

# Chapter 2

## Alternatives

### Introduction

This chapter describes and compares the alternatives considered by the Forest Service for the Logjam Timber Sale Project. It includes a discussion of how alternatives were developed, an overview of mitigation measures, monitoring and other features common to all alternatives, a description and map of each alternative considered in detail, and a comparison of these alternatives focusing on the key, or significant issues identified in the interdisciplinary process. Alternative 2 is identified as the preferred alternative. Chapter 2 presents the alternatives in comparative form and is intended to sharply define the issues and provide a clear basis for choice among options by the decision maker (40 CFR 1502.14). For a complete discussion of the effects used to compare alternatives, consult Chapter 3, “Affected Environment and Environmental Consequences.”

### Alternative Development

An alternative is a set of activities designed to accomplish the goals described in the Purpose and Need section of Chapter 1. The Proposed Action (Alternative 2) is one of other possible approaches to accomplishing these goals by harvesting timber in the project area. It was developed during the early planning phase of this project. The planning phase included completing a Logging System and Transportation Analysis (LSTA) for the project area. During this analysis, the suitable timber in the project area was divided into logical harvest settings. These groups of settings were used to create the harvest unit pool. In addition, the roads needed to access the harvest unit pool were mapped. These units and the roads were surveyed between 2001 and 2007. During this field verification, the shape of the units and the locations of roads were modified to reflect on-the-ground conditions and a number of units and roads were dropped because they were determined to be inconsistent with the Forest Plan.

Forest Service resource specialists make up the Interdisciplinary Team (IDT). The IDT considered various alternatives to the Proposed Action to provide a reasonable range of options for meeting the purpose and need of this project. These alternatives were designed to address the issues identified during scoping (see Chapter 1). They were also designed to meet Forest Plan Standards and Guidelines (2008 Tongass Land and Resource Management Plan) and applicable laws. Within this range, various combinations of alternatives can be considered in determining the selected alternative.

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### Alternatives Considered but Eliminated From Detailed Analysis

Several alternatives were considered during the planning process, but have not been included in the Draft EIS for detailed study. These are described briefly below, along with the reasons for not considering them further.

While the roadless concerns are analyzed as a significant issue, an alternative designed to address roadless concerns was considered, but eliminated as an alternative considered in detail. As this issue is addressed in Alternatives 3, 4 and 5 and each of these alternatives propose no harvest in Inventoried Roadless Areas (IRAs), therefore an Alternative was not considered solely to address IRAs.

A “no roads” alternative was considered to address the concerns of new roads; however, such an alternative would not meet the purpose and need for project action because constraining a timber sale to the existing road system would have not been able to produce economic sawtimber that would significantly contribute to timber demand in Southeast Alaska. Given the amount of timber available in the project area which could be accessed with roaded alternatives, an unroaded alternative would have necessitated harvest in other project areas.

Additionally, an alternative was considered which used goshawk and marten standards and guidelines as specified in the 1997 Forest Plan. This alternative was eliminated from detailed study because with the 2008 Forest Plan the goshawk and marten standards and guidelines no longer apply to the project area in the same manner as they did in the 1997 Forest Plan.

### Alternatives Considered in Detail

#### Alternative 1

If selected, no new Forest Service harvest activities would be initiated as a result of this decision. Current and on-going management activities would continue. Vegetation management activities such as pre-commercial thinning (including riparian and wildlife thinning) would continue. Changes might occur through current management direction (i.e., road maintenance), natural processes, or other management decisions in the future. This alternative (see Map 3 at the end of this chapter) does not preclude timber harvesting from other areas at this time or from the project area at some time in the future.

This alternative provides a foundation for describing and comparing the magnitude of environmental changes associated with the action alternatives against those changes that occur with no new federal action at this time.

The CEQ regulations require a no action alternative ((40 C.F.R. §§1508.9(b), 1508.25(b)(2)) and 40CFR 1502.14 (d)). This alternative unlike the following action alternatives does not meet the Purpose and Need for this project.

#### Alternative 2

**Objectives:** Alternative 2 (see Map 4 at the end of this chapter) seeks to maximize timber volume in this entry. Alternative 2 meets the Purpose and Need of this project.

**Alternative Design Criteria:** 1) Meet Forest Plan Standards and Guidelines; 2) Two-aged stand Management using a Helicopter harvest system; 3) Even-age Stand Management using conventional harvest systems; and 4) Provide the maximum timber volume for large and small sales programs

**Timber Harvest:** This alternative includes clearcutting (even-age management) using helicopter, conventional cable, and shovel logging systems to harvest approximately 75 MMBF of timber on about 3,703 total acres. The subset of helicopter harvest in this alternative would produce approximately 17 MMBF of timber from about 1,284 acres. For helicopter yarding areas, two-age management, using the clearcutting with reserves as a silvicultural prescription, with either 50% basal area retention, or 75% basal area retention was selected. This alternative includes approximately 99 acres of harvest within Inventoried Roadless Areas (IRAs) categorized by the Forest Plan as lower value inventoried roadless areas which remains in Phase 1 of the Adaptive Management Strategy (see Chapter 1, Timber Sale Program Adaptive Management Strategy).

**Roads:** This alternative proposes approximately 29 miles of road construction, which includes: 8 miles of new NFS road and approximately 21 miles of temporary road; all new construction would be from the existing road system; all newly constructed NFS road would be stored after timber haul and associated activities are complete; all temporary roads would be decommissioned after timber haul is complete; of the 21 miles of temporary road construction, approximately 3.2 miles of road would be reconstructed.

### Alternative 3

**Objectives:** This alternative (see Map 5 at the end of this chapter) addresses effects related to road construction and stream crossings. Alternative 3 also addresses cumulative effects of past harvest on stream flow. Alternative 3 meets the Purpose and Need of this project.

**Alternative Design Criteria:** 1) design units to further reduce risk of sediment generation (above and beyond Forest Plan Standards and Guidelines). Specifically, buffer widths were increased in some areas and logging systems were changed to further minimize soil disturbance; 2) minimize road construction where economically feasible in order to reduce site specific water quality (sediment) concerns; 3) minimize harvest in watersheds where past harvest exceeds or is approaching 20 percent of watershed area in the past 30 years; and 4) minimize the number of new road-stream crossings.

**Timber Harvest:** This alternative includes clearcutting using helicopter, conventional cable and conventional shovel logging systems to harvest approximately 52 MMBF of timber on about 2,708 total acres. The subset of helicopter harvest in this alternative would produce approximately 16 MMBF of timber from about 1,153 acres. For helicopter yarding areas, two-age management, using clearcutting with reserves as a silvicultural prescription, with either 50% basal area retention or 75% basal area retention was selected. This alternative does not include harvest within IRAs.

**Roads:** This alternative proposes construction of approximately 15 miles of road construction, which includes: 2 miles of new NFS road and approximately 13 miles of temporary road. All new construction would be from the existing road system; all newly constructed NFS road would be stored after timber haul and associated activities are complete; and, all temporary roads would be decommissioned after timber haul is complete.

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### Alternative 4

**Objectives:** The primary objective of Alternative 4 (see Map 6 at the end of this chapter) minimizes the fragmentation of wildlife habitat. This alternative maintains the current roadless characteristics (Issue 4) of the Inventoried Roadless Areas (IRAs). Alternative 4 emphasizes wildlife habitat and travel corridors while providing opportunities for timber harvest and road construction (Issue 2). It minimizes the effects on wildlife by reducing the amount of timber harvest acres and miles of road construction. Alternative 4 meets the Purpose and Need of this project.

**Alternative Design Criteria:** 1) Reduce harvest where needed to maintain travel corridors/dispersal routes; 2) Reduce harvest in areas of known sensitive plant populations; 3) Emphasize timber harvest opportunities on the existing road system that do not require extensive new road construction; 4) Eliminate units from IRA; 5) Reduce overall harvest in the project area where appropriate to minimize effects on wildlife population; 6) Protect isolated Old-Growth habitat; 7) Protect areas of high wildlife use.

**Timber Harvest:** This alternative includes clearcutting using helicopter, conventional cable and conventional shovel logging systems to harvest approximately 38 MMBF on about 1,694 total acres. The subset of helicopter harvest in this alternative would produce approximately 5 MMBF from about 412 acres. For helicopter yarding areas, two-age management, using the clearcutting with reserves as a silvicultural prescription with either 50% basal area retention, or 75% basal area retention, was selected. This alternative does not include harvest within IRAs.

**Roads:** This alternative proposes construction of approximately 13 miles of road, which includes: 3 miles of new NFS road and approximately 10 miles of temporary road; all new construction would be from the existing road system; all newly constructed NFS road would be stored after timber haul and associated activities are complete; all temporary roads would be decommissioned after timber haul is complete; and, approximately 0.8 miles of road would be reconstructed.

### Alternative 5

**Objectives:** Alternative 5 (see Map 7 at the end of this chapter) emphasizes timber sale economics while maximizing total volume harvested (Issue 3). This alternative emphasizes economical timber harvest, by minimizing road construction and maximizing cable and shovel clearcut settings. This alternative is also designed to maintain current roadless characteristics in IRAs in same the manner of Alternative 4. Alternative 5 meets the Purpose and Need of this project.

**Design Criteria:** 1) Maximize volume recovery on new road construction by excluding those roads with the lowest recovery; 2) Use two-aged silvicultural prescriptions in helicopter units to meet resource objectives including economics; 4) Maximize average stumpage rates for the project by excluding units with high logging costs and low pond log values; 6) Provide economically viable timber for small and mid-size timber operators; 7) Include harvest units of varying size and species composition to provide suitable timber sale offerings to both small and mid-size businesses.

**Timber Harvest:** This alternative includes clearcutting using helicopter, conventional cable, and conventional shovel logging systems to harvest approximately 68 MMBF on about 3,348 total acres. The subset of helicopter harvest in this alternative would produce 12 MMBF from about 1,220 acres. For helicopter yarding areas, two-age management, using the clearcutting with reserves as a silvicultural prescription, with either 50% basal area retention, or 75% basal area retention, was selected. This alternative does not include harvest within IRAs.

**Roads:** This alternative proposes construction of approximately 18 miles of total road construction which includes: 4 miles of new NFS road and approximately 14 miles of temporary road; all new construction would be from the existing road system; all newly constructed NFS road would be stored after timber haul and associated activities are complete; all temporary roads would be decommissioned after timber haul is complete; and, approximately 2.8 miles of road would be reconstructed.

### **Activities, Design Elements and Mitigation Common to all Action Alternatives**

All alternatives are consistent with the Forest Plan. All applicable Forest Plan Standards and Guidelines have been incorporated into the design of the proposed units and alternatives. While some alternatives have been designed to provide a greater measure of protection than is required by the Forest Plan for some resources, such as spreading out units to reduce the impacts to the sensitive watersheds (see Alternative 4), all alternatives were designed to meet Forest Plan Standards and Guidelines for these and all other resources. Additional direction comes from applicable laws and Forest Service manuals and handbooks. Site-specific descriptions and resource considerations for each potential harvest unit are included as unit cards in Appendix B of this Draft EIS. These unit cards serve as the prescription or design narrative for implementation of this project after the NEPA process is complete. Design elements for the construction of new roads and reconditioning needed for existing NFS roads are also described in detail in Appendix C, Road Cards.

### **Marine Access Facility**

A Marine Access Facility (MAF) is an area used by humans to transfer items from land to saltwater or vice versa, that contains a structure such as a mooring buoy, dock, Log Transfer Facility (LTF), boat ramp, or a combination of these. A LTF is used to transfer logs and timber products from land-based transportation forms to water-based transportation forms (or vice-versa). These facilities are often used for the movement of equipment needed for logging and road building. Three existing log transfer facilities (LTFs) may be utilized to service the timber sale. These are located in: Naukati, Coffman Cove and Thorne Bay.

### **Old-growth Habitat Reserves (OGRs)**

All small Old-growth Habitat Reserves were reviewed Forest-wide for the 2008 Forest Plan. The decision was made during the Forest Plan amendment for the small OGRs in the project area.

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### Sort yards

The Forest Service has a log sorting facility at Thorne Bay which may be used for this project.

### Project-specific Mitigation

The analysis documented in this DEIS discloses the possible adverse impacts that may occur from implementing the actions proposed under each alternative. Measures have been formulated to mitigate or reduce these impacts. These measures were guided by the direction from the Tongass Forest Plan previously described (in this chapter and in Chapter 1). Resource specialists from the IDT use on-the-ground inventories, computer (GIS) data, and aerial photographs to prepare the documents called unit cards (Appendix B) for each harvest unit in the unit pool for the project. Cards are also prepared for each segment of road (Appendix C). Resource specialists have included site specific concerns on the cards and have described how these concerns would be mitigated (if not completely avoided) in the design of each unit and road segment. Resource concerns and mitigation measures may be refined further during final layout, when specialists have one more opportunity to refine their unit and road card recommendations.

### Other Mitigation of Adverse Effects

Windthrow of standing timber adjacent to harvest units is a problem in Southeast Alaska. Windthrow affects riparian areas that is otherwise buffered for fish habitat protection, in class I, II, and III streams. In addition to mitigation measures found on unit and road cards in Appendices B and C, each harvest prescription, if implemented would apply a RAW buffer (Reasonable Assurance of Windfirmness) to each Forest Plan minimum buffer in class I, II, and III streams. This would provide additional protection to Riparian Management Areas (RMAs) that may be affected by windthrow. This mitigation would be applied with interdisciplinary consultation during sale layout on a case-by-case basis; because some areas would benefit from these additional buffers, while others would have no need of this additional measure. The need for this additional measure is most often apparent at the time of implementation.

Applicable Forest Plan, Standards and Guidelines, and the “Best Management Practices” (BMP’s) are used to meet the requirements of the Clean Water Act, and project-specific mitigation measures are identified on the harvest unit and road cards (Appendices B and C). Additionally, there would be a mitigating action to reduce the risk of increasing the invasive plant problem; all harvest equipment brought to Prince of Wales from other locations would be washed before entering the project area. All erosion control and revegetating devices, such as mulches fill or seed, should be certified weed-free.

## Best Management Practices and Monitoring

### Best Management Practices

Best management practices (BMPs) are methods, measures, or practices to prevent or reduce water pollution, including but not limited to structural and non-structural controls, operation and maintenance procedures, other requirements and scheduling and distribution of activities (FSH 2509.22, Region 10 Soil and Water Conservation Handbook). They are the result of extensive efforts between the Forest Service and the State of Alaska to identify practices that will ensure that timber harvest activities minimize soil erosion and protect aquatic habitat.

BMPs as applied to unit harvest can be found in Appendices B and C.

### Monitoring

Monitoring activities can be divided into Forest Plan monitoring, routine implementation monitoring, and project-specific monitoring. These are described below.

#### Forest Plan Monitoring

Three levels of monitoring are incorporated into Forest Plan monitoring:

- Implementation monitoring and evaluation is used to determine whether standards and guidelines are implemented.
- Effectiveness monitoring and evaluation is used to determine whether standards and guidelines are achieving objectives, whether objectives are achieving goals, and ultimately whether there are significant changes in productivity of the land as a result.
- Validation monitoring and evaluation is used to examine whether the assumptions and predicted effects used to formulate the plan are accurate.

As part of Forest Plan monitoring, samples will be taken within the Logjam project area. These results can be used to help answer questions regarding the implementation and effectiveness of mitigation within the project area.

#### Routine Implementation Monitoring

Routine implementation monitoring assesses whether the project was implemented as designed; and whether or not it complies with the Forest Plan. Planning for routine implementation monitoring began with the preliminary design of harvest units and roads (see previous discussion of mitigation). The unit and road cards (Appendices B and C), and unit silvicultural prescriptions, will be the basis for determining whether recommendations were implemented for various aspects of the Logjam project.

Routine implementation monitoring is part of the administration of a timber sale contract. The sale administrators and road inspectors ensure that the prescriptions contained on the unit and road cards, and the unit silvicultural prescriptions, are incorporated into contract documents; they then monitor performance relative to contract requirements. Input by resource staff specialists, such as fisheries biologists, soil scientists, hydrologists and engineers, is regularly requested during this implementation monitoring process. These specialists provide technical advice when questions arise during project implementation.

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Tongass National Forest annually conducts a review of BMP implementation and effectiveness. The results of this and other monitoring are summarized in a Tongass National Forest Annual Monitoring and Evaluation Report. This report provides information about how well the management direction of the Forest is being carried out, and measures the accomplishment of anticipated outputs, activities and effects.

### **Project-specific Effectiveness Monitoring**

Effectiveness monitoring is designed to determine how well specific design features or mitigation measures work in protecting natural resources and their beneficial uses. The Forest Service will continue to monitor federal subsistence permits for take of salmon and steelhead to protect fish populations. Riparian thinning monitoring would take place to determine successful thinning prescriptions for increasing the sizes of trees in riparian areas over time (short-term versus long-term). Monitoring for prescription implementation would take place through required reforestation surveys and harvest inspection. Monitoring second growth condition class would take place through periodic field surveys and treatment needs assessment.

An Engineering Representative or Contracting Officer Representative monitors work progress and effectiveness during the construction, or when the road is completed or a unit is closed. The Forest Service will evaluate a sample of roads during their annual monitoring review.

Most monitoring elements involve Best Management Practices discussed on unit and road cards.

The three types of monitoring listed above are used to determine if the measures were implemented and if they are effective in mitigating the effects of the project or if they need to be revised. Information derived from monitoring can be used to develop improved or additional treatments to ensure that these safeguards will be effective in the future.

### **Comparison of Alternatives**

This section compares outputs, objectives and effects of the alternatives in terms of the significant issues for the Logjam Timber Sales project. The discussions of effects are summarized from Chapter 3, which should be consulted for a full understanding of these and other environmental consequences. Table 3 provides an overview comparison of information from the effects analysis in Chapter 3 relevant to key or significant issues.

Table 3. Comparison of Alternatives by Issue

Measures	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
<b>ISSUE 1—EFFECTS TO AQUATIC HABITAT</b>					
Watersheds with more than 20% basin area harvested from 1979 to present (young growth thirty years of age or younger)	Coffman Naukati Trumpeter	Coffman Naukati Logjam Trumpeter	Coffman Naukati Logjam Trumpeter	Coffman Naukati Trumpeter	Coffman Naukati Logjam Trumpeter
Total miles of new road construction	0	29	14	13	18
New Class I and II stream crossings	0	27	6	7	11
<b>ISSUE 2—WILDLIFE AND SUBSISTENCE USE</b>					
<b>Acres of POG remaining</b>					
VCU 5730 (acres)	13,712	11,637	12,139	12,773	11,867
POG acres (%)	80%	68%	70%	74%	69%
VCU 5770 (acres)	12,179	10,585	11,095	11,459	10,754
POG acres (%)	68%	59%	62%	64%	60%
Acres POG remaining in the Project Area	25,891	22,522	23,183	24,232	22,543
% change from current	0	-13%	-10%	-7%	-13%
Acres of deer winter range harvest proposed	0	487	356	286	492
% change from current	0	-12%	-9%	-7%	-12%
<b>Road density by WAA 1421</b>					
Total NFS road (miles per square mile)	1.36	1.57	1.46	1.44	1.49
Open (temporary roads and stored roads not counted) NFS roads on Forest Service lands (miles per square mile)	0.7	1.0	.89	.88	.92
<b>POG patch by size remaining</b>					
0-25 acres	196	392	305	243	354
26- 100	174	188	186	184	186
101-500	1	1	1	1	1
500+	29	32	31	29	32
<b>ISSUE 3—TIMBER SUPPLY AND SALE ECONOMICS</b>					
Sitka Spruce	0	8,540	5,899	4,352	7,837
Hemlock	0	34,378	23,818	17,552	31,663
Western Red Cedar	0	15,302	10,648	7,847	13,979
Alaska Yellow Cedar	0	7,076	4,690	3,498	6,284
Total sawlog volume (MBF)	0	65,296	45,055	33,249	59,763
Utility volume (MBF)	0	9,534	6,603	4,867	8,778
<b>Total volume (MMBF)<sup>2</sup></b>		<b>75</b>	<b>52</b>	<b>38</b>	<b>68</b>

<sup>2</sup> Numbers are rounded to the nearest MMBF

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Measures	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
<b>Acres of harvest by logging system</b>					
Cable, Even-aged Harvest(acres)	0	876	508	445	766
Shovel, Even-aged harvest (acres)	0	1,543	1,047	837	1,362
Helicopter, Two-aged harvest	0	1,284	1,153	412	1,220
Total harvest acres	0	3,703	2,708	1,694	3,348
Indicated bid value (\$)	\$0	\$1,378,399	\$1,704,881	\$1,180,007	\$2,369,005
Indicated Bid Value (\$/MBF)	\$0	\$21	\$38	\$35	\$40
<b>Miles of road construction and reconstruction</b>					
Proposed new NFS Road	0	8	2	3	4
Temporary road construction (miles)	0	21	13	10	14
Total construction (miles)	0	29	15	13	18
Road reconstruction (miles)	0	3.2	0	0.8	2.8
<b>Costs and Benefits</b>					
Logging cost \$/MBF <sup>a</sup>	\$0	\$266	\$269	\$258	\$265
Road cost \$/MBF <sup>b</sup>	\$0	\$57	\$36	\$50	\$39
Sawmilling Direct Employment (annualized job years <sup>c</sup> )	0	108 to 216	75 to 149	55 to 110	99 to 198
Logging direct employment (annualized job years)	0	151	104	77	138
Total Direct Employment (annualized job years)	0	259 to 367	179 to 253	132 to 187	237 to 336
Total Direct Income (\$ million)	\$0	\$10 to \$13.8	\$6.9 to \$9.5	\$5.1 to \$7.0	\$9.2 to \$12.6
<b>ISSUE 4—INVENTORIED ROADLESS AREAS</b>					
<b>Acres of timber harvest in Thorne River IRA #511</b>					
Harvest Acres	0	70	0	0	0
Harvest acres with impact area (600') <sup>d</sup>	0	369	13	0	13
<b>Acres of timber harvest in Sarkar IRA # 514</b>					
Harvest Acres	0	29	0	0	0
Harvest acres with impact area (600')	0	107	0	0	0
<b>Miles of new road construction in IRA</b>					
Thorne River IRA #511 (miles)	0	0.7	0	0	0
Sarkar IRA #514 (miles)	0	0.3	0	0	0
<b>Acres of IRA retaining roadless characteristics</b>					
Thorne River IRA #511	74,362	73,801	74,362	74,362	74,362
Sarkar IRA # 514	62,170	61,984	62,170	62,170	62,170

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- <sup>a</sup> Logging Cost: The harvesting and transportation costs for an operator of average efficiency.
- <sup>b</sup> Road Cost: Estimated average cost of new road construction, existing road reconstruction and maintenance.
- <sup>c</sup> Annualized jobs per MMBF based on net sawlog volume sold.
- <sup>d</sup> The 600 foot “impact area” for timber harvests is based on how the roadless inventory was completed for the 2003 Forest Plan SEIS. This added acreage around each unit accounts for impacts indirectly affecting nearby acres through sound travel, visual disturbance and possible limited access.

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