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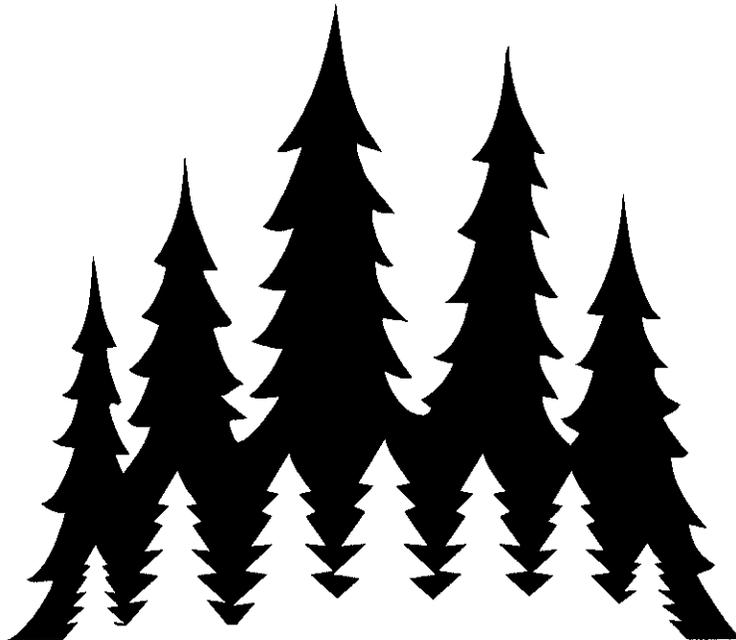
Forest  
Service

R10-MB-499  
March 2004



# **Shady Timber Sale Environmental Assessment And Finding of No Significant Impact**

**Wrangell Ranger District,  
Tongass National Forest  
Wrangell, Alaska**



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United States  
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Forest  
Service

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Tongass National Forest  
Wrangell Ranger District

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File Code: 1950

Date: March 17, 2004

Dear Reviewer:

Enclosed is your copy of the Environmental Assessment (EA) for the Shady Timber Sale project area on the Wrangell Ranger District, Tongass National Forest.

The EA proposes two action alternatives for harvesting timber and one no-action alternative. The action alternatives would make approximately 3-5 million board feet (MMBF) of timber available for harvest in the project area, and include up to 0.6 mile of new temporary road construction. Proposed harvest methods for this project is a combination of even-aged and two-aged management.

New requirements apply for participating in the Forest Service notice and comment process. On June 4, 2003 the final rule for Notice, Comment, and Appeal Procedures for National Forest System Projects and Activities (36 CFR Part 215) was published in the Federal Register and became immediately effective for all projects that had not previously distributed documents for notice and comment. There are some important changes in the final rule for persons interested in Forest Service projects.

1. No time extensions on comment periods are allowed.
2. Persons or organizations submitting comments must provide substantive comments during the 30-day comment period to have standing to appeal the final decision. Substantive comments are defined as "comments that are within the scope of the proposed action are specific to the proposed action, have a direct relationship to the proposed action and include supporting reasons for the Responsible Official to consider."
3. In order to have standing to appeal, each individual or representative from each organization submitting substantive comments must sign the comments or verify identity upon request. Individual members of an organization do not meet appeal eligibility solely on the basis of membership in an organization.
4. The new regulations no longer allow for participation of "interested parties" in the appeal process.

Please contact Jamie Roberts, Project Team Leader or Randy Hojem at 907-874-2323, if you have any questions relating to the new regulations or process for commenting on the Shady Timber Sale. Your interest in the management of the Tongass National Forest is appreciated.

Sincerely,

BRIAN RIGGERS  
Acting District Ranger



# Shady Timber Sale

## Environmental Assessment and FONSI

March 2004

United States Department of Agriculture  
Forest Service - Alaska Region

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Lead Agency: USDA Forest Service  
Tongass National Forest

Responsible Official: Chip Weber  
District Ranger  
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### **Abstract:**

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The Forest Service is proposing to implement the 1997 Tongass Land and Resource Management Plan (Forest Plan) by harvesting timber in the Shady Project Area. This Environmental Assessment describes the effects of two action alternatives for harvesting timber and one no-action alternative. Under the action alternatives, approximately 3 –5 million board feet of timber would be made available for harvest within the Shady Project Area on Wrangell Island on the Wrangell Ranger District. The key issues addressed by the alternatives and this EA include: 1) project economics, 2) wildlife habitat connectivity and travel corridors. Other issues and environmental considerations are also addressed.

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# **Shady Timber Sale**

**Finding of No Significant Impact  
(FONSI)**



# Shady Timber Sale EA

## Finding of No Significant Impact

USDA, Forest Service, Tongass National Forest  
Wrangell Ranger District, Wrangell, Alaska

### Introduction

All major Federal actions must undergo some level of environmental analysis in compliance with the National Environmental Policy Act of 1969 (NEPA). NEPA provides for three levels of analysis, with different documentation requirements for each level.

- Proposals to take major Federal actions that may significantly affect the quality of the human environment require preparation of an Environmental Impact Statement (EIS), with a decision documented in a Record of Decision (ROD).
- Routine proposed actions that fit within specific categories defined in the Forest Service Handbook (FSH 1909.15.30) may be excluded from documentation in an EIS or Environmental Assessment (EA); however, a project or case file is often required and the decision to proceed is documented in a Decision Memo (DM).
- An EA is prepared for proposed actions that are not categorically excluded from documentation, and for which the need for an EIS has not been determined. The purpose of an EA is to:
  1. Briefly provide sufficient evidence and analysis for determining whether to prepare an EIS or a Finding of No Significant Impact (FONSI).
  2. Aid an agency's compliance with the National Environmental Policy Act (NEPA) when no EIS is necessary.
  3. Facilitate preparation of an EIS when one is necessary. (40 CFR 1508.9)(a).

The decision to proceed with a project that has been analyzed in an EA is documented in a Decision Notice (DN). Often the FONSI is included within the DN.

The proposed Shady Timber Sale fits into the group of actions for which an EA is prepared. For this particular project, we are including the FONSI along with the EA for public review. The final finding will be included with the Decision Notice. A vicinity map showing the location of the Shady project area on Wrangell Island is available on page 1-2, Figure 1-1.

# FONSI

A FONSI is a document prepared by a Federal agency briefly presenting the reasons why an action will not have a significant effect on the human environment and as a result an EIS will not be prepared. It shall include the environmental assessment or a summary of it and shall note any other environmental documents related to it (1501.7(a)(5)). If the assessment is included, the finding need not repeat any of the discussion in the assessment but may incorporate it by reference (40 CFR 1508.13).

## Finding of No Significant Impact

In making a determination of “significant impact,” we use the criteria described under the term “significantly” in the Forest Service Environmental Policy and Procedures Handbook (FSH 1909.15 (05)). This term includes both context and intensity. These criteria are listed below in italics.

*1) Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.*

Chapter 3 of the Shady EA describes effects that are both beneficial (jobs) and adverse (change in habitat). While both beneficial and adverse effects are important, they are not significant, in either context or intensity, to the degree that an EIS is warranted for the Shady project.

*2) The degree to which the proposed action affects public health or safety.*

This action does not pose a substantial question of significant effect upon public health or safety. Similar past forest management activities have not resulted in significant effects upon public health or safety. All applicable Federal and State laws pertaining to public health and safety would be followed.

*3) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.*

This decision would not significantly affect any unique characteristics of the geographic area. There are no known significant effects to prime farmlands, wetlands, wild and scenic rivers, wilderness or ecologically critical areas. No roads would be built into any Inventoried Roadless Area.

*4) The degree to which the effects on the quality of the human environment are likely to be highly controversial.*

The effects on the quality of the human environment are not likely to be highly controversial. Although there is controversy over timber harvest in Southeast Alaska in general, scientific and professional experience indicates harvest can occur without significant environmental effects.

*5) The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.*

There are no known effects on the human environment that are highly uncertain or involve unique or unknown risks. The mitigations, harvest methods, and other features of this decision are either commonly used and/or present known risks.

*6) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.*

The proposed action does not set a precedent for any future actions with significant effects nor does it represent a decision in principle about a future consideration. This decision only pertains to the timber harvest within the Shady project area. Any future decisions will need to consider relevant scientific and site-specific information available at that time.

*7) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.*

There are no known significant cumulative effects between this project and other projects implemented or planned on the areas separated from the affected area of this project. Cumulative effects have been analyzed and disclosed throughout Chapter 3 of the EA.

*8) The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.*

This action would not cause the loss or destruction of significant scientific, cultural, or historical resources. There are no known cultural resource sites that would be affected by this project. A Cultural Resource Investigation culminated in a detailed report which was prepared and submitted to the State Historic Preservation Officer (SHPO) with our Heritage Program Annual Report (2002). We have determined that no known historic properties will be affected by project implementation (EA, section 3.12).

*9) The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.*

No threatened, endangered or sensitive species or their critical habitats are affected by this decision. The planning file contains the biological evaluations supporting this judgment (EA, section 3.2.6).

*10) Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.*

This action does not violate Federal, State, or local law requirements imposed for the protection of the environment, and has been reviewed by Federal and State agencies (EA, section 1.10). There are no known significant effects on civil rights, women or minorities (EA, section 3.13).

## Table of Findings

The following table is useful in displaying our rationale for a finding of no significant impact.

<b>Context – What is the effect?</b>	<b>Intensity – How big is it?</b>	<b>Reasons why this is not significant.</b>
Old growth acres are converted to second growth through even-aged harvesting.	Up to 240 acres within the 26,500 acre project area could be harvested.	240 acres is about 1.7% of the 13,840 acres of Productive Old-Growth in the project area. (EA section 3.2.2)
High, Medium and Low volume strata (volstrata) are harvested in the project area.	Up to 132 acres High volstrata Up to 89 acres Med. volstrata Up to 9 acres Low volstrata could be harvested.	2.3% of 5,761 acres of High 1.8% of 4,867 acres of Med 0.3% of 3,212 acres of Low (EA section 3.2.2; Table 3-4)
Coarse canopy acres (volume class 6 and 7) may be harvested.	Up to 10 acres of volume class 6 and 7 could be harvest.	10 acres is about 1.4% of the 723 acres of existing volume class 6 and 7 stands. (EA section 3.2.2)
Wildlife travel corridors may be affected by additional harvest in the project area.	Two Units (60 and 63) are located adjacent to an identified wildlife travel corridor between two small Old-Growth Reserves (OGRs).	Beach buffers, riparian management areas, location of small OGRs, and retention within units all combine to provide sufficient travel corridors.(EA section 3.2.3)
Harvesting trees using an even-aged method can contribute to forest fragmentation.	Up to 16 acres of interior old-growth could be changed to second growth and 18 acres changed to edge forest (adjacent to an opening).	4,757 of the existing 4,791 acres of interior old-growth (99.3%) would remain as interior old-growth. (EA section 3.2.4)
High-value goshawk nesting habitat could be reduced.	Up to 120 acres of low elevation (<800 ft.), high volume strata could be harvested.	120 acres is 4.2% of the 2,957 acres of existing high-value goshawk nesting habitat. (EA section 3.2.8; Table 3-6)
High-value marten habitat could be reduced.	Up to 132 acres of low elevation (<1500 ft.), high volume strata could be harvested.	132 acres is 2.5% of the 5,420 acres of existing high-value marten habitat. (EA section 3.2.8; Table 3-6)
Marbled murrelet nesting habitat could be reduced.	Up to 222 acres of medium and high volume strata could be harvested.	222 acres is 2.1% of the 10,732 acres of existing marbled murrelet nesting habitat. (Table 3-6)
High-value deer winter range could be reduced in the project area and on Wrangell Island.	Up to 7 acres of high-value deer winter range could be converted to second growth.	7 acres is 3.1% of the 231 acres of high-value winter range in the project area, and 0.2% of the 3,400 acres on Wrangell Island (EA section 3.2.9; Table 3-7)

Context – What is the effect?	Intensity – How big is it?	Reasons why this is not significant.
Habitat capability for deer could be reduced	Habitat capability could be reduced to 598 deer within the project area.	This would be a reduction of 9 deer, or 1.5% below the current habitat capability of 607 deer. (Table 3-8)
Cumulative effects of past, present and future activities under the current Forest Plan could lead to a reduction in deer available for subsistence and non-subsistence harvest.	Implementation of the Forest Plan over the next 100 years, in conjunction with other factors, could lead to the possibility of a restriction on subsistence deer harvest.	Restrictions are modeled to occur by 2095, not in the near future. A subsistence hearing will be held for this project during the EA comment period. (EA section 3.3)
Management activities may affect the scenic resource, particularly views from travel routes.	No harvest will be visible from marine travel routes. All units will be visible from either the Fools Inlet Road or the Long Lake Road.	The Land Use Designation is Timber Management, where harvest units are expected to be visible. All units will meet the Modification Visual Quality Objective (VQO) (EA section 3.5)
Inventoried Roadless Areas exist within the project area.	No timber harvest or road construction will occur in any Inventoried Roadless Area.	The three Inventoried Roadless Areas that are partially within the project area will remain unchanged. (EA section 3.6.3)
Temporary roads may be constructed to facilitate timber harvest.	Up to 0.6 mile of temporary road may be constructed.	All temporary roads will be closed following harvest. (EA sections 2.3 & 2.4)
Some timber harvest may occur on forested wetlands.	Up to 53 acres of forested wetland could be harvest.	53 acres is 0.4% of the 12,220 acres of forested wetland mosaic in the project area. (EA section 3.7)
Some timber harvest may occur on slopes in excess of 72%.	Up to 20 acres of harvest could occur on slopes greater than 72%.	No impacts to adjacent resources (Class I or II streams, or roads) are expected to result from potential mass failures. (EA section 3.8)
Cumulative harvest within a watershed will increase.	Cumulative % of watershed harvested in West Fools would be 7.9% and in East Fools would be 10%	The cumulative harvest is well below the threshold of concern, which is generally 20%. (EA section 3.9)



# **Shady Timber Sale**

## **Environmental Assessment**



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# **Chapter 1**

## **Purpose and Need**



# Chapter 1

## Purpose and Need

### Introduction

#### Document Structure

The Forest Service has prepared this Environmental Assessment (EA) on the potential effects of timber harvest and road building in the Shady project area in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized as follows:

**Finding of No Significant Impact (FONSI):** The FONSI briefly presents the reasons why the proposed project will not have a significant effect on the human environment, thus an environmental impact statement will not be prepared.

**Chapter 1** provides the purpose and need for the proposed project, the public issues surrounding the action, and other introductory information. It also discusses how the Shady Timber Sale relates to the Forest Plan.

**Chapter 2** describes and compares the alternatives for the proposed activities. These alternatives were developed based on issues raised by the public, the Interdisciplinary Team and other agencies.

**Chapter 3** describes the existing environment and predicts environmental effects likely to occur with implementation of the alternatives. These effects include both direct and indirect impacts of each alternative on the human and natural environment for each resource issue. Potential cumulative impacts of reasonably foreseeable or similar actions are also disclosed.

**Consultation and Coordination** section provides a list of preparers and agencies consulted during the development of the Environmental Assessment.

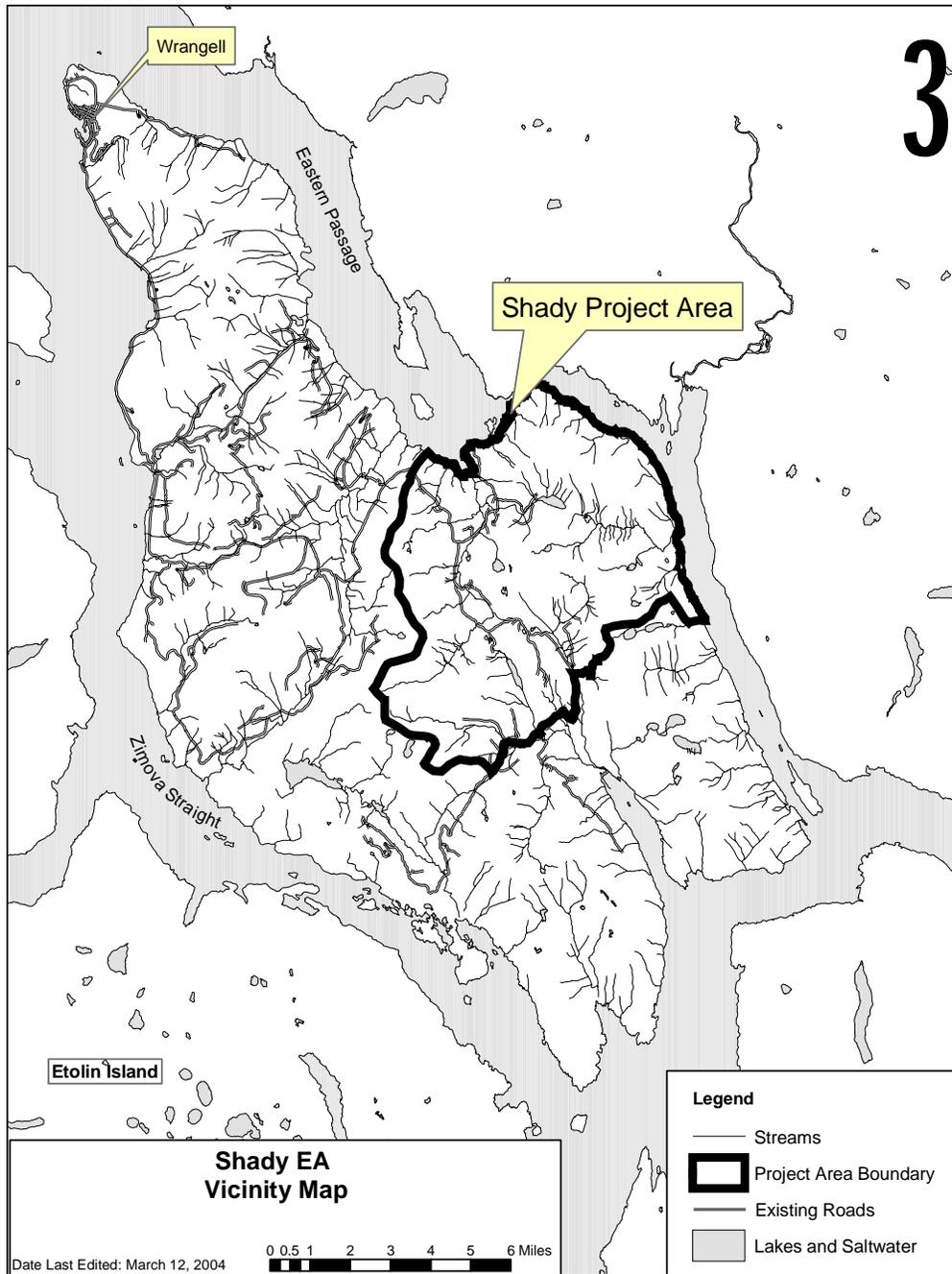
The **appendices** include supporting information including the list of preparers, glossary, references cited, and unit cards.

Additional documentation, including more detailed analyses of project-area resources, can be found in the Shady planning record located at the Wrangell Ranger District Office, Tongass National Forest in Wrangell, Alaska.

The Forest Plan can be viewed at the following website: <http://www.fs.fed.us/r10/tlmp>.

# 1 Purpose and Need

Figure 1-1 Vicinity Map of Wrangell Island showing the Shady Project Area



## Project Area

The Shady project area is located on Wrangell Island, within the boundaries of the Wrangell Ranger District, Tongass National Forest, Alaska (see Figure 1-1). The project area includes approximately 26,500 acres of National Forest land, of which 7,350 acres are considered suitable for timber management. It lies directly adjacent to State of Alaska selected lands (3,156 acres) around Earl West Cove. The project area is located along Road 6270 on Wrangell Island and includes portions of Value Comparison Units (VCUs) 478, 480, 504, and 505.

## Proposed Action

The Wrangell Ranger District proposes to harvest approximately 5 million board feet (MMBF) of timber from the Shady project area. Logging will be accomplished using a cable system. The proposed action will construct 0.6 mile of temporary road to facilitate access. Timber harvested could be hauled to mills on Wrangell Island, or to one of two existing Log Transfer Facilities (LTFs) on the island, either Earl West Cove or Pats Creek. If approved, harvest activities are expected to begin in FY 2006.

## Purpose and Need for Action

The purpose and need for this project is:

- To manage suitable timber lands to achieve Forest Plan goals and objectives in order to move from the existing condition toward the desired forest conditions prescribed for the Land Use Designations (LUDs), (Forest Plan, Chapter 2);
- To assist in providing a continuous wood supply to meet society's needs; and
- To contribute to the job market and the over-all economy of Southeast Alaska.

The Shady Timber Sale is included as part of the overall Tongass National Forest timber sale program. A full discussion on the reasons and timing for scheduling timber sales on the Tongass National Forest is included in the project planning record.

# 1 Purpose and Need

## Project Area Desired Future Condition

The existing condition of the project area is described under “Environment” in each resource section in Chapter 3.

The Forest Plan uses Land Use Designations (LUDs) to guide management of the Tongass National Forest. Each designation provides for a unique combination of activities, practices and uses. LUDs for the Shady project area include Timber Production (74 percent), Scenic Viewshed (14 percent), and Old-Growth Habitat (12 percent). Chapter 3 of the Forest Plan describes the desired conditions of the various LUDs within the project area. Since we are only proposing management activities within the Timber Production LUD, it is summarized below.

Timber Production – Suitable timber lands are managed for the production of sawtimber and other wood products on an even-flow, long-term sustained yield basis. An extensive road system provides access for timber management activities, recreation uses, hunting and fishing, and other public and administrative uses. Management activities will generally dominate most seen areas. Tree stands are healthy and in a balanced mix of age classes from young stands to trees of harvestable age, often in 40- to 100-acre stands. A variety of wildlife habitats, predominately in the early and middle successional stages, are present. (Forest Plan 3-144).

The desired future condition has been further refined within the Earl West and Fools landscape units of the Wrangell Island Analysis (USDA Forest Service, 1998). Objectives defined in the Wrangell Island Analysis are not legally binding, but represent a considerable amount of collaborative planning with the citizens and communities of Wrangell Island.

## Decision to be Made

The Record of Decision (ROD) for the Forest Plan established that timber harvest is appropriate in the project area.

In addition to providing the information to support a Finding of No Significant Impact (FONSI), the Wrangell District Ranger will decide whether and how to make timber available from the Shady project area in accordance with the Purpose and Need for this project. This decision will address:

- The location, design, and scheduling of timber harvest, temporary road construction, log-transfer facilities, and silvicultural practices;
- Project-specific mitigation measures and monitoring requirements; and
- If there may be a significant restriction on subsistence uses.

## Project Background and Public Involvement

- Fall 1999 - Placed on Schedule of Proposed Actions (SOPA).
- April 2000 – Interdisciplinary meetings began.
- July 2000 – Initial scoping and environmental analysis for the original Shady project began. There were 10 comments in response to the Shady Public Scoping Letter.
- March 2002 – Decision was made to expand the project area to include the neighboring Highbush area in order to better address issues and effects. The Highbush Timber Sale was originally listed on the Tongass 10-year action plan for 2006, just two years after the Shady Timber Sale.
- March 2002 - A Notice of Intent to prepare the Shady-Highbush EIS was published in the Federal Register on March 8, 2002.
- May 2002 – Scoping for the Shady-Highbush Timber Sale began.
- January 2003 – Decision was made to not propose any road building or timber harvesting in the Highbush area due to unresolved Roadless Rule issues. However, the Highbush area is still considered part of the Shady project area for analysis purposes. At this point, the project name was changed from Shady-Highbush to Shady. The decision was also made to prepare an Environmental Assessment (EA) to determine if an EIS was necessary.

## Field Studies

Preliminary fieldwork for this project began in 1999 to collect specific information relative to issues and to verify resource information contained in the Tongass National Forest Geographic Information System (GIS). Resource information maintained in the GIS includes streams, wildlife habitat, timber, and soil inventories, and locations of proposed harvest units and roads. Unit pool cards were used to document the location of possible harvest units and roads. Resource specialists listed specific concerns on the cards and gave recommendations for addressing or mitigating those concerns. Information from field studies and GIS was used to address issues and analyze the environmental effects of each alternative. For this EA, all maps and most of the numerical analyses are based on resource information stored in GIS databases.

# 1 Purpose and Need

## Key Issues

The following key issues were identified from public and internal scoping. Key issues are addressed through the proposed action and alternatives.

### 1. Project Economics

This issue relates to the economic viability of the proposed timber sale, and the potential employment and revenues generated by the project.

### 2. Wildlife Habitat Connectivity and Travel Corridors

This issue relates to wildlife travel corridors, habitat between Old-Growth Reserves (OGR) and the potential reduction in preferred habitat for various wildlife species.

## Other Environmental Considerations

The following issues were brought up during scoping or must be disclosed by law. Although the issues are not considered “key issues”, some are connected to the key issues and all are considered in the analysis. They are discussed in Chapter 3.

- Subsistence
- Silviculture
- Scenery
- Recreation
- Wetlands
- Forest Soils
- Watershed
- Fisheries and Marine Habitat
- Heritage resources

## Agency Involvement – Permits, Licenses, and Certifications

To proceed with timber harvest as addressed in this EA, we must obtain various permits from federal and state agencies. Below, we describe our relationship to other agencies in planning this project.

**U.S. Army Corp of Engineers** – The U.S. Army Corps of Engineers (Corps) is responsible for approving proposals to dredge or place fill materials in the coastal waters of the United States under Section 404 of the Clean Water Act. The Corps also has administrative authority over activities associated with wetlands. Any road construction in wetlands is of interest to the Corps; therefore, effects on those areas must be considered and reduced. All roads and associated facilities proposed for this project are for the primary purpose of managing the timber resource.

**U.S. Environmental Protection Agency** – The EPA provides a general review in accordance with their responsibilities under the National Environmental Policy Act, Section 309 of the Clean Air Act, and Section 402 of the Clean Water Act. They also administer permits associated with the LTFs under the National Pollution Discharge Elimination System.

**U.S. Fish & Wildlife Service** – USF&WS administers the Endangered Species Act. We consult with USF&WS to determine if we are affecting Threatened or Endangered species.

**State of Alaska** – Five departments in the State of Alaska were asked to participate in planning this project by giving general comments and suggestions as well as specific reviews. These departments included:

**Division of Governmental Coordination** – DGC formerly provided overall coordination for the State's comments and administered the Alaska Coastal Management Program (ACMP), which requires the Forest Service to design activities to be compatible with approved State management guidelines. The Division of Governmental Coordination was abolished in 2003 and the Office of Project Management and Permitting (OPMP) now conducts ACMP review, within the Department of Natural Resources.

**Alaska Department of Natural Resources** – ADNR issues tideland permits and any leases or easement necessary for the LTF.

**Alaska Department of Fish & Game** – ADF&G is involved in the Coastal Zone Consistency review and is especially interested in instream activities and other fish, water, wildlife, and subsistence issues.

# 1 Purpose and Need

**Alaska Department of Environmental Conservation** – ADEC participates in cooperative water quality management through Section 319 of the Clean Water Act and a Memorandum of Agreement with the Forest Service. They also issue a certificate of compliance with Alaska Water Quality Standards under Section 401 of the Clean Water Act.

**State Historic Preservation Office** – SHPO determines compliance with Section 106 of the National Historic Preservation Act, a process to determine the effects of alternatives on heritage resources. SHPO has been informed and they concur with our finding that this project is not likely to affect any known cultural resources in the area.

## Applicable Laws and Executive Orders

Below is a partial list of federal laws and executive orders pertaining to project-specific planning and environmental analysis on federal lands. While most pertain to all federal lands, some of the laws are specific to Alaska. Disclosures and findings required by these laws and orders are contained in Section 3.17 of this EA.

- **Organic Act of 1897**
- **Migratory Bird Treaty Act 1918 amended 1936 and 1972**
- **Multiple-Use Sustained Yield Act of 1960**
- **National Historic Preservation Act of 1966 (as amended)**
- **Wild and Scenic Rivers Act of 1968, amended 1986**
- **National Environmental Policy Act (NEPA) of 1969 (as amended)**
- **Clean Air Act of 1970 (as amended)**
- **Alaska Native Claims Settlement Act (ANCSA) of 1971**
- **Marine Mammal Protection Act of 1972**
- **Coastal Zone Management Act of 1972 (as amended)**
- **Endangered Species Act (ESA) of 1973 (as amended)**
- **Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974 (as amended)**
- **National Forest Management Act (NFMA) of 1976 (as amended)**
- **Clean Water Act of 1977 (as amended)**
- **American Indian Religious Freedom Act of 1978**
- **Alaska National Interest Lands Conservation Act (ANILCA) of 1980**

# 1 Purpose and Need

- **Archeological Resource Protection Act of 1980**
- **Cave Resource Protection Act of 1988**
- **Tongass Timber Reform Act (TTRA) of 1990**
- **1990 Native American Protection and Repatriation Act**
- **Magnuson- Stevens Fishery Conservation and Management Act of 1996**
- **Executive Order 11593 (cultural resources)**
- **Executive Order 11988 (floodplains)**
- **Executive Order 11990 (wetlands)**
- **Executive Order 12898 (environmental justice)**
- **Executive Order 12962 (aquatic systems and recreational fisheries)**
- **Executive Order 13007 (American Indian Sacred Sites)**
- **Executive Order 13084 (Consultation and Coordination with Tribal Governments)**
- **Executive Order 13175 (Government to Government Consultation)**
- **Executive Order 13186 (Migratory Bird Protection)**
- **Migratory Bird Treaty Act 1918 amended 1936 and 1972**



# **Chapter 2**

## **Alternatives**



# Chapter 2

## Alternatives

Included in this Chapter are a description, map, and comparison of the alternatives considered for the Shady project. This section presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options for the decision-maker and the public. Some of the information used to compare the alternatives is based upon the design of the alternative and some is based upon the environmental, social, and economic effects of implementing each alternative. All alternatives are consistent with the Forest Plan. All applicable standards and guidelines and Best Management Practices (BMPs) have been incorporated in the design of these alternatives.

### 2.1 Alternative Development Process

The alternatives were developed to address the Purpose and Need for the project, to respond to key issues that were identified during project analysis and public involvement, and to meet Forest Plan Standards and Guidelines and applicable laws.

### 2.2 Alternative 1 - The No Action Alternative

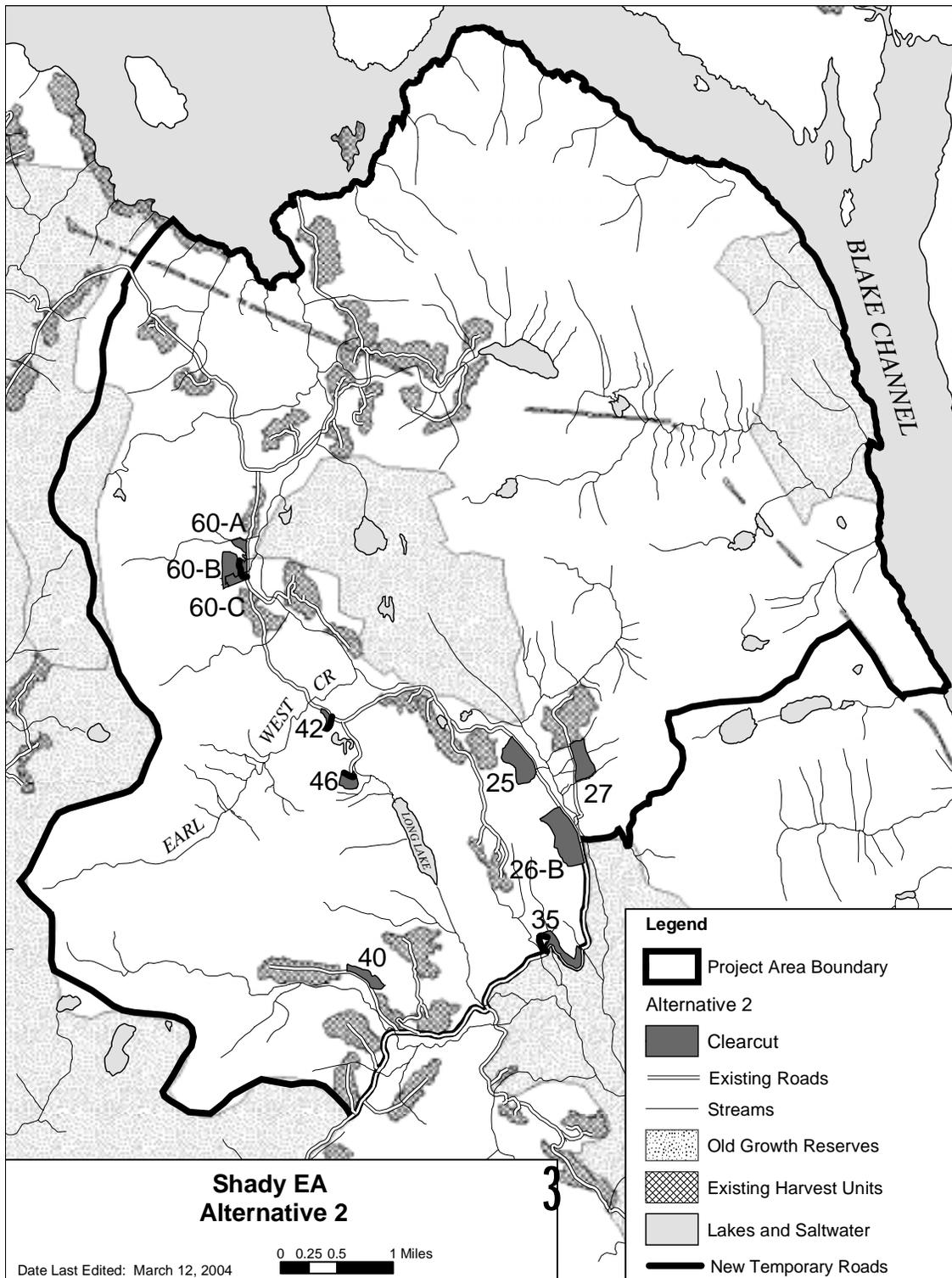
This alternative is required by the National Environmental Policy Act of 1976, and is used as a benchmark for comparing the existing condition with conditions generated by implementing any of the action alternatives. This alternative is the existing condition.

This alternative would not move the project area towards the desired future condition as described in the Forest Plan and in Chapter 1. There would be no new timber harvest or road construction. It does not preclude timber harvest from other areas at this time or from the project area at some time in the future. Watersheds would continue to recover as vegetation grows. Water quality and fish habitat would remain at current levels, subject to naturally occurring processes. The existing stands of timber would continue to provide wildlife travel corridors. Connectivity between stands would be maintained, subject to naturally occurring disturbances.

There would be no timber harvest or road construction within inventoried roadless areas. Future options for continued management along the existing road system and possible entry into adjacent inventoried roadless areas are maintained.

# 2 Alternatives

Figure 2-1 Alternative 2 Map



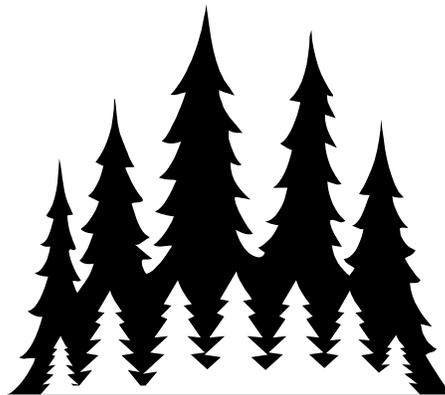
## 2.3 Alternative 2 (Figure 2-1)

Alternative 2 is designed to emphasize project economics. It will implement the standards and guidelines outlined in the Forest Plan. It promotes project economics by maximizing the amount of wood available for harvest this entry, and reduces project costs by using conventional logging systems and even-aged management.

This alternative manages 240 acres along the existing road system. It will harvest approximately 4,630 MBF [9,446 CCF (Hundred Cubic Feet)] on 240 acres and build approximately 0.6 miles (3,400 feet) of temporary road.

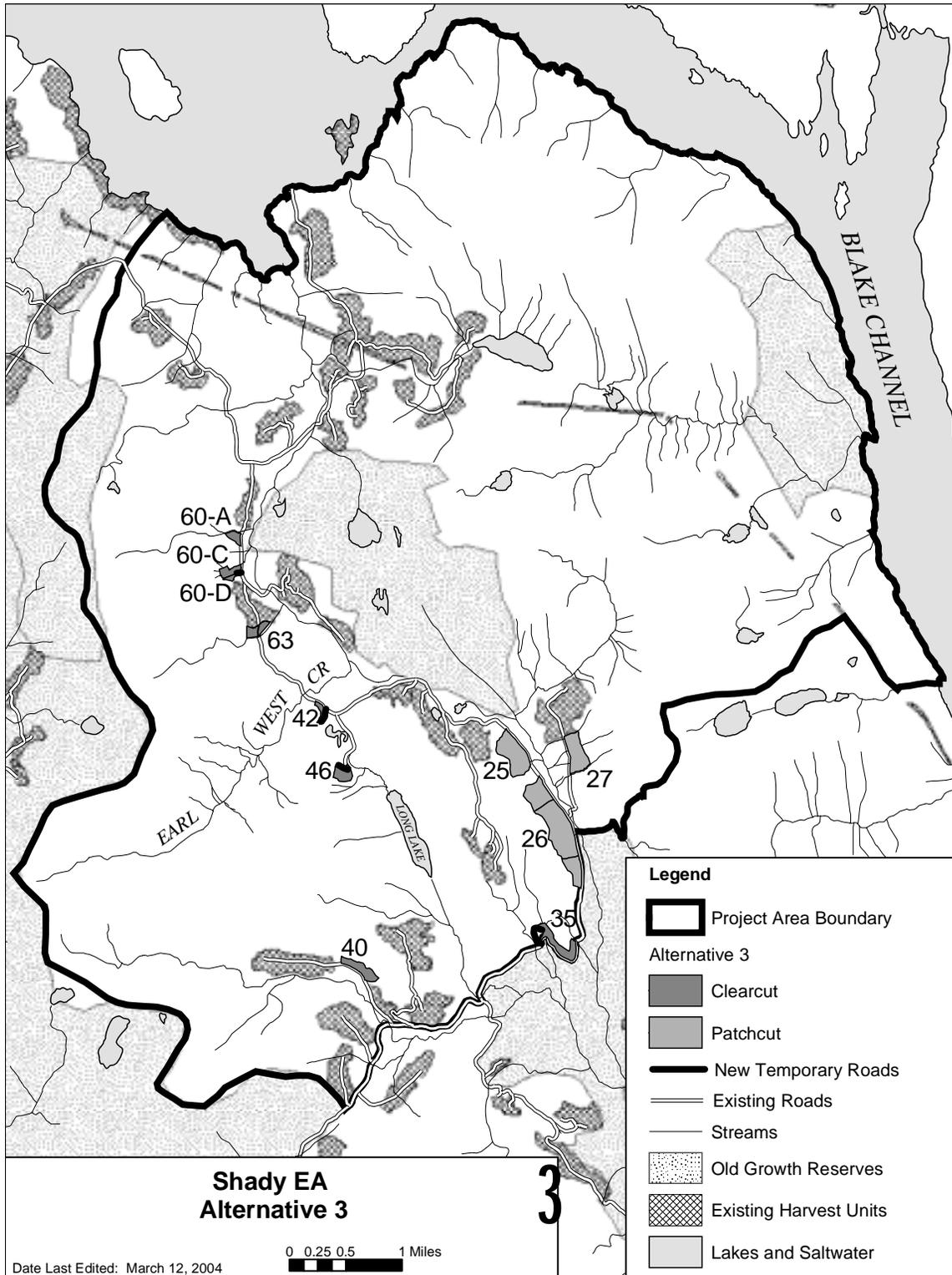
The proposed timber harvest and road construction for this alternative is within 1,200 feet of the existing road system. There will be no timber harvest or road construction within Inventoried Roadless Areas.

The temporary roads constructed will be closed and natural drainage patterns restored after harvest. Future options for continued management along the existing road system and possible entry into adjacent inventoried roadless areas are maintained.



# 2 Alternatives

Figure 2-2 Alternative 3 Map



### Alternative 3

Alternative 3 is designed to provide timber harvest and road construction while minimizing affects on wildlife habitat connectivity and travel corridors. This alternative will implement mitigation measures that exceed those required by Forest Plan Standards and Guidelines for some resources. It attempts to minimize effects on wildlife by reducing the size of openings, using patch cuts, and retaining 60 percent of the stands in the Fools Creek units (Units 25, 26, 27).

This alternative manages 270 acres (actual harvest of 159 acres) along the existing road system. It will harvest approximately 3,139 MBF (6,404 CCF) on 159 acres and build 0.5 miles (2,600 feet) of temporary road.

The proposed timber harvest and road construction is within 1,200 feet of the existing road system. There will be no timber harvest or road construction within Inventoried Roadless Areas.

The temporary roads constructed will be closed and natural drainage patterns restored after harvest. Future options for continued management along the existing road system and possible entry into adjacent inventoried roadless areas are maintained.



## 2 Alternatives

### Comparison of Alternatives by Issue

Table 2-1 provides a comparison of the alternatives, focusing on the key issues. For more detailed descriptions of the environment and the effects of the alternatives, refer to Chapter 3.

**Table 2-1 Comparison of Alternative by Issue**

<b>Issue/Measurement</b>	<b>Unit</b>	<b>Alt. 1</b>	<b>Alt. 2</b>	<b>Alt. 3</b>
<b>Project Economics</b>				
Acres harvested	acres	0	240	159
Total volume harvested	MBF <sup>2</sup>	0	4,630	3,139
Total volume harvested	CCF	0	9,446	6,404
Expected Bid Rate w/6" top <sup>1</sup>	\$/CCF	0	\$(5.16)	\$(5.98)
Expected Bid Rate w/10" top	\$/CCF	0	\$14.23	\$13.21
Temporary Road Construction	miles	0	0.6	0.5
Direct Jobs Created	#/year	0	25	17
Income from Direct Jobs	\$/year	0	\$1,110,680.60	\$753,012.74
		<b>Alt. 1</b>	<b>Alt. 2</b>	<b>Alt. 3</b>
<b>Wildlife habitat &amp; travel corridors</b>	<b>Existing Acres</b>	<b>Acres Harvested</b>		
High Volume POG	5,788	0	132	90
Medium Volume POG	5,909	0	89	57
Low Volume POG	3,264	0	9	7
High probability marten habitat	5,420	0	132	90
High probability goshawk habitat	2,957	0	120	77
High probability marbled murrelet habitat	10,732	0	222	147
High-value deer winter range (HSI>.64)	231	0	7	7

<sup>1</sup> ( ) indicates a negative value.

<sup>2</sup> Million Board Feet (MBF)

### 2.4 Monitoring

As directed by the National Forest Management Act (NFMA), proposed activities would be monitored to ensure compliance with project-specific and Forest Plan direction (36 CFR 219.11). Two kinds of monitoring, Forest Plan and Routine Implementation, are described below:

Forest Plan monitoring is conducted over the entire Tongass National Forest on a sample basis, and the Shady project will be included in the base of potential sample units. Forest Plan monitoring includes:

- Implementation monitoring: Used to assess the implementation of the goals, objectives, and standards and guidelines of the Forest Plan.
- Effectiveness monitoring: Used to assess the effectiveness of the goals, objectives, and standards and guidelines of the Forest Plan.
- Validation monitoring: Used to verify and/or validate the data, assumptions, and estimated effects used in developing the Forest Plan.

Routine implementation monitoring is conducted in each project to assess whether the project was implemented as designed and whether it complies with the Forest Plan. Examples of routine implementation monitoring include sale administration specialists monitoring harvest activities to ensure prescriptions and mitigation measures are properly implemented.

Routine post-sale monitoring is also done by the road maintenance crew and by silviculturists. The road maintenance crew annually checks roads on the district for trees across the road, plugged culverts, and brushing needs. The silviculturist routinely monitors each harvest unit to determine if adequate regeneration of trees to meet NFMA requirements has been accomplished.



# **Chapter 3**

## **Environment and Effects**



# Chapter 3

## Environment and Effects

This chapter briefly describes the affected environment and the environmental effects of each alternative by issue. It discusses the effects to the applicable physical, biological, social, and economic environments of the project area. All effects, including direct, indirect, and cumulative effects are disclosed. The means by which potential adverse effects will be reduced or mitigated are also described.

**Direct and Indirect Effects** - Direct environmental effects are those occurring at the same time and place as the initial cause or action. Indirect effects are those that occur later in time or are spatially removed from the activity, but would be significant in the foreseeable future.

**Cumulative Effects** - Cumulative effects result from incremental effects of actions, when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor, but collectively significant, actions taking place over a period of time. The following activities were considered reasonably foreseeable for cumulative effects analysis: (Reference State 5-year plan and FS 10-year Action Plan.)

- 2004 - State of Alaska proposes the Eastern Passage Unit 6 Sale on the north end of Wrangell Island. This sale will harvest approximately 1.5 MMBF of timber and build approximately 0.6 mile of mainline road.
- 2005 - State of Alaska proposes the Eastern Passage Unit 7 & 8 Sale on the north end of Wrangell Island. This sale will harvest approximately 1.5 MMBF of timber and build approximately 0.6 mile of mainline road.
- 2006 - State of Alaska proposes the Eastern Passage Unit 9 & 10 Sale on the north end of Wrangell Island. This sale will harvest approximately 900 MBF of timber and build approximately 0.6 mile of mainline road.
- ❖ 2007 - State of Alaska proposes the Shady Tie-In Sale near the junction of USFS Road 6265 and 6270, approximately two miles south of Earl West Cove. This sale will harvest approximately 1.5 MMBF.
- 2007 - US Forest Service proposes the Backline Timber Sale. This sale will harvest approximately 7.0 MMBF.
- ❖ 2010 - US Forest Service proposes the Highbush Timber Sale. This sale will harvest approximately 5.0 MMBF.
- ❖ 2011 – 2025 - Southeast Alaska Transportation Plan includes a potential ferry terminal at Fools Inlet, and an upgrade and extension of the Fools Inlet Road (Roads 6265 and 6570).

The starred projects ( ❖ ) are the only proposed activities within the project area.

# 3 Environment and Effects

## 3.1 Key Issue 1 - Project Economics

**Issue:** This issue relates to the economic viability of proposed timber sales, and the potential employment and revenues generated by the project.

### 3.1.1 Employment

#### Environment

##### Employment in Southeast Alaska

The communities of Southeast Alaska depend on the Tongass National Forest to provide the foundation for natural resource-based industries, which include wood products, commercial fishing and fish processing, recreation, tourism, mining, and mineral development. Many residents also depend heavily on subsistence hunting and fishing to meet their basic needs. There is very little private land in the region to provide these resources. Appropriate management of the Tongass' natural resources is, therefore, extremely important for local communities and the overall regional economy. An overview and analysis of the Regional economy can be found in the Forest Plan.

### 3.1.2 Employment in the Project Area

The community of Wrangell is directly affected by this project. Additionally, residents of Thoms Place on Wrangell Island may be affected by this project.

Timber and fishing have been the economic foundation of the community. Timber once dominated Wrangell's economy, however, with the closing of the Alaska Pulp Company mill (1994) and Age Cedar Products small sawmill, timber has lost its dominance. Today Silver Bay Logging owns and operates the former Alaska Pulp Company mill. In addition, one small sawmill is currently operated by Luthier Tone Woods. The cornerstones of Wrangell's present day economy include tourism, government, airport, and commercial fishing, fish processing and timber.

#### **Forest Products Employment**

The forest products industry has been an important part of the economy of Southeast Alaska since the 1950s. Recent forest products employment data are presented in Table 3-1. From 1987 through 1996, the forest products industry provided direct employment for an average of 2,791 workers. Indirect employment, which includes related service activities, such as transportation, marketing, and equipment sales and maintenance, provided an additional 2,014 jobs. Direct and indirect employment during this period peaked in 1990 with totals of 3,543 and 2,570 jobs, respectively.

## 3 Environment and Effects

Employment has dropped recently, primarily due to lower market conditions and the closure of the Ketchikan Pulp Mill in 1997. With that closure, employment in this category has been reduced by approximately 520 jobs.

**Table 3-1  
Forest Products Industry Employment in Southeast Alaska 1991 to 2000**

Employment Type	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Logging	1,554	1415	1,344	1,177	1,185	1,157	1,049	889	824	711
Saw Mill	604	538	447	515	301	230	184	284	303	280
Pulp Mill	911	910	859	533	516	524	318	96	63	2
<b>Total Direct Jobs</b>	<b>3,069</b>	<b>2,863</b>	<b>2,650</b>	<b>2,225</b>	<b>2,002</b>	<b>1,911</b>	<b>1,551</b>	<b>1,269</b>	<b>1,190</b>	<b>993</b>

Source: Forest Plan Final EIS, 1997; USDA Forest Service, 1998n, and AK Dept. of Labor 2000

### Effects

#### **Projected Employment and Income**

The action alternatives would have direct and indirect impacts to the economies of the local communities. The estimated amount of employment and income likely to result from timber harvest, using Forest Plan multipliers developed for Southeast Alaska, is displayed in Table 3-2. Alternative 1, no-action, would not generate timber-related jobs or income.

**Table 3-2  
Project Employment and Income**

	Alt 2	Alt 3
<b>Employment:<sup>1</sup></b>		
Direct Jobs	25	17
Indirect Jobs	18	12
Total Jobs	43	29
<b>Income:</b>		
Direct	\$1,110,680.60	\$753,012.74
Indirect	\$810,796.84	\$549,699.30
Total Income	\$1,921,477.44	\$1,302,712.05

Estimates based on alternative volume and Forest Plan multipliers; calculated by NEAT.

<sup>1</sup>Number of Jobs/Year

Source: NEAT, 1st Quarter 2003

# 3 Environment and Effects

## 3.1.3 Timber Supply and Market Demand

Determining market demand is a complex process. Detailed explanations of the rationale for considering timber harvest in the Shady project area and market demand for wood products is located in the project planning record. More information can also be found in the Forest Plan Final Environmental Impact Statement (FEIS), Part 1 (pages 3-248 to 3-307).

There are many variables that can increase the cost of timber sale offerings and may carry significant economic risk for potential purchasers. High cost could be incurred as a result of road construction, helicopter logging, and amount of timber volume and value of timber being removed. Market stumpage values must be sufficient to cover this cost and offer a profit for potential purchasers. The timber economics of this project have the potential to affect the timber supply to the forest products industry and employment in the local communities of Southeast Alaska. Economic deferral (deferring a timber sale for economic reasons) is dependent on changing conditions that include log prices, costs of accessing harvest units (roads), and efficiency of harvest systems (including yarding and hauling costs). There is the potential for economic deferral of timber sale offerings from the Shady project, depending on current conditions.

In order to maintain a stable wood-products industry in Southeast Alaska, we need to provide a continuous flow of timber for the industry to purchase. The Forest Service has developed a timber sale program to respond to this need. The proposed Shady Timber Sale is a necessary component of this program, and the sale is identified on the 10-Year Timber Sale Plan.

### **Direct and Indirect Effects**

The Shady project will have short-term and long-term effects to supply and demand of wood. The project's opportunity to provide one or more timber sale offerings, the volume removed by these offerings and the volume retained for future harvest entries affect short-term and long-term timber supply.

## 3.1.4 Timber Financial Efficiency Analysis

Financial efficiency analysis is a comparison of those costs and benefits that can be quantified in terms of actual dollars spent or received from the project. When considering quantitative issues, financial efficiency analysis offers a consistent measure in dollars for comparison of alternatives. This type of analysis does not account for non-market benefits, opportunity costs, individual values, or other values, benefits, and costs that are not easily quantifiable, such as recreation. This is not to imply that such values are not significant or important, but to recognize that non-market values are difficult to represent by appropriate dollar figures. Therefore, financial efficiency should not be viewed as a complete answer, but as

## 3 Environment and Effects

one tool that decision-makers use to gain information about resources, alternatives, and trade-offs between costs and benefits.

Although individual timber harvest units may or may not be economical to harvest by themselves, the management of less productive land, or land containing a high percentage of defective timber, will help to increase future timber yields. The harvest of units with higher returns will help compensate for those with less economical returns.

An analysis of the action alternatives was performed using the NEPA Economic Analysis Tool (NEAT), which is based on the Transaction Evidence Appraisal (TEA) method. The analysis compared the alternatives' timber quantity, quality and logging efficiency with estimated costs and values to determine an estimated bid value (minimum stumpage value) for the current and 12 previous appraisal quarters. The analysis included estimated stump to truck, transportation, logging overhead, and road construction costs. The analysis demonstrates the cyclical nature of timber markets and the range of values associated with high- and low-market conditions. Alternative 1 was not analyzed because there is no harvest associated with it.

It should be noted that base rates would be the minimum rates advertised for sales appraised deficit. This would cover the cost of essential reforestation and provide a small return to the National Treasury.

### **Direct and Indirect Effects**

**Table 3-3  
Timber Financial Efficiency Analysis - Timber Sale Values and Costs to an Operator of Average Efficiency<sup>1</sup>**

	<b>Alt 2</b>	<b>Alt 3</b>
Net Sawlog Volume (CCF):		
Sitka Spruce	2565	1737
Hemlock	5998	4066
Alaska Yellow-Cedar	838	570
Western Redcedar	45	30
Total Net Sawlog CCF	9,446	640
Total Net Sawlog MBF	4,630	3,139
Logging Cost per CCF	\$115.37	\$116.28
Expected Bid Value <sup>1</sup>	\$(48,726) <sup>3</sup>	\$(38,301) <sup>3</sup>
Expected Bid Rate/CCF <sup>1</sup>	\$(5.16) <sup>3</sup>	\$(5.98) <sup>3</sup>
Modified Bid Value <sup>2</sup>	\$118,191	\$74,341
Modified Bid Rate/CCF <sup>2</sup>	\$14.23	\$13.21

<sup>1</sup>6" utilization standard and domestic redcedar processing

<sup>2</sup>10" utilization standard and domestic redcedar processing (see section 3.1.7)

<sup>3</sup> ( ) indicates negative value

Source: NEAT, 1st Quarter 2003

## 3 Environment and Effects

**Alternative 2** -The financial efficiency produced an expected minimum sale value of \$(48,726.00) for current market conditions. Since this alternative's expected minimum sale value is negative the advertised net stumpage rate would be base rates \$3.23 per CCF.

**Alternative 3** - The financial efficiency analysis produced an expected minimum sale value of \$(38,301.00) for current market conditions. Since this alternative's expected minimum sale value is negative the advertised net stumpage rate would be base rates \$3.23 per CCF.

The predominant reasons Alternatives 2 and 3 have negative sale value is low net volume per acre (Alt. 2 at 19 MBF/acre and Alt. 3 at 20MBF/acre) and poor log quality (small diameter sawlogs). The alternatives' reliance on cable logging systems and even-aged management are positive economic factors, leading to low logging costs. However, the reduced logging costs are not enough to offset the low value associated with the small diameter sawlogs (see section 3.1.7 for opportunities to improve sale economics).

### 3.1.5 Public Investment Analysis

A public investment analysis of each alternative was performed to compare the current value of the timber with the estimated cost of preparing and administering the timber sale. The Forest Service's estimated costs and management expenses (based on average budget allocations) are subtracted from the alternative's estimated bid value.

Environmental analysis costs include field inventory and the analysis of data, public involvement, and the preparation of a document that satisfies the requirements of the National Environmental Policy Act (NEPA). The environmental analysis cost is constant and applies to all alternatives, including the no-action alternative.

Sale preparation consists of harvest unit layout and timber cruising. Sale preparation costs increase significantly when implementing partial harvest units, as compared to clearcut harvest units. The Alternatives-to-Clearcutting (ATC) Research Study on Kupreanof Island required about eight times more person-days to prepare a harvest unit that required marking individual trees (uneven-aged partial harvest) and about four times longer to designate 2-acre patches (even-aged partial harvest) as compared to implementing a clearcut harvest unit in the same area.

Sale administration consists of administering the timber sale contract after sale award through sale completion. Normally costs are associated with office documentation, timber sale accounting, and site visits to the sale area.

## 3 Environment and Effects

Engineering support consists of timber sale contract administration activities associated with new facility and road construction, use of existing facilities, and road maintenance.

### **Direct and Indirect Effects**

Alternative 3 (\$323,385.14) would cost the least to prepare, followed by Alternative 2 (\$476,987.42). Both alternatives will cost more to prepare than their expected revenue under the current market. Alternative 3 has a net revenue of \$(361,686.25) and alternative 2 has a net revenue of \$(525,713.76). However, this revenue versus cost analysis should be weighed against the expected employment and income (Table 3-2) generated by the project. Additionally, if the timber market improves the alternatives could generate enough revenue to provide a positive net return.

### **3.1.6 Payments to the State of Alaska**

Prior to 2000, 25 percent of the returns to the National Treasury from revenue producing Forest Service activities was returned to each State containing National Forest Lands and then distributed to counties (or, in Alaska, to Organized and Unorganized Boroughs) with national forest acreage within their boundaries. These were termed “25 percent fund payments” and were dedicated to schools and roads. More recently, in order to stabilize these payments in the face of declining Forest Service timber harvests and associated revenues, Congress enacted the Secure Rural Schools and Community Self-Determination Act of 2000. Under this act, boroughs can elect to receive a “full payment amount,” which is the average of the highest three payments made between 1986 and 1999. The act makes this option available through fiscal year 2006.

For fiscal years 2001 through 2006 under the new legislation, Alaska boroughs and communities have elected to receive a full payment amount rather than 25 percent of receipts. The full payment amount is the average of the highest three payments made to the state during the 14 year period between 1986 and 1999. These annual full payment amounts would be primarily dedicated to roads and schools, with provisions for special project funding under certain conditions. Under the full payment approach, Forest Service payments to the State of Alaska during the 2001 to 2006 period would not be linked to annual Forest Service revenue, rather they would be based on the high three-year historic average.

# 3 Environment and Effects

## Direct and Indirect Effects

The difference in revenues among the alternatives considered in the EA would have no effect on the payments boroughs receive during the 2001 through 2006 time period.

### 3.1.7 Opportunities to Improve Economics

The alternatives have been analyzed with required removal of merchantable sawlogs to a 6-inch top Diameter Inside Bark (DIB) and domestic processing of western redcedar sawlogs. If an alternative appraises deficit at the time of offer, management standards could be applied to the alternative to improve sale economics. Changes to utilization standards might be made that only require removal to an 8-inch or 10-inch top DIB. The export of western redcedar could also be authorized, but only if changes to utilization standards do not improve sale economics. These tools are only applied in specific circumstances and require Forest Supervisor and Regional Forester approval.

Two scenarios are readily apparent when considering whether the Shady project will provide positive economic timber sale offerings. In scenario one, it is anticipated that the timber market will improve and log values will increase. In scenario two, utilization standards are changed from 6" top DIB to 10" top DIB. If this were done under current market conditions then Alternative 2 would produce an expected minimum sale value of \$118,191.00 (+\$14.23 per CCF) and harvest 8,304 CCF. Alternative 3 would produce an expected minimum sale value of \$74,341.00 (+\$13.21 per CCF) and harvest 5,630 CCF.

## 3.2 Issue 2 - Wildlife habitat connectivity and travel corridors

This issue relates to wildlife corridors and habitat between Old-Growth Reserves (OGR), and the potential reduction in preferred habitat for some wildlife species.

### 3.2.1 Beach and Estuary Fringe, Riparian, and Wetland Habitats

#### Environment

Beach and estuary fringe, riparian areas, and other non-forested wetland types provide valuable habitat for a variety of wildlife species.

#### Direct and Indirect Effects

No harvest would occur in the 1000-foot beach and estuary fringe or Riparian Management Areas (RMA) under any of the alternatives due to protections given under Tongass Land and Resource Management Plan (Forest Plan) Standards and Guidelines (USDA 1997b). Effects to non-forested wetlands would be minimal under either alternative (See Section 3.7 Wetlands).

### 3.2.2 Old-Growth Forest

#### Environment

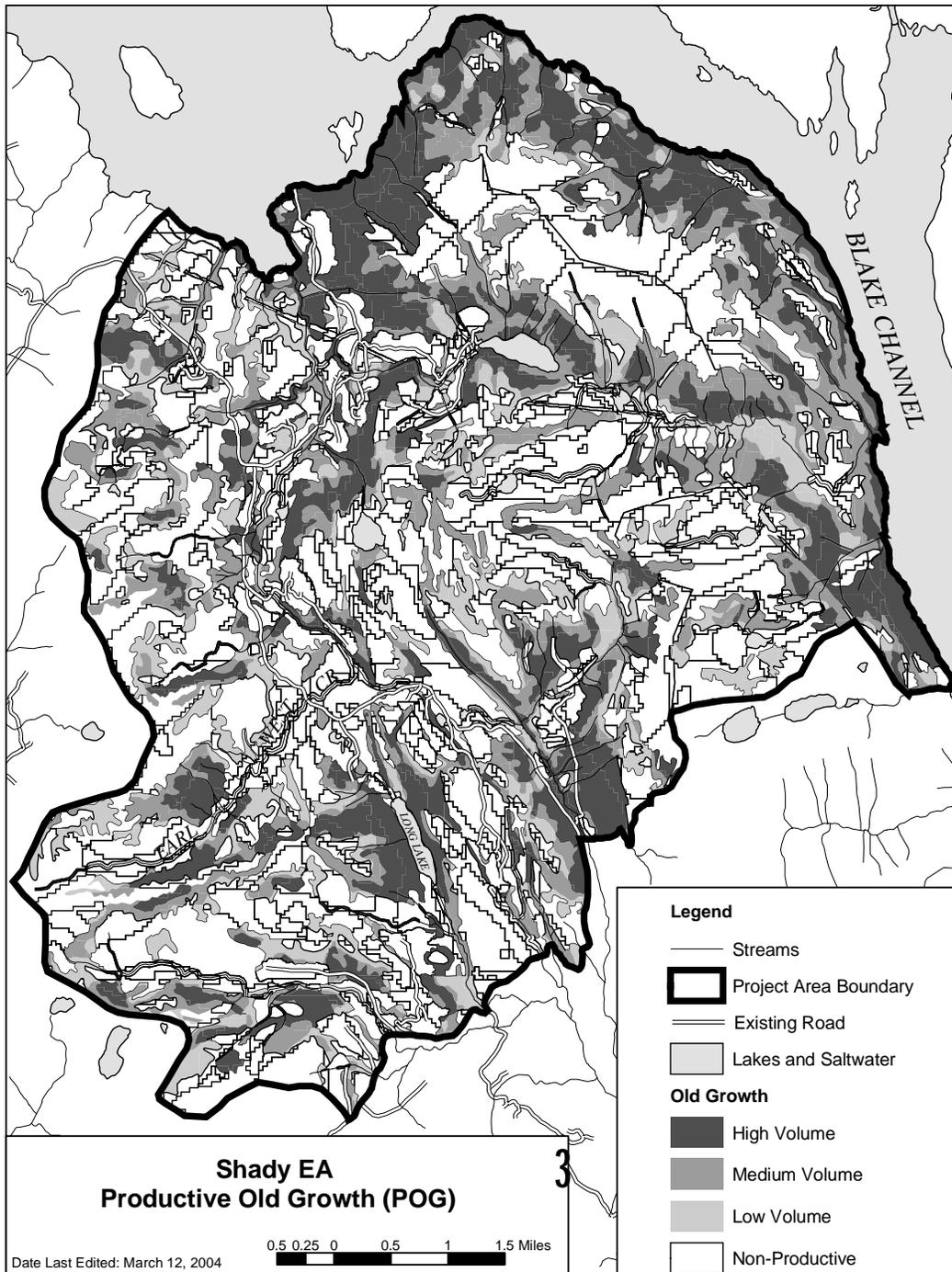
Old-growth forest stands are ecosystems characterized by old and large trees. The combination of dense canopy with scattered small openings allow for forage development while intercepting snowfall. Large dead or defective trees provide nesting and feeding sites for birds and small mammals. Overall, this structural diversity is used by a variety of wildlife species.

Productive Old-Growth (POG) is defined as old-growth forest capable of producing at least 20 cubic feet of wood fiber per acre a year, or having greater than 8,000 board feet per acre. Approximately 1,456 acres (9.4 percent) of the productive old-growth in the project area has been harvested to date (1,009 acres National Forest Lands, 447 acres State Selected Lands). The project area currently has 13,840 acres remaining of POG, which are high (5,761 acres), medium (4,867 acres), and low (3,212 acres) old-growth forest volume strata (Table 3-4). The distribution of old-growth forest in the project area (Figure 3-4) is rather patchy due to natural breaks caused by muskeg, scrub-shrub wetlands, and forested wetlands. Timber harvest has further fragmented the distribution of old-growth along the existing road system in the project area.

Coarse-structured (multi-aged, large trees) low elevation forest is important for several wildlife species including deer, goshawk, and forest songbirds. Timber volume classes 6 and 7 (from the GIS cover TIMTYP) are believed to be an adequate predictor of those stands (Caouette et al. 2000). There are currently 723 acres of coarse canopy forest within the project area.

# 3 Environment and Effects

**Figure 3-1 Productive Old Growth**



### 3 Environment and Effects

#### Direct and Indirect Effects

Harvest of non-commercial forest, low volume strata productive old-growth, and total acreage of old-growth forest will be minimal under all alternatives. Harvest of high volume and medium volume POG forest is greater under Alternative 2 than Alternative 3. However, harvest under both alternatives is still relatively minimal given the amount of acreage in the study area (Table 3-4). Alternative 2 will harvest 10 acres of coarse canopy forest. Alternative 3 will harvest 7 acres of coarse canopy forest (Table 3-5).

**Table 3-4 Old-Growth Forest**

	Existing acres	Acres Harvested	
		Alt 2	Alt 3
<b>Volstrata:</b>			
<b>Total Non-commercial Forest Lands:</b>	<b>15933</b>		
Unproductive Old-Growth <sup>1</sup>	14985	10	5
Open Muskeg	948		
<b>Total Productive Old-Growth (POG):<sup>2</sup></b>	<b>13840</b>	<b>230</b>	<b>154<sup>6</sup></b>
High Volume Strata <sup>3</sup>	5761	132	90
Medium Volume Strata <sup>4</sup>	4867	89	57
Low Volume Strata <sup>5</sup>	3212	9	7
<b>Total Old- Growth Forest (Unprod + Prod)</b>	<b>28,825</b>	<b>240</b>	<b>159</b>

1/ Less than 8,000 board-feet per acre (USDA 1997b). (scrub forest or past harvest units)

2/ Greater than 8,000 board-feet per acre (USDA 1997b).

3/ Averages 35,000 board-feet per acre (USDA 1997a).

4/ Averages 25,000 board-feet per acre (USDA 1997a).

5/ Averages 16,000 board-feet per acre (USDA 1997a).

6/ Acres in Alt 3 corrected for patch cut harvest: Harvested area = Unit acres - (Patch cut unit acres x 0.6)

**Table 3-5 Coarse Canopy Forest**

Coarse Canopy Forest	Existing acres	Acres Harvested	
		Alt 2	Alt 3
<b>Volume Class 6 &amp; 7</b>	<b>723</b>	<b>10</b>	<b>7</b>

For wildlife analysis in this project, “existing acres” encompasses the entire project area, including the area within the state selected lands. State selected lands include a total of 3,156 acres, of which 605 acres are productive old growth and 2,551 are unproductive old growth or muskeg (unproductive old-growth includes non-commercial forest lands and past harvested units).

# 3 Environment and Effects

## 3.2.3 Wildlife Corridors

### Environment

Wildlife travel routes are referred to as “corridors” and are identified during analysis of the project area. Corridors function as connective links between patches of suitable habitat and in maintaining biodiversity. Low elevation passes, beach fringe, and stream corridors provide natural connections between forested blocks and are important areas for migrating and dispersing wildlife.

The Wrangell Island Analysis identified wildlife corridors on Wrangell Island, several of which fall within the project area (USDA 1998b). These corridors are believed to provide important links between Old-Growth Reserves (OGRs) and other blocks of important habitat.

### Direct and Indirect Effects

Protections under the Forest Plan Standards and Guidelines, in the form of beach buffers and RMAs (USDA 1997b), will maintain many of the corridor values in the project area. Corridor values adjacent to Units 60 and 63 will be maintained by riparian buffers and un-harvested areas adjacent to units. This will allow for wildlife movement between Earl West Small OGR and Salamander Small OGR. Stream buffers preserve corridor values for corridors between Earl West and Fools OGRs under all alternatives. The Fools Creek riparian corridor is protected under all alternatives.

Alternative 3 was designed in large part to address connectivity and corridor concerns especially in the Fools Creek area.

Overall, Alternative 3 preserves corridors to a greater extent in the Earl West and Fools Creek Watersheds. Under Alternative 3, a large section of Unit 60 is left intact, while harvesting Unit 63 instead. Additionally, the patch cuts in the Fools Creek Area would serve as corridors for the upland areas.

## 3.2.4 Forest Fragmentation

The Tongass National Forest is characterized by fragmentation at many scales and is fragmented by different processes. Fragmentation has the potential to isolate small populations, contribute to decreased population distribution, and increase the likelihood of local extinction. Across the project area, at a landscape level, the natural distribution of POG is quite patchy and has been fragmented by muskegs and forested wetlands. Timber harvest tends to increase forest fragmentation and the amount of “edge” (USDA 1997a).

We identified contiguous blocks of old-growth forest habitat through GIS analysis. We defined “edge” as the forested area within a distance of 2-3 tree

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lengths (300 feet) from an opening. “Interior forest” was defined as the portion of the forest greater than 300 feet inside the edge or perimeter of the block (USDA 1997a). Road cuts were considered as breaks in contiguous forest.

Based on our analysis, the project area contains the largest remaining block of contiguous old-growth forest on Wrangell Island. This block extends around much of the project area boundary on the east side. Because of the branched and linear nature of this block, the amount of edge relative to interior forest is high. For example, this contiguous block contains a total of 14,184 acres of old-growth forest. However, the remaining interior forest habitat is broken down into three separate, smaller blocks (>500 acres) of 2,053 acres, 1,414 acres and 1,324 acres, respectively, once the edge effect is subtracted (4,791 acres total). The next largest contiguous block in the project area contains 594 total acres of old-growth forest, but is reduced to less than 500 acres when edge effects are factored in.

### **Direct and Indirect Effects**

In both Alternatives 2 and 3, only Unit 27 impacts any old-growth blocks over 500 acres in total size. This unit impacts a block of interior forest that is 390 acres. Harvest of this unit under Alternative 2 would directly remove 16 acres of interior old-growth. In addition, the creation of an opening within the block would change 18 acres from interior forest to edge forest. For Alternative 3, a patch cut placed near the edge of a block would have less impact on the interior forest than one placed in interior forest that had been buffered for edge effects. However, the smaller opening sizes of the patch cuts have a higher edge-to-interior ratio. Overall, depending on the arrangement of patch cuts associated with Alternative 3, there would likely be slightly less impact on interior forest. Under either harvest alternative, there would be an estimated minimum of 4,757 acres of interior forest remaining in the blocks of old-growth forest (blocks>500 acres) in the project area. This amounts to a reduction of less than 1 percent of the interior old-growth forest. The amount of edge habitat in the project area is already high due to the naturally patchy distribution of old-growth forest. Overall, the impacts of either Alternative 2 or 3 on forest fragmentation would be minimal.

### **3.2.5 Old-Growth Reserves**

#### **Environment**

A system of mapped large, medium, and small Old-Growth Reserves (OGR) is part of a forest-wide habitat conservation strategy designed to protect the integrity of the existing old-growth ecosystem (USDA 1997a). There are two small OGRs within the project area and a small and medium OGR adjacent to the project area (see Alternative Maps, Figure 2-1 and 2-2)

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### **Direct and Indirect Effects**

Neither of the timber harvest alternatives would affect any of the current reserve designs or future options for modification.

### **3.2.6 Threatened and Endangered Species**

#### **Environment**

The humpback whale and the Stellar sea lion are the only two federally listed wildlife species that occur within the boundaries of the Tongass National Forest in the vicinity of the project area.

#### **Direct and Indirect Effects**

Both the humpback whale and Stellar sea lion are restricted to the marine environment and therefore, do not occur in the project area. The proposed action is of a very limited size and scope and would not modify adjacent marine habitat. As a result, no adverse effects on humpback whales, Stellar sea lions or their habitat would be expected as a result of any of the proposed alternatives.

### **3.2.7 Sensitive Species**

A Biological Evaluation (BE) for sensitive plants was conducted. No sensitive or rare plants were found. The BE and results of the surveys are in the Shady planning record.

Sensitive wildlife species that may occur within the project area are Peale's peregrine falcon, Queen Charlotte (northern) goshawk, trumpeter swan, and osprey. Only the goshawk is known to occur in or immediately adjacent to the project area for extended periods of time. Protections under the Forest Plan Standards and Guidelines, in the form of beach buffers, and Riparian Management Areas (RMAs) (USDA 1997b), will protect important habitat for osprey, Peale's peregrine falcon, and trumpeter swan. No impacts on osprey, Peale's peregrine falcon, and trumpeter swan are expected as a result of any of the proposed alternatives. Only the goshawk is discussed in more detail here. The Biological Evaluations (BE) are included in the planning record.

#### **3.2.7.1 Queen Charlotte Goshawk**

##### **Environment**

Goshawks occur in low densities throughout most of the Tongass National Forest. Two subspecies of the northern goshawk, *Accipiter gentilis atricapillus* and *Accipiter gentilis laingi*, are old-growth/mature forest associated raptors of special concern in the Tongass. The goshawk was a key consideration for the viability assessment of the revised Forest Plan (Iverson

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et al. 1996, USDA 1997a). Concern for the goshawk stems from reductions in preferred habitat due to timber harvesting.

Goshawks use Productive Old-Growth (POG) forests extensively for foraging and nesting. Table 3-6 shows the existing amount of high value goshawk nesting habitat in the project area. High value nesting habitat is defined here as high volume strata POG under 800 feet elevation, with slopes less than 35 percent (Iverson et al 1996).

Surveys for raptors (hawks and owls, including goshawks) were conducted between March and September 2000, 2001, 2002, and 2003.

An active goshawk nest was located in the project area in 2000 and a failed nesting attempt occurred in 2001 at the same nest. Goshawks have not successfully nested in that nest since that time, but have been detected in the general vicinity on State land. Goshawks were noted in other portions of the project area, but nesting behavior was not detected.

#### **Direct and Indirect Effects**

Effects of both alternatives would be minimized by Forest Plan Standards and Guidelines, in the form of beach buffers, RMAs, and nest protection (USDA 1997b), habitat available in OGRs, and the amount of habitat remaining in the project area. However, timber harvest will reduce the amount of POG available to goshawks (Table 3-6). Overall, Alternative 3 would have the least affect on goshawks.

**Table 3-6 Total acres in project area and harvest acres of High Probability Habitat for Species**

Species:	Existing (Alt 1)		Alt 2		Alt 3 <sup>4</sup>	
	Acres	% Decrease	Acres	% Decrease	Acres	% Decrease
Goshawk <sup>1</sup>	2957	0	120	4.2%	77	2.7%
Marten <sup>2</sup>	5420	0	132	2.5%	90	1.7%
Marbled murrelet <sup>3</sup>	10732	0	222	2.1%	147	1.4%

<sup>1</sup> High volume forest and <800 ft. elevation and slopes < 35%

<sup>2</sup> High volume forest and <1500 ft. elevation

<sup>3</sup> Medium and high volume forest

<sup>4</sup> Values in Alt 3 adjusted to reflect partial harvest/patch cuts.

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## 3.2.8 Management Indicator Species (MIS)

MIS are species whose response to land management activities can be used to predict the likely response of other species with similar habitat requirements. Twelve of the thirteen MIS identified in the Forest Plan (USDA 1997a) are likely to occur in the project area. The mountain goat (*Oreamnos americanus*) does not occur on Wrangell Island and is therefore not discussed. Only three of these species (Sitka black-tailed deer, wolf, and marten) are discussed here. The remaining nine species would be largely protected by Forest Plan Standards and Guidelines through beach buffers, RMAs, (USDA 1997b), OGRs and the amount of habitat remaining in the project area. Discussion of these species is found in the Wildlife Resource Report located in the Shady planning record. While there will be minimal effects to these species under either alternative, Alternative 3 was generally more responsive to habitat-related concerns.

### 3.2.8.1 Sitka Black-tailed Deer

#### Environment

Sitka black-tailed deer (*Odocoileus hemionus sitkensis*) are indigenous to the coastal regions of Southeast Alaska. The availability of suitable winter range is believed to be the factor limiting deer populations in Southeast Alaska (Suring et al. 1992).

The Forest Plan Standards and Guidelines require identification of important deer winter range during project analysis (USDA 1997b). A habitat capability model for deer is used to assist in identifying important winter range areas. Sensitivity analysis has shown that successional stage and snow depth have the greatest effect on deer habitat capability estimates (Suring et al 1992).

Habitat mapping through the habitat capability model identified few areas in the project area that have relatively higher potential winter range value (Habitat Suitability Index [HSI] > 0.64) (Figure 3-2, Tables 3-7 and 3-8). It should be noted that the habitat capability model is a tool for estimating habitat capability for deer. It is not intended to estimate actual deer population size and should only be included as part of an overall package of information used in the decision-making process.

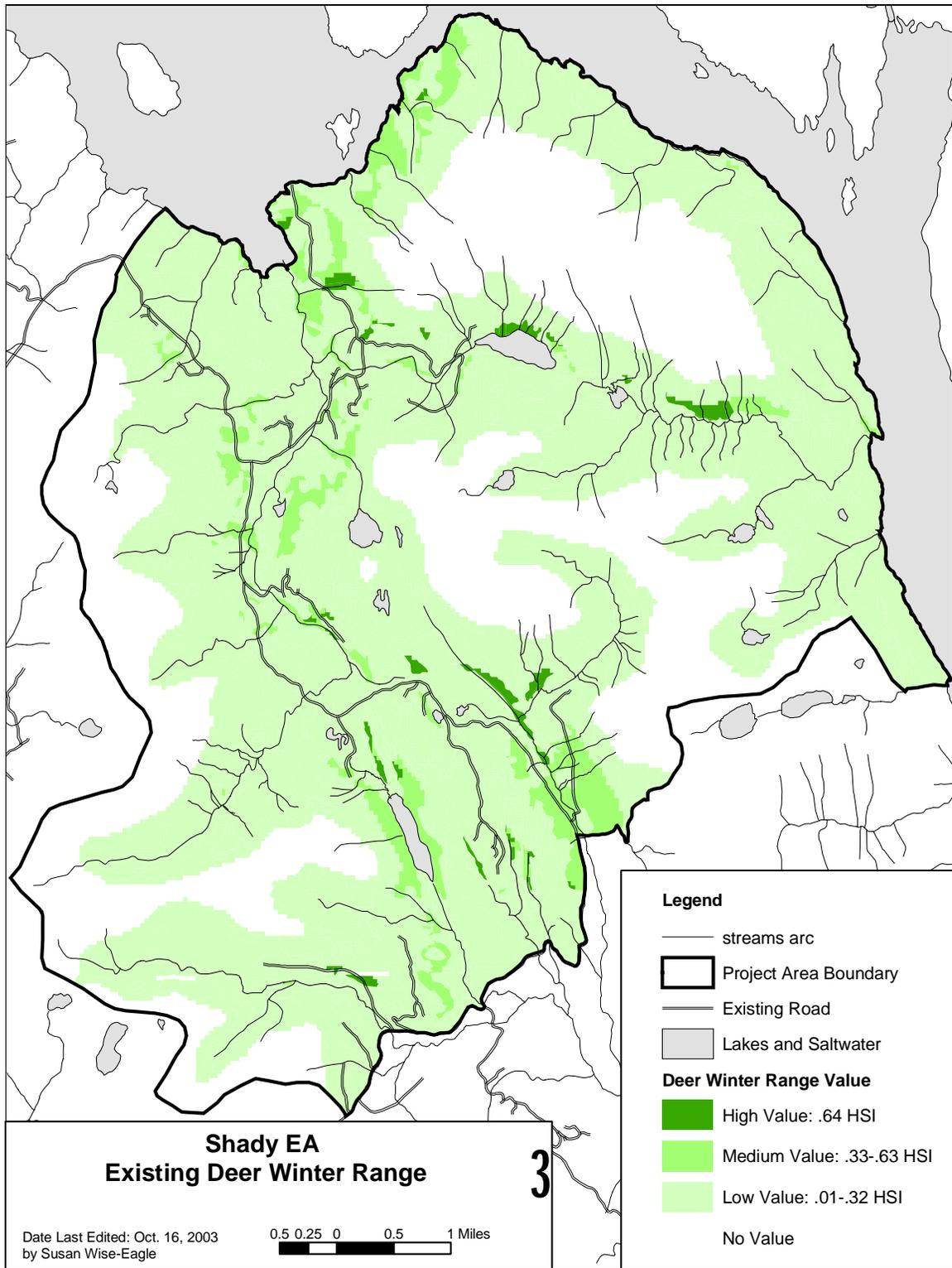
Deer “Quick Cruise” habitat evaluation methods allowed for a standardized and relatively objective field assessment of the quality of winter range in the project area (Kirchhoff and Hanley, 1992). This assessment assigned an overall deer winter habitat score (0-100 points) based on forage and snow-intercept components. The average score in the unit pool was 65.2 points, with a range from 47-85 points (n=64).

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The harvest of deer on Wrangell Island is variable, making it difficult to determine a trend. Hunter effort appears to have increased between 1992 and 2001. Deer pellet transect information for Wrangell Island (Fools Inlet) is limited. Differences were negligible and recorded pellet group densities were low (<1 pellet-groups/plot) (ADFG 2002). Browse indications, deer pellet density information, and hunter harvest information suggest that deer numbers are lower on Wrangell than on surrounding islands.

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Figure 3-2 Deer Winter Range in the Shady Project Area.



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#### **Direct and Indirect Effects**

Protections under the Forest Plan Standards and Guidelines, in the form of beach buffers and RMAs (USDA 1997b), in addition to the OGRs, will protect important deer habitat in the project area. Harvest of productive old-growth at lower elevations will further reduce the amount of habitat available to Sitka black-tailed deer in the winter months (Table 3-7). Harvest also increases the isolation of remaining old-growth stands, further diminishing connectivity.

The quality of deer winter range will be reduced under either alternative. A greater number of high value deer winter range acres are harvested under Alternative 2 (Table 3-8). Overall, the effects to deer winter range and habitat capability in the project area or island-wide would be relatively minor. Yet any additional loss of important deer habitat could reduce the ability of an already depressed population to recover. In that sense, Alternative 3 would be more responsive to deer habitat concerns.

**Table 3-7 Acres of High Value Deer Winter Range (HSI>0.64) currently in the project area and remaining post-harvest by Alternative**

	Existing	Alt 2	Alt 3 <sup>1</sup>
<b>Project Area:</b>			
Acres remaining post-harvest	231	224	224
Percent Decrease	0	3.1%	3.1%
<b>Wrangell Island:</b>			
Acres remaining post-harvest	3400	3393	3393
Percent Decrease	0	0.2%	0.2%

<sup>1</sup> Assumes a clear cut. However, no high value acres are in the patch cuts so numbers are the same.

**Table 3-8 Habitat Capability for Sitka Black-Tailed Deer immediately after harvest**

	Existing	Alt 2	Alt 3
<b>Project Area:</b>			
Number of Deer	607	598	604
Percent Decrease	0%	1.5%	0.5%
Deer per square mile	13	13	13
<b>Wrangell Island:</b>			
Number of Deer	3435	3426	3432
Percent Decrease	0.0	0.3%	0.1%
Deer per square mile	16	16	16

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## 3.2.8.2 Wolves

### Environment

The Alexander Archipelago wolf (*Canis lupus ligoni*) occurs on Wrangell Island. Conservation concerns over the short- and long-term viability of wolf populations in Southeast Alaska led to a petition to list the Alexander Archipelago wolf as a Threatened Species under the Endangered Species Act. The decision by the U.S. Fish and Wildlife Service (USFWS) not to list the wolf was based in part on species-specific conservation strategies placed in the Tongass Forest Plan (USDA 1997a). The Forest Plan identified three strategies to address wolf viability concerns: 1) deer habitat capability, 2) a roadless reserve system, and 3) road density management where wolf mortality concerns exist (USDA 1997b).

Deer are the primary prey of wolves in Southeast Alaska (Person et al. 1996). Consequently, deer habitat values are important in determining wolf population parameters (Person et al. 1996, Person 2001). Section 3.2.8.3 describes the impacts of habitat loss on deer populations.

The vast majority of wolf mortality in Southeast Alaska is human-caused (Person 2001). Wolves in Southeast Alaska experience higher mortality from hunting and trapping in Wildlife Analysis Areas (WAA) with higher road densities (Person et al. 1996). Where there are concerns about excessive wolf mortality, the Forest Plan mandates development of a Wolf Habitat Management Program, especially where road densities exceed 0.7 to 1.0 miles/square mile (USDA 1997b, 4-116).

### Direct and Indirect Effects

An interagency group of biologists (USFWS, USFS, and ADF&G) discussed wolf mortality on Wrangell Island in 2003. It was determined that there were no concerns about excessive human-caused wolf mortality on Wrangell Island, even though there were high road densities at the watershed scale. Road densities remain at 0.57 mi/mi<sup>2</sup> within the project area, and at 0.64 mi/mi<sup>2</sup> on Wrangell Island (Table 3-9).

Standards and guidelines will protect any wolf dens that are discovered in the project area (USDA 1997b). The effects on deer habitat capabilities were discussed previously. Alternative 3 is more responsive to deer habitat concerns than Alternative 2.

Total length and densities of system roads remain the same under all alternatives. Alternatives 2 and 3 propose building 0.5 to 0.6 miles of temporary road. These roads will not remain open to passenger vehicles, but will still be passable to foot traffic and possibly All-Terrain-Vehicles (ATV). Overall, the effects to wolves will be relatively minimal under either alternative. Alternative 3 is more responsive to wolf concerns than Alternative 2 because of deer habitat issues.

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**Table 3-9 Existing Road Length And Density**

	Existing miles of NF System road	Existing miles of total roads (System +non-System)	Area of Land (Square Miles)	Existing miles of NF System road per square mile	Miles of Total Road Per square mile <sup>1</sup>	
					Alt 2	Alt 3
Project Area	26.5	31.1	46.7	0.57	0.68	0.68
Wrangell Island	134.8	134.8	209.3	0.64	0.65	0.65

<sup>1</sup>/ System road would not change with either alternative.

### 3.2.8.3 Marten

#### Environment

High-value marten habitat has been defined by the Forest Plan as high volume strata old-growth stands below 1500 feet in elevation (USDA 1997b). This habitat was identified and mapped using GIS (USDA 1998c). There are 5,420 acres of high-value marten habitat in the project area. Table 3-6 displays the distribution of high-value marten habitat in the project area. The unit cards show the distribution of marten habitat within the units.

Marten are susceptible to over-harvest. Forest management activities that increase human access may influence the potential for over-trapping (USDA 1997a). Marten densities may decrease when road densities exceed 0.2 miles per square mile and can decrease by as much as 90 percent when road densities approach 0.6 miles per square mile (Suring et al. 1992). Road densities currently exceed the critical road density threshold for marten. An interagency group of biologists (USFWS, USFS, and ADFG) discussed marten mortality on Wrangell in 2003. It was determined that there were no concerns about excessive human-caused marten mortality on Wrangell Island even though there were high road densities at the watershed scale.

#### Direct and Indirect Effects

Protection under the Forest Plan Standards and Guidelines, in the form of beach buffers and RMAs (USDA 1997b), in addition to the OGRs, will protect important marten habitat in the project area. To meet Forest Plan Standards and Guidelines, those units containing high-value marten habitat (high volume productive old-growth forest below 1500 feet) will include stand-structure retention (USDA 1997b).

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## 3.2.9 Other Key Species

Other important species include moose, marbled murrelet, endemics, small mammals, Neotropical migratory birds, raptors, and great blue heron. Only the marbled murrelet is discussed here. The other species will be largely protected by Forest Plan Standards and Guidelines, in the form of beach buffers, RMAs, (USDA 1997b), OGRs, and the amount of habitat remaining in the project area. Effects to these species would be minimal under both alternatives. However, Alternative 3 is generally more responsive to habitat-related concerns. The other species are discussed in the Wildlife Resource Report located in the project planning record.

### 3.2.9.1 Marbled Murrelet

#### Environment

Marbled murrelets were detected in the project area on several occasions, including in a number of the proposed harvest units. There are 10,732 acres of high-value marbled murrelet habitat in the project area (Table 3-6). High-value marbled murrelet habitat is broadly defined as medium and high volume strata (POG).

Murrelet surveys were conducted in 2002. A high amount of marbled murrelet activity was detected along upper Fools Creek and may indicate nesting in nearby units as well as general flight corridor values.

#### Direct and Indirect Effects

Protection under the Forest Plan Standards and Guidelines, in the form of beach buffers and RMAs (USDA 1997b), will protect important marbled murrelet habitat in the project area, especially lower elevation habitat. Nests are protected under specific Forest Plan Standards and Guidelines (USDA 1997b).

Alternative 2 harvests more high volume POG and high-value marbled murrelet habitat (222 acres) than Alternative 3 (147 acres) (Tables 3-4 and 3-6). Under all alternatives the percent reduction in total high-value habitat in the project area is minimal. The upper Fools Creek riparian area is protected in all alternatives. Given the difficulty of finding nests, it is unlikely any will be found. This suggests that some nests may inadvertently be lost due to timber harvest. The 60 percent retention in units adjacent to Fools Creek under Alternative 3 will retain potentially important nesting habitat. Alternative 3 will likely have fewer impacts on marbled murrelets than Alternative 2.

### 3.2.10 Cumulative Effects on Wildlife

Future timber sales over the next 10 years, including past sales, were considered in order to examine cumulative effects on wildlife species dependent on old-growth forest. Other activities with the potential to affect wildlife and habitat were also considered.

Approximately 12 MMBF of timber is planned for harvest on National Forest System Lands on Wrangell Island over the next 10 years, 5 MMBF of which will occur in the project area. An estimated 6 miles of road may be constructed. The Alaska Department of Natural Resources (DNR) intends to harvest 5.4 MMBF on Wrangell Island over a 5-year period. Some of this potential harvest encroaches upon the beach fringe or is adjacent to an OGR. Approximately 1.8 miles of road would be constructed at the north end of Wrangell. This will effectively create a roaded loop that, while increasing access, could lead to increased effects on deer and other wildlife.

Any additional harvest in the project area may have negative impacts on species dependent on old-growth forest. Forest Plan Standards and Guidelines protect beach and estuary fringe and riparian habitat that is valuable to many species (USDA 1997b), but these standards do not apply to State Lands. Retaining habitat in OGRs and maintaining wildlife corridors could also serve to lessen these impacts. Results from GIS analysis suggest that deer habitat capability is already lower in the project area than other portions of Wrangell Island (USDA 2000), likely due to greater accumulated snow depths that result in lower capability values.

Cumulative effects to wildlife and habitat would be slightly greater under Alternative 2 compared to Alternative 3. A greater difference might occur in the event of the development of the South Wrangell Ferry Terminal, because of the potential to greatly increase human access. Any activities that reduce the value of existing winter deer range and increase vulnerability to harvest or predation could negatively impact the existing deer population. In that case, there may be greater benefits of the harvest strategy along Fools Creek in Alternative 3 because of the lessened impacts on connectivity and corridors.

## 3.3 Subsistence

### Environment

**Abundance, Distribution and Demand for Deer** - Deer are believed to be the most important subsistence resource impacted by this proposed plan and have historically been an important resource to Wrangell residents (Cohen 1989). Recent analysis suggests that deer habitat capability in the project area is below

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15 deer per square mile and will remain essentially unchanged under either alternative.

**Abundance, Distribution and Demand for Moose** - Moose are the second most important source of subsistence for Wrangell residents (Cohen 1989). The Stikine River has traditionally been the most important moose hunting area for Wrangell residents and will likely continue to be. However, a small but increasing number of moose are harvested annually on Wrangell Island. This project is not likely to result in a noticeable change in moose distribution or abundance island-wide.

**Abundance, Distribution and Demand for other Species** - Black bears, grouse, and ptarmigan are harvested on Wrangell Island. However, furbearer and waterfowl harvest within the project area currently makes up an insignificant portion of the total subsistence harvest and is not considered an important hunting area for Wrangell hunters (Cohen 1989). The increased human access due to the minimal amount of temporary road building should not relate to increased harvest or change in distribution and abundance of black bear populations. It is expected that any change in the island-wide abundance, distribution, access to and competition for other subsistence species, such as fish, shellfish, and marine mammals, will be insignificant.

**Human Access** - Road building can have both negative and positive effects on subsistence by “providing access, dispersing hunting and fishing pressure, and creating the potential for increased competition” (USDA 1997a) or by leading to local declines in wildlife abundance. Effects to human access and harvest levels of deer, moose, and other subsistence resources will be insignificant under either alternative.

**Competition** - Competition between rural hunters in the project area is not expected to increase, given the minimal amount (0.6 miles) of temporary roads that will be built.

#### **Cumulative Effects**

The Forest Plan states that “...implementation of any alternative [Forest Plan Alternatives] could be accompanied by a significant possibility of a significant restriction on the abundance and/or distribution of subsistence uses of deer” (USDA 1997a). In this sense, while an individual timber sale may not lead to a possibility of a significant restriction, the cumulative effect of timber sales on Wrangell Island may lead to an effect.

Changes in subsistence opportunities can occur as a result of the cumulative effects of past and future management activities. Approximately 12 MMBF of timber is planned for harvest on National Forest System Lands on Wrangell Island over the next 10 years, 5 MMBF of which would occur in the project area. A minimal amount of road would be constructed. The Alaska Department of Natural Resources (DNR) intends to harvest 5.4 MMBF on Wrangell Island over

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a 5-year period. Some of this potential harvest encroaches upon the beach fringe or is adjacent to an OGR. Approximately 1.8 miles of road would be constructed at the north end of Wrangell. This would effectively create a roaded loop that, while increasing access, could lead to increased effects on deer and other subsistence resources.

The additional island-wide timber harvest may have negative impacts on species dependent on old-growth forest. However, Forest Plan Standards and Guidelines will continue to protect beach and estuary fringe and riparian habitat on National Forest System Lands that is valuable to many subsistence species (USDA 1997b). Retaining habitat in OGRs and maintaining wildlife corridors could also serve to lessen these impacts.

Other potential activities such as road and ferry projects could have impacts as well, because of the potential to greatly increase human access. Overall, any activities that reduce the value of existing winter deer range and increase vulnerability to harvest or predation could negatively impact the existing deer population. This in turn could impact subsistence users.

### **Subsistence Findings/ANILCA 810 Finding**

**This analysis leads to the conclusion that there may be the significant possibility of a significant restriction on subsistence use of deer on Wrangell Island due to cumulative effects.** Any additional loss of winter habitat and increased access due to other activities could lead to further population declines. The potential cumulative effects of full implementation of the Forest Plan, in conjunction with other factors (weather events, predators, hunting), could lead to competition for subsistence deer resources by 2095 (USDA 1997b). The analysis does not find a significant impact on subsistence use of other wildlife, fish, shellfish, marine mammals, and timber resources. This finding is not to be confused with significance as used in the context of NEPA assessments.

## 3.4 Silviculture

### **Environment**

The “project area” as described in this silviculture section does not include the acreage that is within the State selected lands. The current condition of the project area is a mosaic of vegetation types and structures including:

**Non-forested and non-productive forest types – 13,202 acres,** Non-forested types include rock outcroppings, meadows, muskeg, and other areas not capable of growing stands of trees. Non-productive types include forested wetlands and poor sites, which are not capable of growing commercial forests (less than 20 cubic feet of growth per year).

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#### **Productive Old-Growth (POG) - 12,225 acres**

POG is assigned to any commercial stand that has not received previous management. It includes even-aged stands created by past stand-level disturbance (wind, landslides, etc), and uneven-aged stands created by gap-phased disturbances (disturbance affecting individual trees or groups of trees within a stand). A majority of the POG stands within the project area are multi-storied with a complex stand structure. On higher productivity sites (Site Index 80+ feet) with this complex structure, western hemlock dominates the overstory. Sitka spruce generally represents less than 15 percent of the overstory, with minor components of western and/or Alaska yellow-cedar. Log defect is generally high, particularly in western hemlock.

Advanced regeneration is generally prolific and heavy to western hemlock (90+ percent). Net volume growth is generally static to declining due to mortality and defect. Even-aged POG stands on well-drained sites generally contain a higher component of Sitka spruce, but may be dominated by western hemlock. Growth is generally good, and defect is low. Advanced regeneration is considerably lower due to shading. On low to moderate productivity sites (Site Index 50 - 79 feet), growth is generally limited by soil drainage. Mixed conifer series generally occur on these sites. Cedars or hemlock may dominate the overstory, with spruce making up a minor component. Log defect is generally high, and canopy closure is much lower than on higher productivity sites, resulting in a well-established understory of brush and a variety of tree species.

#### **Managed forests – 1,009 acres**

Managed stands in the project area were created beginning in 1981 using even-aged silviculture systems, primarily high-lead cable clearcut harvest. These stands are composed of healthy, vigorously growing trees, free from defect. Many of the stands have been or will soon be Pre-Commercially Thinned (PCT). Species mix is generally more favorable for timber management objectives than the parent stand, with all native species being well represented. PCT allows an opportunity to shift species mix in a more favorable direction than un-thinned stands.

#### **Direct and Indirect Effects**

The desired condition of the Timber Management LUD is healthy, vigorously growing trees of commercial value arranged across the landscape in a variety of age-classes and stand structures.

An analysis of changes in stand structure over time by alternative was conducted (reference Silviculture Resource Report, Appendix 5, located in the project planning record). No significant change was evident as a result of this analysis.

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An analysis of changes in growth and yield over time was conducted. No significant changes are evident for growth and yield as a result of this analysis. (Reference Silviculture Resource Report located in the project planning file)

## 3.5 Scenery

Much of the project area is located along mainline roads. The road system on Wrangell Island provides for recreational driving opportunities and access to dispersed and developed recreation sites. The project area is within the home range of the community of Wrangell, making it an important recreation area for local residents. Portions of the project area are visible from the Eastern Passage and Blake Channel waterways.

### 3.5.1 Views from Marine Travel Routes and Saltwater Use Areas

#### **Environment**

The project area is visible from Blake Channel, Eastern Passage, and Earl West Cove, all of which are identified as Visual Priority Routes or saltwater use areas in the Forest Plan.

#### **Direct and Indirect Effects**

This project does not propose any harvest or road construction that will be visible from Blake Channel, Eastern Passage or Earl West Cove. Potential use of the Earl West LTF could result in a temporary visual impact. There will be no permanent change to the viewshed of these marine travel routes and use areas.

### 3.5.2 Views from Public Use Roads

#### **Environment**

The following roads are within the project area and listed in the Forest Plan as Visual Priority Routes:

- McCormick Creek to Earl West Cove (Road 6265)
- Fools Inlet (Road 6270)
- Thoms Creek Crossing (Road 6299)
- Long Lake Access (Road 6271)

Alternatives 2 and 3 propose harvest units along Forest Roads 6270 and 6271. All proposed harvest along these routes must meet the Modification Visual Quality Objectives (VQO) in the foreground distance zone.

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## **Direct and Indirect Effects**

Alternative 2 proposes seven harvest units directly adjacent to Road 6270 (Units 60A, 60B, 60C, 42, 25, 26B, and 35), and one unit (Unit 46) directly adjacent to Forest Road 6271.

Units 60 (A, B and C), 25, 26B and 35 are proposed as clearcuts with reserves that run along the main road for anywhere from one-third to one-half of a mile. Much of Unit 60 (A and B) will be screened by a 250-350 foot leave strip. Units 25, 26B and 35 will be partially screened by a series of long wedge-shaped leave areas that will be a maximum of 300 feet wide. A series of landings will be located along the main road between these leave areas. To further mitigate the impact of harvest directly along this road, the slash accumulated at these landings will be burned at a landing, hauled to a nearby rock pit and left, or hauled to a nearby rock pit and burned. Unit 42 will be a 6-acre opening along Road 6270 and Unit 46 will be a 13-acre unit with reserves at the end of Road 6271. All of these units, with the mitigation measures described, will meet the Modification VQO.

Alternative 3 proposes eight harvest units directly adjacent to Road 6270 (Units 60A, 60C, 60D, 63, 42, 25, 26, and 35), and one unit (Unit 46) directly adjacent to Road 6271.

Unit 60 (A, C, and D) will appear as two openings, separated by approximately 300 yards. The resulting impact will meet the required Modification VQO. Unit 63 will also meet the Modification VQO, due to its small size and the reserves that will be left within the unit. In Alternative 3, Units 25 and 26 are proposed with 60 percent retention. This amount of structure retention will result in these units meeting the required Modification VQO. Units 35, 42, and 46 are identical to that proposed in Alternative 2, and will meet the Modification VQO.

### **3.5.3 Views from Developed Recreation Sites and Hiking Trails**

#### **Environment**

The following developed recreation sites are within the project area and listed in the Forest Plan as Visual Priority Use Areas:

- Earl West Picnic Area
- Long Lake Trailhead, Long Lake Shelter, and Long Lake Trail (#574)
- Highbush Lake Day Use Site and Highbush Lake Trail (#572)

## 3 Environment and Effects

Forest Plan direction requires that any proposed harvest must meet the Modification VQO when viewed in the foreground distance zone from these areas, and meet the Maximum Modification VQO when viewed in the middleground and background distance zones from these areas.

### **Direct and Indirect Effects**

#### **Earl West Picnic Area**

This project does not propose any harvest or road construction that will be visible from the Earl West Picnic Site. If Earl West LTF is used, there will be temporary visual impacts associated with its use, but no permanent change to the area viewed from the Earl West Picnic site.

#### **Long Lake Trailhead, Long Lake Trail, and Long Lake Shelter sites**

Alternatives 2 and 3 both propose Unit 46, which is located at the end of Road 6271. The eastern boundary of Unit 46 will parallel the trail for about 750 feet, with an approximately 150 foot buffer of trees being left between the unit and the trail. With this mitigation, the unit would meet the required Modification VQO as seen from the Long Lake Trailhead and Long Lake Trail. Unit 46 will not be visible from the Long Lake Shelter, but may be visible at oblique angles from positions out in the lake. From this distance, the unit will meet the required Maximum Modification VQO.

#### **Highbush Lake Day Use Site and Highbush Lake Trail**

There are no harvest units and no road construction proposed that would have any effect to the area viewed from the Highbush Lake Day Use Site or Highbush Lake Trail.

## 3.6 Recreation

Recreation use of the project area is predominately road-based. The main recreation attractions within the project area are the Long Lake developments including Long Lake trailhead/picnic site, Long Lake Trail (#574), and Long Lake Shelter. Other developed recreation attractions include the Earl West Picnic site and LTF/boat launch, and the Highbush Lake Trail (#572). The road system on Wrangell Island provides for recreational driving for local residents. Activities often accompanying recreational driving on Wrangell Island include berry-picking, hunting, opportunistic wildlife viewing, and just “getting out of town”.

# 3 Environment and Effects

## 3.6.1 Inventoried Recreation Places

### 6265 Road (22094.04 and 22094.08) and 6270 Road (22094.08)

#### Environment

Roads 6265 and 6270 are mainline roads connecting the community of Wrangell to Earl West Cove (6265 Road), and leading from the 6265 Road to Fools Inlet (6270 Road). Both provide for recreational driving and access to dispersed and developed recreation sites on Wrangell Island. The roads are used for recreational driving/sightseeing, and provide access to such activities as berry-picking, hiking, camping, fishing, and hunting. The roads are also used to provide commercial services to cruise ship passengers in the form of nature-based driving tours.

#### Direct and Indirect Effects

Both Alternative 2 and 3 will have temporary effects to recreational driving on Forest Roads on Wrangell Island due to logging operations. Once logging operations are finished, recreational driving opportunities will return to their existing condition.

### Earl West Road Buffer (22094.05) including Earl West Cove Recreation Developments

#### Environment

The Earl West Road buffer is located adjacent to the boundary with the State selected lands surrounding Earl West Cove. The Forest Service developed the Earl West picnic site in conjunction with the Log Transfer Facility (LTF). The ramp-style LTF serves as an alternative boat launch for trailered vessels and non-motorized watercraft. The site is also used as a convenient drop-off or pickup point for gear, people and/or boats fishing or motoring through the Eastern Passage/Back Channel area.

#### Direct and Indirect Effects

None of the alternatives proposed in the Shady project area will result in lasting impacts to the Earl West Cove developed recreation site. Use of the Earl West LTF by the contractor may temporarily displace picnickers and boat launching during the project. If logs are hauled to Wrangell, there will be no effect to this inventoried recreation place.

### Earl West Marsh (22094.06)

#### Environment

Earl West Marsh is located approximately one-half mile south of the junction of Roads 6265 and 6270. Although there are no developed parking areas or trails in this area, the marsh and creek are good places to view wildlife and fish.

## 3 Environment and Effects

There has been interest in offering commercial nature/educational hiking and paddling tours.

### **Direct and Indirect Effects**

None of the alternatives proposed in the project area will have lasting effects to the Earl West Marsh area. Logging operations and log hauling traffic will have a temporary effect on access to this area. The effects for both alternatives will be the same.

Noise from logging operations in Unit 60 will likely be heard by people using the Earl West Marsh area. Alternative 3 will likely result in a shorter duration of noise heard by people using the area.

### **Highbush Lake (22094.20), Highbush Lake Buffer (22094.02), and Road 50041 (22094.03)**

#### **Environment**

The Highbush Lake Recreation site is located at the end of Road 50040. The Highbush Lake Trail (#572) begins at the parking area and is a 300 foot long surfaced trail that leads to the lakeshore. The lake offers opportunities for boating and fishing in addition to scenery and wildlife viewing. Road 50041 forks off of Road 50040 just before reaching the Highbush Lake Trailhead, providing approximately one-half mile of driving opportunities and access to old harvest units for berry-picking or hunting.

#### **Direct and Indirect Effects**

None of the alternatives in the Shady project area propose harvest or road construction in the Highbush Lake area. There will be no effect to this inventoried recreation place.

### **Long Lake Trailhead Campsite (22100.00)**

#### **Environment**

The Long Lake Trailhead Campsite is located near the end of Road 6271, approximately one-half mile from its junction with Road 6270. The recreation site is used as a parking area for recreation visitors hiking the trail to Long Lake and as a destination itself as a developed picnic/campsite.

#### **Direct and Indirect Effects**

Both Alternative 2 and 3 propose the harvest of Unit 46 at the end of Road 6271, near the Long Lake Trailhead Campsite. Harvest of the unit will have no effect to the trailhead or roadside developed site, but logging operations will temporarily disturb users, mainly due to noise and increased traffic on Road 6271. Day use of the site will temporarily be restricted during logging operations.

### 3 Environment and Effects

#### **Long Lake (22100.01) including the Long Lake Trail and Long Lake Shelter**

##### **Environment**

The Long Lake Trail (#574) is a 0.6 mile boardwalk-surfaced trail leading from the Long Lake Trailhead Campsite to Long Lake. The lake offers opportunities for fishing, boating, camping, and wildlife viewing.

##### **Direct and Indirect Effects**

Both action alternatives propose the harvest of Unit 46. The eastern boundary of Unit 46 runs parallel to the Long Lake Trail for approximately 750 feet, at a distance of approximately 150 feet off the trail. Harvest of the unit will have no effect on trail or shelter site use, but the trail will be closed during logging operations temporarily restricting use of the trail and shelter. Once logging operations are complete, there will be no effect to the recreation use of this area.

#### **3.6.2 Outfitter/Guide Use**

##### **Environment**

Currently, there are three guiding companies authorized to use the road system as part of their guiding operations. Most of the road-based nature tours offered on Wrangell Island occur in conjunction with cruise ship port calls in Wrangell. Past guiding-use has been reported in the Long Lake and Earl West Marsh Areas.

##### **Direct and Indirect Effects**

Both action alternatives propose to harvest units along Road 6270 and near the Long Lake recreation developments at the end of Road 6271. Any logging operations will result in increased traffic on the Wrangell Island road system. Outfitter/guides providing road-based nature tours could be impacted by that traffic. Please see the discussion above (3.6.1 Inventoried Recreation Places) for identified impacts to those areas.

#### **3.6.3 Inventoried Roadless Areas**

For this analysis the roadless area acres are based on Roadless Rule Inventoried Roadless Areas.

##### **Environment**

East Wrangell (247) – The East Wrangell Roadless area is 7,769 acres in size, of which 7,489 acres fall within the project area. The inventoried roadless area is bounded on the east by Blake Channel. Roads define the western boundary of the inventoried roadless area.

Central Wrangell (289) – The Central Wrangell Roadless area is 13,487 acres in size, of which 6,799 acres fall within the project area. The inventoried roadless

## 3 Environment and Effects

area is defined by roads on all side, except for a small portion defined by the Thoms Lake State land selection.

Southeast Wrangell (290) – The Southeast Wrangell Roadless area is 18,529 acres in size, of which 5,543 acres fall within the project area. The inventoried roadless area is bounded on the east by Blake Channel and to the south by Earnest Sound. Roads and Fools Inlet define the western boundary.

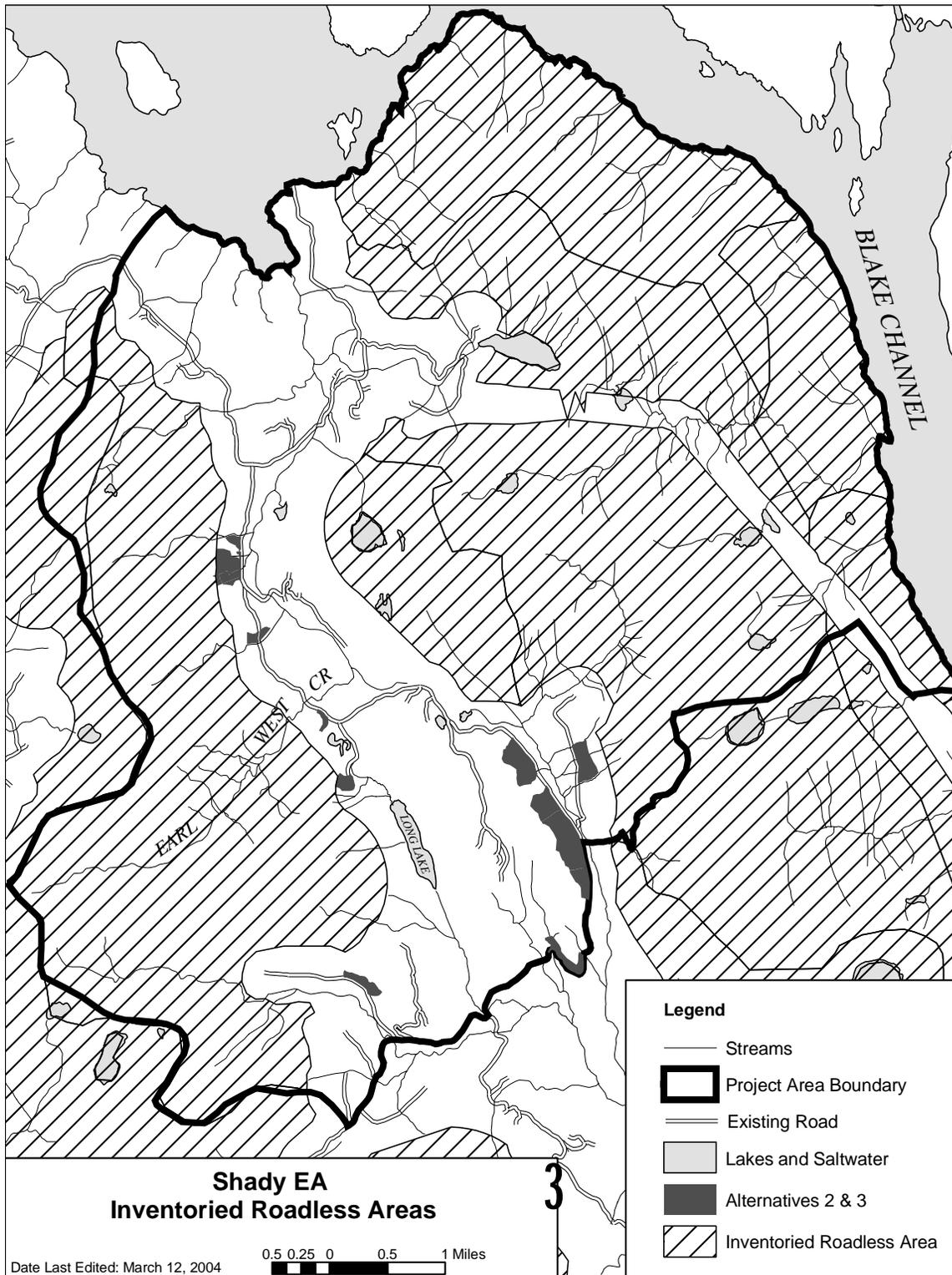
Figure 3-3 displays the Inventoried Roadless Area within the project area.

### **Direct and Indirect Effects**

None of the alternatives propose road construction or timber harvest in any inventoried roadless areas on Wrangell Island. Implementation of any of the proposed alternatives will result in no effect to the resources within these roadless areas.

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Figure 3-3 Roadless Map



### 3.7 Wetlands

#### Environment

A wetland map was developed using information from CLU (GIS cover), National Wetland Inventory (NWI), aerial photo interpretation, and field information. This map is the basis for the wetland evaluation in the project area. Field verification was done following the protocol in Corps of Engineers wetland delineation manual (U.S. Army Corps of Engineers, 1987).

Wetlands were classified based on vegetation composition and function. Wetland types in the project area include:

**Alpine/Subalpine Muskeg (2,500 acres)** - High elevation wetlands are important for snow storage and can be a source for snowmelt water throughout the summer. They also provide summer habitat for terrestrial wildlife species. Many of these alpine and sub-alpine areas on Wrangell Island are heavily used during the summer months by deer and bear.

**Sedge Fens (106 acres)** - Earl West Marsh is the primary fen in the project area. These wetlands function as areas for recharge of groundwater and streams, deposition and storage of sediment and nutrients, and as habitat for waterfowl and terrestrial wildlife including black bear, mink, river otter, and beaver. Many sedge fens contain beaver ponds that often provide high quality waterfowl habitat and salmon-rearing habitat. There is no harvest or road construction planned in the immediate vicinity of the Earl West Marsh. Numerous smaller sedge fens are located in the project area but are too small to map individually, they are included in the Muskeg polygons. A circular fen is located immediately downslope from the road that accesses Unit 46.

**Muskeg (1,400 acres)** - Muskegs function as areas for recharge of groundwater and streams and for deposition and storage of sediment, and nutrients. They are a valuable source of biological and vegetative diversity. Muskegs are most commonly found in broad valley bottoms, on rounded hilltops, and on rolling lowlands on Wrangell Island.

**Forested Wetlands (2,240 acres)** - Forested wetlands function as recharge areas for groundwater and streams, and for deposition of sediment and nutrients. They also produce commercial forest products.

#### **Muskeg/Forested Wetland Mosaic (9,980 acres)**

This wetland consists of small patches of muskegs and forested wetlands as described above, arranged in a mosaic pattern on the landscape. These wetlands have vegetative properties of each of the respective components but functions

### 3 Environment and Effects

somewhat differently in respect to habitats due to their small size and spatial arrangements.

The Forest Service is directed to avoid alteration of, and new construction on, wetlands wherever there is a practical, environmentally preferred alternative. On the Tongass NF, however, it is usually impossible to avoid all wetlands in projects that involve road construction. This is due to the large proportion of wetlands in the landscape. Our strategy, therefore, is to avoid those wetland types that are scarce in the immediate landscape, and/or those wetlands recognized as having a “high value” to the ecosystem, such as estuaries, floating bogs, raised dome bogs, and sedge fens. Where avoidance of wetlands is not practical, we apply appropriate mitigation measures to minimize the magnitude of impacts and/or maintain wetland function.

Policy and standards that guide the analysis are found in:

- a) The Forest Plan Standards and Guidelines (Page 4-111),
- b) BMP 12.5, Wetland Identification, Evaluation, and Protection, and
- c) The Executive Order 11990.

#### **Direct and Indirect Effects**

Road construction in wetlands results in a permanent conversion from wetland to non-wetland. Roads and landings will be built to a minimum standard to reduce the amount of impact to wetlands. Where possible, roads are located in the uplands. Harvest on wetlands is considered a temporary alteration of the existing vegetation. The following tables display the amount of impact from road construct and timber harvest by alternative.

**Table 3-10 Miles of Road by Wetland Type.**

Wetland Type	Miles of Road			
	Existing	Alt 1	Alt 2	Alt 3
Upland (non wet)	12.9	0	.3	.2
Muskeg	1.8	0	.2	.2
Forested Wetland	2.4	0	0	0
Muskeg/Forested Mosaic	9.5	0	.1	.1
<b>Total miles of road</b>	<b>26.6</b>	<b>0</b>	<b>.6</b>	<b>.5</b>

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**Table 3-11 Acres of Harvest on Wetlands.**

Wetland Type	Acres Harvested			
	Existing	Alt 1	Alt 2	Alt 3
Alpine/subalpine	.5	0	0	0
Sedge Fen	.9	0	0	0
Muskeg	5	0	.8	.8
Forested Wetlands	121	0	7.2	7.7
Muskeg/Forested Mosaic	165	0	27.5	44
<b>Total Acres Harvested<sup>1</sup></b>	<b>292</b>	<b>0</b>	<b>36</b>	<b>53</b>

<sup>1</sup>Total Acres Harvest acres are rounded off.

Alternative 1 will have no impacts on wetlands in the project area. Alternative 2 will result in less acres of wetland harvested, however, harvest prescription in Alternative 2 will be clearcut, and Alternative 3 will use a combination of clearcut and partial harvest. Alternative 2 and 3 will construct the same amount of road on wetlands.

### **Cumulative Effects**

Cumulative effects to wetlands are determined by adding the existing roads and harvest on wetlands to the proposed roads and harvest for each alternative, in addition to an estimate of the reasonably foreseeable activities on wetlands.

Within the Shady project area, approximately 290 acres of wetlands have been harvested to date. Approximately 14 miles of road has been constructed on wetlands, with the majority of it on the muskeg/wet forest complex. Implementation of this project will result in less than one-third mile of additional wetland road construction, and between 36 and 53 acres of harvest on wetlands. In the reasonably foreseeable future, approximately 7 MMBF may be harvested from an estimated 325 acres and 3 miles of new road may be constructed within the project area [Highbush (USFS) and Shady Tie-in (ADNR) projects]. Based on similar amount of impacts to wetlands as the existing project, cumulative effects are calculated as follows:

	Harvest on Wetlands	Roads on Wetlands
Existing	290 acres	13.7 miles
Shady project	36-53 acres	.3 miles
Future (estimated)	<u>75 acres</u>	<u>2.0 miles</u>
Total, up to	418 acres	16.0 miles

Other activities that could affect wetlands on Wrangell Island include three State of Alaska timber sales (3.9 MMBF; 2.5 miles of new road) and one Forest Service timber sale (7 MMBF; 3.5 miles of new road), which are listed on current state and federal plans, but outside the Shady project area. In addition, the potential road and ferry terminal projects could affect wetlands on the island, however the cumulative effects of these projects is speculative and difficult to quantify.

# 3 Environment and Effects

## 3.8 Soils

### **Environment**

Much of the project area has glacial deposits overlying and masking the underlying bedrock. Windthrow, landslides and flooding are the dominant natural disturbance agents that alter existing vegetation and the soil properties.

The Forest Service uses a Mass Movement Index (MMI) to identify unstable sites in a project area. The MMI summarizes the physical properties of a soil, and rates the relative stability of the soil into four classes of landslide potential, from low (MMI 1) to very high (MMI 4). Most mineral soils that occur on slopes greater than 72 percent gradient, and some mineral soils with restricted drainage on slopes greater than 60 percent gradient, are classified as MMI 4. While most MMI 4 sites are avoided, the Shady project includes 6 acres mapped as MMI 4.

Timber harvest and road construction can cause increased surface erosion and subsequent loss of soil productivity. In an undisturbed setting, thick organic surface layers and roots protect the underlying mineral soil from erosion. When the organic surface layer is removed and the mineral soils are exposed, they are very susceptible to accelerated erosion. An existing road in the project area with active cut slope erosion is the 6296 Road. A landslide in the harvest unit along Road 50061 was revegetated in 2002 to decrease the amount of surface erosion and improve site productivity.

### **Direct and Indirect Effects**

The Forest Plan directs us to plan land use activities to “avoid irreversible or serious and adverse effects on soil resources”. The primary concerns are with slope stability and surface erosion. Harvest units and roads were planned to minimize soil disturbance and avoid oversteepened and unstable slopes.

The GIS database identified 6 acres of High Hazard (MMI 4) soils within Unit 27. Light Detection and Radar (LIDAR) information identified approximately 62 acres of slopes steeper than 72 percent, mostly in Units 26, 27 and 35. Field investigations found that the LIDAR data was able to locate small steep inclusions and vertical rock faces, which do not have stability concerns. Segregating the small inclusions resulted in approximately 20 acres (Table 3-12) of slopes over 72 percent.

Potential harvest units with indicators of soil instability were field reviewed by a soil scientist. Most of these areas were found to have shallow soils over bedrock, with a low risk of mass wasting associated with harvesting. Soil productivity may be reduced if displacement of the surface horizon occurs, and this can be mitigated with partial suspension of logs during yarding.

## 3 Environment and Effects

**Table 3-12 Soil Disturbance**

	<b>Alt 1</b>	<b>Alt 2</b>	<b>Alt 3</b>
Acres of disturbance from road construction	0	1.8 acres	1.4 acres
Acres of disturbance from rock pit development	0	0	0
Miles of road constructed on slopes > 65%	0	0	0
Total acres of harvest on slopes > 72% <sup>1</sup>	0	18 acres	20 acres <sup>2</sup>

<sup>1/</sup> Area is based on LIDAR and adjusted to remove small areas

<sup>2/</sup> A reduction was not used for harvest units with 60% retention prescriptions, therefore, the amount of harvest on slopes > 72% will be lower than displayed.

Under Alternative 1, no additional sediment sources or transport pathways will be created; existing sources will continue to produce minor amounts of sediment. In comparison to Alternative 3, Alternative 2 shows a result of slightly more direct effects on soil resources. While timber felling and yarding may result in ground disturbance, the use of BMPs and no-disturbance buffers will minimize sediment delivery from harvest units to the stream system. No impacts to adjacent resources (Class I or Class II streams, or roads) are expected to result from any potential mass failures.

### **Cumulative Effects**

A minor degree of site disturbance is unavoidable under any timber harvest activity.

In both action alternatives, there will be a loss of productivity where roads are constructed. Soil and water resource protection measures will be incorporated into the design of roads (BMP 14.3, FSH 2509.22).

Timber harvest can induce slumping in the inner gorges of V-notches (steep streams deeply incised into the bedrock) through the removal of protective vegetation. This effect would be minimized by applying no-harvest buffers to at least the topographic slope break above Class III streams and by using harvest systems that yard the timber away from streams.

For the purpose of analysis and unit comparison, the amount of harvest on slopes steeper than 72 percent and roads constructed across slopes with a gradient steeper than 65 percent was used as measure of the potential for detrimental soil disturbance. Table 3-12 shows potential soil disturbance by alternative.

# 3 Environment and Effects

## 3.9 Watershed

### Environment

There are six major drainages that reside within the Shady project area. These six watersheds are: Highbush Lake, Earl West, Upper Earl West, East Fools, West Fools, and Blake. The other three watersheds can be described as groups of unconsolidated small watersheds based on their small drainage areas and their short lengths from headwaters coast. The four watersheds that would be affected by road construction and timber management are Earl West, Upper Earl West, East Fools, and West Fools.

A watershed sensitivity analysis conducted in 1998 show that watersheds in the Shady project area have a low inherent risk of sensitivity to mass movement and sediment transport events (USDA Forest Service, 1998).

Current riparian harvest levels are minimal. According to GIS analysis, current riparian harvest is 2.3 percent of the total riparian acres in the project area. No new riparian harvest is allowed under the Forest Plan.

All proposed units in the Shady project area have been visited by field personnel, and no problematic or sensitive stream courses have been identified.

### Direct and Indirect Effects

Alternative 2 will harvest 240 acres and build 0.6 miles of temporary road within the four affected watersheds of the project area. Alternative 3 will harvest 159 acres and construct 0.5 miles of temporary road. Appendix J of the Forest Plan suggests that if more than 20 percent of a watershed is harvested within a 30-year period, a threshold of concern has been surpassed. The cumulative watershed harvest levels for both action alternatives would fall well below this threshold of concern. Table 3-13 compares cumulative watershed harvest levels with existing levels for each action alternative.

**Table 3-13 Current and Cumulative Percent of Watershed Harvested**

Watershed (acres)	Percent of Watershed Harvested		
	Existing	Alt 2 Cumulative	Alt 3 Cumulative
West Fools (5,254)	7.0	7.9	7.9
East Fools (3,829)	5.0	8.8	10.0
Earl West (5,386)	5.8	6.6	6.3
Upper Earl (2,246)	0.0	0.2	0.2
Highbush <sup>1</sup> (2,303)	13.8	13.8	13.8
Blake <sup>1</sup> (3,464)	0.6	0.6	0.6

<sup>1</sup>/No harvest is proposed in this watershed.

Roads can affect streams directly by accelerating erosion and sediment loadings, by altering stream morphology, and by changing the runoff characteristics of watersheds

## 3 Environment and Effects

(Furniss et al, 1991). Higher road densities generally result in a greater amount of sediment generated from road surface erosion. Table 3-14 compares cumulative road densities with existing road densities for each action alternative.

**Table 3-14 Road Densities of the Four affected Watersheds**

Watershed	Road Density Mi/SqMi		
	Existing	Alt 2 Cumulative	Alt 3 Cumulative
West Fools	1.26	1.30	1.30
East Fools	0.93	0.93	0.93
Earl West	0.99	1.01	0.99
Upper Earl	0.23	0.25	0.25

Road density levels are increased negligibly with temporary roads. All temporary roads will be closed to Forest Standards at the end of the sale. Construction of temporary roads in the project area should be carefully examined with consideration given to road design that emphasizes drainage of road surface, the use of the best available rock source, and road storage after haul.

There will be no new stream crossings at sensitive alluvial fan and flood plain channels. There are no new fish stream crossings proposed in the project.

### 3.10 Fisheries and Marine Habitat

#### Essential Fish Habitat

##### Environment

The Magnuson-Stevens Fishery Conservation and Management Act of 1996 require consultation with the National Marine Fisheries Service on activities, which may affect Essential Fish Habitat, defined as “those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity.” The Act promotes the protection of these habitats through review, assessment, and mitigation of activities, which may adversely affect these habitats. This EA satisfies the consultation requirements by providing a description and assessment of Essential Fish Habitat in the project area, a description of the Shady project and its potential impacts on these habitats and a description of the mitigation measures that will be implemented to protect these habitats.

Essential Fish Habitat includes all freshwater streams accessible to anadromous fish, marine waters, and inter-tidal habitats. For the Shady project area this would include the low reaches of Earl West Creek, East Fools Creek, West Fools Creek, Blake Creek and the marine and inter-tidal habitats at the Pats Creek LTF.

# 3 Environment and Effects

## **Direct and Indirect Effects**

The Shady project will have “no adverse effects on Essential Fish Habitat” for the following reasons:

1. Management activities are well outside areas of Essential Fish Habitat.
2. Proposed road construction crosses no Essential Fish Habitat.
3. There are no harvest units adjacent to Essential Fish habitat, and all harvest units employ no-harvest buffers according to Forest Plan Standards and Guidelines.
4. Monitoring data suggests there is sufficient tidal flushing to minimize bark accumulation in the marine waters and inter-tidal habitats adjacent to the Pats Creek LTF.

Best Management Practices in the unit cards provide assurance of water quality and aquatic habitat protection for all freshwater streams affected by the project.

## **Marine Habitats**

### **Environment**

The marine waters in Zimovia Strait adjacent to the Pats Creek Log Transfer Facility (LTF) and marine waters of the Eastern Passage adjacent to Earl West LTF are the only marine waters likely to be affected by the Shady Timber Sale. Both action alternatives for the Shady project may result in the use of either LTF. If the Shady Timber Sale is awarded to a Wrangell purchaser, it is unlikely that the LTFs would be used. However, if the timber is awarded to an off-island purchaser, either LTF could be used to transfer logs to water for rafting or barging to another processing location.

### **Pats Creek LTF**

The near-shore waters of Zimovia Strait in the vicinity of the Pats Creek LTF provide fishing grounds for a variety of commercial and personal use species including salmon, shrimp and crab. The extensive mud flat associated with Pats Creek, about one-half mile south of the LTF, provides a popular area for personal use clamming.

The Pats Creek LTF was originally constructed as a log crib bulkhead in the 1960s and reconstructed to its present configuration as a concrete panel-faced bulkhead in 1986. In 1996, a pollution prevention plan was implemented at the site, including storm water treatment and sediment detention features. Approximately 127 MMBF of timber has been transferred over this facility.

The permits for Pats Creek LTF do not require monitoring for bark deposition. Nevertheless, a scuba dive survey was conducted in 2000 to determine the extent of bark deposition (Alaska Commercial Divers, Inc., 2000). The survey consisted of five transects covering an area of 0.49 acres. Bark depths ranged from 5-50 cm.

## 3 Environment and Effects

Continuous cover of bark was calculated as 0.33 acres. The dive results indicate that bark deposition at the Pats Creek LTF meets State water quality criteria for LTF permits. Marine life (shrimp, crab, sun star and sea cucumber) was noted on all five transects. The biological productivity and diversity of this area is unknown.

### **Earl West LTF**

The Earl West LTF was constructed in the early 1980s as a concrete ramp. The ramp-style LTF serves as an alternative boat launch for trailered vessels and non-motorized watercraft. The site is also used as a convenient drop-off or pickup point for gear, people and boats fishing or motoring through the Eastern Passage/Back Channel area.

In 1996, a pollution prevention plan was implemented at the site, including storm water treatment, and sediment detention features. Approximately 30 MMBF of timber has been transferred over this facility.

The permits for Earl West LTF do not require monitoring for bark deposition. Nevertheless, a scuba dive survey was conducted in 2001 to determine the extent of bark deposition (USDA, 2001). The survey consisted of five transects covering an area of 0.2 acres. Bark depths ranged from 1 – 35 inches. Continuous cover of bark was calculated as 0.1 acres. The dive results indicate that bark deposition at the Earl West LTF meets State water quality criteria for LTF permits. No information is available on the marine flora or fauna in the vicinity of the LTF. The biological productivity and diversity of this area is unknown.

### **Direct and Indirect Effects**

The accumulation of bark and other woody debris on the ocean floor associated with the transfer and storage of logs can impact marine habitats by smothering organisms or creating unfavorable chemical conditions. All action alternatives have potential to impact marine habitat during rafting and other activities at the LTF if it is used to transfer logs to marine waters. Alternative 2 would have a slightly greater effect than Alternative 3 because it would generate more volume that could potentially be transferred over one of the LTFs.

## 3.11 Heritage Resource

### **Environment**

The National Historic Preservation Act (NHPA) sets forth Government policy and procedures regarding "historic properties" -- that is, districts, sites, buildings, structures and objects included in or eligible for the National Register of Historic Places. Section 106 of NHPA requires that Federal agencies consider the effects of their actions on such properties, following regulations issued by the Advisory Council on Historic Preservation (36 CFR 800).

### 3 Environment and Effects

To fulfill Section 106 obligations, Forest Service archaeologists researched past heritage resource investigations in and around the Shady project area. We also consulted with the federally recognized tribes that claim a cultural affiliation with the project area to gather information about traditional knowledge and past area. The Shady project area lies within the traditional territory of the Stikinekwaan Tlingit. The Wrangell Cooperative Association (WCA) is the federally recognized tribal government who was consulted for this project.

The level of consultation included government-to-government and staff level communications.

In the summer of 2001, Forest Service archaeologists surveyed portions of the project area for previously undiscovered archaeology sites or other heritage resources. Our survey plan was based in part on an archaeological site sensitivity model developed over the past several decades. This model is defined in a Programmatic Agreement between the USDA Forest Service, Alaska Region, the Advisory Council on Historic Preservation (ACHP), and the Alaska State Historic Preservation Officer (SHPO) (Programmatic Agreement 2002).

#### **Direct and Indirect Effects**

Our work did not result in the discovery of any new heritage resources. A detailed report was prepared and submitted to the SHPO with our Heritage Program Annual Report (2002). We have determined that no known historic properties will be affected by project implementation. Stipulations in the Programmatic Agreement (2002) that address procedural requirements of 36 CFR 800 have been met.

All of the action alternatives and their potential to affect identified heritage resources were considered. No new archaeological sites were discovered, and those that were previously identified, lie within a protective buffer zone established in the Forest Plan, Beach and Estuary Fringe, Standards and Guidelines (Forest Plan, page 4-4). There would be no direct effect from any alternative to any of the heritage resources that lie in the project area. Indirect effects could occur through increased activities near sites with implementation of the proposed action. No roads, harvest units, log transfer facilities or camp facilities will impact the identified heritage resources in any alternative.

The Forest Plan addresses the desired future condition of heritage resources through a monitoring and evaluation plan. Selected areas of direct impact are monitored to ensure that the applied management approach is successful in assessing project area heritage resources. If inadvertent discoveries are made during project implementation, the Forest Service shall fulfill its consultation requirements in accordance with 36 CFR 800.13.

### **Cumulative Effects**

Current use of the project area centers on timber harvest, hunting, and recreation. Logging occurs inland while most of the recreation activities take place along the beach. Some of the existing logging roads allow inland hunter access as well. Over the years these activities have had little known effect on historic properties. This trend will likely continue unless new use patterns develop. Future expanded use of the beach and estuary fringe could eventually affect historic properties, but would not be a result of any of the project alternatives.

### **3.12 Effects on Civil Rights, Women, and Minorities**

There will be no adverse impacts on civil rights, women, and/or minorities as a result of any of the alternatives.

### **3.13 Short-term Use and Long-term Productivity**

Short-term uses, and their effects, are those that occur annually or within the first few years of project implementation. Long-term productivity refers to the capability of the land and resources to continue producing goods and services long after the project has been implemented. Under the Multiple-Use Sustained-Yield Act, and the National Forest Management Act, all renewable resources are to be managed in such a way that they are available for future generations. The harvesting and use of standing timber can be considered a short-term use of a renewable resource. As a renewable resource, trees can be reestablished and grown again if the long-term productivity of the land is maintained. This long-term productivity is maintained through the application of the resource protection measures described in Chapter 3.

### **3.14 Irreversible and Irretrievable Commitments**

Irreversible commitments are decisions affecting non-renewable resources where renewal can occur only over a long period of time or at a great expense, or because the resource has been destroyed or removed. Irretrievable commitments represent opportunities forgone for the period during which resource use or production cannot be realized.

Use of petroleum fuels and rock sources for road commits non-renewable resources.

## 3 Environment and Effects

The construction of roads for timber harvesting is an irreversible action because of the time it takes for a constructed road to revert to natural conditions.

### 3.15 Unavoidable Adverse Effects

Implementation of any action alternative would cause some adverse environmental effects that cannot be effectively mitigated or avoided. Unavoidable adverse effects often result from managing the land for one resource at the expense of the use or condition of other resources. Many adverse effects can be reduced, mitigated or avoided by limiting the extent or duration of effects. The interdisciplinary procedure used to identify specific harvest units and roads was designed to eliminate or lessen the significant adverse consequences. The application of Forest Plan Standards and Guidelines, Best Management Practices, project-specific mitigation measures, and monitoring are all intended to further limit the extent, severity, and duration of potential effects. Such measures are discussed throughout this chapter. Regardless of the use of these measures, some adverse effects will occur. The purpose of this chapter is to fully disclose these effects.

### 3.16 Findings and Disclosures

Several laws and executive orders require project-specific findings or other disclosures. These are included here. They apply to all alternatives considered in detail in this EA.

**National Forest Management Act** - The National Forest Management Act (NFMA) requires specific determinations to be made for this project: consistency with the Forest Plan and FSM 2410.3, R10 Supp. 2400-2002-1 (5/7/2002), a determination of clearcutting as the optimal method of harvesting, if used, and specific authorizations to create openings over 100 acres in size. Specific information and rationale used to develop unit prescriptions is shown on unit cards, in Chapter 3 of this EA, and in the planning record.

The Forest Plan complies with all resource integration and management requirements of 36 CFR 219 (219.14 through 219.27). Application of Forest Plan direction for the Shady project ensures compliance at the project level. Specific NFMA findings pertaining to silviculture systems are included in unit cards and the project planning record.

**Tongass Land and Resource Management Plan** – All project alternatives comply with the Tongass Land and Resource Management Plan. This project

## 3 Environment and Effects

incorporates all applicable Forest Plan Standards and Guidelines and management prescriptions as they apply to the project area, and complies with Forest Plan goals and objectives.

**Clearcutting as the Optimal Method of Harvesting** - The Forest Plan (4-96 to 4-97) gives guidance on when to use even-aged management. Clearcutting (an even-aged method) is used in this project to preclude or minimize mistletoe infestations, yellow-cedar decline, logging damage or other factors affecting forest health. Specific information for use of this prescription is shown in the silvicultural prescriptions, which is part of the project planning record, and in the individual unit cards in Appendix A. Where used, this prescription has been deemed optimal related to site-specific considerations as described above.

**Harvest Openings Over 100 Acres in Size** - There are no harvest openings over 100 acres proposed for this project.

**Endangered Species Act** – None of the alternatives is anticipated to have a direct, indirect or cumulative effect on any threatened and endangered species in or outside the project area. Consultations with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service have been conducted, and these agencies have concurred that the proposed project is not likely to affect any threatened or endangered species. A complete Biological Assessment is included in the planning record.

**Tongass Timber Reform Act** – Application of Forest Plan riparian standards and guidelines ensures that no commercial timber harvest will occur within 100 feet of any Class I stream or any Class II stream flowing directly into a Class I stream.

**National Historic Preservation Act** – In accordance with the Act, the Tongass National Forest has a program to identify, evaluate, preserve, and protect heritage resources. Heritage resource investigations of various intensities have been conducted in the Shady project area, following inventory protocols approved by the Alaska State Historic Preservation Officer (SHPO). Our work includes background and existing literature searches and fieldwork complete with subsurface testing. Native communities have been contacted, and public comment encouraged. The Wrangell Cooperative Association was consulted during analysis for this project. The Alaska SHPO was consulted and our obligations under 36 CFR 800 have been met.

**Federal Cave Resource Protection Act** – No known significant caves in the project area will be directly or indirectly affected by project activities. Forest Plan Karst and Caves Standards and Guidelines are applied to areas known or suspected to contain karst resources.

**Alaska National Interest Lands Conservation Act (ANILCA)** – An ANILCA Section 810 subsistence evaluation was conducted. This analysis leads to the

### 3 Environment and Effects

conclusion that there may be the significant possibility of a significant restriction on subsistence use of deer on Wrangell Island due to cumulative effects. See Section 3.3 for more details.

**Clean Water Act** – Congress intended the Clean Water Act of 1972 (Public Law 92-500) as amended in 1977 (Public Law 95-217) and 1987 (Public Law 100-4) to protect and improve the quality of water resources and maintain their beneficial uses. Section 313 of the Clean Water Act and Executive Order 12088 of January 23, 1987 address Federal agency compliance and consistency with water pollution control mandates. Agencies must be consistent with requirements that apply to "any governmental entity" or private person. Compliance is to be in line with "all Federal, State, interstate, and local requirements, administrative authority, and process and sanctions respecting the control and abatement of water pollution".

The Clean Water Act (Sections 208 and 319) recognized the need for control strategies for nonpoint source pollution. The National Nonpoint Source Policy (December 12, 1984), the Forest Service Nonpoint Strategy (January 29, 1985), and the USDA Nonpoint Source Water Quality Policy (December 5, 1986) provide a protection and improvement emphasis for soil and water resources and water-related beneficial uses. Soil and water conservation practices (BMPs) were recognized as the primary control mechanisms for nonpoint source pollution on National Forest System lands. The Environmental Protection Agency supports this perspective in their guidance, "Nonpoint Source Controls and Water Quality Standards" (August 19, 1987).

The Forest Service must apply Best Management Practices that are consistent with the Alaska Forest Resources and Practices Regulations to achieve Alaska Water Quality Standards. The site-specific application of BMPs, with a monitoring and feedback mechanism, is the approved strategy for controlling nonpoint source pollution as defined by Alaska's Nonpoint Source Pollution Control Strategy (October 2000). In 1997, The State approved the BMPs in the Forest Service's Soil and Water Conservation Handbook (FSH Handbook 2509.22, October 1996) as consistent with the Alaska Forest Resources and Practices Regulations. This Handbook is incorporated into the Tongass Land Management Plan.

A discharge of dredge or fill material from normal silviculture activities such as harvesting for the production of forest products is exempt from Section 404 permitting requirements in waters of the United States, including wetlands (404(f)(1)(A)). Forest roads qualify for this exemption only if they are constructed and maintained in accordance with best management practices to assure that flow and circulation patterns and chemical and biological characteristics of the waters are not impaired (404)(f)(1)(E)). The BMPs that must be followed are specified in 33 CFR 323.4(a). These specific BMPs have been incorporated into the Forest Service's Soil and Water Conservation Handbook under BMP 12.5.

## 3 Environment and Effects

**Clean Air Act** - Emissions anticipated from the implementation of any project alternative will be of short duration and are not expected to exceed State of Alaska ambient air quality standards (18 AAC 50).

### **Coastal Zone Management Act**

Under the Coastal Zone Management Act (CZMA) of 1972, as amended, Forest Service activities and development projects that affect the coastal zone must be consistent to the maximum extent practicable with the enforceable policies of the Alaska Coastal Management Program (ACMP). Such “consistency determinations” are made by the Forest Service, and are reviewed by the State of Alaska as required by the CZMA.

Under the Alaska Forest Resources and Practices Act (AFRPA) of 1979 (as amended), Forest Service timber harvest projects satisfy the CZMA consistency requirement if the Forest Plan and all related standards and guidelines applicable to the project provide no less resource protection than the AFRPA requires for timber harvest projects on State land, except that the AFRPA specifies a different minimum riparian standard for Federal projects than for State projects.

The Forest Service has determined that the Shady project does not affect the coastal zone, and that Forest Plan Standards and Guidelines and mitigation measures applicable to the Shady project meet or exceed the requirements of the State of Alaska Forest Resources and Practices Act. Therefore, the project is consistent to the maximum extent practicable with the enforceable policies of the Alaska Coastal Management Program. Copies of this determination and supporting information will be provided to the State of Alaska, Department of Program Management and Permitting, for review as required by the CZMA.

**Executive Order 11988** directs Federal agencies to take action to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains.

The numerous streams in the Shady project area make it virtually impossible to avoid what is technically considered the “flood prone area” of streams during timber harvest and road construction. However, timber harvest and road construction activities in the Shady project area are well outside of all identified floodplain stream channels. Therefore, no direct adverse effects on floodplains are expected from project activities.

**Executive Order 11990** requires Federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the destruction or modification of wetlands.

Because wetlands are so extensive in the Shady project area, it is not feasible to avoid all wetland areas. Wetland soils not meeting Forest Plan criteria for timber harvest suitability are excluded from the harvest base. Soil moisture regimes and vegetation

### 3 Environment and Effects

on some wetlands may be altered in some harvest units. However, the affected wetlands will meet wetland classification and will still function as wetlands in the ecosystem.

Road construction across wetlands is permitted within Alaska. Such construction requires the filling-in of wetlands and creates permanent loss of wetland habitat. Effects to wetlands are minimized through the application of specific BMPs. Road construction through wetlands is avoided where possible.

**Executive Order 12898** directs Federal agencies to identify and address the issue of environmental justice, i.e., adverse human health and environmental effects of agency programs that disproportionately impact minority and low-income populations.

Implementation of any project alternative is not anticipated to cause disproportionate adverse human health or environmental effects to minority or low-income populations.

**Executive Order 12962** directs Federal agencies to conserve, restore, and enhance aquatic systems to provide for increased recreational fishing opportunities nationwide.

With the application of Forest Plan Standards and Guidelines, including those for riparian areas, no significant adverse effects to freshwater or marine resources will occur. Post-project road closures could limit, to foot-traffic or permitted all-terrain vehicle (ATV) means, access to some recreational fishing opportunities. However, most recreational fishing throughout the Tongass occurs by boat in saltwater, and any adverse effects would be minimal.

# Chapter 4

## Lists



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# Glossary

## **Access**

The opportunity to approach, enter, and make use of public lands.

## **Alaska National Interest Lands Conservation Act (ANILCA)**

Passed by Congress in 1980, this legislation designated 14 National Forest wilderness areas in Southeast Alaska. The Alaska National Interest Lands Conservation Act of December 2, 1980. Public Law 96-487, 96th Congress, 94 Stat. 2371-2551. In Section 810 requires evaluations of subsistence impacts before changing the use of these lands.

## **Alaska Native Claims Settlement Act (ANCSA)**

Public Law 92-203, 92nd Congress, 85 Stat. 2371-2551. Approved December 18, 1971, ANCSA provides for the settlement of certain land claims of Alaska natives and for other purposes.

## **Allowable Sale Quantity (ASQ)**

ASQ refers to the maximum quantity of timber that may be sold each decade from the Tongass National Forest. This quantity, expressed as a board foot measure, is calculated per timber utilization standards specified in the Alaska Regional Guide, the number and type of acres available for timber management, and the intensity of timber management. The ASQ was calculated at 4.5 billion board feet per decade for the Tongass National Forest.

## **Alluvial Fan**

A cone-shaped deposit of organic and mineral material made by a stream where it runs out onto a level plain or meets a slower stream.

## **Alluvium**

Material deposited by rivers or streams, including the sediment laid down in river beds, floodplains and at the foot of mountain slopes and estuaries.

## **Alpine**

Parts of mountains above tree growth and/or the organisms living there.

## **Alternative**

One of several policies, plans, or projects proposed for decision making.

## **Anadromous Fish**

Anadromous fish (such as salmon, steelhead, and sea run cutthroat trout) spend part of their lives in freshwater and part of their lives in saltwater.

## **Aquatic Habitat Management Unit (AHMU)**

A mapping unit that displays an identified value for aquatic resources. It is a mechanism for carrying out aquatic resource management policy.

*Class I:* Streams and lakes with anadromous or adfluvial fish habitat; or high quality resident fish waters listed in Appendix 68.1, Region 10 Aquatic Habitat Management Handbook (FSH 2609.24), June 1986; or habitat above fish migration barriers known to be reasonable enhancement opportunities for

## 4 Glossary

anadromous fish.

*Class II:* Streams and lakes with resident fish populations and generally steep (6-15 percent) gradient (can also include streams from 0-5 percent gradient) where no anadromous fish occur, and otherwise not meeting Class I criteria. These populations have limited fisheries values and generally occur upstream of migration barriers or have other habitat features that preclude anadromous fish use.

*Class III:* Perennial and intermittent streams with no fish populations, but which have sufficient flow or transport sufficient sediment and debris to have an immediate influence on downstream water quality or fish habitat capability. These streams generally have bankfull widths greater than 5 feet and are highly incised into the surrounding hillslope.

*Class IV:* Intermittent, ephemeral, and small perennial channels with insufficient flow or sediment transport capabilities to have an immediate influence on downstream water quality or fish habitat capability. These streams generally are shallowly incised into the surrounding hillslope.

### **Background**

The distant part of a landscape. The seen or viewed area located from three or five miles to infinity from the viewer. (See "Foreground" and "Middleground".)

### **Beach Fringe**

Habitat that occurs from the intertidal zone inland 1,000 feet, and islands less than 50 acres.

### **Bedload**

Sand, silt, and gravel, or soil and rock debris rolled along the bottom of a stream by the moving water.

### **Best Management Practice (BMP)**

Land management methods, measures, or practices intended to minimize or reduce water pollution. Usually BMPs are applied as a system of practices rather than a single practice. BMPs are selected on the basis of site-specific conditions that reflect natural background conditions and political, social, economic, and technical feasibility.

### **Biological Diversity (Biodiversity)**

The variety of life in all its forms and at all levels. This includes the various kinds and combinations of: genes; species of plants, animals, and microorganisms; populations; communities; and ecosystems. It also includes the physical and ecological processes that allow all levels to interact and survive. The most familiar level of biological diversity is the species level, which is the number and abundance of plants, animals, and microorganisms.

### **Blowdown**

See windthrow.

### **Board Foot (BF)**

A unit of wood 12" X 12" X 1". One acre of commercial timber in Southeast Alaska on the average yields 28,000-34,000 board feet per acre (ranging from

8,000-90,000 board feet per acre). One million board feet (MMBF) would be the volume of wood covering one acre two feet thick. One million board feet yields approximately enough timber to build 120 houses or 75,555 pounds of dissolving pulp.

### **Brush Disposal**

Cleanup and disposal of slash and other hazardous fuels within the forest or project areas.

### **Buffer**

An area around a resource where timber harvest is restricted or prohibited. For example, the Tongass Timber Reform Act (TTRA) requires that timber harvest be prohibited in an area no less than 100 feet on each side of all Class I streams and Class II streams which flow directly into Class I streams. This 100-foot area is known as a "stream buffer".

### **Capability**

An evaluation of a resource's inherent potential for use.

### **Clearcut**

The harvesting in one cut of all trees on an area. The area harvested may be a patch, strip, or stand large enough to be mapped or recorded as a separate class in planning for sustained yield. Clearcut size on the Tongass National Forest is limited to 100 acres, except for specific conditions noted in the Alaska Regional Guide.

### **Code of Federal Regulations (CFR)**

A codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal Government.

### **Commercial Forest Land (CFL)**

Productive Forest and that is producing or capable of producing crops of industrial wood and is not withdrawn from timber utilization by statute or administrative regulation. This includes areas suitable for management and generally capable of producing in excess of 20 cubic feet per acre of annual growth or in excess of 8,000 board feet net volume per acre. It includes accessible and inaccessible areas.

### **Connectivity**

A measure of the extent that forest areas between or outside reserves provide habitat for breeding, feeding, dispersal, and movement.

### **Corridor**

Connective links of certain types of vegetation between patches of suitable habitat which are necessary for certain species to facilitate movement of individuals between patches of suitable habitat. Also refers to transportation or utility rights-of-way.

### **Cover**

Refers to trees, shrubs, or other landscape features that allow an animal to partly or fully conceal itself.

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### **Critical Habitat**

Specific terrain within the geographical area occupied by threatened or endangered species. Physical and biological features that are essential to conservation of the species and which may require special management considerations or protection are found in these areas.

### **Cultural Resources**

See Heritage Resources.

### **Cumulative Effects**

The impacts on the environment resulting from additional incremental impacts of past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions occurring over time.

### **Deer Winter Range**

A combination of environmental elements that support Sitka black-tailed deer under moderately severe or severe winter conditions. Usually associated with high volume old-growth stands at low elevations and south aspects.

### **Developed Recreation**

Recreation that requires facilities that, in turn, result in concentrated use of an area. Facilities in these areas might include roads, parking lots, picnic tables, toilets, drinking water, and buildings.

### **Direct Employment**

Jobs that are immediately associated with a timber sale, including, for example, logging, sawmills, and pulpmills.

### **Dispersal**

The movement, usually one way, of plants and animals from their point of origin to another location where they subsequently produce offspring.

### **Distance Zone**

Areas of landscapes denoted by specified distances from the observer (foreground, middleground, or background). Used as a frame of reference in which to discuss landscape characteristics of management activities.

### **Diversity**

The distribution and abundance of different plant and animal communities and species within the area controlled by the Forest Plan.

### **Eagle Nest Tree Buffer Zone**

A 330-foot radius around eagle nest trees established in an Agreement between the U.S. Fish and Wildlife Service and the Forest Service.

### **Ecological Province**

Twenty-one ecological subdivisions of Southeast Alaska that are identified by generally distinct ecological, physiographic, and biogeographic features. Plant and animal species composition, climate, and geology within each province are generally more similar within than among adjacent provinces. Historical events

(such as glaciers and uplifting) are important to the nature of the province and to the barriers that distinguish each province.

### **Ecosystem**

A community of organisms and its physical setting. An ecosystem, whether a fallen log or an entire watershed, includes resident organisms, non-living components such as soil nutrients, inputs such as rainfall, and outputs such as organisms that disperse to other ecosystems.

### **Effects**

Effects, impacts, and consequences as used in this environmental impact statement are synonymous. Effects may be ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historical, cultural, economic, or social, and may be direct, indirect, or cumulative.

*Direct Effects:* Results of an action occurring when and where the action takes place.

*Indirect Effects:* Results of an action occurring at a location other than where the action takes place and/or later in time, but in the reasonably foreseeable future.

*Cumulative Effects:* See Cumulative Effects.

### **Endangered Species**

Any species of animal or plant that is in danger of extinction throughout all or a significant portion of its range. Plant or animal species identified by the Secretary of the Interior as endangered in accordance with the 1973 Endangered Species Act. See also, threatened species, sensitive species.

### **Endemic**

Restricted to a particular locality. For example, a particular species or subspecies may occur on only one or a very few islands.

### **Environmental Assessment (EA)**

A statement of environmental effects for a major Federal action which is released to the public and other agencies for comment and review prior to a final management decision. Required by Section 102 of the National Environmental Policy Act (NEPA).

### **Estuary**

For the purpose of this EA process, estuary refers to the relatively flat, intertidal, and upland areas generally found at the heads of bays and mouths of streams. They are predominately mud and grass flats and are not forested except for scattered spruce or cottonwood.

### **Even-Aged Stand Management**

The application of a combination of actions that result in the creation of stands in which trees of essentially the same age grow together. The difference in age between trees in forming the main canopy level of a stand usually does not exceed 20 percent of that age of the stand at harvest rotation age. Clearcut, shelterwood, or seed tree cutting methods produce even-aged stands.

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### **Executive Order**

An order or regulation issued by the President or some administrative authority under his or her direction.

### **Fen**

A tract of low, wet ground containing sedge peat, relatively rich in mineral salts, alkaline in reaction, and characterized by slowly flowing water. Unlike peatlands (commonly referred to as bogs or muskegs), fens contribute to stable stream flows, provide nutrient input to streams and often contribute to fish rearing habitat.

### **Floodplain**

That portion of a river valley, adjacent to the river channel, which is covered with water when the river overflows its banks at flood stages.

### **Foreground**

The stand of trees immediately adjacent to a scenic area, recreation facility, or forest highway; area located less than 1/4 mile from the viewer. See also, Background and Middleground.

### **Forest and Rangeland Renewable Resources Planning Act of 1976 (RPA)**

Amended in 1976 by the National Forest Management Act. See RPA Assessment and Program.

### **Forest or Forest Land**

National Forest lands currently supporting or capable of supporting forests at a density of 10 percent crown closure or better. Includes all areas with forest cover, including old growth and second growth, and both commercial and non-commercial forest land.

### **Forested Habitat**

All areas with forest cover. Used in this EA to represent a general habitat zone.

### **Forested Wetland**

A wetland whose vegetation is characterized by an overstory of trees that are 20 feet or taller.

### **Forest Plan**

The Tongass Land Management Revision, signed in 1997. This is the 10-year land allocation plan for the Tongass National Forest that directs and coordinates planning, the daily uses, and the activities carried out within the forest.

### **Fragmentation**

An element of biological diversity that describes the natural condition of habitats in terms of the size of discrete habitat blocks or patches, their distribution, the extent to which they are interconnected, and the effects of management on these natural conditions. Also the process of reducing the size and connectivity of stands within a forest.

### **FSH**

Forest Service Handbook.

### **FSM**

Forest Service Manual.

### **Geographic Information System (GIS)**

An information processing technology to input, store, manipulate, analyze, and display spatial and attribute data to support the decision-making process. It is a system of computer maps with corresponding site specific information that can be electronically combined to provide reports and maps.

### **Guideline**

A preferred or advisable course of action or level of attainment designed to promote achievement of goals and objectives.

### **Habitat**

The sum total of environmental conditions of a specific place occupied by an organism, population, or community of plants and animals.

### **Habitat Capability**

The estimated number of healthy animals that a habitat can sustain. Often shown as a relative percentage of optimum habitat conditions.

### **Habitat Suitability Index**

This is a value assigned to a unit of land using a computerized model that relates vegetative and geographic characteristic (e.g. stand volume, proximity to a stream or cliff, slope, aspect, etc.) to the land unit's value for a particular wildlife species. Values generally range from 0 to 1, with 1 being the best. The Habitat Capability Models used to generate HSIs were developed by interagency teams of biologists using the best available information including research results and best professional judgement.

### **Heritage Resources**

Also known as Cultural Resources. Historic or prehistoric objects, sites, buildings, structures, and their remains, resulting from past human activities.

### **Important Subsistence Use Area**

Important Subsistence Use Areas include the "most -reliable" and "most often hunted" categories from the TRUCS survey and from subsistence survey data from ADFG, the University of Alaska, and the Forest Service, Region 10. Important use areas include both intensive and extensive use areas for subsistence harvest of deer, furbearers, and salmon.

### **Indirect Employment**

The jobs in service industries that are associated with a timber sale including, for example, suppliers of logging and milling equipment.

### **Interdisciplinary Team (IDT)**

Two or more natural resource planners who use relevant information to develop alternative design and comparison for a proposed project. The team insures that integrated use of environmental, social, and economic information is clearly presented so the best decision can be made.

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### **Intermediate Stand Treatments**

A stand management treatment which manipulates stand growth, composition, structure, or tree quality. Intermediate treatments include thinning, pruning, clearing, weeding, liberation, release, improvement, salvage, and sanitation cutting to achieve different management objectives. These stand treatments do not attempt to obtain new tree regeneration, and they occur before the final regeneration harvest. Some treatments such as salvage cutting or commercial thinning result in the harvest of forest products.

### **Irretrievable Commitments**

Losses of production or use of renewable natural resources for a period of time. For example, timber production from an area is irretrievably lost during the time an area is allocated to a no-harvest prescription; if the allocation is changed to allow timber harvest, timber production can be resumed. The production lost is irretrievable, but is not irreversible.

### **Irreversible Commitments**

Decisions causing changes which cannot be reversed. For example, if a roadless area is allocated to allow timber harvest and timber is actually harvested, that area cannot, at a later date, be allocated to wilderness. Once harvested, the ability of that area to meet wilderness criteria has been irreversibly lost. Often applies to nonrenewable resources such as minerals and cultural resources.

### **Issue**

A point, matter, or section of public discussion or interest to be addressed or decided.

### **Landslides**

The moderately rapid to rapid down slope movement of soil and rock materials that may or may not be water-saturated.

### **Log Transfer Facility (LTF)**

A facility that is used for transferring commercially harvested logs to and from a vessel or log raft, or the formation of a log raft. It is wholly or partially constructed in waters of the United States and location and construction are regulated by the 1987 Amendments to the Clean Water Act. Formerly termed "terminal transfer facility" or "log dump".

### **Logging Systems**

*Cable:* Ground based yarding of logs using a steel cable to pull logs to a landing.

*Helicopter:* Flight path cannot exceed 40 percent downhill or 30 percent uphill; landings must be selected so there is adequate room for the operation and so that the helicopter can make an upwind approach to the drop zone.

### **MBF**

A thousand board feet net sawlog and utility volume.

### **MMBF**

A million board feet net sawlog and utility volume.

### **Management Indicator Species (MIS)**

Species selected in a planning process that are used to monitor the effects of planned management activities on viable populations of wildlife and fish.

### **Management Prescriptions**

Method of classifying land uses presented in the Forest Plan. Replaces the Land Use Designations (LUDs) originally presented in TLMP.

### **Mass Movement**

The downslope movement of a block or mass of soil. This usually occurs under conditions of high-soil moisture and does not include individual soil particles displaced as surface erosion.

### **Memorandum of Understanding (MOU)**

A legal agreement between the Forest Service and other agencies resulting from consultation between agencies that states specific measures the agencies will follow to accomplish a large or complex project. A memorandum of understanding is not a fund obligating document.

### **Middleground**

The visible terrain beyond the foreground where individual trees are still visible but do not stand out distinctly for the landscape; area located from 1/4 to 5 miles from the viewer. See also, Foreground and Background.

### **Mineral Soils**

Soils consisting predominately of, and having its properties determined by, mineral material.

### **Minimum Viable Population**

A population with the estimated numbers and distribution of reproductive individuals to maintain the population over time.

### **Mitigation**

Measures designed to counteract environmental impacts or to make impacts less severe. These may include: avoiding an impact by not taking a certain action or part of an action; minimizing an impact by limiting the degree or magnitude of an action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or compensating for the impact by replacing or providing substitute resources.

### **Mixed Conifer**

In Southeast Alaska, mixed conifer stands usually consist of western hemlock, mountain hemlock, Alaska yellowcedar, Western redcedar, and Sitka spruce species. Shorepine may occasionally be present.

### **Model**

A representation of reality used to describe, analyze, or understand a particular concept. A model may be a relatively simple qualitative description of a system or organization, or a highly abstract set of mathematical equations. A model has limits to its effectiveness, and is used as one of several tools to analyze a problem.

## 4 Glossary

### **Monitoring**

A process of collecting information to evaluate whether or not objectives of a project and its mitigation plan are being realized. Monitoring can occur at different levels: to confirm whether mitigation measures were carried out in the manner called for, to determine whether the mitigation measures were effective, or to validate whether overall goals and objectives were appropriate. Different levels call for different methods of monitoring.

### **Multiple-aged Stands**

An intermediate form of stand structure between even and uneven-aged stands. These stands generally have two or three distinct tree canopy levels occurring within a single stand.

### **Multiple Entry**

More than one stand or land treatment activity during a rotation of a stand or area.

### **Multiple Use**

The management of all the various renewable resources of the National Forest System to be used in the combination that will best met the needs of the American people.

### **Muskeg**

In Southeast Alaska a type of bog that has developed over thousands of years in depressions or flat areas on gentle to steep slopes. Also called peatlands.

### **National Environmental Policy Act (NEPA) of 1969**

An Act to declare a national policy which will encourage productive and enjoyable harmony between humankind and the environment, to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of humanity, to enrich the understanding of the ecological systems and natural resources important to the Nation, and to establish a Council on Environmental Quality (The Principal Laws Relating to Forest Service Activities, agric. Handb. 453. USDA Forest Service, 359 p.).

### **National Forest Management Act (NFMA)**

A law passed in 1976 as an amendment to the Forest and Rangeland Renewable Resources Planning Act requiring the preparation of Regional Guides and Forest Plans and the preparation of regulations to guide that development.

### **National Wild and Scenic River System**

Rivers with outstanding scenic, recreational, geological, fish and wildlife, historic, cultural, or other similar values designated by Congress under the Wild and Scenic Rivers Act of 1968 and amended in 1986, for preservation of their free-flowing condition. May be classified and administered under one or more of the following categories: Wild, Scenic, and/or Recreational.

### **Net Sawlog Volume**

Tree or log volume suitable in size and quality to be processed into lumber. In Southeast Alaska, depending on the market, the volume may be processed as pulp or lumber.

### **No action Alternative**

The most likely condition expected to exist in the future if current management direction were to continue unchanged.

### **Non-Commercial Forest Land**

Land with more than 10 percent cover of commercial tree species but not qualifying as Commercial Forest land. These are typically very steep.

### **Non-Forest Land**

Land that has never supported forests and lands formerly forested but now developed for such nonforest uses as crops, improved pasture, etc.

### **Objectives**

The precise steps to be taken and the resources to be used in achieving goals.

### **Old Growth**

Ecosystems distinguished by old trees and related structural attributes. Old-growth forests are characterized by larger tree size, higher accumulations of large dead woody material, multiple canopy layers, different species composition, and different ecosystem function. The structure and function of an old-growth ecosystem will be influenced by its stand size and landscape position and context.

### **Old-Growth Habitat**

Wildlife habitat managed to maintain old-growth forest characteristics through the planning period.

### **Organic Soils**

Soils that contain a high percentage (generally greater than 20 to 30 percent) of organic matter throughout the soil depth.

### **Partial Cut**

Method of harvesting trees where any number of live stems are left standing in any of various spatial patterns. Not clearcutting. Can include seed tree, shelterwood, or other methods.

### **Patch**

A non-linear surface area differing in appearance from its surroundings.

### **Planning Record**

A system that records decisions and activities that result from the process of developing a forest plan, revision, or significant amendment.

### **Process Group**

A combination of similar stream channel types based on major differences in landform, gradient, and channel shapes.

### **Productive Old Growth (POG)**

Old-growth forest capable of producing at least 20 cubic feet of wood fiber per acre per year, or having greater than 8,000 board feet per acre.

## 4 Glossary

### **Public Participation**

Meetings, conferences, seminars, workshops, tours, written comments, responses to survey questionnaires, and similar activities designed and held to obtain comments from the public about Forest Service activities.

### **Reforestation**

The natural or artificial restocking of an area with trees.

### **Regeneration**

The process of establishing a new crop of trees on previously harvested land.

### **Reserve Trees**

Live or dead trees that are retained for various resource objectives such as wildlife, structural diversity, etc.

### **Resident Fish**

Fish that are not migratory and complete their entire life cycle in freshwater. Fish that are not anadromous and that reside in freshwater on a permanent basis. Resident fish include non-anadromous Dolly Varden char and cutthroat trout.

### **Resource values**

The tangible and intangible worth of forest resources.

### **Responsible Official**

The Forest Service employee who has the delegated authority to make a specific decision.

### **Revegetation**

The re-establishment and development of a plant cover. This may take place naturally through the reproductive processes of the existing flora or artificially through the direct action of reforestation or reseeding.

### **Riparian Area**

Geographically definable area with distinctive resource values and characteristics that contain elements of aquatic and riparian ecosystems.

### **Riparian Ecosystem**

Land next to water where plants that are dependent on a perpetual source of water occur.

### **Riparian Management Area (RMA)**

Land areas delineated in the Forest Plan to provide for the management of riparian resources. Specific standards and guidelines, by stream process group, are associated with riparian management areas. Riparian management areas may be modified by watershed analysis.

### **Roads**

*Specified:* Roads usually developed and operated for long-term land and resource management purposes to constant service.

*Temporary:* For National Forest timber sales, temporary roads are constructed to harvest timber on a one-time basis. These logging roads are not considered part

of the permanent Forest transportation network and have stream crossing structures removed, erosion measures put into place, and the road closed to vehicular traffic after harvest is completed.

### **Roadless Area**

An area of undeveloped public land, identified in the roadless area inventory of the 1997 TLMP, within which there are no improved roads maintained for travel by means of motorized vehicles intended for highway use.

### **Rotation**

The planned number of years (approximately 100 years in Alaska) between the time that a Forest stand is regenerated and its next cutting at a specified stage of maturity.

### **Sawlog**

That portion of a tree that is suitable in size and quality for the production of dimension lumber collectively known as sawtimber.

### **Scoping Process**

Early and open activities used to determine the scope and significance of a proposed action, what level of analysis is required, what data is needed, and what level of public participation is appropriate. Scoping focuses on the issues surrounding the proposed action, and the range of actions, alternatives, and impacts to be considered in an EA or an EIS.

### **Scrub-Shrub Wetland**

Wetlands dominated by woody vegetation less than 20 feet tall. The species include true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions. In Southeast Alaska this includes forested lands where trees are stunted because of poor soil drainage.

### **Second Growth**

Forest growth that has become established following some disturbance such as cutting, serious fire, windthrow, or insect attack; even-aged stands that will grow back on a site after removal of the previous timber stand.

### **Sediment**

Solid material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by streams or mass movement.

### **Sensitive Species**

Plant and animal species which are susceptible or vulnerable to activity impacts or habitat alterations. Species that are recognized by the regional forester as needing special management to prevent placement on Federal or state lists.

### **Seral**

Early stage of succession.

### **Silviculture**

The branch of forestry involving the theory and practice of manipulating the establishment, composition, structure, and growth of forest vegetation.

## 4 Glossary

Silviculture involves the appropriate application of ecological, social, and economic principles of vegetative management to achieve resource management objectives and desired future forest conditions.

### **Silvicultural Prescription**

A written technical document which provides detailed implementation direction about methods, techniques, timing, and monitoring or vegetative treatments. A prescription is prepared after a preferred treatment alternative has been selected, but before the project is implemented. A prescription is prepared by a silviculturist who uses interdisciplinary input to best achieve established objectives, direction, and requirements for land managed by the USDA Forest Service.

### **Site Productivity**

Production capability of specific areas of land.

### **Slash**

Debris left over after a logging operation; i.e. limbs, bark, broken pieces of logs.

### **Snag**

A standing dead tree.

### **Soil Productivity**

The capacity of a soil, in its normal environment, to produce a specific plant or sequence of plants under a specific system of management.

### **Soil Resource Inventory (SRI)**

An inventory of the soil resource based on landform, vegetative characteristics, soil characteristics, and management potentials.

### **Split Yarding**

The process of separating the direction of timber harvest yarding into opposite directions. Often a stream is used as a dividing line.

### **Stand (Tree Stand)**

An aggregation of trees occupying a specific area and sufficiently uniform in composition, age arrangement, and condition as to be distinguishable from the trees in adjoining areas.

### **Standard**

A course of action or level of attainment required by the forest plan to promote achievement of goals and objectives.

### **State Historic Preservation Officer (SHPO)**

State appointed official who administers Federal and State programs for cultural resources.

### **Stocking**

The degree of occupancy of land by trees as measured by basal area or number of trees and as compared to a stocking standard; that is, the basal area or number of trees required to fully use the growth potential of the land.

### **Structural Diversity**

The diversity of forest structure, both vertically and horizontally, which provides for a variety of forest habitats such as logs and multi-layered forest canopy for plants and animals.

### **Stumpage**

The value of timber as it stands uncut in terms of dollar value per thousand board feet.

### **Project Area**

The area of the National Forest System controlled by a decision document.

### **Subsistence**

The term "subsistence uses" means the customary and traditional uses by rural Alaska residents of wild renewable resources for direct, personal, or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of non-edible byproducts of fish and wildlife resources taken for personal or family consumption; and for customary trade.

### **Subsistence Use Area**

Important Subsistence Use Areas include the "most reliable" and "most often hunted" categories from the Tongass Resource Use Cooperative Survey (TRUCS) and from subsistence survey data from ADFG, the University of Alaska, and the Forest Service, Region 10. Important use areas include both intensive and extensive use areas for subsistence harvest of deer, furbearers, and salmon.

### **Substrate**

The type of material in the bed (bottom) of rivers and streams.

### **Succession**

The ecological progression of community change over time, characterized by displacements of species leading towards a stable climax community.

### **Suitability**

An evaluation based upon a resource's potential use within proposed management activities.

### **Suitable Forest land**

Forest land for which technology is available that will ensure timber production without irreversible resource damage to soils, productivity, or watershed conditions, and for which there is reasonable assurance that such lands can be adequately restocked, and for which there is management direction that indicated that timber production is an appropriate use of that area.

### **Sustained Yield**

The amount of renewable resources that can be produced continuously at a given intensity of management.

### **Thinning**

The practice of removing some of the trees in a stand so that the remaining trees will grow faster due to reduced competition for nutrients, water, and sunlight.

## 4 Glossary

Thinning may also be done to change the characteristics of a stand or wildlife or other purposes. Thinning may be done at two different stages.

### **Threatened Species**

Plant or animal species which is likely to become endangered throughout all or a significant portion of its range within the foreseeable future, as defined in the Endangered Species Act of 1973, and which has been designated in the Federal Register by the Secretary of the Interior as a threatened species. (See also, endangered species, sensitive species.)

### **Threshold**

The point or level of activity beyond which an undesirable set of responses begins to take place within a given resource system.

### **Timber Classification**

Forested land is classified under each of the land management alternatives according to how it relates to the management of the timber resource. The following are definitions of timber classifications used for this purpose.

*Nonforest:* Land that has never supported forests and land formerly forested where use for timber production is precluded by development or other uses.

*Forest:* Land at least 10-percent stocked (based on crown cover) by forest trees of any size, or formerly having had such tree cover and not currently developed for nonforest use.

*Suitable or suitable available:* Land to be managed for timber production on a regulated basis.

*Unsuitable:* Forest land withdrawn from timber utilization by statute or administrative regulation (for example, wilderness), or identified as inappropriate for timber production in the Forest planning process.

*Commercial forest:* Forest land tentatively suitable for the production of continuous crops of timber and that has not been withdrawn.

### **Timber Harvest Unit**

A "Timber Harvest Unit" is an area within which Forest Service specifies for harvest all or part of the timber.

### **Timber Stand Improvement (TSI)**

All noncommercial intermediate cutting and other treatments to improve composition, condition, and volume growth of a timber stand.

### **Tongass Land Management Plan (TLMP)**

See Forest Plan

### **Understory**

The trees and shrubs in a forest growing under the canopy or overstory.

### **Unsuitable Forest Land**

Forest land withdrawn from timber utilization by statute or administrative regulation; for example, Wilderness, or identified as not appropriate for timber production in the forest planning process.

### **Utility Logs**

Those logs that do not meet sawlog grade but are suitable for production of firm useable pulp chips.

### **Value Comparison Unit (VCU)**

Areas which generally encompass a drainage basin containing one or more large stream systems; boundaries usually follow easily recognizable watershed divides. Established to provide a common set of areas where resource inventories could be conducted and resource interpretations made.

### **Viable Population**

The number of individuals of a species required to ensure the long-term existence of the species in natural, self-sustaining populations adequately distributed throughout their region.

### **Viewshed**

An expansive landscape or panoramic vista seen from a road, marine water way, or specific viewpoint.

### **Visual Quality Objectives (VQO)**

A desired level of scenic quality and diversity of natural features based on physical and sociological characteristics of an area. Refers to the degree of acceptable alterations of the characteristic landscape.

*Preservation:* Permits ecological changes only. Applies to wilderness areas and other special classified areas. Management activities are generally not allowed in this setting.

*Retention:* Provides for management activities that are not visually evident to the casual Forest visitor.

*Partial Retention:* Management activities remain visually subordinate to the natural landscape.

*Modification:* Management activities may visually dominate the characteristics landscape. However, activities must borrow from naturally established form-line color and texture so that the visual characteristics resemble natural occurrences within the surrounding area when viewed in the middleground distance.

*Maximum Modification:* Management activities may dominate the landscape but should appear as a natural occurrence when viewed as background.

### **V-Notches**

A deeply incised valley along some waterways that would look like a "V" from a cross-section. These abrupt changes in terrain features are often used as harvest unit or yarding boundaries.

### **Volume**

Stand volume based on standing net board feet per acre by Scribner Rule.

### **Volume Strata**

Categories of timber volume derived from the timber type data layer (TIMTYP) and the common land unit data layer (CLU). Three volume strata (low, medium, and high) are recognized in the Forest Plan.

## 4 Glossary

### **Watershed**

The area that contributes water to a drainage or stream. Portion of land from which all surface water drains to a common point. Watersheds can range from a few tens of acres that drain a single small intermittent stream to many thousands of acres for a stream that drains hundreds of connected intermittent and perennial streams.

### **Wetland**

Areas that are inundated by surface or groundwater frequently enough to support vegetation that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include: swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mudflats, and natural ponds.

### **Wildlife Analysis Area (WAA)**

A division of land used by the Alaska Department of Fish and Game for wildlife analysis and harvest statistics.

### **Wildlife Habitat**

The locality where a species may be found and where the essentials for its development and sustained existence are obtained.

### **Windfirm**

Trees that have been exposed to the wind throughout their life and have developed a strong root system or trees that are protected from the wind by terrain features.

### **Windthrow**

The act of trees being uprooted by the wind. In Southeast Alaska, Sitka spruce and hemlock trees are shallow rooted and susceptible to windthrow. There generally are three types of windthrow:

*Endemic*: where individual trees are blown over;

*Catastrophic*: where a major windstorm can destroy hundreds of acres; and

*Management Related*: where the clearing of trees in an area make the adjacent standing trees vulnerable to windthrow.

### **Winter Range**

An area, usually at lower elevation, used by big game during the winter months; usually smaller and better defined than summer ranges.

### **Yarding**

Moving timber from the stump to a collection point done with helicopter, cable or shovels.

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# **Appendix A**

## **Unit Cards**



# Appendix A

Table 3-15 Unit Summary Table

Abbreviations:  
 CC = Clearcut  
 PC = Patch cut

Unit #	Alternative 2		Alternative 3	
	Prescription	Acres	Prescription	Acres
25	CC with Reserves	44	PC - 60% Reserves	44
26	CC with Reserves	64	PC - 60% Reserves	110
27	CC with Reserves	31	PC - 60% Reserves	31
35	CC with Reserves	22	CC with Reserves	22
40	CC with Reserves	17	CC with Reserves	17
42	CC with Reserves	6	CC with Reserves	6
46	CC with Reserves	13	CC with Reserves	13
60	CC with Reserves	43	CC with Reserves	18
63		0	CC with Reserves	10
				Managed acres <b>271</b>
	Total acres	<b>240</b>	Total acres	Actual Harvest acres <b>159</b>

Volstrata Acres:	Low: <u>1</u>	Medium: <u>13</u>	High: <u>30</u>	Net Volume (MBF/Acre): <u>21 MBF</u>
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**Unit Development & Stand Description:**

The current stand is an over-mature multi-layered stand that has resulted from gap-phased stand initiation caused by mortality of overstory trees. Current stand composition is approximately 98% western hemlock, 1% Alaska yellow-cedar, and 1% Sitka spruce. The stand consists of a large component of highly-defective trees, particularly in the western hemlock. The understory is fully stocked with western hemlock advanced regeneration. Net volume growth is static or declining due to mortality and decay.

**Stand Management Objectives:**

**Alternative 2** prescribes even-aged regeneration harvest using conventional cable yarding systems. Future stand structure will be primarily even-aged with some overstory trees retained for wildlife and biodiversity purposes.

**Alternative 3** prescribes patch cuts, generally 5 to 10 acres in size, using conventional cable yarding systems. The resulting stand structure will be composed of aggregates of even-aged patches with 60% of the overstory retained un-harvested for future entries.

All alternatives employ natural regeneration and may require supplemental treatments such as precommercial thinning and timber stand improvement to enhance forest health and timber management objectives.

**Water Quality and Fisheries**

**Concern:** One Class IV stream channel within the unit boundary

**Mitigation:** Avoid pulling logs down the stream channel if possible, or provide at least partial suspension across Class IV stream. Split yard to either side of the stream channel.

**Soils**

**Concern:** Soil disturbance associated with logging.

**Mitigation:** Implement BMP 12.17.

**Wildlife:**

**Concern:** High value marten habitat. Raptor observations in vicinity. Marbled murrelet activity. High value deer winter habitat. Wildlife corridor values.

**Mitigation:** Retain at least 7 trees >20 inches DBH (4 live trees and 3 decadent trees) per acre and at least three pieces of downed woody material (>20 inches diameter at large end and 10 feet long) per acre to meet Forest Plan Marten Standards. If eggshell fragments or nests are located, flag nearest tree and report to wildlife biologist. Protect raptor nests with a forested 600-foot wind-firm buffer and prevent disturbance from March 1 through July 31 to meet Forest Plan Raptor Standards. Protect marbled murrelet nests with a 600-foot wind-firm buffer and minimize disturbance activities from May 1 through June 15 to meet Forest Plan Marbled Murrelet Standards. In **Alternative 2**, wildlife corridor and deer winter habitat concerns will be mitigated by marten retention and additional retention wherever possible. In **Alternative 3**, the area between patch cuts along with marten retention will maintain wildlife corridor values and alleviate deer winter habitat concerns.

**Visuals:**

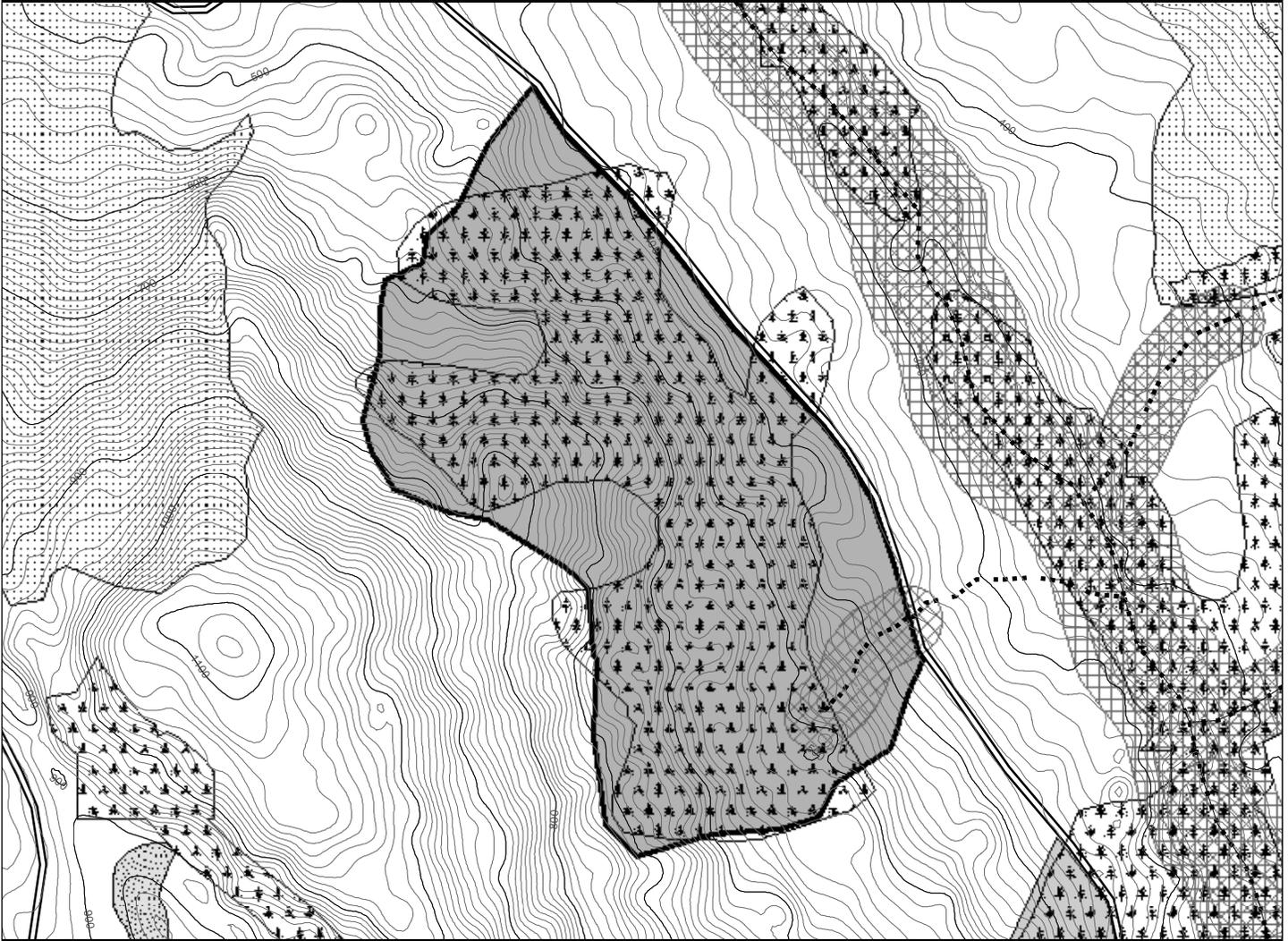
**Concern:** Unit is located along visual priority route (FDR #6270) within the Timber Management LUD. Meet the Modification VQO in the foreground from priority use route. Unit boundary is parallel with road for approximately 1/3 mile.

**Mitigation: Alternative 2** - Mitigate the impacts of this harvest by leaving a series of variable width leave strips between approximately 3-5 landings located along the road. The unit would be yarded to each of these landings in a radial pattern. The leave areas between the landings would be roughly wedge-shaped with the apex of the wedge strip being roughly 300 to 400 ft. wide then tapering to a lesser width at each landing. Impacts of logging slash at landings would be mitigated by burning the slash at the landing, hauling it to a nearby rock pit, or hauling it to a nearby rock pit and burning it. **Alternative 3** - None

**44 ACRES**

**Shady EA**

**UNIT 25**



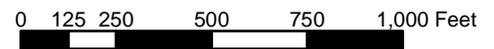
-  Riparian Management Area
-  TTRA Buffer
-  Existing Managed Stands
-  State Selected Lands
-  High Hazard Soils
-  Inventoried Roadless Area
-  Lakes
-  Marten Guidelines Apply

- Existing Roads**
-  Existing-drivable
  -  Closed
  -  Unmaintained
  -  Proposed New Roads
  -  Proposed Unit
  -  Adjacent Proposed Units

- Stream AHMU-Class**
-  1
  -  2
  -  3
  -  4

Date Last Edited : February 13, 2004

1 inch equals 500 feet



Alt	Acres	Prescription	Harvest System	New Roads
2	44	Clearcut with Reserves	Cable	None
3	44	Patch Cut – 60% Retention	Cable	None

Volstrata Acres:	Low: <u>2</u>	Medium: <u>28</u>	High: <u>80</u>	Net Volume (MBF/Acre): <u>21 MBF</u>
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**Unit Development & Stand Description:**

The current stand is an over-mature, multi-layered stand that has resulted from gap-phased stand initiation caused by mortality of overstory trees. Current stand composition is approximately 85% western and mountain hemlock and 15% Sitka spruce. The stand consists of a large component of highly-defective trees, particularly in the western hemlock. The understory is fully stocked with western hemlock advanced regeneration. Net volume growth is static or declining due to mortality and decay.

**Stand Management Objectives:**

**Alternative 2** prescribes even-aged regeneration harvest using conventional cable yarding systems. Future stand structure will be primarily even-aged with some overstory trees retained for wildlife and biodiversity purposes.

**Alternative 3** prescribes patch cuts, generally 5 to 10 acres in size, using conventional cable yarding systems. The resulting stand structure will be composed of aggregates of even-aged patches with 60% of the overstory retained unharvested for future entries.

All alternatives employ natural regeneration and may require supplemental treatments such as precommercial thinning and timber stand improvement to enhance forest health and timber management objectives.

**Water Quality and Fisheries**

**Concern:** One Class IV stream channel located in the central portion of Unit 26 that flows west to east.

**Mitigation:** Avoid pulling logs down the stream channel. Split yard to either side of the stream if possible, or provide at least partial suspension across Class IV stream.

**Soils**

**Concern:** Highly erosive cutslopes along road.

**Mitigation:** Revegetate disturbed cutslopes in a timely manner. Buttress sandy slopes if necessary to facilitate establishment of vegetation and reduce sedimentation. Implement BMP 12.17.

**Wildlife:**

**Concern:** High value marten habitat. Raptor observations in vicinity. Marbled murrelet observations. High value deer winter habitat. Wildlife corridor values.

**Mitigation:** Retain at least 7 trees >20 inches DBH (4 live trees and 3 decadent trees) per acre and at least 3 pieces of downed woody material (>20 inches diameter at large end and 10 feet long) per acre to meet Forest Plan Marten Standards. If eggshell fragments or nests are located, flag nearest tree and report to wildlife biologist. Protect raptor nests with a forested 600-foot wind-firm buffer and prevent disturbance from March 1 through July 31 to meet Forest Plan Raptor Standards. Protect marbled murrelet nests with a 600-foot wind-firm buffer and minimize disturbance activities from May 1 through June 15 to meet Forest Plan Marbled Murrelet Standards. In **Alternative 2**, wildlife corridor and deer winter habitat concerns will be mitigated by marten retention and additional retention wherever possible. In **Alternative 3**, the area between patch cuts along with marten retention will maintain wildlife corridor values and alleviate deer winter habitat concerns.

**Visuals:**

**Concern:** Unit is located along visual priority route (FDR #6270) within the Timber Management LUD. Meet the Modification VQO in the foreground from priority use route.

**Alternative 2** - Unit boundary is parallel with road for approximately 1/2 mile.

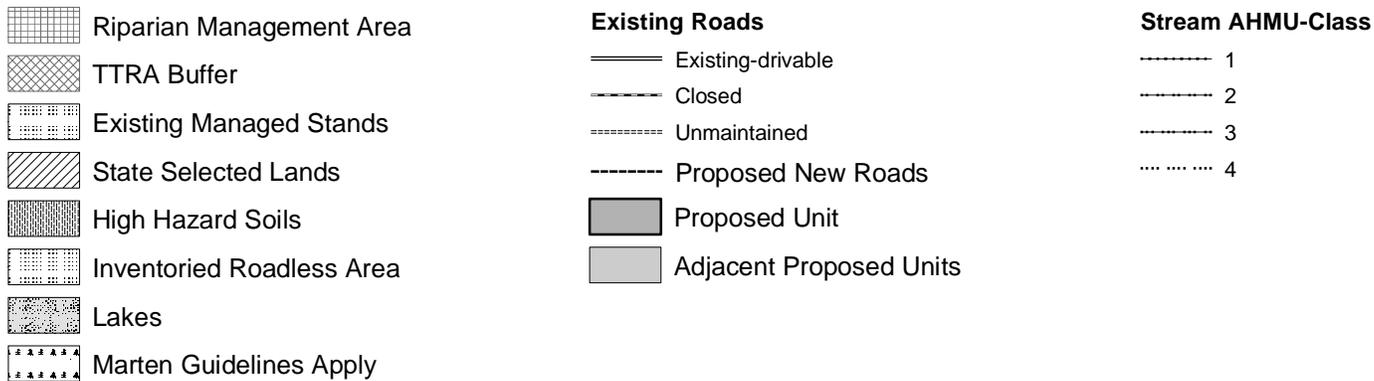
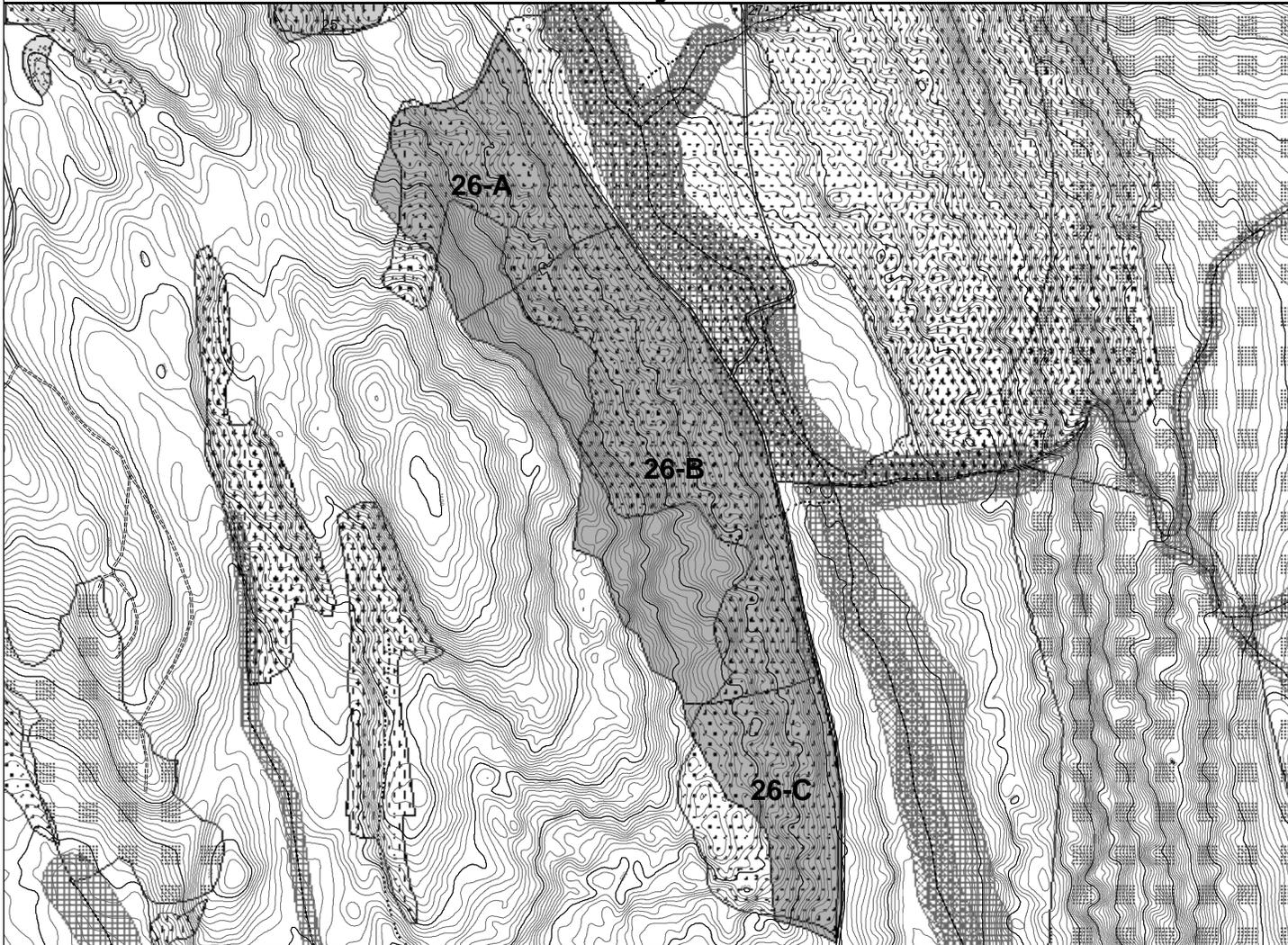
**Alternative 3** - Unit boundary is parallel with road for approximately 1 mile.

**Mitigation:** **Alternative 2** - Mitigate the impacts of this harvest by leaving a series of variable width leave strips between approximately 3-5 landing located along the road. The unit would be yarded to each of these landings in a radial pattern. The leave areas between the landings would be roughly wedge-shaped with the apex of the wedge strip being a maximum of 300 to 400 feet wide then tapering to a lesser width at each landing. Impacts of logging slash at landings would be mitigated by burning the slash at the landing, hauling it to a nearby rock pit, or hauling it to a nearby rock pit and burning it. **Alternative 3** - None

**110 ACRES**

**Shady EA**

**UNIT 26**



Date Last Edited : February 13, 2004

1 inch equals 1,000 feet

0 250 500 1,000 1,500 2,000 Feet

Alt	Sub-units	Acres	Prescription	Harvest System	New Roads
2	B	64	Clearcut with Reserves	Cable	None
3	A, B & C	110	Patch Cut – 60% Retention	Cable	None

Volstrata Acres:	Low: <u>0</u>	Medium: <u>0</u>	High: <u>31</u>	Net Volume (MBF/Acre): <u>22 MBF</u>
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**Unit Development & Stand Description:**

The current stand is an over-mature multi-layered stand that has resulted from gap-phased stand initiation caused by mortality of overstory trees. Current stand composition is approximately 95% western hemlock and 5% Sitka spruce. The stand consists of a large component of highly-defective trees, particularly in the western hemlock. The understory is fully stocked with western hemlock advanced regeneration. Net volume growth is static or declining due to mortality and decay.

**Stand Management Objectives:**

**Alternative 2** prescribes even-aged regeneration harvest using conventional cable yarding systems. Future stand structure will be primarily even-aged with some overstory trees retained for wildlife and biodiversity purposes.

**Alternative 3** prescribes patch cuts, generally 5 to 10 acres in size, using conventional cable yarding systems. The resulting stand structure will be composed of aggregates of even-aged patches with 60% of the overstory retained unharvested for future entries.

All alternatives employ natural regeneration and may require supplemental treatments such as precommercial thinning and timber stand improvement to enhance forest health and timber management objectives.

**Water Quality and Fisheries**

**Concern:** Identified sedimentation into the Class III stream channel located along the western unit edge and noted.

**Mitigation:** Apply BMPs 12.4, 12.6, 12.6a, 13.9, and 13.16. Unit will require layout review to exclude side-slopes to Class III streams. Directional fall and split yard away from the two Class III streams located in the N-Central unit portion. No programmed commercial timber harvest within the Riparian Management Area, defined as the V-notch (side-slope break). Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height, 120 feet, of the Riparian Management Area). Fall and yard away from the stream located along the far northern edge and within the N-Central Unit portion.

**Soils**

**Concern:** Erosive cutslopes along road. Six acres of MM14 along backline of unit.

**Mitigation:** Revegetate disturbed cutslopes in a timely manner. Buttress sandy slopes if necessary to facilitate establishment of vegetation and reduce sedimentation. Partial suspension to minimize disturbance of surface organic material.

**Wildlife:**

**Concern:** High value marten habitat. Marbled murrelet observations. High value deer winter habitat. Wildlife corridor values.

**Mitigation:** Retain at least 7 trees >20 inches DBH (4 live trees and 3 decadent trees) per acre and at least 3 pieces of downed woody material (>20 inches diameter at large end and 10 feet long) per acre to meet Forest Plan marten standards. If eggshell fragments or nests are located, flag nearest tree and report to wildlife biologist. Protect raptor nests with a forested 600-foot wind-firm buffer and prevent disturbance from March 1 through July 31 to meet Forest Plan raptor standards. Protect Marbled murrelet nests with a 600-foot wind-firm buffer and minimize disturbance activities from May 1 through June 15 to meet Forest Plan Marbled murrelet standards. In **Alternative 2**, wildlife corridor and deer winter habitat concerns will be mitigated by marten retention and additional retention wherever possible. In **Alternative 3**, the area between patch cuts along with marten retention will maintain corridor values and alleviate deer winter habitat concerns.

**Visuals:**

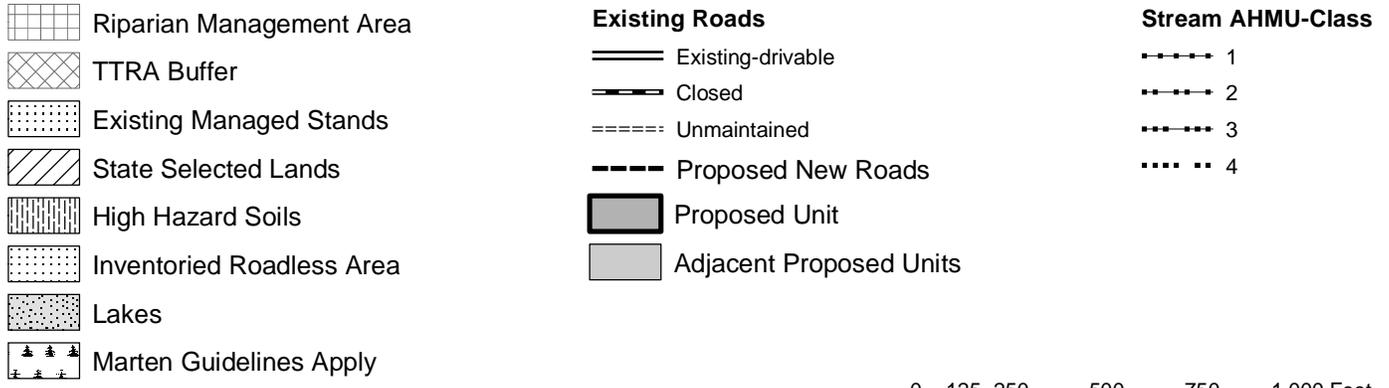
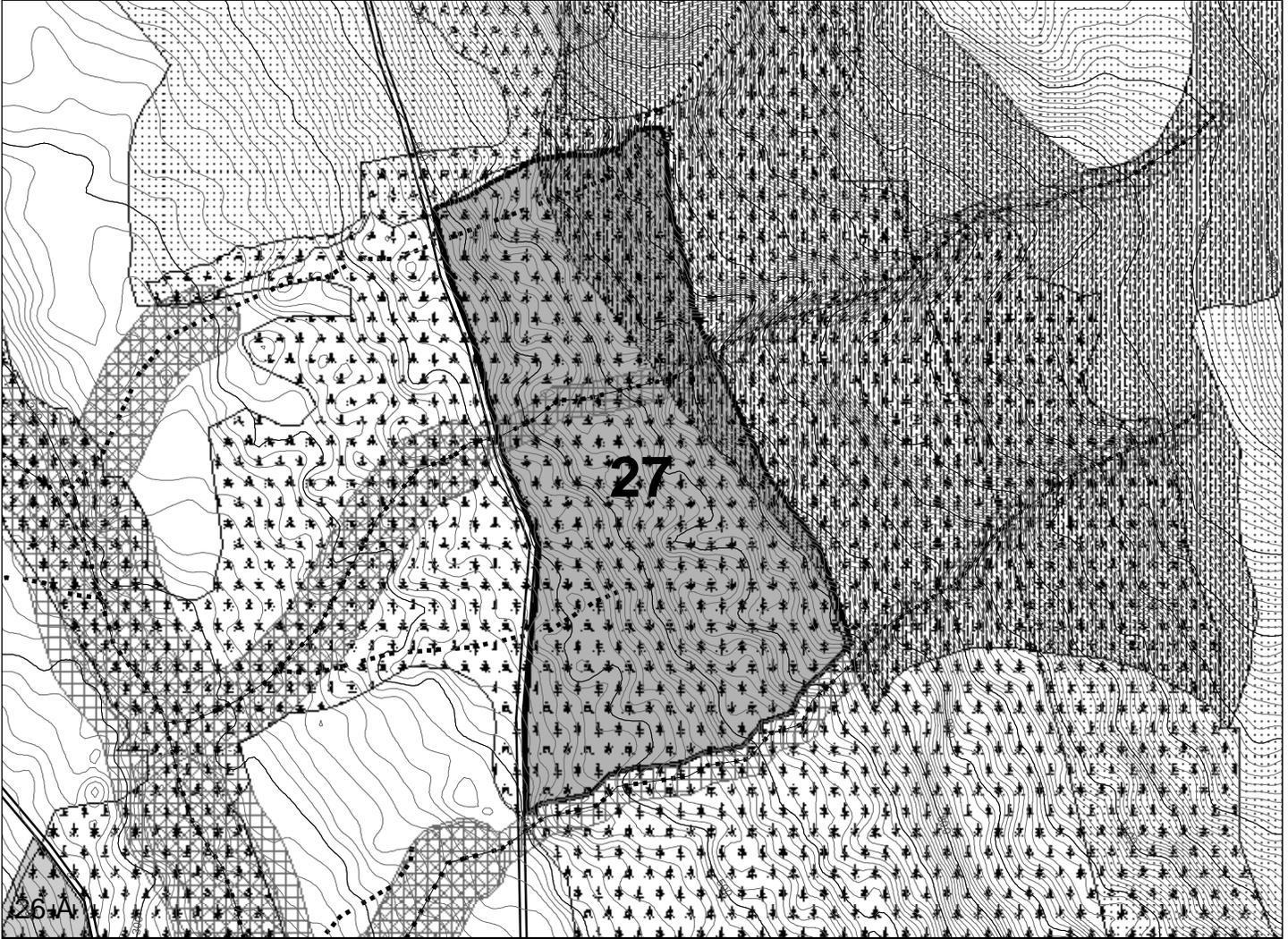
**Concern:** No Concern

**Mitigation:** None

**31 ACRES**

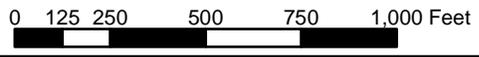
**Shady EA**

**UNIT 27**



Date Last Edited : February 13, 2004

1 inch equals 500 feet



Alt	Acres	Prescription	Harvest System	New Roads
2	31	Clearcut with Reserves	Cable	None
3	31	Patch Cut – 60% Retention	Cable	None

Volstrata Acres:	Non-CFL: <u>3</u>	Low: <u>6</u>	Medium: <u>13</u>	High: <u>0</u>	Net_Volume (MBF/Acre): <u>17 MBF</u>
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**Unit Development & Stand Description:**

The current stand is an over-mature, multi-layered stand that has resulted from gap-phased stand initiation caused by mortality of overstory trees. Current stand composition is approximately 90% western and mountain hemlock, 7% Sitka spruce, 2% western redcedar, and 1% Alaska yellow-cedar. The stand consists of a large component of highly-defective trees, particularly in the western hemlock. The understory is fully stocked with western hemlock advanced regeneration. Net volume growth is static or declining due to mortality and decay. This unit contains 3 acres that is classified in GIS as non-Commercial Forest Land (non-CFL). This non-CFL area will be reviewed and updated if needed, during layout.

**Stand Management Objectives:**

**Alternatives 2 & 3** prescribe even-aged regeneration harvest using conventional cable yarding systems. Future stand structure will be primarily even-aged with some overstory trees retained for wildlife and biodiversity purposes.

Both alternatives employ natural regeneration and may require supplemental treatments such as precommercial thinning and timber stand improvement to enhance forest health and timber management objectives.

**Water Quality and Fisheries**

**Concern:** One Class IV stream channel is present within the unit.

**Mitigation:** Split yard where possible or provide at least partial suspension across the stream channel.

**Soils**

**Concern:** Steep slopes in eastern part of the unit.

**Mitigation:** Provide full suspension where possible and provide at least partial suspension on slopes greater than 70%.

**Wildlife:**

**Concern:** Raptor observation. Marbled murrelet activity.

**Mitigation:** If eggshell fragments or nests are located, flag nearest tree and report to wildlife biologist. Protect raptor nests with a forested 600-foot wind-firm buffer and prevent disturbance from March 1 through July 31 to meet Forest Plan raptor standards. Protect marbled murrelet nests with a 600-foot wind-firm buffer and minimize disturbance activities from May 1 through June 15 to meet Forest Plan marbled murrelet standards.

**Visuals:**

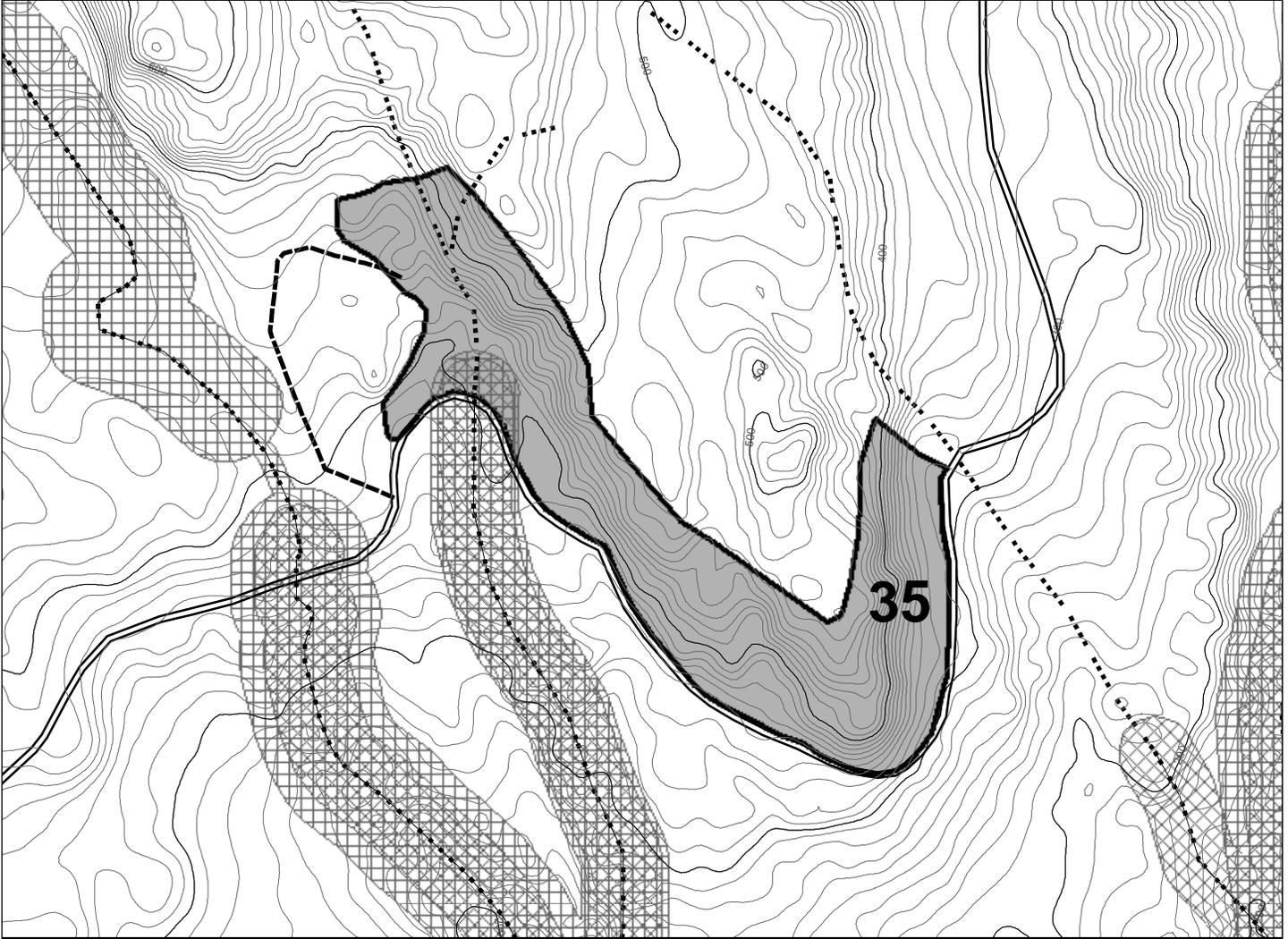
**Concern:** Unit is located along visual priority route (FDR #6270) within the Timber Management LUD. Meet the Modification VQO in the foreground from priority use route. Unit boundary is parallel with road for approximately 1/2 mile.

**Mitigation:** Mitigate the impacts of this harvest by leaving a series of variable width leave strips between approximately 3-5 landings located along the road. The unit would be yarded to each of these landings in a radial pattern. The leave areas between the landings would be roughly wedge-shaped with the apex of the wedge strip being roughly 150 feet wide then tapering to a lesser width at each landing. Impacts of logging slash at landings would be mitigated by burning the slash at the landing, hauling it to a nearby rock pit, or hauling it to a nearby rock pit and burning it.

**22 ACRES**

**Shady EA**

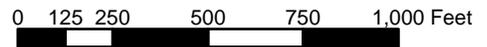
**UNIT 35**



 Riparian Management Area	<b>Existing Roads</b>	<b>Stream AHMU-Class</b>
 TTRA Buffer	 Existing-drivable	 1
 Existing Managed Stands	 Closed	 2
 State Selected Lands	 Unmaintained	 3
 High Hazard Soils	 Proposed New Temporary Roads	 4
 Inventoried Roadless Area	 Proposed Unit	
 Lakes	 Adjacent Proposed Units	
 Marten Guidelines Apply		

Date Last Edited : February 13, 2004

1 inch equals 500 feet



Alt	Acres	Prescription	Harvest System	New Roads
2	22	Clearcut with Reserves	Cable	0.24 miles temporary
3	22	Clearcut with Reserves	Cable	0.24 miles temporary

Volstrata Acres:	Low: <u>0</u>	Medium: <u>1</u>	High: <u>16</u>	Net Volume (MBF/Acre): <u>21 MBF</u>
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**Unit Development & Stand Description:**

The current stand is two-aged with an overstocked younger cohort of nearly 100% western hemlock ranging in age of 80- to 120-years, and a scattered older cohort of large Sitka spruce 250+ years of age. This stand resulted from a previous landslide or possibly large-scale blowdown. Current stand composition is approximately 99% western hemlock, 1% Sitka spruce, and a minor component of Alaska yellow-cedar. The younger cohort is severely overstocked resulting in competition-induced mortality. The understory is fully stocked with western hemlock advanced regeneration. However, any new growing space created due to mortality will most likely be occupied by the 80 - 120 year-old cohort. Net volume growth is increasing, but is well below the site potential due to overstocking.

**Stand Management Objectives:**

Both alternatives prescribe even-aged regeneration harvest using conventional cable yarding systems. Future stand structure will be primarily even-aged with some overstory trees retained for wildlife and biodiversity purposes.

Both alternatives employ natural regeneration and may require supplemental treatments such as precommercial thinning and timber stand improvement to enhance forest health and timber management objectives.

**Water Quality and Fisheries**

**Concern:** Extensive cut slope erosion located at bottom of unit boundary that parallels the road.

**Mitigation:** Implement BMPs 13.11, 13.14, and 13.17

**Soils**

**Concern:** Existing road has slumping/eroding cutslopes. Yarding across it will greatly increase the amount of erosion.

**Mitigation:** Avoid yarding over existing slump. Revegetate disturbed cutslopes in a timely manner. Buttress slopes if necessary to facilitate establishment of vegetation and reduce sedimentation. Implement BMP 12.17.

**Wildlife:**

**Concern:** High value marten habitat. Raptor observations in vicinity.

**Mitigation:** Retain at least 7 trees >20 inches DBH (4 live trees and 3 decadent trees) per acre and at least 3 pieces of downed woody material (>20 inches diameter at large end and 10 feet long) per acre to meet Forest Plan marten standards. If eggshell fragments or nests are located, flag nearest tree and report to wildlife biologist. Protect raptor nests with a forested 600-foot wind-firm buffer and prevent disturbance between March 1 and July 31 to meet Forest Plan raptor standards.

**Visuals:**

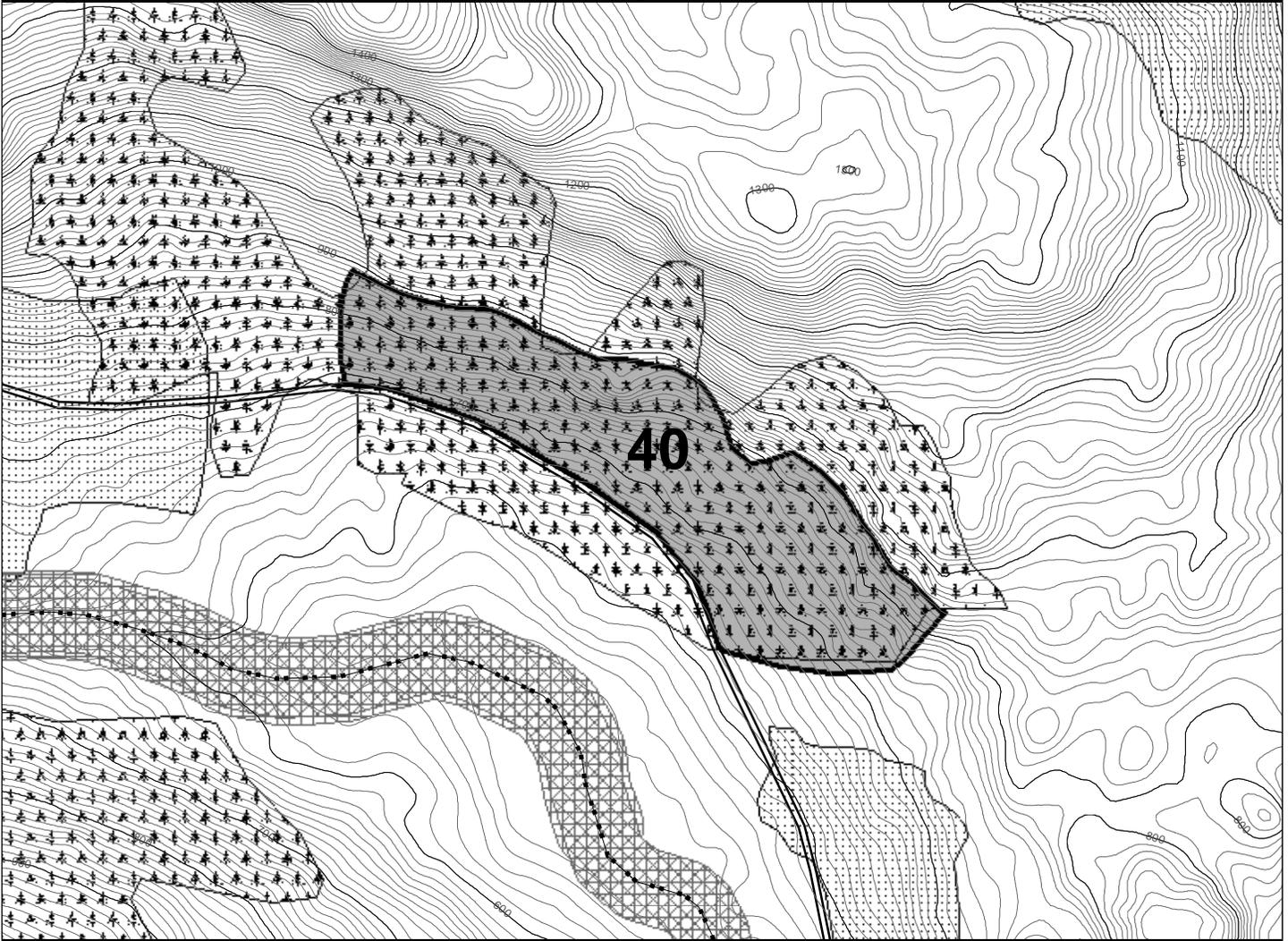
**Concern:** No concern

**Mitigation:** None

**17 ACRES**

**Shady EA**

**UNIT 40**



- |   |  |   |
|---|--|---|
|  Riparian Management Area  | <b>Existing Roads</b>  | <b>Stream AHMU-Class</b>  |
|  TTRA Buffer               |  Existing-drivable            |  1 |
|  Existing Managed Stands   |  Closed                       |  2 |
|  State Selected Lands      |  Unmaintained                 |  3 |
|  High Hazard Soils         |  Proposed New Temporary Roads |  4 |
|  Inventoried Roadless Area |  Proposed Unit                |   |
|  Lakes                     |  Adjacent Proposed Units      |   |
|  Marten Guidelines Apply   |  |   |

Date Last Edited : February 13, 2004

1 inch equals 500 feet

0 125 250 500 750 1,000 Feet

Alt	Acres	Prescription	Harvest System	New Roads
2	17	Clearcut with Reserves	Cable	None
3	17	Clearcut with Reserves	Cable	None

Volstrata Acres:	Low: <u>1</u>	Medium: <u>5</u>	High: <u>0</u>	Net Volume (MBF/Acre): <u>18 MBF</u>
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**Unit Development & Stand Description:**

The current stand is an over-mature multi-layered stand that has resulted from gap-phased stand initiation caused by mortality of overstory trees. Current stand composition is approximately 65% western and mountain hemlock, 10% Sitka spruce, and 25% Alaska yellow-cedar. The stand consists of a large component of highly-defective trees, particularly in the western hemlock. The understory is fully stocked with western hemlock and Alaska yellow-cedar advanced regeneration. Net volume growth is static or declining due to mortality and decay.

**Stand Management Objectives:**

**Alternatives 2 and 3** prescribe even-aged regeneration harvest using conventional cable yarding systems. Future stand structure will be primarily even-aged with some overstory trees retained for wildlife and biodiversity purposes.

Both alternatives employ natural regeneration and may require supplemental treatments such as precommercial thinning and timber stand improvement to enhance forest health and timber management objectives.

**Water Quality and Fisheries**

**Concern:** No concerns within this unit.

**Mitigation:** None

**Soils**

**Concern:** Steep slopes.

**Mitigation:** Achieve full suspension where feasible, and at least partial suspension on slopes greater than 70%.

**Wildlife:**

**Concern:** Possible raptor observation.

**Mitigation:** If eggshell fragments or nests are located, flag nearest tree and report to wildlife biologist. Protect raptor nests with a forested 600-foot wind-firm buffer and prevent disturbance from March 1 through July 31 to meet Forest Plan raptor standards.

**Visuals:**

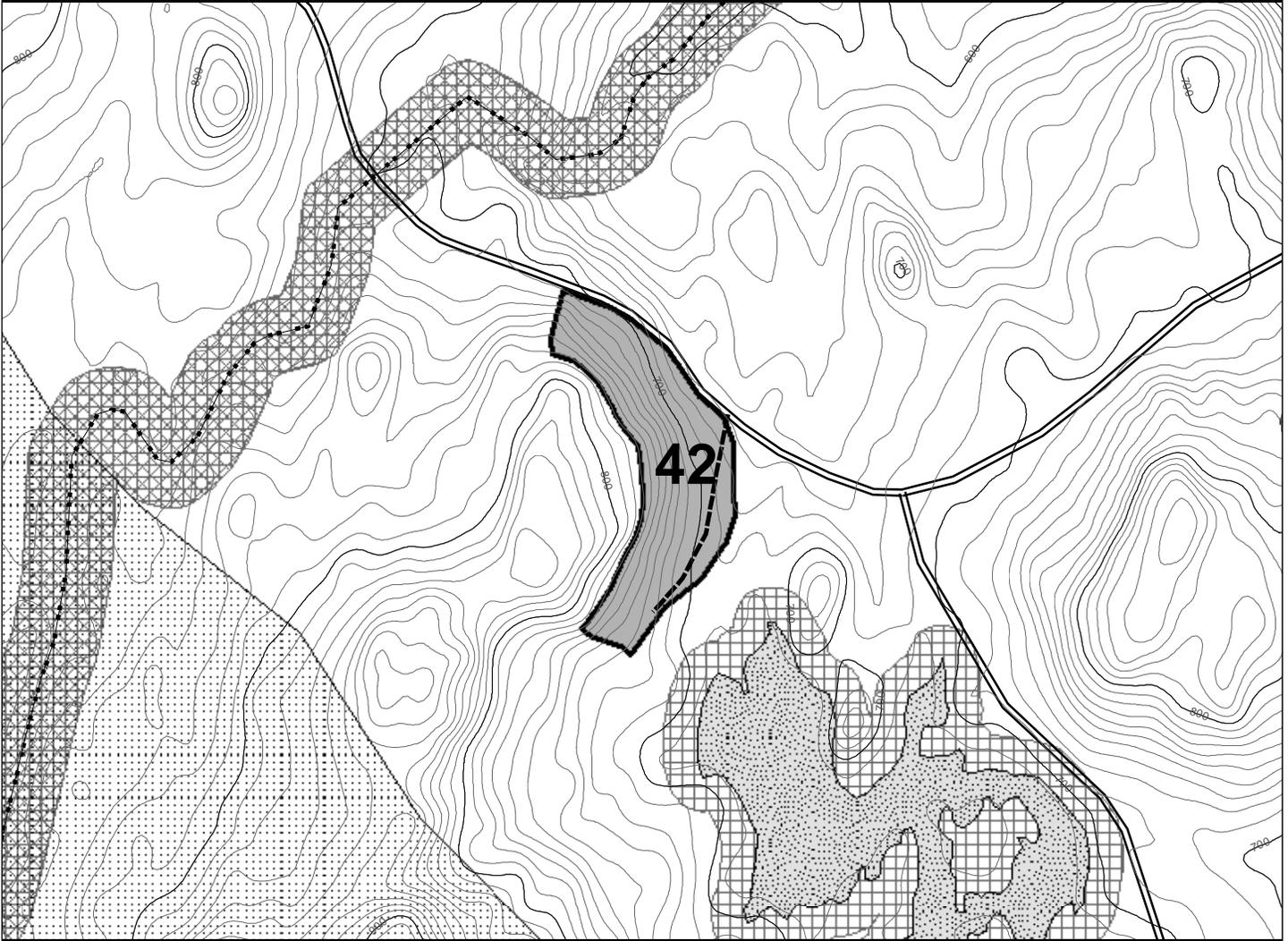
**Concern:** None

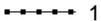
**Mitigation:** None

**6 ACRES**

**Shady EA**

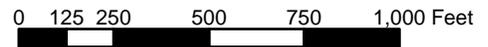
**UNIT 42**



 Riparian Management Area	<b>Existing Roads</b>	<b>Stream AHMU-Class</b>
 TTRA Buffer	 Existing-drivable	 1
 Existing Managed Stands	 Closed	 2
 State Selected Lands	 Unmaintained	 3
 High Hazard Soils	 Proposed New Temporary Roads	 4
 Inventoried Roadless Area	 Proposed Unit	
 Lakes	 Adjacent Proposed Units	
 Marten Guidelines Apply		

Date Last Edited : February 13, 2004

1 inch equals 500 feet



Alt	Acres	Prescription	Harvest System	New Roads
2	6	Clearcut with Reserves	Cable	0.12 miles temporary
3	6	Clearcut with Reserves	Cable	0.12 miles temporary

Volstrata Acres:	Low: <u>0</u>	Medium: <u>3</u>	High: <u>10</u>	Net Volume (MBF/Acre): <u>21 MBF</u>
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**Unit Development & Stand Description:**

The current stand is an over-mature multi-layered stand that has resulted from gap-phased stand initiation caused by mortality of overstory trees. Current stand composition is approximately 95% western hemlock and 5% Sitka spruce. The stand consists of a large component of highly-defective trees, particularly in the western hemlock. The understory is fully stocked with western hemlock advanced regeneration. Net volume growth is static or declining due to mortality and decay.

**Stand Management Objectives:**

Alts. 2 and 3 prescribe even-aged regeneration harvest using conventional cable yarding systems. Future stand structure will be primarily even-aged with some overstory trees retained for wildlife and biodiversity purposes.

Both alternatives employ natural regeneration and may require supplemental treatments such as precommercial thinning and timber stand improvement to enhance forest health and timber management objectives.

**Water Quality and Fisheries**

**Concern:** No concerns within this unit.

**Mitigation:** None

**Soils**

**Concern:** Tall sedge wetlands north of the unit.

**Mitigation:** Place harvest unit boundary and road outside of tall sedge wetlands.

**Wildlife:**

**Concern:** High value marten habitat. Raptor observations in vicinity. Marbled murrelet activity.

**Mitigation:** Retain at least 7 trees >20 inches DBH (4 live trees and 3 decadent trees) per acre and at least 3 pieces of downed woody material (>20 inches diameter at large end and 10 feet long) per acre to meet Forest Plan marten standards. If eggshell fragments or nests are located, flag nearest tree and report to wildlife biologist. Protect raptor nests with a forested 600-foot wind-firm buffer and prevent disturbance from March 1 through July 31 to meet Forest Plan raptor standards. Protect marbled murrelet nests with a 600-foot wind-firm buffer and minimize disturbance activities from May 1 through June 15 to meet Forest Plan marbled murrelet standards.

**Visuals:**

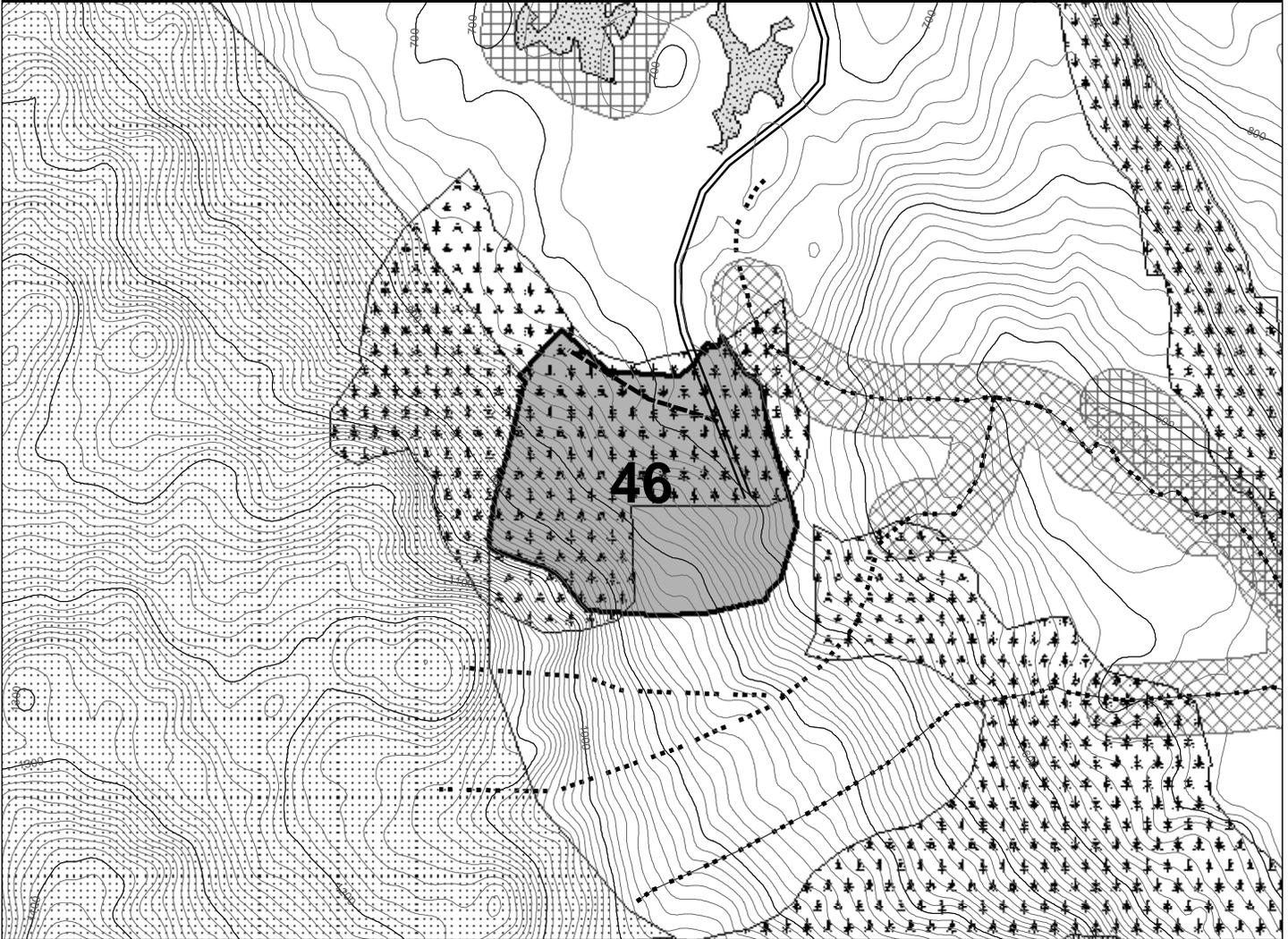
**Concern:** Unit is located along a Visual Priority Route (FDR #6271) within the Timber Management LUD. Unit is also in close proximity to the Long Lake Trail (#574) which is a hiking trail listed in the Forest Plan as a Visual Priority Route. Meet the Modification VQO in the foreground from priority routes and use areas, and meet the Maximum Modification VQO in the middle and background. Unit boundary is about 125 feet from Long Lake Trail at its closest point.

**Mitigation:** District Recreation Technician should be contacted when logging is in progress to mitigate impact to recreation users of trail.

**13 ACRES**

**Shady EA**

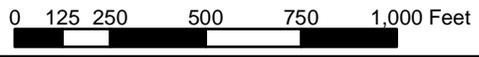
**UNIT 46**



 Riparian Management Area	<b>Existing Roads</b>	<b>Stream AHMU-Class</b>
 TTRA Buffer	 Existing-drivable	 1
 Existing Managed Stands	 Closed	 2
 State Selected Lands	 Unmaintained	 3
 High Hazard Soils	 Proposed New Temporary Roads	 4
 Inventoried Roadless Area	 Proposed Unit	
 Lakes	 Adjacent Proposed Units	
 Marten Guidelines Apply		

Date Last Edited : February 13, 2004

1 inch equals 500 feet



Alt	Acres	Prescription	Harvest System	New Roads
2	13	Clearcut with Reserves	Cable	0.09 miles temporary
3	13	Clearcut with Reserves	Cable	0.09 miles temporary

Volstrata Acres:	Non-CFL: <u>15</u>	Low: <u>1</u>	Medium: <u>27</u>	High: <u>4</u>	Net_Volume (MBF/Acre): <u>19 MBF</u>
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**Unit Development & Stand Description:**

The current stand is an over-mature multi-layered stand that has resulted from gap-phased stand initiation caused by mortality of overstory trees. Current stand composition is approximately 66% western hemlock, 17% Alaska yellow-cedar, and 17% Sitka spruce. The stand consists of a large component of highly-defective trees, particularly in the western hemlock. The understory is fully stocked with western hemlock advanced regeneration. Net volume growth is static or declining due to mortality and decay. This unit contains 15 acres that is classified in GIS as non-Commercial Forest Land (non-CFL). This non-CFL area will be reviewed and updated if needed, during layout.

**Stand Management Objectives:**

**Alternatives 2 and 3** prescribe even-aged regeneration harvest using conventional cable yarding systems. Future stand structure will be primarily even-aged with some overstory trees retained for wildlife and biodiversity purposes.

Both alternatives employ natural regeneration and may require supplemental treatments such as precommercial thinning and timber stand improvement to enhance forest health and timber management objectives.

**Water Quality and Fisheries**

**Concern:** A small section of Class II, HC2 fish habitat located at the NE corner of the unit boundary upstream of RCS milepost 0.624. Upstream of Class II break, stream becomes Class III forming the edge of the unit boundary. Three other Class IV streams are present in Unit 60.

**Mitigation:** A 120 foot no-cut buffer will be applied to the Class II stream. Additionally, manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area). Provide full suspension where possible and provide at least partial suspension across Class IV streams. Apply BMPs 12.6, 12.6a, 13.9, and 13.16. Unit will require layout review to exclude side-slopes to class three streams.

**Soils**

**Concern:** No issues.

**Mitigation:** None.

**Wildlife:**

**Concern:** High value marten habitat. Observations indicate a high probability of red-tailed hawk nesting activity along western portion of unit. Sharp-shinned hawk nest located north and outside of unit boundary. Marbled murrelet activity.

**Mitigation:** Retain at least 7 trees >20 inches DBH (4 live trees and 3 decadent trees) per acre and at least 3 pieces of downed woody material (>20 inches diameter at large end and 10 feet long) per acre to meet Forest Plan marten standards. If eggshell fragments or nests are located, flag nearest tree and report to wildlife biologist. Protect raptor nests with a forested 600-foot wind-firm buffer and prevent disturbance from March 1 through July 31 to meet Forest Plan raptor standards. Protect marbled murrelet nests with a 600-foot wind-firm buffer and minimize disturbance activities from May 1 through June 15 to meet Forest Plan marbled murrelet standards.

**Visuals:**

**Concern:** Unit is located along a Visual Priority Route (FDR #6270) within the Timber Management LUD. Meet the Modification VQO in the foreground from priority use route.

**Alternative 2** - Unit boundary is parallel with road for approximately 1/3 mile, with a leave strip between 60A and 60B.

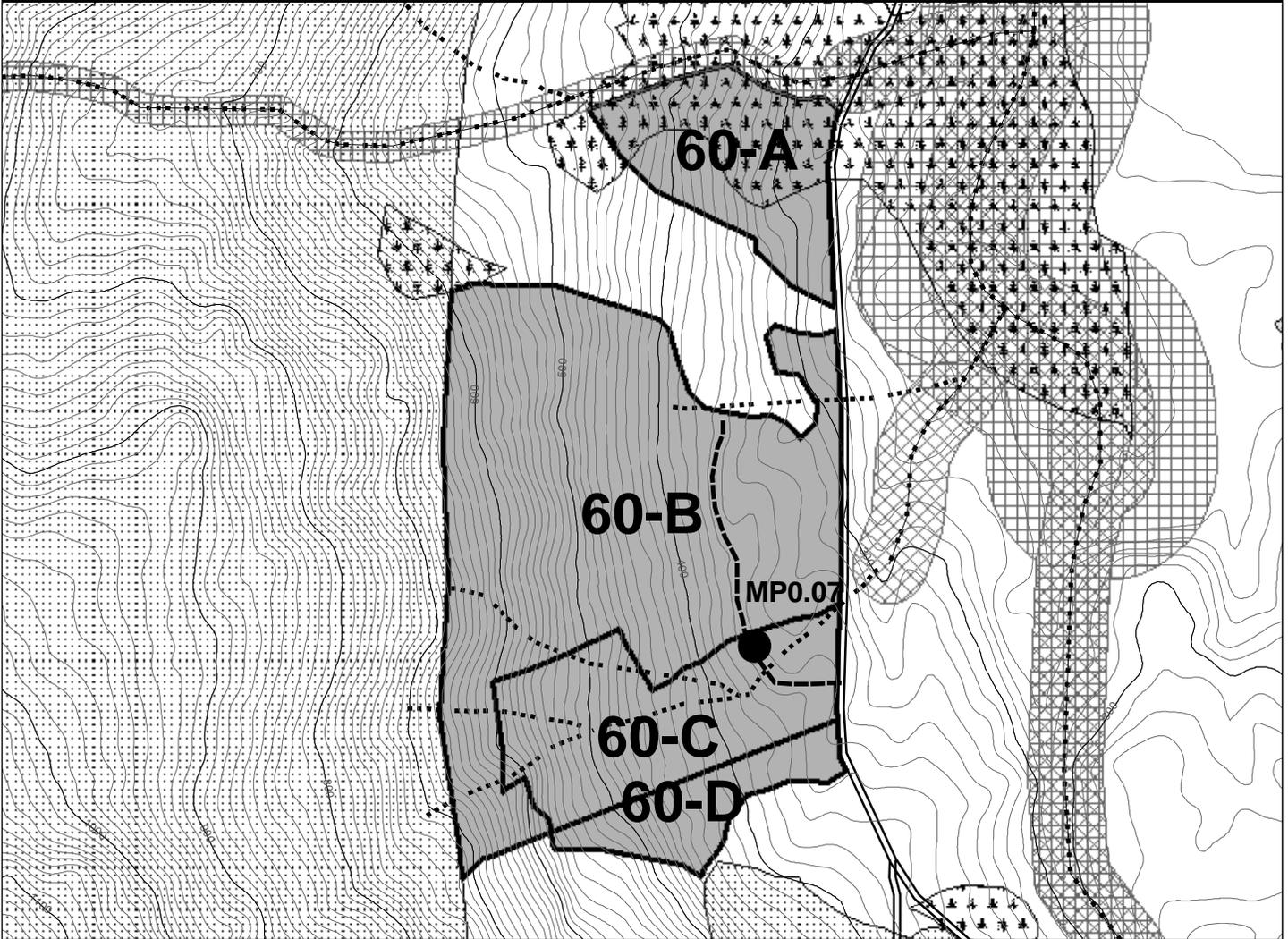
**Mitigation: Alternative 2** – To mitigate impacts, retain a leave strip in Unit 60B that is at least 250-300 ft. wide along the road. A spur into the unit behind the leave area will take off from the main road through this opening. The actual width of the strip will be based on what is needed to visually screen the evidence of harvest in the unit.

**Alternative 3** - None

**47 ACRES**

**Shady EA**

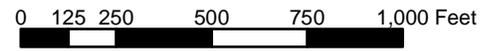
**UNIT 60**



 Riparian Management Area	<b>Existing Roads</b>	<b>Stream AHMU-Class</b>
 TTRA Buffer	 Existing-drivable	 1
 Existing Managed Stands	 Closed	 2
 State Selected Lands	 Unmaintained	 3
 High Hazard Soils	 Proposed New Temporary Roads	 4
 Inventoried Roadless Area	 Proposed Unit	
 Lakes	 Adjacent Proposed Units	
 Marten Guidelines Apply		

Date Last Edited : February 13, 2004

1 inch equals 500 feet



Alt	Sub-units	Acres	Prescription	Harvest System	New Roads
2	A, B & C	43	Clearcut with Reserves	Cable	0.19 miles temporary
3	A, C & D	18	Clearcut with Reserves	Cable	0.07 miles temporary

Volstrata Acres:	Low: <u>0</u>	Medium: <u>6</u>	High: <u>4</u>	Net Volume (MBF/Acre): <u>20 MBF</u>
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**Unit Development & Stand Description:**

The current stand is an over-mature multi-layered stand that has resulted from gap-phased stand initiation caused by mortality of overstory trees. Current stand composition is approximately 66% western hemlock, 17% Alaska yellow-cedar, and 17% Sitka spruce. The stand consists of a large component of highly-defective trees, particularly in the western hemlock. The understory is fully stocked with western hemlock advanced regeneration. Net volume growth is static or declining due to mortality and decay.

**Stand Management Objectives:**

**Alternative 3** prescribes even-aged regeneration harvest using conventional cable yarding systems. Future stand structure will be primarily even-aged with some overstory trees retained for wildlife and biodiversity purposes.

**Alternative 3** employs natural regeneration and may require supplemental treatments such as precommercial thinning and timber stand improvement to enhance forest health and timber management objectives.

**Water Quality and Fisheries**

**Concern:** There is an HC6 Class III stream that flows from west to east and crosses the 6270 Road. No programmed commercial timber harvest within the Riparian Management Area, defined as the V-notch (side-slope break). Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

**Mitigation:** Apply BMPs 12.6, 12.6a, 13.9, and 13.16. Unit will require layout review to exclude side-slopes to class three streams.

**Soils**

**Concern:** No issue.

**Mitigation:** None.

**Wildlife:**

**Concern:** High value marten habitat. Raptor observations. Marbled murrelet observations.

**Mitigation:** Retain at least 7 trees >20 inches DBH (4 live trees and 3 decadent trees) per acre and at least 3 pieces of downed woody material (>20 inches diameter at large end and 10 feet long) per acre to meet Forest Plan marten standards. If eggshell fragments or nests are located, flag nearest tree and report to wildlife biologist. Protect raptor nests with a forested 600-foot wind-firm buffer and prevent disturbance from March 1 through July 31 to meet Forest Plan raptor standards. Protect marbled murrelet nests with a 600-foot wind-firm buffer and minimize disturbance activities from May 1 through June 15 to meet Forest Plan marbled murrelet standards.

**Visuals:**

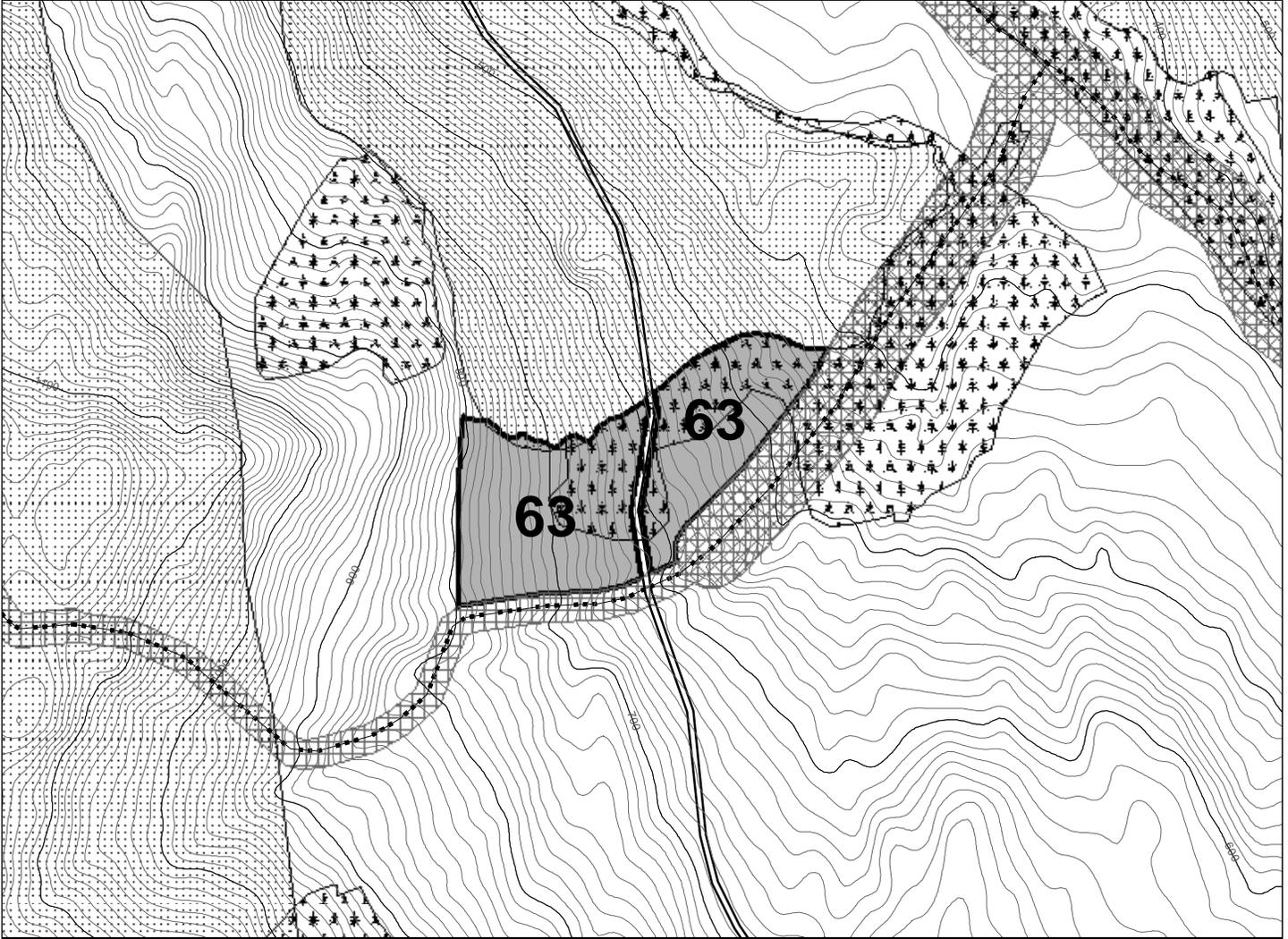
**Concern:** None

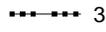
**Mitigation:** None

**10 ACRES**

**Shady EA**

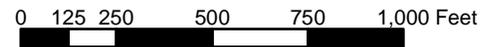
**UNIT 63**



 Riparian Management Area	<b>Existing Roads</b>	<b>Stream AHMU-Class</b>
 TTRA Buffer	 Existing-drivable	 1
 Existing Managed Stands	 Closed	 2
 State Selected Lands	 Unmaintained	 3
 High Hazard Soils	 Proposed New Temporary Roads	 4
 Inventoried Roadless Area	 Proposed Unit	
 Lakes	 Adjacent Proposed Units	
 Marten Guidelines Apply		

Date Last Edited : February 13, 2004

1 inch equals 500 feet



Alt	Acres	Prescription	Harvest System	New Roads
2				
3	10	Clearcut with Reserves	Cable	None