternative features to maintaining wildlife habitat.

SUMMARY BEFORE

Panel Name: Wolf

Tongass Land Management Plan Revision -- Panel Assessments

March 27-28, 1997

Alternative 1

Evaluator	1	2	3	4	5	6	Mean
Outcomes							
I	90	100	70	90			88
II	10	0	10	10			8
III	0	0	5	0			1
IV	0	0	10	0			3
V	0	0	5	0			1

Alternative 2

Evaluator	1	2	3	4	5	6	Mean
Outcomes							
I	35	10	55	10			28
II	60	60	15	50			46
III	5	30	20	20			19
IV	0	0	5	10			4
V	0	0	5	10			4

Alternative 5

Evaluator	1	2	3	4	5	6	Mean
Outcomes							
I	60	90	65	10			56
II	45	10	15	70			35
III	0	0	10	30			10
IV	0	0	5	0			1
V	0	0	5	0			1

Alternative 9

Evaluator	1	2	3	4	5	6	Mean
Outcomes							
I	40	0	55	0			24
II	45	40	15	0			25
III	10	60	20	40			33
IV	5	0	5	30			10
V	0	0	5	30			9

Alternative 9 '

Evaluator	1	2	3	4	5	6	Mean
Outcomes							
I	40	0	55	0			24
II	45	40	15	0			25
III	10	60	20	40			33
IV	5	0	5	30			10
V	0	0	5	30			9

Alternative 10

Evaluator	1	2	3	4	5	6	Mean
Outcomes							
I	50	100	55	10			54
II	40	0	15	20			19
III	10	0	20	50			20
IV	0	0	5	10			4
V	0	0	5	10			4

Alternative 11

Evaluator	1	2	3	4	5	6	Mean
Outcomes							
I	50	100	60	30			60
II	40	0	15	60			29
III	10	0	15	10			9
IV	0	0	5	0			1
V	0	0	5	0			1

Historical

Evaluator	1	2	3	4	5	6	Mean
Outcomes							
I	100	100	65	90			89
II	0	0	15	10			6
III	0	0	10	0			3
IV	0	0	5	0			1
V	0	0	5	0			1

SUMMARY AFTER

Panel Name: Wolf

Tongass Land Management Plan Revision -- Panel Assessments

March 27-28, 1997

Alternative 1

Evaluator	1	2	3	4	5	6	Mean
Outcomes							
I	80	100	80	90			88
II	10	0	5	10			6
III	5	0	5	0			3
IV	5	0	5	0			3
V	0	0	5	0			1

Alternative 2

Evaluator	1	2	3	4	5	6	Mean
Outcomes							
I	20	0	50	10			20
II	50	50	20	50			43
III	25	50	20	40			34
IV	5	0	5	0			3
V	0	0	5	0			1

Alternative 5

Evaluator	1	2	3	4	5	6	Mean
Outcomes							
I	45	80	65	30			55
II	40	20	15	40			29
III	10	0	10	30			13
IV	5	0	5	0			3
V	0	0	5	0			1

Alternative 9

Evaluator	1	2	3	4	5	6	Mean
Outcomes							
I	20	0	50	0			18
II	35	30	25	30			30
III	35	70	10	60			44
IV	5	0	10	10			6
V	5	0	5	0			3

Alternative 9'

Evaluator	1	2	3	4	5	6	Mean
Outcomes							
I	20	0	50	0			18
II	35	30	25	30			30
III	35	70	10	60			44
IV	5	0	10	10			6
V	5	0	5	0			3

Alternative 10

Evaluator	1	2	3	4	5	6	Mean
Outcomes							
I	40	90	55	30			54
II	40	10	15	40			26
III	15	0	20	30			16
IV	5	0	5	0			3
V	0	0	5	0			1

Alternative 11

Evaluator	1	2	3	4	5	6	Mean
Outcomes							
I	45	100	55	30			58
II	40	0	20	40			25
III	10	0	15	30			14
IV	5	0	5	0			3
V	0	0	5	0			1

Historical

Evaluator	1	2	3	4	5	6	Mean
Outcomes							
I	90	100	75	90			89
II	10	0	10	10			8
III	0	0	5	0			1
IV	0	0	5	0			1
V	0	0	5	0			1

Evaluator Form

Tongass Land Management Plan Revision -- Panel Assessments

March 27-28, 1997

Panel Name: Wolf

Evaluator: 1

Outcomes	Alternative 1		Alternative 2		Alternative 5		Alternative 9		Alternative 9 '		Alternative 10		Alternative 11		Historical	
	before	after	before	after	before	after	before	after	before	after	before	after	before	after	before	after
I	90	80	35	20	60	45	40	20	40	20	50	40	50	45	100	90
II	10	10	60	50	45	40	45	35	45	35	40	40	40	40	0	10
III	0	5	5	25	0	10	10	35	10	35	10	15	10	10	0	0
IV	0	5	0	5	0	5	5	5	5	5	0	5	0	5	0	0
V	0	0	0	0	0	0	0	5	0	5	0	0	0	0	0	0
Total	100	100	100	100	105	100	100	100	100	100	100	100	100	100	100	100

Did not feel comfortable to rate ☐

Totals of outcomes must equal 100

Notes on changed scores:

Evaluator Form

Tongass Land Management Plan Revision -- Panel Assessments

March 27-28, 1997

Panel Name: Wolf

Evaluator: 2

Outcomes	Alternative 1		Alternative 2		Alternative 5		Alternative 9		Alternative 9 '		Alternative 10		Alternative 11		Historical	
	before	after	before	after	before	after	before	after	before	after	before	after	before	after	before	after
I	100	100	10	0	90	80	0	0	0	0	100	90	100	100	100	100
II	0	0	60	50	10	20	40	30	40	30	0	10	0	0	0	0
III	0	0	30	50	0	0	60	70	60	70	0	0	0	0	0	0
IV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Did not feel comfortable to rate ☐

Totals of outcomes must equal 100

Notes on changed scores:

Evaluator Form

Tongass Land Management Plan Revision -- Panel Assessments

March 27-28, 1997

Panel Name: Wolf

Evaluator: 3

Outcomes	Alternative 1		Alternative 2		Alternative 5		Alternative 9		Alternative 9'		Alternative 10		Alternative 11		Historical	
	before	after	before	after	before	after	before	after	before	after	before	after	before	after	before	after
I	70	80	55	50	65	65	55	50	55	50	55	55	60	55	65	75
II	10	5	15	20	15	15	15	25	15	25	15	15	15	20	15	10
III	5	5	20	20	10	10	20	10	20	10	20	20	15	15	10	5
IV	10	5	5	5	5	5	5	10	5	10	5	5	5	5	5	5
V	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Did not feel comfortable to rate ☐

Totals of outcomes must equal 100

Notes on changed scores:

Evaluator Form

Tongass Land Management Plan Revision -- Panel Assessments

March 27-28, 1997

Panel Name: Wolf

Evaluator: 4

Outcomes	Alternative 1		Alternative 2		Alternative 5		Alternative 9		Alternative 9 '		Alternative 10		Alternative 11		Historical	
	before	after	before	after	before	after	before	after	before	after	before	after	before	after	before	after
I	90	90	10	10	10	30	0	0	0	0	10	30	30	30	90	90
II	10	10	50	50	70	40	0	30	0	30	20	40	60	40	10	10
III	0	0	20	40	30	30	40	60	40	60	50	30	10	30	0	0
IV	0	0	10	0	0	0	30	10	30	10	10	0	0	0	0	0
V	0	0	10	0	0	0	30	0	30	0	10	0	0	0	0	0
Total	100	100	100	100	110	100	100	100	100	100	100	100	100	100	100	100

Did not feel comfortable to rate ☐

Totals of outcomes must equal 100

Notes on changed scores:

Appraisal of the Contribution of Alternative Features to Maintaining Wildlife Habitat--AFTER

Panel Name: Wolf

Evaluator: 1

FEATURE	CONCEPTUAL	AS APPLIED IN ALTERNATIVE						
Old-growth Strategy		1	2	5	9	9'	10	11
Small Reserves	0	0	0	0	0	0	0	0
Medium Reserves	+	+	-	+	-	-	+	++
Large Reserves	++	+	-	+	-	-	++	++
Semi-remote Recreation Areas	+	++	+	+	--	--	+	+
Legislated Conservation Areas	+	+	+	+	+	+	+	+
Small Island Protection	0	0	0	0	0	0	0	0
Deer Winter Range	+	+	-	+	-	-	-	-
Other Non-development Areas /1/	+	+	-	0	-	-	0	+
Overall Strategy	+	++	-	-	-	-	-	+
Mixed Management Strategy								
Acres Harvested	-	++	-	+	-	-	-	+
Rotation Length /2/	300>200>100	++	-	+	-	-	-	-
Primary Harvest Method /3/	0	0	0	0	0	0	0	0
VCU Harvest Thresholds	+	0	-	+	-	-	-	-
Mix of Harvest Methods	0	0	0	0	0	0	0	0
% Old growth Retained /4/	++	++	-	+	-	-	-	+
Riparian Options /4,5/	+	0	0	0	0	0	0	0
Beach Buffer /1,6/	+	+	-	+	-	-	-	+
Estuary Buffer /1,6/	0	0	0	0	0	0	0	0
Brown Bear Feeding Areas	0	0	0	0	0	0	0	0
Road	-	-	-	-	-	-	-	-
Overall Strategy	+	+	-	-	.-	-	-	-
Biological Evaluations /7/	0	0	0	0	0	0	0	0
"Firmness" of S&Gs	+	+	-	+	-	-	-	-
Access mgmt	.+	+	-	-	-	-	-	-

Ratings of the contribution of the feature to maintaining wildlife habitat

0 : Feature Is Neutral
DK : Don't Know
+ : Important Positive Feature
++ : Critical Feature
- : Detrimental
-- : Very Detrimental
> : More Than
< : Less Than
= : Comparable
NA : Not Applicable

/1/ Includes wild/scenic rivers, remote recreation areas, municipal watersheds, research natural areas, etc.
/2/ In the conceptual column, consider using "<, > or =" for different rotation lengths (e.g.., 100 years, 200 years, 300 years).
/3/ In the conceptual column, consider using "<, > or =" for different methods (e.g., evenaged, unevenaged, two-aged).
/4/ Include consideration of their "contribution" towards connectivity.
/5/ In the conceptual column, consider using "<, > or =" for the different options (i.e., options 1, 2, 2A, 3, TTRA, BMPs).
/6/ In the conceptual column, consider using "<, > or =" for different buffer widths (i.e., none, 0-500', 500-1,000').
/7/ New ones to be triggered for small mammals considered to be sensitive.

Appraisal of the Contribution of Alternative Features to Maintaining Wildlife Habitat--AFTER

Panel Name: Wolf

Evaluator: 2

FEATURE	CONCEPTUAL	AS APPLIED IN ALTERNATIVE						
Old-growth Strategy		1	2	5	9	9'	10	11
Small Reserves	0	0	0	0	0	0	0	0
Medium Reserves	+	+	--	-	--	--	++	++
Large Reserves	++	+	--	-	--	--	++	++
Semi-remote Recreation Areas	+	+	+	+	--	--	+	+
Legislated Conservation Areas	+	+	+	+	+	+	+	+
Small Island Protection	0	0	0	0	0	0	0	0
Deer Winter Range	+	0	0	+	0	0	0	0
Other Non-development Areas	+	++	+	+	-	-	+	+
Overall Strategy	++	++	-	-	-	-	++	++
Mixed Management Strategy								
Acres Harvested	-	++	0	+	-	-	0	+
Rotation Length /2/	0	0	0	0	0	0	0	0
Primary Harvest Method /3/	0	0	0	0	0	0	0	0
VCU Harvest Thresholds	+	0	0	+	0	0	0	0
Mix of Harvest Methods	0	0	0	0	0	0	0	0
% Old growth Retained /4/	++	++	-	-	-	-	++	++
Riparian Options /4,5/	0	0	0	0	0	0	0	0
Beach Buffer /1,6/	+1000>500	++	+	++	-	-	+	++
Estuary Buffer /1,6/	0	0	0	0	0	0	0	0
Brown Bear Feeding Areas	0	0	0	0	0	0	0	0
Road	-	-	-	-	-	-	-	-
Overall Strategy	++	++	-	-	-	-	+	+
Biological Evaluations /7/	NA							
"Firmness" of S&Gs	NA							
Other (roads and access mgmt)	+	+	+	+	-	-	+	+

Ratings of the contribution of the feature to maintaining wildlife habitat

0	**: Feature is Neutral**
DK	**: Don't Know**
+	**: Important Positive Feature**
++	**: Critical Feature**
-	**: Detrimental**
--	**: Very Detrimental**
>	**: More Than**
<	**: Less Than**
=	**: Comparable**
NA	**: Not Applicable**

/1/ Includes wild/scenic rivers, remote recreation areas, municipal watersheds, research natural areas, etc.

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/3/ In the conceptual column, consider using "<, > or =" for different methods (e.g., evenaged, unevenaged, two-aged).

/4/ Include consideration of their "contribution" towards connectivity.

/5/ In the conceptual column, consider using "<, > or =" for the different options (i.e., options 1, 2, 2A, 3, TTRA, BMPs).

/6/ In the conceptual column, consider using "<, > or =" for different buffer widths (i.e., none, 0-500', 500-1,000').

/7/ New ones to be triggered for small mammals considered to be sensitive.

Appraisal of the Contribution of Alternative Features to Maintaining Wildlife Habitat--AFTER

Panel Name: Wolf

Evaluator: 3

FEATURE	CONCEPTUAL	AS APPLIED IN ALTERNATIVE						
Old-growth Strategy		1	2	5	9	9'	10	11
Small Reserves	0	0	0	0	0	0	0	0
Medium Reserves	+	0	+	+	+	+	+	+
Large Reserves	++	0	++	++	++	++	++	++
Semi-remote Recreation Areas	++	0	+	+	+	+	+	+
Legislated Conservation Areas	++	0	+	+	+	+	+	+
Small Island Protection	0	0	0	0	0	0	0	0
Deer Winter Range	++	+	0	+	0	0	0	0
Other Non-development Areas	++	+	+	+	+	+	+	+
Overall Strategy	+	+	+	+	+	+	+	+
Mixed Management Strategy								
Acres Harvested	++ less > more	0	-	-	--	--	-	-
Rotation Length /2/	200>100	+	-	+	-	-	-	-
Primary Harvest Method /3/	0	0	0	0	0	0	0	0
VCU Harvest Thresholds	DK	DK	DK	DK	DK	DK	DK	DK
Mix of Harvest Methods	0	0	0	0	0	0	0	0
% Old growth Retained /4/	++	+	-	-	-	-	-	-
Riparian Options /4,5/	0	0	0	0	0	0	0	0
Beach Buffer /1,6/	++	+	-	+	-	-	-	+
Estuary Buffer /1,6/	0	0	0	0	0	0	0	0
Brown Bear Feeding Areas	0	0	0	0	0	0	0	0
Road	-	0	-	-	-	-	-	-
Overall Strategy	+	+	+	+	+	+	+	+
Biological Evaluations /7/	0	0	0	0	0	0	0	0
"Firmness" of S&Gs	DK	DK	DK	DK	DK	DK	DK	DK
Other - road access mgmt	+	+	+	+	+	+	+	+

Ratings of the contribution of the feature to maintaining wildlife habitat

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- **++ : Critical Feature**
- **- : Detrimental**
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/6/ In the conceptual column, consider using "<, > or =" for different buffer widths (i.e., none, 0-500', 500-1,000').

/7/ New ones to be triggered for small mammals considered to be sensitive.

Appraisal of the Contribution of Alternative Features to Maintaining Wildlife Habitat--AFTER

Panel Name: Wolf

Evaluator: 4

FEATURE	CONCEPTUAL	AS APPLIED IN ALTERNATIVE						
Old-growth Strategy		1	2	5	9	9'	10	11
Small Reserves	+	0	-	0	-	-	+	+
Medium Reserves	+	-	-	+	-	-	+	++
Large Reserves	++	-	--	+	-	-	+	++
Semi-remote Recreation Areas	+	++	+	+	-	-	+	+
Legislated Conservation Areas	++	+	+	+	+	+	+	+
Small Island Protection	0	0	0	0	0	0	0	0
Deer Winter Range	++	++	-	+	-	-	-	-
Other Non-development Areas /1/	+	+	+	+	+	+	+	+
Overall Strategy								
Mixed Management Strategy								
Acres Harvested	less > more	+	--	-	--	--	-	-
Rotation Length /2/	+>300	-	-	-	-	-	-	-
Primary Harvest Method /3/	0	0	0	0	0	0	0	0
VCU Harvest Thresholds	+	0	-	+	-	-	-	-
Mix of Harvest Methods	0	0	0	0	0	0	0	0
% Old growth Retained /4/	++	++	-	+	-	-	-	-
Riparian Options /4,5/	+	+	+	+	+	+	+	+
Beach Buffer /1,6/	+>1000>500	+		+			+	++
Estuary Buffer /1,6/	+	+	+	+	-	-	+	+
Brown Bear Feeding Areas	0	0	0	0	0	0	0	0
Road & Access Management	+	+	+	+	-	-	+	+
Overall Strategy	++	+	-	+	-	-	+	+
Biological Evaluations /7/								
"Firmness" of S&Gs	0	DK	DK	DK	DK	DK	DK	DK
Road access mgmt	+	+	-	+	-	-	+	+

Ratings of the contribution of the feature to maintaining wildlife habitat

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