



United States  
Department of  
Agriculture

Forest Service

Tongass National Forest  
R10-MB-739

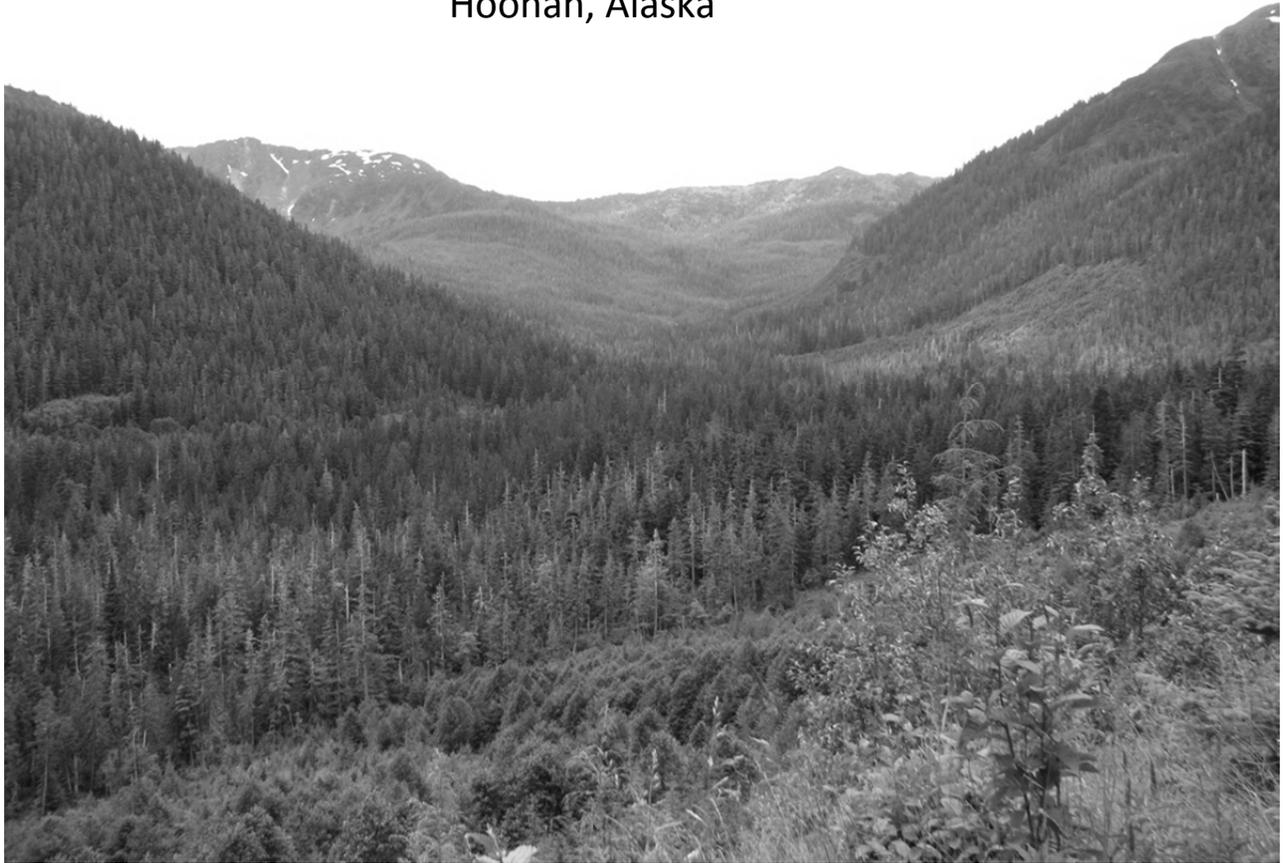
January 2012



# Kennel Creek Integrated Resource Project I

## Environmental Assessment

Hoonah Ranger District  
Hoonah, Alaska



# Acronyms

ANCSA	Alaska Native Claims Settlement Act	HUC	Hydrologic unit code
ANILCA	Alaska National Interest Lands Conservation Act	IDT	Interdisciplinary team
APE	Area of potential effect	IRMP	Integrated resource management plan
ATM	Access travel management	LUD	Land use designation
ATV	All-terrain vehicle	MAF	Marine access facility
BMP	Best management practice	MBF	Thousand board feet
CE	Categorical exclusion	MIS	Management indicator species
CEQ	Council on Environmental Quality	ML	Maintenance level (of roads)
CZMA	Coastal Zone Management Act	NEPA	National Environmental Policy Act
DN	Decision notice	NFS	National Forest system
EA	Environmental assessment	NRIS	National resource information system
EFH	Essential fish habitat	OHV	Off highway vehicle
ESA	Endangered Species Act	OPML	Operational management level
FONSI	Finding of no significant impact	RCS	Road condition surveys
FSH	Forest Service handbook	RMA	Riparian management area
GIS	Geographic information system	SHPO	State Historic Preservation Officer
		SOPA	Schedule of proposed actions
		USDA	United States Department of Agriculture

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Cover photo: View from NFS road 85911 looking west/southwest to headwaters of the Kennel Creek drainage. Photograph by Jon Hyde.



United States  
Department of  
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Forest  
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Tongass National Forest  
Hoonah Ranger District

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File Code: 1950

Date: January 30, 2012

Dear Planning Participant:

The Hoonah Ranger District is proposing timber management, watershed enhancement and restoration treatments in the Kennel Creek watershed, located approximately 18 miles south-southeast of the town of Hoonah, Alaska, on the eastern shore of Chichagof Island.

The action alternative proposes 500 thousand board feet (MBF) of selection old-growth harvest; 350 acres of precommercial and commercial upland thinning in managed timber stands; 100 acres of slash reduction in previously thinned units; 19 acres of riparian thinning in a previously harvested riparian management area (RMA); placement of large wood in the floodplain of the main channel of Kennel Creek; and replacement of five red pipes and one gray pipe. The treatments proposed specifically target the effects of past timber harvest and road management that have altered riparian and upland function and are designed to help reach the desired condition, as prescribed by the Forest Plan.

The action alternative is the preferred alternative. However, please review both alternatives since either alternative or a new alternative within the range of these alternatives may be selected in the final decision for this project.

It is important to this planning process that you as a reviewer provide comments. Comments should be submitted prior to the close of the comment period and should clearly articulate your concerns (40 CFR 1503.3).

Comments received in response to this document, including names and addresses of those who comment, will be part of the public record for this proposed action. Comments submitted anonymously will be accepted and considered, but will not provide the respondent with standing to participate in subsequent administrative or judicial review.

The 30-day comment period for the EA will begin on the day the notice of availability is published in the Juneau Empire, the newspaper of record. The submission of untimely comments can affect your ability to participate in subsequent administrative or judicial review.

Please send written comments to Rich Jennings, Hoonah District Ranger, ATTN: Kennel Creek IRP, USDA Forest Service, P.O. Box 135, Hoonah, AK 99829. Comments may also be e-mailed to: [comments-alaska-tongass-hoonah@fs.fed.us](mailto:comments-alaska-tongass-hoonah@fs.fed.us) with Kennel Creek in the subject line.

If you would like additional information please call the Hoonah Ranger District at (907) 945-3631 during regular business hours, Monday through Friday, 8 a.m. to 4:30 p.m.

The document can also be accessed online at:

[http://www.fs.fed.us/r10/tongass/projects/nepa\\_project.shtml?project=36217](http://www.fs.fed.us/r10/tongass/projects/nepa_project.shtml?project=36217).

Sincerely,



*Richard D. Jennings*

RICHARD D. JENNINGS  
District Ranger

# Kennel Creek Integrate Resource Project I Environmental Assessment

Agency: USDA Forest Service  
Tongass National Forest

Responsible Official: Richard D. Jennings, District Ranger  
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## Abstract

The Hoonah Ranger District is proposing timber management, watershed enhancement and restoration treatments in the Kennel Creek watershed, located approximately 18 miles south-southeast of the town of Hoonah, Alaska, on the eastern shore of Chichagof Island. The action alternative proposes 500 thousand board feet (MBF) of selection old-growth harvest; 350 acres of precommercial and commercial upland thinning in managed timber stands; 100 acres of slash reduction in previously thinned units; 19 acres of riparian thinning in a previously harvested riparian management area (RMA); placement of large wood in the floodplain of the main channel of Kennel Creek; and replacement of five red culverts and one gray culvert. The treatments proposed specifically target the effects of past timber harvest and road management that have altered riparian and upland function and are designed to help reach the desired condition, as prescribed by the Forest Plan.

This document is available online at:

[http://www.fs.fed.us/r10/tongass/projects/nepa\\_project.shtml?project=36217](http://www.fs.fed.us/r10/tongass/projects/nepa_project.shtml?project=36217).

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# Summary

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## **What actions are proposed?**

The Hoonah Ranger District is proposing timber management, watershed enhancement and restoration treatments in the Kennel Creek watershed, located approximately 18 miles south-southeast of the town of Hoonah, Alaska, on the eastern shore of Chichagof Island (Figure 1). Alternative 2 proposes 500 thousand board feet (MBF) of selection old-growth harvest; 350 acres of precommercial and commercial upland thinning in managed timber stands; 100 acres of slash reduction in previously thinned units; 19 acres of riparian thinning in a previously harvested riparian management area (RMA); placement of large wood in the floodplain of the main channel of Kennel Creek; and replacement of five red culverts and one gray culvert.

## **Why is this project being proposed?**

The Forest Service has determined that the existing condition of the Kennel Creek watershed does not meet the desired condition described in the Forest Plan. The treatments proposed specifically target the effects of past timber harvest and road management that have altered riparian and upland function and are designed to help reach the desired condition, as prescribed by the Forest Plan.

## **What other action would meet the same need?**

Treatments similar to those proposed in this environmental assessment (EA), could still be proposed and analyzed individually; however, the ecological impact and fiscal efficiency of the activities would be less than optimal since the proposal, analysis and implementation of the various activities would likely happen independently and over a much longer period of time.

## **What would it mean not to meet the need for project action?**

Alternative 1 (the no action alternative) would result in the continued alteration of watershed processes, possible decline in fish and wildlife habitat capability, slower old-growth development within managed stands, and less timber available for local operators within the Kennel Creek watershed.

## **What are the effects of the proposed action and alternatives?**

Alternative 2 (the action alternative) is intended to improve watershed conditions by restoring the ecological function of riparian and in-stream areas, enhance wildlife and old-growth conditions in upland areas and provide timber for local operators.

## **What factors will be used when making the decision between alternatives?**

Using the effects analysis from this EA, public input, Forest Plan guidance and applicable laws, the Hoonah District Ranger will decide whether to implement all or part of the proposed actions, the timing of treatments, and any mitigation and monitoring.

## Introduction

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In 2010, the Hoonah Ranger District started the Kennel Creek Watershed Integrated Resource Management Plan (IRMP). During Phase I of this process, the Kennel Creek watershed analysis was completed. Management activities were identified to meet the desired condition as described in the Tongass Land and Resource Management Plan (Forest Plan). Phase II of the IRMP process is this environmental analysis of the management activities identified in Phase I.

## Proposed Action

The Hoonah Ranger District is proposing to authorize multiple projects across the Kennel Creek watershed as identified during the Phase I watershed analysis completed in 2010. See Figure 3 for locations of the proposed activities.

- In the Timber Production LUD, selectively harvest approximately 500 MBF (250 acres) of old-growth from 4 units to move the area closer to the desired conditions outlined in the Forest Plan. Two units are located north of the NFS roads 85191 and 851911 in the north-central portion of the project area and 2 units are located off of NFS roads 8510 and 8517 in the eastern portion of the project area.
- Reduce slash accumulations on approximately 100 acres to facilitate wildlife movement in previously thinned areas along NFS roads 8519, 85191 and 85193. Proposed slash reduction method is lop and scatter to increase the rate of slash decadence.
- Treat 350 acres within three previously harvested upland stands with commercial and precommercial thinning (refer to proposed wildlife treatments on Figure 3). The type of thinning proposed is dependent on stand age and past treatments. The treatment goal is to enable residual trees to grow larger and taller in less time to allow the stands to attain mature forest characteristics sooner.
- Selectively thin 19 acres within the previously harvested riparian management area (RMA) that runs parallel to NFS road 8519 to remove dominant red alder to promote conifer growth and large woody debris recruits, and increase conifer spacing and old-growth characteristics.
- Place large wood within the floodplain of Kennel Creek's main channel, approximately 300 meters upstream of Kennel Creek Trail, to improve aquatic habitat.
- Remove and/or replace five red culverts and one gray culvert on NFS roads 8519, 85191, 851911, and 8510 to improve access to upstream fish habitat.

## Decision Framework

The Hoonah District Ranger is the responsible official for this project. Based on the environmental analysis contained in this EA and project record, and evaluation of public comments, the responsible official will decide whether to implement none, all or part of the proposed action, the timing of treatments, and any mitigation measures and monitoring. The decision and rationale will be documented in a decision notice and finding of no significant impact (DN and FONSI).

## Project Area

The project area is the Kennel Creek watershed which is located approximately 18 miles south-southeast of the town of Hoonah, Alaska, on the eastern shore of Chichagof Island (Figure 1). Kennel Creek drains directly into saltwater on the west shore of Freshwater Bay. The watershed encompasses approximately 8,520 acres (13.3 square miles) and contains 43.4 miles of mapped stream channels.

Prior to European settlement the watershed was used mostly for subsistence purposes. The watershed is now primarily within development status (Timber Production LUD) under the 2008 Tongass Forest Plan (Table 1). Chapter 3 of the Forest Plan contains a detailed description of each land use designation (USDA 2008b).

The entire Kennel Creek watershed is in federal ownership and managed by the Forest Service.

**Table 1. Land Use Designations within the Kennel Creek Watershed**

LUD	LUD Group	Acres <sup>1</sup>	Percent of Area
Timber Production	Development	7,921	93
Scenic Viewshed	Development	76	1
Old-growth Habitat	Natural Setting	488	6

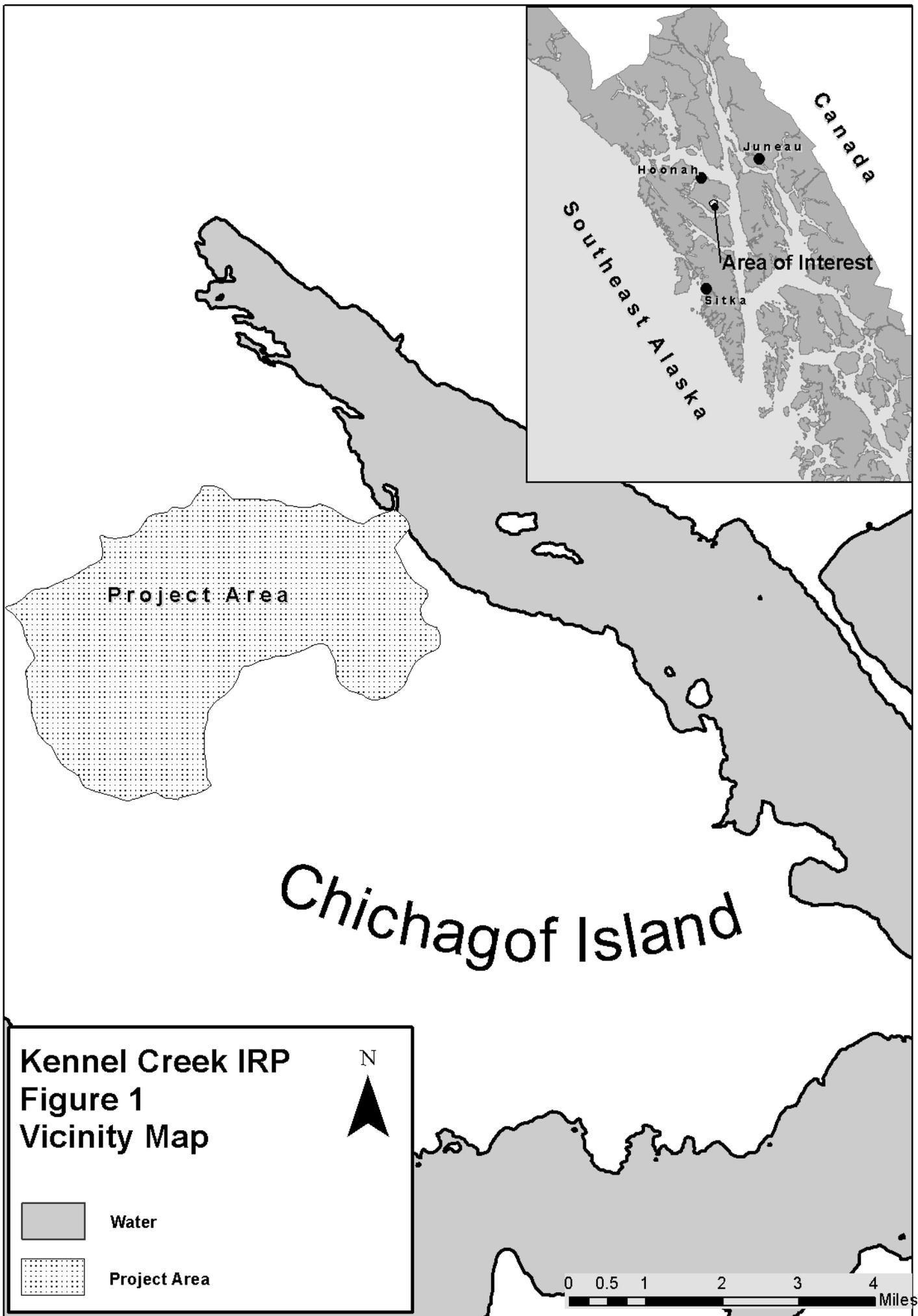
Source: Sitka Ranger District 2009 GIS Coverage.

<sup>1</sup> Acres do not equal total watershed area due to portions of the watershed boundaries falling within saltwater.

## Purpose and Need

The purpose of the Kennel Creek Integrated Resource Project I is to improve watershed conditions by restoring the ecological function of riparian and in-stream areas, enhance wildlife and old-growth conditions in upland areas, and provide timber for local operators. These actions would help address the effects of past management actions and move the project area from the current condition to a desired future condition described by the 2008 Tongass National Forest Land and Resource Management Plan (Forest Plan) (USDA 2008b).

The need for action is documented in the Kennel Creek IRMP Assessment (USDA 2010) which outlines the effects of past timber and road management actions on watershed and habitat function.



The need for this project is to:

- Manage Kennel Creek watershed and bring the project area closer to desired conditions outlined in the Forest Plan.
- Provide for a diversity of opportunities for resource uses that contribute to the local and regional economies of Southeast Alaska.
- Support a wide range of natural resource employment opportunities within Southeast Alaska's communities.

## **Background and Current Condition**

Over 1,422 acres of clearcut timber harvest occurred within the watershed under management by the USDA Forest Service between 1964 and 1993 (see managed stands in Figure 2). Some of the stream channel types in the watershed are sensitive to disturbances and are dependent on large woody debris for proper functioning. Fisheries habitat and aquatic ecosystem function has been impaired along some of the mid-valley reaches in the watershed due to riparian harvest and the conversion from conifer-dominated riparian areas to red alder-dominated riparian areas. Roads in riparian management areas (RMAs) or stream crossing structures such as culverts have modified some stream flow regimes, diverted water from natural stream courses, and routed sediment to streams.

Clearcut harvest converted approximately 170 acres of conifer-dominated old-growth riparian habitat to red alder-dominated forest or young-growth conifer stands. These stands contain an understory component of conifers but these trees continue to be shaded by red alder overstory, slowing the growth of conifers and reducing vegetation on the forest floor. Harvest activities and stand conversion also reduced wildlife habitat quantity, quality and connectivity in the watershed for Management Indicator Species (MIS) such as Sitka black-tailed deer, marten and goshawk which were identified in the Tongass Forest Plan FEIS (USDA 2008c) as dependant on old-growth habitat.

About 16 miles of road were built to facilitate timber harvest. Road-related effects range from disrupting the natural flow of water (hydrologic conductivity) and sediment (sediment routing and sedimentation) to impeding fish movements. Five red and one gray fish culverts are located within the watershed that block or limit fish passage (Figure 3).

## **Desired Condition**

The proposed action responds to the goals and objectives outlined in the Forest Plan, and helps move the project area toward the desired conditions described in the Plan. The Forest Plan also directs land managers to:

- Maintain or restore the natural range and frequency of aquatic habitat conditions on the Tongass National Forest to sustain the diversity and production of fish and other freshwater organisms.
- Maintain or restore water quality to provide for fish production.
- Maintain or restore natural and beneficial quantities of large woody debris over the short- and long-term.

- Maintain or restore stream banks and stream channel processes.
- Maintain fish passage through stream crossing structures.
- Maintain habitat capability sufficient to produce wildlife populations that support the use of wildlife resources for sport, subsistence, and recreational activities.
- Include a young-growth management program to maintain, prolong, and/or improve understory forage production in young-growth timber stands for wildlife on both suitable and unsuitable lands.
- Precommercially thin previously harvested suitable forest land.
- Manage young-growth to improve habitat for wildlife and commercial timber products.
- Manage suitable forest lands for the production of sawtimber and other wood products on an even-flow, long-term sustained yield basis.

## Public Involvement

The project has been listed in the Schedule of Proposed Actions (SOPA) since July 2011.

A scoping letter for the project was mailed in June 2011 to approximately 65 individuals, organizations, federal and state agencies and Native Tribes and Corporations that had previously shown interest in USDA Forest Service projects within the vicinity of Hoonah, Alaska. Two responses to scoping were received. One response was from the Army Corps of Engineers informing the Forest Service that authorization from the Corps is required for placement of instream wood. The second response was from the State supporting the project; however, the State would like to see more timber harvest planned within the project area. Both letters are filed in the project record.

## Issues

For the purposes of this analysis, issues identified during the public involvement process are categorized by the project interdisciplinary team (IDT) as either significant or non-significant. Significant issues are those directly or indirectly caused by implementing the proposed action and represent unresolved disputes, disagreements or debate about the effects of the proposed action. Non-significant issues are those that have been resolved through analysis by the IDT. They are typically resolved in a number of ways, and are categorized as: 1) outside the scope (not related to the effects) of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The magnitude, extent, duration, speed, and direction of preliminary effects can also be considered in determining non-significance. The Council for Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)...".

Scoping comments were evaluated by the IDT, using the above process, and all concerns were resolved, thus no significant issues were brought forward. Comments generated during

scoping, and the IDT response of those comments, are incorporated in this document and can be found in the project record at the Hoonah Ranger District.

## Alternatives

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This section describes and compares the alternatives considered for the Kennel Creek Integrated Resource Project I. This section also presents the alternatives in a comparative form, defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public.

### Alternative 1: No Action

The no action alternative is included to meet NEPA requirements, and provide a baseline for comparison. Activities such as thinning, old-growth harvest and in-stream restoration could still be proposed individually, analyzed, and implemented, however, the cost efficiency of the activities could be diminished as they would likely occur independently and over a longer period of time.

### Alternative 2: Proposed Action

The proposed action responds to the goals and objectives outlined in the Forest Plan, and helps move the project area toward the desired conditions described therein.

This alternative proposes to manage suitable forest lands for the production of sawtimber and other wood products with selection harvest of old-growth stands and to improve the short and long-term health of the aquatic and upland ecosystems by implementing a wide range of watershed restoration and enhancement activities. Alternative 2 addresses the cumulative effects of past management by removing human-created fish passage barriers, reducing road related erosion, restoring instream processes that provide fish habitat, reducing stream-bank erosion and stream diversion potential, improving wildlife movement through managed stands, and enhancing tree growth and yield in designated timber production areas.

This alternative proposes an integrated, landscape-level approach to resource management and facilitates a comprehensive analysis of the proposed actions. This approach also provides for more cost-efficient analysis and implementation, for contracting or potential stewardship projects.

Projects proposed in this alternative (Table 2 and Figure 3) are grouped into three categories:

#### Aquatic Restoration

- Five stream crossing structures currently do not allow fish passage (red culverts) and there is one structure that is a possible fish barrier (gray culvert). The proposed action would improve fish passage by removing two red culverts, and replacing three red and a gray culvert with passable structures. The culverts proposed for removal are on NFS roads 85191 and 851911.
- Riparian thinning on 19 acres to improve floodplain function by increasing bank stability through understory development and to increase the growth rate of young

conifers for future large woody debris. Treatments would be low intensity and small in scale.

- Approximately 300 meters of Kennel Creek has lost its natural influx of large wood as a result of past timber harvest. The proposed action includes an in-stream project, approximately 300 meters upstream from the Kennel Creek Trail, to improve habitat complexity and spawning and rearing habitat for anadromous fish along this stretch. The proposal is to place two to four whole trees with rootwads attached within the active stream channel to act as an anchor. Five to ten logs, from dismantled log stringer bridges, would be placed onto the upstream side of each whole tree, creating a log jam. Trees and logs would be placed by an excavator or log shovel tracked machine.

### **Wildlife Enhancement**

- Reduce slash accumulations on approximately 100 acres of precommercially thinned managed stands by brushing trails, 5 feet wide, through areas of heavy slash buildup. The slash would be either scattered or piled. Treatment is proposed within the lower portion of four managed stands along NFS roads 8519, 85191 and 85193. All work would be done by hand. Corridors are expected to facilitate wildlife movement and stimulate forage production.
- Create gaps and thickets by thinning 350 acres in three previously harvested upland stands to improve species composition, increase growth rates and move the stands toward old-growth conditions (see proposed wildlife treatments in Figure 3).
  - The majority of the area proposed for treatment (250 acres) is located on the east side of compartment 21700 stand 49 (hereafter stand 49) where the area is in the stem exclusion stage. Access to the stand would be via closed road 8510 1.01R.
    - Thinning, and potentially some girdling, is proposed on approximately 200 acres in the eastern portion of the stand. Some of the trees proposed for removal as part of the thinning process may have commercial value; consequently, ground-based equipment may salvage some of these trees.
    - The remaining 50 acres, consisting of younger and smaller trees, are proposed for thinning and slash removal using hand tools.
  - The remaining acres proposed for thinning, approximately 100, are located in stands harvested in 1981 and 1991 off of NFS roads 85191 and 851911.

### **Timber Management**

- Manage 250 acres of suitable forest lands for the production of sawtimber and other wood products by selectively harvesting 500 MBF of old-growth timber from four units. Two units are north of NFS roads 85191 and 851911 above existing young-growth stands. The other two units are in the southeast portion of the project area near NFS roads 8517, 8510 and 85171. The harvest prescription is designed to maintain and manage an uneven-aged stand structure through the selection of individual trees

of various size classes throughout the stand, while encouraging regeneration and stand growth. No new roads would be constructed but existing closed roads would be re-opened as needed. Shovel yarding would be used for the majority of the proposed harvest units; however, if feasible, helicopter yarding may occur within approximately 80 acres. Cut material removed from the area would be appraised to the sort yard at Long Island.

**Table 2. Comparison of alternatives**

	Alternative1	Alternative 2
<b>Aquatic Restoration</b>		
Culverts impeding fish movement	6	0
Class I and II habitat made accessible by replacing culverts	0	500 meters
Riparian thinning	0	19 acres
Aquatic habitat improvement	0	300 meters
<b>Wildlife Habitat Enhancement<sup>1</sup></b>		
Slash removal	0	100 acres
Upland thinning	0	350 acres
<b>Timber Management</b>		
Old-growth harvest	0	250 acres/500 MBF

## Mitigation

There are no site-specific mitigation measures necessary to implement this project, outside of Forest Plan Standards and Guidelines and the Alaska Region Best Management Practices (BMPs). See the Forest Service's Soil and Water Conservation Handbook (FSH 2509.22) for Best Management Practices (see Reference section for link to the handbook) and Forest Plan Standards and Guidelines to be used during project implementation.

Information and documents regarding the Tongass Land and Resource Management Plan may be accessed at <http://www.fs.fed.us/r10/tongass/projects/tlmp/index.shtml>. Monitoring of BMPs on the Tongass demonstrates that BMPs are effective at maintaining Alaska Water Quality Standards for suspended sediments and turbidity (USDA 2002).

The Forest Service must apply BMPs 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 non-point 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 2509.22, October 1996) as consistent with the Alaska Forest Resources and Practices Regulations. This handbook is incorporated into the Forest Plan.

<sup>1</sup> Slash removal and upland thinning will also benefit timber management.

## **Federal and State Permits, Licenses and Certificates**

To proceed with the projects in Alternative 2, various permits, licenses, or certifications will be obtained from federal and state agencies. The following permits would be obtained: approval of discharge of dredged or fill material into the waters of the United States under Section 404 of the Clean Water Act from the U.S. Army Corps of Engineers; certification of compliance with Alaska Water Quality Standards (Section 401 Certification) from the State of Alaska, Department of Environmental Conservation; and Title 16 concurrence for in-stream work to proceed with the proposed action, from the State of Alaska, Department of Fish and Game, Division of Habitat.

## **Applicable Laws and Executive Orders**

Below is a partial list of federal laws and executive orders pertaining to this project. While most pertain to all federal lands, some of the laws are specific to Alaska. Activities proposed in this project comply with all applicable federal laws and executive orders.

National Forest Management Act

Migratory Bird Treaty Act of 1918 (as amended)

Bald and Golden Eagle Act of 1940 (as amended)

National Historic Preservation Act of 1966 (as amended)

National Environmental Policy Act (NEPA) of 1969 (as amended)

Clean Air Act of 1970 (as amended)

Clean Water Act of 1977 (as amended)

Alaska Native Interest Lands Conservation Act (ANILCA) of 1980

Marine Mammal Protection Act of 1972

Endangered Species Act (ESA) of 1973 (as amended)

Archaeological Resource Protection Act of 1980

Federal Cave Resource Protection Act of 1988

Magnuson-Stevens Fishery Conservation and Management Act of 1996

Executive Order 11593 (cultural resources)

Executive Order 11988 (floodplains)

Executive Order 11990 (wetlands)

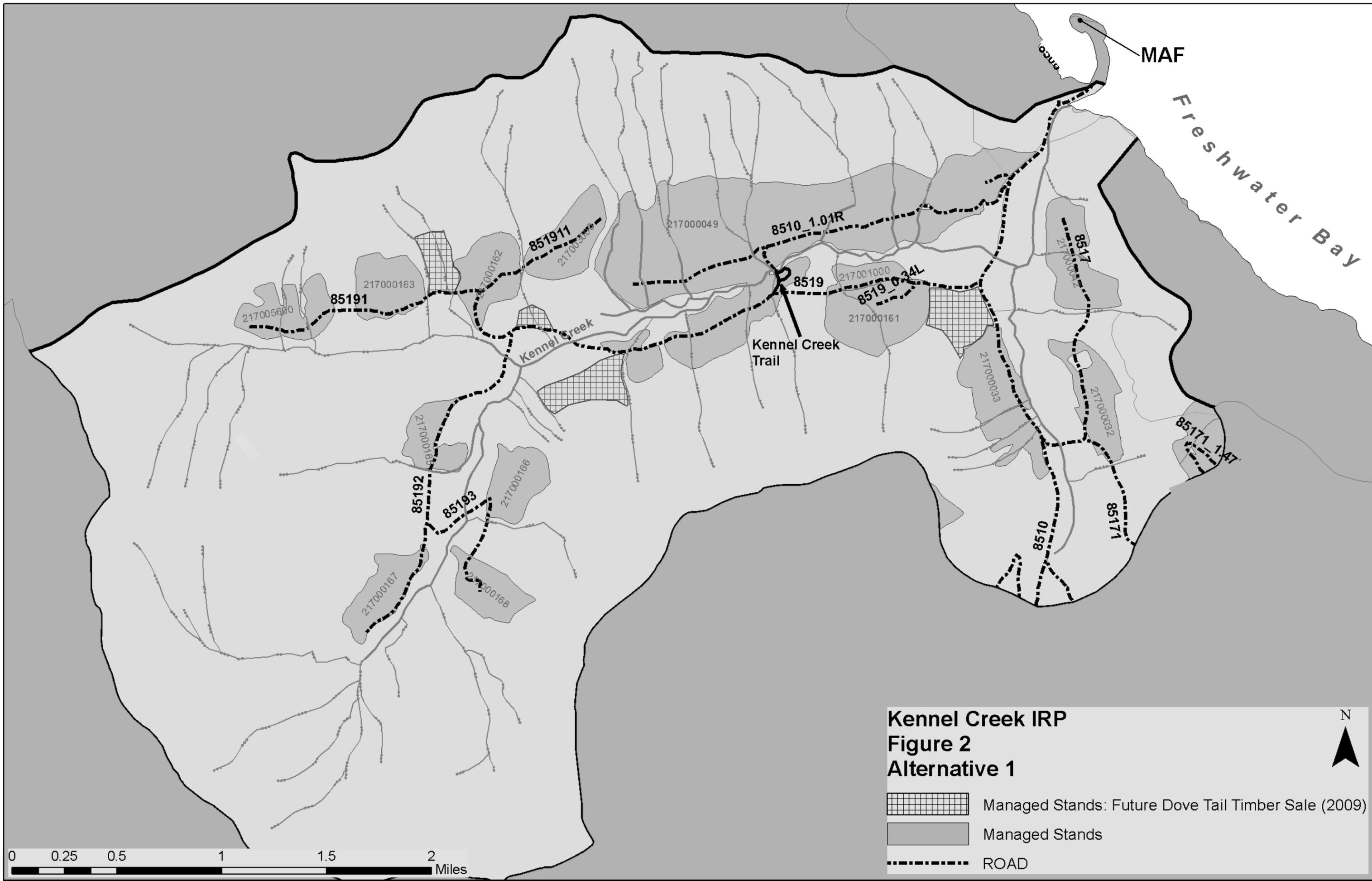
Executive Order 12898 (environmental justice)

Executive Order 12962 (aquatic systems and recreational fisheries)

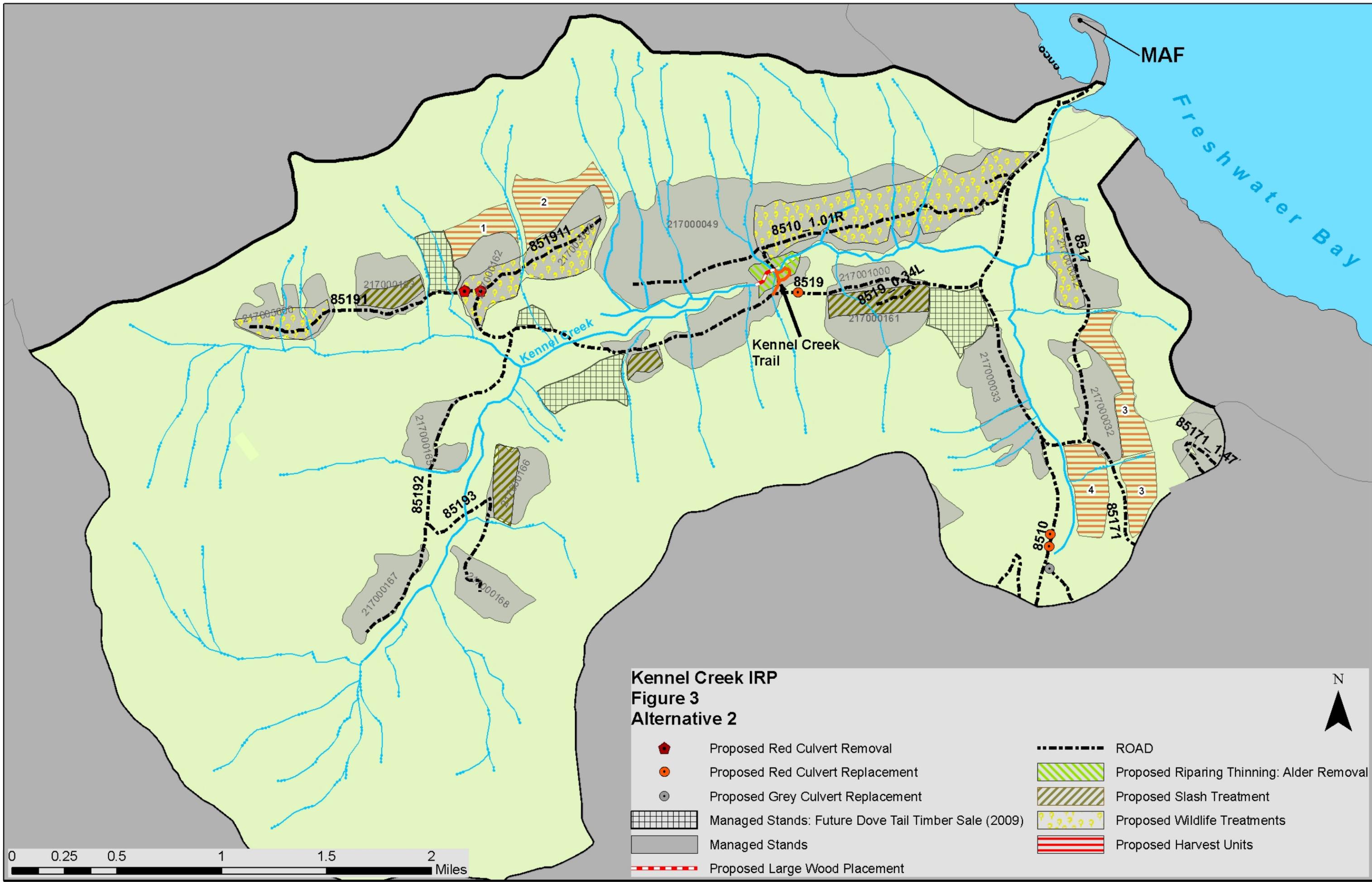
Executive Order 13007 (Indian sacred sites)

Executive Order 13112 (invasive plant species)

Executive Order 13175 (consultation and coordination with Indian tribal governments)



## **Backside of Map**



MAF

Freshwater Bay

Kennel Creek

Kennel Creek Trail

0 0.25 0.5 1 1.5 2 Miles



## **Backside of Map**

## Environment and Effects

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This section provides information about the current condition of the Kennel Creek Integrated Resource Project I project area, and the potential consequence of each alternative. Effects are quantified when possible, otherwise qualified to clearly display differences between alternatives. The means by which negative effects will be reduced or mitigated are also described.

Environmental consequences are the effects of implementing an alternative on the physical, biological, or social environment. Direct environmental effects are those occurring at the same time or place as the proposed action. Indirect effects are those that occur at a later time or are spatially removed from the activity. Cumulative effects result from the incremental effects of the actions proposed by this project, when added to other past, present, or reasonably foreseeable future actions, regardless of what agency or person undertakes the action. For the purpose of this analysis, the words “impacts” and “effects” are synonymous.

Reasonably foreseeable future actions include projects such as free-use, firewood cutting, hunting, fishing, recreation, on-going road maintenance, roadside salvage harvest of dead and downed timber, and the concurrent Hoonah Ranger District Access and Travel Management Plan (ATM). The road management objectives for this project mirror the objectives outlined in the ATM and include storing about 4.9 miles of road in the project area. There are also four areas (30 acres total) in the project area previously NEPA-cleared for individual tree and group selection. Total board feet authorized for harvest is approximately 250 MBF. The rate at which cumulative effects occur will depend on the rate at which new projects are implemented and the rate at which disturbances from past and present activities recover.

## Aquatics

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### Introduction

The quality and quantity of the abundant water in Kennel Creek are crucial to maintaining the ecological integrity of the watershed. Factors contributing to the existing condition of aquatic resources include loss of fish habitat due to impassable culverts, alder dominated riparian areas, and lack of large wood in the main stem of Kennel Creek. While many hydrologic processes are attaining equilibrium in a natural state of recovery, portions of this watershed are still in a state of degradation. Roughly 500 meters of Class I and II habitat are blocked by impassable culverts, and approximately 400 meters of main-stem spawning and rearing habitat is degraded (focused at the historic road crossing into the 1964 harvest unit). Resource concerns in the Kennel Creek watershed have been identified through data analysis, field investigation, and aerial photo interpretation and can be found in the Kennel Creek IRMP Assessment (USDA 2010a). The restoration activities proposed are aimed at improving riparian condition, hydrologic function, and maintaining high value aquatic resources.

### Affected Environment

The watershed contains 43.4 miles of mapped stream channels. Some of the stream channel types in the watershed are sensitive to disturbances and are dependent on large woody debris

for proper functioning (USDA 2009d). Fisheries habitat and aquatic ecosystem function has been impaired along some of the mid-valley reaches in the watershed due to riparian harvest and the conversion from conifer-dominated riparian areas to red alder-dominated riparian areas. Roads in riparian management areas (RMAs) or stream crossing structures such as culverts have modified some stream flow regimes, diverted water from natural stream courses, and routed sediment to streams.

The Kennel Creek watershed ranges in elevation from sea level to 3,100 feet. Drainage patterns of the watershed generally run west to east and empty into saltwater.

Drainage density in the watershed is 3.3 mi/mi<sup>2</sup> (Table 3).

**Table 3. Stream Miles and Drainage Density for the watershed**

Watershed	Area (mi <sup>2</sup> )	Total Stream Miles	Drainage Density (mi/mi <sup>2</sup> )
Kennel Creek	13.3	43.4	3.3

Source: 2009 Tongass GIS Coverage.

Note: Total stream miles denote only mapped class I-IV stream channels. Unmapped stream channels including more Class IV channels would significantly increase total stream miles and basin drainage density.

### Stream Channel Types

Stream channel types are determined by their size, location in the watershed, adjacent landforms, gradient, hydraulic control, and riparian vegetation. Channel type and stream class are influenced by geology, landform, climate, and vegetation. To see a breakdown of stream miles by channel type and process groups, refer to the complete fisheries report located in the project record.

### Fish Species Present

The Alaska Department of Fish and Game Anadromous Fish Catalog lists steelhead, coho, pink and chum salmon, as well as sculpin and Dolly Varden char for streams in the watershed.

### Stream Habitat

The watershed contains a total of 10.6 miles of Class I streams (25 percent of all stream miles), 7.5 miles of Class II streams (17 percent of all stream miles), and 25.3 miles of Class III streams (58 percent of all stream miles) (Table 4).

Past surveys from Kennel & Pavlof Watershed Inventory & Assessment (USDA 2009d), and the Preliminary Habitat Condition Assessment for Kennel Creek (USDA 2008a) conclude that most stream reaches are healthy due to the use of no cut stream buffers. The four surveyed (Tier II) reaches are within normal range for the majority of habitat variables analyzed, except for a 300 meter reach of the main-stem near the Kennel Creek Trail where several outlying values indicate the channel may be at risk for destabilization.

**Table 4. Stream by Class within the Kennel Creek Watershed**

Stream Class	Distance (miles)/Percent of Watershed
I	10.6 25%
II	7.5 17%
III	25.3 58%
<b>Total stream miles</b>	<b>43.4</b>

Source: 2009 Tongass GIS Coverage.

### Management Effects by Stream Class

Timber harvest was not necessarily evenly distributed throughout the watershed, with older harvest areas occurring primarily in valley bottoms and lowlands. Consequently, a majority of the streams affected in this area are Class I and II fish channels. Table 5 displays the miles of stream by class within harvest units. This data shows that roughly 15 percent of the stream channels in the watershed have been impacted by harvest, with 31 percent of the impacted channels containing anadromous fish habitat. Sixteen percent of Class II and 13 percent of Class III streams have been harvested in the watershed.

**Table 5. Stream Miles by Class within Harvest Units in the Kennel Creek Watershed**

Stream Class	Distance (miles)
I	2.1
II	1.2
III	3.2
<b>Total</b>	<b>6.5</b>

### Water Quality Concern and Status

There are no state-listed water quality-impaired water bodies in the watershed. However, the Kennel Creek IRMP (USDA 2010a) identified five fish blocking culverts (red culverts) and one potentially fish blocking culvert (gray culvert) affecting 500 meters of Class I and II habitat. The Kennel Creek IRMP (2010) also identified an alluvial fan that shows signs of degradation; however, the alluvial fan is outside the scope of this analysis.

### Management Indicator Species (MIS)

The Forest Service uses MIS to assess the impacts of proposed actions to the fishery resource. Pink salmon (*Oncorhynchus gorbuscha*), coho salmon (*Oncorhynchus kisutch*), cutthroat trout (*Oncorhynchus clarki*), and Dolly Varden char (*Salvelinus malma*) have been identified as MIS for the Tongass National Forest (USDA 2008c, pp. 3-230 to 3-241). All four MIS species listed above exist within the project area.

Potential adverse effects on these fish species may include changes in water yield, sediment, water temperature, and fish passage at road crossings.

## **Environmental Consequences**

### **Direct and Indirect Effects – Essential Fish Habitat**

#### Alternative 1

By choosing the no action alternative, the existing condition would not change. Five red culverts and one gray culvert would continue to potentially isolate 500 meters of fish rearing habitat. Three hundred meters of main stem habitat would continue to lack existing and future large wood and habitat complexity. The continuation of existing conditions would not greatly affect fish and essential fish habitat due to the abundance high quality habitat upstream and downstream.

#### Alternative 2

The proposed action is expected to have beneficial direct and indirect effects on the managed fish species by restoring access to over 500 meters of Class I and II habitat, and improving habitat complexity on 300 meters of Kennel Creek that provide spawning and rearing habitat for anadromous fish. The restoration and enhancement activities are anticipated to bring the in-stream and riparian habitat systems closer to old-growth pre-harvest conditions.

Proposed aquatic and wildlife habitat improvement activities, as well as proposed selection harvest are expected to have “no adverse effects” on essential fish habitat because Forest BMPs and timing restrictions would be followed. Furthermore, the scale of the project area is small compared to EFH as a whole.

### **Cumulative Effects – Essential Fish Habitat**

#### Alternative 1

Within the project area, no new road crossings are proposed and there are no proposed projects that may harm essential fish habitat, or impede fish movement.

#### Alternative 2

No negative cumulative effects to fish, water quality, or EFH are expected from the implementation of the proposed action. However, beneficial cumulative effects may result from past and proposed restoration activities.

## **Botany and Invasive Species**

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### **Affected Environment**

To determine the condition of the affected environment, a pre-field review was conducted to identify known or suspected rare and sensitive plant populations in the area; data from the National Resource Information System (NRIS)<sup>2</sup> was accessed; botany surveys were completed for the project area; and a 10-year history of surveys from the surrounding area

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<sup>2</sup> NRIS is a comprehensive program for the acquisition, storage and retrieval of existing data relating to natural history.

was referenced. The botany resource report, located in the project record, summarizes information about sensitive and rare plants and invasive species of concern in the project area.

### **Threatened, Endangered and Sensitive Plant Species**

No listed threatened or endangered species are known to occur on the Tongass National Forest. There are, however, 17 plant species and one lichen listed as sensitive on Forest Service lands in Alaska (USDA 2009a). A biological evaluation was completed for sensitive species in the project area and only one plant species, Alaska rein orchid (*Piperia unalascensis*), is suspected of occurring. A determination of “may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing,” was given to the Alaskan rein orchid.

### **Rare Plant Species**

The Alaska Natural Heritage Program maintains a list of plants considered rare in Alaska. A subset of this list (plants known or suspected to occur on Chichagof Island) was considered for this project. From this list, three rare plant species are known to occur within or near the project area. Habitat for all three species is open wetland or meadow settings, which will not be affected by project activities. Two of the species, *Galium kamtschaticum* and *Listera convallarioides*, are relatively common and widely dispersed on Chichagof Island. *Glyceria striata*, documented in two areas on Chichagof Island, is not currently known to be in the project area.

### **Invasive Plants**

Surveys for invasive species were completed on the Hoonah road system in 2007. In the project area, approximately 20 introduced or invasive species are known to occur. Weed species of concern are being controlled, where feasible.

## **Environmental Consequences**

### **Direct and Indirect Effects**

#### Alternative 1

The no action alternative (Alternative 1) would result in no direct effects. However, indirect effects may include increased time for the timber stands to return to an old-growth condition which has the anticipated benefits of vegetation diversity, improved wildlife habitat and healthy stream function. If the no action alternative were selected, some or all of the proposed activities may be proposed and analyzed individually and occur at a later date.

#### Alternative 2

In the proposed action (Alternative 2), direct effects would include: culvert replacement resulting in localized disturbance on the roads, which could favor the spread of invasive species along roads; proposed thinning, timber harvest and riparian work, which could cause minor ground disturbance and destruction of some vegetation and an opportunity for invasive plants to invade previously forested habitat; and timber harvest leaving slash on the ground, which could suppress understory vegetation.

**Cumulative Effects**

The history of road construction, logging and the associated logging and work camps at Kennel Creek are the primary source of disturbance and invasive species in the project area. Recreational and guided use in the project area may contribute to the spread of invasive species.

Findings for anticipated effects to botanical resources if the proposed action is implemented are summarized below (Table 6). Definitions for the findings follow.

**Table 6. Findings for effects to botanical resources if proposed action is implemented**

<b>General Vegetation</b>	<b>Rare Plants</b>	<b>Sensitive Plants</b>	<b>Invasive Plants</b>
Minor	Negligible	Negligible	Minor

**Negligible** effects may or may not cause observable changes to natural conditions; regardless, they do not reduce the integrity of a resource.  
**Minor** effects cause observable and short-term changes to natural conditions, but they do not reduce the integrity of a resource.  
**Moderate** effects cause observable and short-term changes to natural conditions, and/or they reduce the integrity of a resource.  
**Major** effects cause observable and long-term changes to natural conditions, and they reduce the integrity of a resource.

**Mitigation Measures and Monitoring Recommendations**

Forest Service personnel and contractors should be made aware of the risks that may result from the implementation of the proposed action regarding the introduction and spread of invasive plants. Construction equipment used in Hoonah should be washed prior to use on the forest roads to prevent the spread of perennial sowthistle, a highly invasive species which is common in the town of Hoonah. Monitoring of the roads and culvert replacement sites within the project area should occur within two years of project completion to determine if invasive species were spread by project activities.

**Cultural**

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**Affected Environment**

Generally speaking, the majority of the Kennel Creek Watershed falls into the low probability zone for the occurrence of cultural resources. There are occasional culturally modified trees identified; however, to date there have been no identified historic properties (cultural sites).

One-thousand fifty-nine acres of the 8,520 acre Kennel Creek Watershed have been surveyed for cultural sites (Table 7). There are 278 additional acres within the watershed that fall within a high probability area for cultural resources (all land between mean low water and 100 feet of elevation above mean high water) that have yet to be inventoried. In addition, surveys have not taken place at lake and stream systems containing, or historically contained, anadromous fish runs or at barrier falls locations. These locations are also considered high probability areas.

Given that less than 12 percent of the overall watershed has been surveyed for cultural resources, there is a great possibility that sites exist, but have yet to be discovered.

**Table 7. Cultural Resource Inventories in the Kennel Creek Watershed**

Project Number	Survey		Citation
	Year	Author	
R1993100531086	1993	Kennerly, Keri	SEIS Road Monitor Northeast Chichagof Island
R1978100532001	1978	Autrey, John	Archaeological reconnaissance of the proposed long-term timber sales 1981-1986 Chichagof Island
R2009100532007	2009	Kinsman, Jay	Kennel Creek cabin, dock, and boat ramp
R1986100531007	1987	Swanson, Karen	Long-term timber sale
R1990100532273		Lively, Ralph	SEIS (86-90) Rock Pit # 466316- Kennel Creek NFS Road 8519
R1990100532303		Swanson, Karen	Rock Pit Located in VCU 217 CU3, along the 85919-1 Road (466309)
R1995100532050	1995	Brown, Katherine	Heritage Resource investigations for the Freshwater Bay limestone rock pits Chichagof Island, Alaska
R1992100532087	1992	Gilman, Michael	Cultural Resource Inventory of the Level I Survey of Kennel Creek 1992 Large Wood Debris (LWD) Enhancement Project
R1990100532138		Philibert, Juli A.	Extension of Rock Pit 466314B on NFS Road 8517, VCU 217

## Environmental Consequences

### Direct, Indirect and Cumulative Effects

Direct, indirect or cumulative effects to cultural resources are unlikely for this project. The logging conducted from 1964 to 1993 would have had the greatest impacts on the resource due to direct ground disturbance and indirect erosion and was larger in scale than the proposed project. The proposed commercial sale areas are well outside the areas of high probability zone for cultural resources; therefore, it is unlikely there would be any indirect or cumulative effects from this project. Large wood structure placement will likely have no direct, indirect or cumulative effects on cultural resources as the likelihood of discovering a site in an active stream channel is minimal. The removal or replacement of red and gray culverts as addressed in the proposed action is not likely to have direct, indirect or cumulative effects on cultural resources in that the disturbance occurred during the construction of the road and placement of the culvert. These roads are not over 50 years in age and are not likely to contain any significant historic properties.

### Conclusion

There is one known cultural site adjacent to the project area but outside of the area of potential effect (APE). Based on the distance from shore, elevation, previous surveys, previous disturbances and that stream restoration activities will occur in an active stream channel, a determination of “No Historic Properties Affected” has been made.

The cultural resource report for this project was submitted to the State Historic Preservation Officer (SHPO) in the FY 2011 Annual Report to SHPO. Submittal of this report fulfills the requirements for consultation as outlined in the Programmatic Agreement (USDA 2010b) among the USDA Forest Service Alaska Region, the Advisory Council and the Alaska State Historic Preservation Office.

If cultural resources or items protected by the Native American Graves Protection and Repatriation Act are discovered during implementation, work should cease in the immediate vicinity. The site administrator should contact the District Ranger first and the zone archaeologist next. The District Ranger and zone archaeologist will then apply stipulations XIII or XV of the Third Amended Programmatic agreement Among the USDA Forest Service, Alaska Region, the Advisory Council on Historic Preservation, and the Alaska State Historic Preservation Officer.

## **Recreation**

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### **Introduction**

Recreational users of the Kennel Creek watershed area are primarily from the community of Hoonah and utilize main NFS roads 8508, 8510, 8519, and adjoining spur roads within the project area. Recreation activities include driving for pleasure, hunting, viewing scenery and wildlife, dispersed camping, gathering forest products, stream fishing, picnicking, hiking, and access to saltwater. The residents of Hoonah use the road system consistently during the spring and summer months and heavily during the fall subsistence deer hunting season. A float dock at the Kennel Creek spit serves as a Marine Access Facility (MAF) for boats and float planes.

Recreation management goals and objectives for an area are determined by its LUD designation. Therefore, existing condition, and environmental consequences are discussed by LUD.

### **Affected Environment – Old-growth Habitat LUD**

This area is approximately 420 acres and is located at the NE corner of the project area. It includes the last 0.5 mile of NFS Road 8517. The area is within the Semi-Primitive Motorized ROS class.

The end of NFS Road 8517 is closed to vehicle traffic but remains open for ATV use (USDA 2009c). Currently this area receives minimal recreation use other than at a large rock pit just outside of the LUD which is occasionally used for hunting camps.

### **Environmental Consequences – Old-growth Habitat LUD**

#### **Direct, Indirect and Cumulative Effects**

##### Alternative 1

Under the no action alternative, the existing conditions and current management practices for recreation resources in the Old-growth Habitat LUD would not change.

### Alternative 2

In Alternative 2, there would be little change to the existing conditions for recreation resources. The proposed projects in this LUD include slash removal along NFS road 8517. This would facilitate wildlife movement and indirectly enhance the recreation opportunities for wildlife viewing and hunting. No recreation enhancement projects are proposed in this LUD.

### **Affected Environment – Scenic Viewshed LUD**

This area is less than 10 acres in size and is located on the NE corner of the project area. It includes the entire Kennel Creek landfill spit from the intersection of NFS roads 8508 and 8510 along the north end of the Kennel Creek outlet. It includes the end of NFS Road 85101 to an abandoned bulk head. This area is within the Roaded Modified ROS class. Road-based use within this LUD is low, as the road is only maintained for high-clearance vehicles.

The Kennel Creek Spit is the site of the abandoned Kennel Creek logging camp. Today it is a destination hub for most of the commercial and non-commercial users traveling the road system on NFS Road 8508. The area is used to access hunting and fishing areas, provide scenery and wildlife viewing, stream fishing, ocean fishing, boat launching, day use picnicking, overnight camping, berry picking, subsistence gathering, and is a place for large groups for special events.

Facilities that remain in place on the spit include a Forest Service float dock, barge loading ramp and logging bulkhead. The dock is available for float plane and boat use and receives use throughout the year. The rough gravel barge loading ramp is used intermittently for loading/unloading heavy equipment. There are three designated day-use picnic sites that include wooden picnic tables and primitive fire rings. These sites receive intermittent public use throughout the spring, summer and fall seasons for day-use picnicking and overnight RV and tent camping. There is a 500-gallon single vault toilet on site that receives steady use throughout the summer season. A boat launch ramp was constructed in 2010 and receives intermittent use throughout the year. The mouth of Kennel Creek exits adjacent to the spit and provides easy access for fishing.

A Forest Service public use cabin is scheduled for construction at this site in 2012. It will be located near a decommissioned Forest Service bunkhouse. The cabin will provide users the ability to gain extended access to a variety of recreation areas within the watershed.

### **Environmental Consequences – Scenic Viewshed LUD**

#### **Direct, Indirect and Cumulative Effects**

#### Alternative 1

Under the no action alternative, the existing conditions and current management practices for recreation resources in the Scenic Viewshed LUD would not change.

### Alternative 2

In this LUD no activities are proposed; therefore, no change to the existing condition of the recreation resources would occur if this alternative was implemented.

### **Affected Environment – Timber Production LUD**

This LUD encompasses a majority of the watershed, approximately 8,100 acres, and is located in the center of the project area. It includes NFS roads: 8510, 8519, 85191, 85192 and 85193.

NFS roads 8519 and 8510 run through the middle of the project area. Road 8510 is Maintenance Level 3 (ML3) for passenger vehicles for the first 0.5 mile beginning at the Kennel Creek Spit. The next 2 miles is ML2 for high clearance vehicles. NFS Road 8519 travels through the center of the watershed along the southeast side of Kennel Creek for approximately 2.5 miles and is ML2. NFS roads 85191, 85192 and 85193 are closed to motor vehicle traffic and remain open for hiking and ATV use (USDA 2009c).

These roads are utilized for a variety of recreation activities including: driving for pleasure, viewing scenery and wildlife, and accessing fishing and hunting areas. Kennel Creek is an important watershed for the community of Hoonah for these activities.

The Kennel Creek Spit is a destination for most of the commercial and non-commercial use within this watershed. Road-based use within this LUD is low, as the road is maintained for high clearance vehicles. Past the Kennel Creek Spit along NFS Road 8510, users encounter a higher level of solitude, less traffic and a more remote experience.

The Kennel Creek trail is approximately 1 mile up NFS Road 8519. It is a 0.25 mile primitive trail that leads to Kennel Creek. Currently it receives low use and is maintained for fishing access.

Closed spur road 8510\_1.01R travels through a 1964 clear cut (stand 49). The spur road is approximately 2 miles long and has a solid base layer that can hold up to repeated hiking traffic. Currently the road is a well-traveled game trail.

### **Environmental Consequences – Timber Production LUD**

#### **Direct, Indirect and Cumulative Effects**

##### Alternative 1

Under the no action alternative, the existing conditions and current management practices for recreation resources in the Timber Production LUD would not change.

##### Alternative 2

In Alternative 2, there would be little change to the existing conditions for recreation resources within the Timber Production LUD. The proposed wildlife and fisheries projects in this LUD are expected to improve wildlife and fisheries habitat and indirectly enhance the recreation opportunities for wildlife viewing, fishing, and hunting. The proposed old-growth activities are expected to have little or no effect to recreation resources in this LUD. No recreation enhancement projects are proposed in this LUD.

## Transportation

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### Introduction

National Forest Transportation System roads are constructed to provide access to National Forest System (NFS) lands and are intended to be maintained for the long term. Roads were built originally for logging and the associated administration; however, recreation and subsistence use also occurs. Road construction in support of logging activities began in the 1960s. Management of National Forest System roads are designated an operational maintenance level (OPML) and an objective maintenance level (OBML). The purpose of maintenance levels is to define the level of service provided by, and maintenance required for, a specific road or segment. Roads are often built and operated at a higher maintenance level during the timber sale or other activities than they are afterwards.

Transportation in this watershed is managed by the 2009 Hoonah ATM (USDA 2009c). The ATM sets the guidelines for activities on all district roads. Roads in the project area include 8510, 8519, 85191, 851912, 851913, 8517, and 85171 for a total 6.62 miles. The haul route is 24 miles, from the project area to the sort yard on Forest Roads 8502 and 8508. Roads closed to vehicle traffic include the last 0.44 of a mile of 8517, all of 85171, all of 85191, and all of 851911. Forest Road 85192 and 85193 has been converted to off-highway vehicle (OHV) trails.

All open roads are considered available for public use; whether it is for high clearance vehicles or foot travel.

### Affected Environment

The Hoonah ATM defines which roads are open and closed. It also designates the use of these roads by different motor vehicles and OHVs. The vast majority of system roads within the watershed are stable and in good shape. Non-system roads are generally closed to motor vehicles but may be used by hikers and hunters.

Road Condition Surveys (RCS) have been performed on the road system in the watershed. There are approximately 20.9 miles of road (system and non-system), all of which are on National Forest System lands. Fifteen and a half miles are currently open to motor vehicle use under the Hoonah ATM. According to the RCS data, there are 92 stream crossings along these roads, of which 33 have verified fish presence (Class I or II) (Table 8). The majority of the structures are metal culverts with some log stringer bridges. The total road density average for the watershed is 1.55 mi/mi<sup>2</sup>.

**Table 8. Road Condition Survey Results for the Kennel Creek Watershed**

Total Stream Crossings	92
Total Fish Stream Crossings	33
Red Culverts	5
Gray Culverts	1

The effects of roads on water resources vary by the type of road as well as its location in the landscape. RCS surveys and subsequent field visits have found moderate OHV use occurring. No resource degradation was identified with this use.

**Table 9. Segment lengths and maintenance levels of roads in the project area**

Road #	Name	Beginning mile post	Ending mile post	Segment length	Maintenance level
8510	Freshwater Bay	0.00	0.50	0.50	3
8510	Freshwater Bay	0.50	10.75	10.25	2
8519	Kennel Creek	0.00	2.40	2.40	2
85191	Kennel Creek	0.00	1.53	1.53	1
851911	Kennel Creek	0.00	0.69	0.69	1
851912	Kennel Creek	0.00	1.70	1.70	Trail
851913	Kennel Creek	0.00	0.88	0.88	Trail
8517	Kennel view	0.00	0.88	0.88	2
8517	Kennel View	0.88	1.32	0.44	1
85171	Pavlof Ridge	0.00	1.39	1.39	2
85171	Pavlof Ridge	1.39	1.50	0.11	1
8515	Pavlof Lake	0.00	3.56	3.56	2

Maintenance Levels:

Level 1 – Closed more than 1 year. Basic custodial maintenance is performed to keep damage to adjacent resources to an acceptable level and to perpetuate the road to facilitate future management activities.

Level 2 – High-clearance vehicles. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses.

Level 3 – Passenger vehicles; surface not smooth. Roads in this ML are typically low speed, single lane with turnouts and spot surfacing. Some roads may be fully surfaced with either native or processed material.

The nearest marine access facility is the Fresh Water Bay marine access facility (MAF), located on the Kennel Creek Spit. Logs could also be hauled approximately 25 miles to the sort yard and MAF at Long Island across from Hoonah. Either MAF could be used to facilitate the transport of logs by barge to processing sites.

No new roads are proposed for construction. Existing roads will be used with some reopened, as needed. The majority of system roads within the watershed are stable and in good shape. The majority of the structures are metal culverts and some manufactured bridges. When the project is completed the roads will be reestablished according to the ATM.

## **Environmental Consequences**

### **Direct and Indirect Effects**

#### Alternative 1

Under the no action alternative, road maintenance and reconditioning would continue based on the OPML assigned to each road. Public access to the project area would remain the same.

#### Alternative 2

The roads in the project area are open to private vehicles and get moderate to light use. During project activities the risk of encounters with other vehicles/equipment may increase and roads may be temporarily blocked to move equipment or for the public's safety.

Reconstruction of currently closed NFS roads needed for accessing proposed timber units would consist of removing blow down trees, brushing, re-grading of the existing roadbed, and clearing road ditch lines and drainage channels. Reconstruction would also involve reinstalling culverts at drainage and stream crossings. Stream crossing structures would be removed after logging operations are complete and drain ditches would be added to move water off of the roadbed. No new roads are proposed.

### **Cumulative Effects**

During project activities roads may be temporarily blocked to move equipment or due to safety considerations. These temporary conditions would not have long-term cumulative impacts.

## **Timber Resources**

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### **Introduction**

Timber management uses a variety of silvicultural systems, or planned series of treatments, for tending, harvesting, and re-establishing timber stands. Silvicultural system prescriptions have been developed to produce more valuable commercial timber at a faster rate, maintain wildlife habitat, and either maintain or enhance scenery values. The Forest Plan and Forest Service Handbook (FSH 2400) provides detailed information about silviculture systems available for use on the Tongass National Forest.

### **Affected Environment**

The project area contains a mosaic of young and old forests, muskegs, forested muskegs, and some alpine areas. Forest vegetation structure, composition, and distribution are largely determined by site productivity and soil drainage, as well as natural and human-caused disturbance. The dominant tree species in the watershed is western hemlock. The roadsides and riparian areas have a strong component of red alder, which is targeted for riparian thinning, to release the conifers. All of these forest types are common on Chichagof Island.

Ninety-three percent of the project area is within the Timber Production LUD.

### **Past timber harvest and thinning**

Over 1,422 acres of clearcut timber harvest occurred within the watershed under Forest Service management between 1964 and 1993. This represents approximately 17 percent of

the project area. Timber harvest is not evenly distributed throughout the watershed, with older harvest areas occurring primarily in valley bottoms and lowlands.

**Table 10. Harvest history within the Kennel Creek Watershed**

<b>Year</b>	<b>1964</b>	<b>1977</b>	<b>1981</b>	<b>1983</b>	<b>1987</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>
Acres of Harvest	577	118	352	42	82	123	57	72
Percent of Total Harvest	41	8	25	3	6	9	4	5
Cumulative Harvest Total (acres)	577	695	1,047	1,089	1,171	1,293	1,350	1,422

At present 1,203 acres, 85 percent, of young-growth stands within the watershed have been pre-commercially thinned to improve the growth and yield of timber, to change the species mix to favor more profitable species, or to improve wildlife or fish habitats. The remaining 219 acres of managed stands are currently too young to thin but may be treated at a later time.

Stand 49, harvested in 1964, is the largest managed stand in the project area (577 acres). It was precommercially thinned in 1983. Six hundred and twenty-two acres were thinned using 14' x 14' spacing. 18' by 18' spacing was used to thin 300 feet on either side of the Kennel Creek Trail. A second thinning (249 acres at 18' by 18' spacing), which included some riparian areas, occurred within the west side of the unit in 2002. Treatments included girdling and creating thickets and gaps.

Between 2003 and the present, approximately 552 acres have been thinned along NFS roads 8519, 85191, 85192 and 85193 using 16' x 16' spacing. Heavy slash in some of these areas pose a problem for deer movement and understory development.

### **Forest Health and Natural Disturbance**

Mistletoe and windthrow disturbance are low in the project area.

## **Environmental Consequences**

### **Direct and Indirect Effects**

#### Alternative 1

Under the no action alternative, no new activities would be implemented to accomplish IRMP goals and objectives. Stand growth and productivity would not be improved as recommended in the objectives for the Timber Production LUD. There would be no contribution of timber products to the local industry and this action would not provide employment in the forest industry. Tree growth and mortality would continue to progress naturally.

Under the no action alternative, the managed stands proposed for thinning would take longer to move to old-growth conditions. The heavy slash would continue to impact wildlife habitat values and structural diversity in the previously thinned areas and habitat fragmentation would continue. Management in the project area would revert back to individual stand needs, possibly without integrated resource collaboration and landscape level consideration.

## Alternative 2

In treated managed stands, the action alternative is expected to improve conditions for tree growth and yield and increase understory forage species through the use of several silvicultural prescriptions. These prescriptions are briefly described below; however, the complete prescriptions are located in the project record.

### **Old-growth Harvest**

The preferred harvest prescription of old-growth in this alternative is uneven-aged management using single-tree selection. This prescription is designed to maintain a portion of the original stand structure (up to 60 percent) and harvest trees with the highest economic value. The remaining old-growth trees would maintain stand structure and diversity. The growth of the younger trees is expected to improve due to reduced tree competition and some natural regeneration is expected to occur in the created openings. The harvest of old-growth trees helps move the Timber Production LUD toward the desired future conditions by providing timber for industry, improving the growth of leave trees, and leaving structural diversity for other resources as outlined in the Forest Plan.

### **Thinning in the Riparian Management Area (RMA)**

By removing alders around selected conifers, competition for light, space, and nutrients would be reduced. The treatment is expected to improve floodplain function by increasing bank stability through understory development, restore riparian area vegetation diversity, improve downstream water quality and increase the growth rate of young conifers for future large woody debris.

### **Upland thinning**

Creating gaps and thickets with thinning, and possibly girdling, is expected to move selected stands towards old-growth conditions and increase browse and wildlife habitat. These treatments would also move the area closer to meeting old-growth timber objectives by improving species composition and increasing growth rates.

### **Slash Treatment**

Creating 5 foot wide swaths through 100 acres of slash is expected to increase wildlife movement. In addition, increased sunlight reaching the forest floor is expected to improve herbaceous and shrub growth.

### **Cumulative Effects**

In summary, the proposed project would have minor cumulative effects on timber resources, merely changing the rate managed timber stands move towards old-growth conditions.

Past activities have contributed to the development of existing roaded infrastructure which would be used to implement the action alternative. The previously harvested acres in the project area, approximately 1,422, were harvested between 1964 and 1993 and have been certified as regenerated, containing species compositions similar to old-growth forests on similar sites. In addition, these previously harvested stands are no longer considered openings for the purpose of scheduling or locating additional created openings (USDA 2008b p. 4-72).

Approximately 1,203 acres of the managed stands have been thinned to reduce stocking and increase tree growth. Thinning the remaining managed stand acres, approximately 216, is planned in the next several years. The cumulative effect of thinning 350 additional acres

would be an increased ability to maintain stand growth and productivity, improve windfirmness, and promote understory vegetation growth.

Currently, there are four areas NEPA-cleared for harvest in the project area by the Dove Tail Timber Sale Categorical Exclusion (CE) signed in 2009 (USDA 2009b). This sale authorizes 30 acres individual tree and group selection, totaling approximately 250 thousand board feet of timber. The proposed harvest of an additional 250 acres would allow for more options in packaging a timber sale in the Kennel Creek Watershed.

## **Soils/Geology**

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### **Introduction**

Methods for inventorying existing conditions varied, contingent upon personal knowledge of the watershed and reliability of data gathered from previous field work and subsequent GIS data queries.

### **Affected Environment**

The geology of this part of Chichagof Island is a mix of carbonate and noncalcareous sedimentary rocks with a scattering of volcanic and intrusive igneous rocks. Soils on mountain and hill slopes are formed of decomposed bedrock and colluvial material (deposited by gravity). Bedrock soils are generally shallow, while colluvial soils are deeper and better drained. Soils formed in glacial till occur in patches plastered along mountain and hill slopes to elevations of about 1,000 feet. In the valley bottoms, soils have formed in river deposits, colluvial material, and marine sediments. The cool, wet climate in the area causes organic matter to decompose slowly, creating soils characterized by thick organic surface layers. Where drainage is restricted by topography or an impermeable layer, such as bedrock or glacial till, peatlands composed entirely of organic matter are common. In coarse alluvium (gravels and cobbles) the soils are well-drained and support forests. Where the alluvium is finer and restricts drainage, nonforested vegetation communities such as fens and bogs form. Tree root depth is shallow, primarily in the nutrient-rich organic layers and the first few inches of the mineral layers. Typically the root zone is moist, acidic, and contains most of the nutrients available for plant growth (Heilman and Gass 1972).

### **Detrimental Soil Conditions**

Less than one percent of the soils in the watershed have been disturbed by past activities (Table 11).

**Table 11. Summary of Existing Soil Disturbance in the Kennel Creek Watershed**

<b>Cause of Disturbance</b>	<b>Acres of Detrimental Disturbance</b>	<b>Percent of the Watershed</b>
Timber Harvest	57	0.7
Temporary Roads <sup>1</sup>	10	0.1
Landslides	13	0.1
<b>Total Detrimental Disturbance</b>	<b>80</b>	<b>0.9</b>

Source: GIS coverage of existing roads, managed stands and landslides used as project area acreage.

<sup>1</sup>This includes about 0.4 miles of existing unauthorized road accessing rock pits. All other temporary road was decommissioned.

### **Soil Stability**

No in-depth landslide inventory was completed for this assessment. Current GIS data along with the 2009 Hoonah ATM indicates two of the seven landslides listed in the watershed are associated with closed roads 851911 and OHV trail 85192 in the Kennel Creek watershed totaling 2.2 acres. The ATM also indicated there was slumping of NFS road 85191 but this was not listed as a landslide. Aerial reconnaissance in 2009 prior to the field inventory observed that there were no recent landslides. The watershed appears to be stable.

#### **Highlights:**

- None of the young growth stands have more than 15 percent detrimental soil conditions (compacted areas, temp roads, displaced soils)
- The watershed appears to be rather stable, evidenced by few landslides
- Nearly all of the past harvest has occurred on uplands. See Table 12 for a summary of wetlands in the project area.

### **Environmental Consequences**

The following discusses the proposed activities and their risks and benefits to the soil resources.

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

##### Alternative 1

The proposed actions would not be implemented and existing conditions would remain the same. No direct or indirect effects are expected with implementation of Alternative 1.

##### Alternative 2

#### **Old-growth Timber Harvest**

Selection harvest is proposed on 250 acres. Shovel yarding would be used for the majority of the proposed harvest units; however, if feasible, helicopter yarding may occur within approximately 80 acres of the proposed 250 acres. No new roads are proposed.

Shovel yarding can cause detrimental soil puddling and compaction and lead to soil erosion. Soil quality monitoring on the Tongass has shown that helicopter yarding (falling disturbance) generally results in less than 1 percent soil disturbance (Landwehr and Nowacki

1999). If BMP 13.9 is followed shovel yarding results in less than 5 percent soil disturbance (Landwehr and Nowacki 1999). In recent years shovel yarding has been approved on slopes up to 35 percent gradient, which is steeper than the 25 percent gradient guideline in BMP 13.9 (FSH 2509.22). Initial monitoring of soil disturbance from mechanized gap creation on steeper slopes indicates that soil disturbance from mechanized gap creation increased with increasing slope (Landwehr and Silkworth 2011). All soil disturbance monitoring to date indicates that shovel yarding and helicopter yarding can result in soil conditions that meet Region 10 Soil Quality Standards if BMP 13.9 is applied.

Using the data from Landwehr and Nowacki (1999) the 250 acres of selection harvest of old-growth timber will create about 12.5 acres of soil disturbance if shovel yarded, and about 11.5 acres of disturbance if 80 of the 250 acres are helicopter yarded. All stands will meet soil quality standards following treatments.

Not all soil disturbances are detrimental to soil productivity. The Tongass National Forest is currently undertaking a four year retrospective study to better define soil conditions that are detrimental to tree growth. Many of the small soil disturbances documented in previous monitoring efforts do not appear to affect tree growth. Therefore, the estimates used in this report are likely to be overestimates of detrimental soil conditions.

#### **Harvest on steep slopes**

Minor areas of slopes over 72 percent gradients occur in and immediately adjacent to the proposed old-growth timber harvest stands. The slopes over 72 percent gradients would be avoided when selecting trees to harvest. Timber harvest is not proposed on slopes over 72 percent gradient in this project.

#### **Young-growth Treatments**

Proposed young-growth treatments include: riparian thinning, slash treatment, and upland thinning. Most of the young-growth treatments would be accomplished with chainsaws. Thinning by hand with chainsaws generally results in negligible soil disturbance.

The proposed slash treatment involves cutting 5 foot wide travel corridors through the slash in the lower portions of four stands totaling about 100 acres. The slash will be either scattered or piled. All work will be done by hand and will have negligible effects to the soil resource.

Ground-based machinery may be used for thinning on approximately 200 acres in the eastern portion of stand 49. This area has slopes less than 35 percent gradient and mostly well drained soils. Soil disturbance monitoring indicates that the resulting soil disturbance from mechanical thinning will be less than 4 percent of the treated area (Landwehr and Silkworth 2011). This level of soil disturbance is within soil quality standards.

In young-growth stands prior harvest activities have caused some detrimental soil conditions (Table 11). By definition detrimental soil conditions are long-term. Stand 49 was originally logged using a combination of caterpillar tractors and downhill cable logging. The Tongass is currently assessing detrimental soil conditions in many older young-growth stands. In tractor logged stands detrimental soil conditions average about 7 percent of the stand. In cable logged stands the detrimental soil conditions average 2 percent of the stand (D. Landwehr personal communication 2011). When this historic soil disturbance is combined with the anticipated soil disturbance from the proposed activity about 11 percent of the stand would

have soil disturbance. The Region 10 Soil Quality Standard requires that 85 percent of a stand be maintained in a condition of acceptable productivity. It is likely that the proposed mechanical thinning would use the skid trails established with the original harvest. Therefore the cumulative effects to the soil resource would not necessarily be as high as estimated. BMP 13.9 applies to ground-based timber harvest and shall be followed for the proposed thinning with ground-based equipment.

### **Large wood placement**

While placing large wood in the stream does not change soil quality, the mechanism of delivery can. Alternative 2 proposes placing two to four whole trees with rootwads attached within the active stream channel to act as key pieces of wood or as anchors. Five to ten surplus logs from dismantled log stringer bridges would be placed onto the upstream side of each whole tree, creating a log jam. Trees and logs would be placed by an excavator or log shovel tracked machine. An old road crossing is located at the bottom of the treatment reach. The reach to be treated is less than 300 meters long. Activities would occur during low flow periods. No excavation or digging into the stream channel or stream bank would occur and soil disturbance is expected to be minimal at the site of placement. Soil disturbance in floodplains and active alluvial areas is a natural occurrence and soil disturbances in these areas tend to become vegetated very quickly due to the high productivity of the site and abundance of seed available from fast growing pioneer plants like salmonberry and alder found in these areas. Although salmonberry and alder are not the desired future condition for vegetation in these areas, the streambanks need to be stable before long-lived conifers can become established.

To minimize soil disturbance in these areas it is important to choose equipment paths and, where appropriate, have equipment operate on a slash mat. The activity should be done during period of low water and low rainfall.

### **Summary of Effects**

Based on the above analysis, the amount of soil disturbance would increase as a result of selection timber harvest in old-growth stands on 250 acres and in portions of a young-growth stand where thinning with ground-based equipment is proposed. The excavator placing large wood in Kennel Creek would also cause some soil disturbance. Following BMPs, and especially using slash under the equipment where possible, will minimize the potential for soil disturbance and compaction in these areas. Prior experience with large wood placement with excavators on the Harris River on Prince of Wales Island indicate that disturbed soil will achieve soil cover and revegetate quickly in these fluvial areas.

The analysis above indicates that all proposed activities will result in soil conditions that meet soil quality standards.

### **Cumulative Effects**

#### **Alternative 1**

Because there will be no direct or indirect effects there will be no cumulative effects.

## Alternative 2

Cumulative effects to the soil resource at the stand scale typically occur when a stand is entered for a second treatment. Cumulative effects would occur in young-growth stand 49 where mechanized thinning is proposed (eastern portion) and where large wood placement is proposed in Kennel Creek (southern lobe of stand 49). The amount of detrimental soil conditions within stand 49 are expected to increase as a result of the proposed activities. In all cases the effects will be within the soil quality standards especially if BMP 13.9 is followed for mechanized thinning. The placement of large wood to help stabilize stream banks will result in soil disturbance in the short-term but help achieve long-term soil stability and vegetation desired future conditions.

## **Wetlands**

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### **Introduction**

Methods for inventorying existing conditions varied, contingent upon personal knowledge of the watershed and reliability of data gathered from previous field work and subsequent GIS data queries.

### **Affected Environment**

The Kennel Creek watershed is about 8,616 acres with about 1,422 acres of existing harvest. Three stands (stand 218000171, 217003500, 218003500) cross the HUC 5 boundary that is the Kennel project area. The entire stand was included in this analysis, not just the portions inside the watershed boundary. The roads connecting these stands to the road system through Kennel are also included even though they are outside of the watershed boundary as well. Nearly all of the past harvest has been on slopes less than 55 percent (Table 12). Very little harvest has occurred on slopes over 72 percent gradient.

### **Kennel Creek Watershed Wetlands**

The Kennel Creek Watershed is mostly uplands with about 30 percent wetlands. Wetlands in the project area include: forested wetland, forested wetland-muskeg complexes, estuaries, and open short sedge fens. The complexes of upland and wetland are: a complex of forested uplands and forested wetlands and subalpine wetland and upland forested complexes.

The units cleared in the Dove Tail Timber Sale CE (USDA 2009b) have about 2 acres of forested wetland within the four proposed harvest areas. These units have not yet been harvested.

Most of the harvest has occurred on uplands with very little on forested wetlands (Table 12).

**Table 12. Wetlands in the Kennel Creek project area and in young growth stands**

Chatham Area Soil Mapping	Project area (8,540 acres)		Young growth stands (1,422 acres)		Dove Tail Timber Sale area (30 acres)
	<i>Acres</i>	<i>Percent</i>	<i>Acres</i>	<i>Percent</i>	<i>Acres</i>
Wetland	1,196	14%	43	3%	2
Mix upland and wetland	1,964	23%	28	2%	0
Upland	5,380	63%	1,351	95%	28

Most of the road has been built on uplands, with about 30 percent built on forested wetlands and scrub wetlands (Table 13). Roads were built on the gentle slopes on the valley bottom of Kennel Creek watershed, where wetlands are more likely to occur.

**Table 13. Miles of road type and impacts to wetland in Kennel Creek Watershed**

Road Type	Wetland (miles)	Mix upland and wetland (miles)	Upland (miles)
FS Roads	4.9	0.5	10.1
Decommissioned Temporary Road	0.4		1.7
OHV trail	1.2		1.5
Tambling Foot trail			0.3
<b>Total</b>	<b>7</b>	<b>0.5</b>	<b>13.6</b>

## Environmental Consequences

There are various risk levels with implementation of all activities. The following discusses the activities and their risks and benefits to the wetlands resources.

### Direct and Indirect Effects

#### Alternative 1

The proposed actions would not be implemented and existing conditions would remain the same. No direct or indirect effects are expected with implementation of alternative one.

#### Alternative 2

The effects to wetlands from hand treatment or timber harvest are temporary and short-term (see discussion below). The proposed activities would harvest timber from about 58 acres of wetland (Table 14) and perform hand work in some forest wetlands.

Selection harvest is proposed on 250 acres. Shovel yarding will be used for the majority of the proposed harvest units, however if feasible helicopter yarding may occur within approximately 80 acres of the proposed 250 acres. Of these, shovel harvest has the largest impact on wetlands. Methods to minimize the impact of shovel on wetlands similar to those used to minimize detrimental soil disturbance in BMP 13.9 (FSH 2509.22). Generally, a slash mattress is required to support the weight of the shovel as indicated in BMP 13.9.

Old-growth units 1, 3 and 4 all have forested wetlands. Unit 4 is dominantly wetland and there are large areas of non forested wetland in the proposed treatment unit.

Two stands (stands 3000 and 162 of compartment 21700) have wetlands or wetland mosaic in them. The southern end of stand 3000 has forested upland/forested wetland mix. The southern end of stand 162 is forested wetland. All work in these two stands would be done by hand and would have a negligible effect to the wetland resource.

Timber harvest is proposed in wetlands (Table 14). Harvest activities are expected to have a minor and short-term effect on wetland soil moisture. Removal of the timber would lead to a short-term increase in soil saturation until young growth establishes evapotranspiration rates similar to preharvest conditions—about 30 years (Jones 2000). All sites are expected to regenerate naturally. Effects on soil moisture would likely be less in areas where partial cutting is utilized. The proposed harvest would not pose a long-term negative impact to wetlands in the project area.

**Table 14. Wetlands in the Proposed Old-growth Treatment areas.**

Chatham Area Soil Mapping	Proposed old-growth harvest (250 acres)	
	<i>Acres</i>	<i>Percent</i>
Wetland	58	23%
Upland	192	77%

## Cumulative Effects

### Alternative 1

Because there will be no direct or indirect effects there will be no cumulative effects.

### Alternative 2

Since the effects to wetlands by timber harvest are temporary, there are not any cumulative effects outside the proposed treatments.

## Wildlife

### Introduction

This section discusses the effects to wildlife for the no action alternative and the proposed action (Alternative 2). The complete report on effects to all TES and MIS are located in the Kennel Creek project record.

The Kennel Creek IRMP Assessment (USDA 2010a), describes the existing conditions in the Kennel Creek drainage, reviews the need for changes to those existing conditions, and includes potential actions to implement those changes. Methods for inventorying existing conditions varied, contingent upon personal knowledge of the watershed and reliability of data gathered from previous field work and subsequent GIS data queries.

## **Affected Environment**

Conversion of old-growth winter range habitat to a young-growth condition, and the subsequent loss of available forage has been identified as a concern for the Kennel Creek IRMP project area. The Kennel Creek IRMP Assessment (USDA 2010a), and past surveys identified a lack of browse and heavy slash in young-growth stands within the Kennel Creek watershed. Roughly 697 acres of winter range (south facing; less than 800 feet elevation) is altered by management practices. The largest stand, 577 acres (Figure 2) had 250 acres treated in 2002 using gaps, thickets, girdling and thinning. This treated area is showing signs of habitat complexity associated with old-growth forests; however, the stand is still too young to provide winter refuge.

### **Threatened, Endangered, or Proposed**

No threatened, endangered or proposed species occur within the Kennel Creek project area.

### **Management Indicator Species**

The Forest Service uses Management Indicator Species (MIS) to assess the impacts of proposed actions to the wildlife resource. The 2008 Forest Plan identifies 13 wildlife MIS, 9 of which are found on Chichagof Island and in the project area: Sitka black-tailed deer, river otter, American marten, bald eagle, red-breasted sapsucker, hairy woodpecker, brown creeper and the Vancouver Canada goose.

Productive old growth habitat provides the highly important habitats and the prevalence of the moderately important habitats for most of the MIS. Only pertinent species are discussed below: Sitka black-tailed deer, bald eagle and brown bear.

#### **MIS: Sitka Black-tailed Deer Habitat**

High-volume old-growth forests provide the primary winter habitat for deer in southeast Alaska. Young-growth forests may provide some level of snow-shedding capability, but provide very little winter forage during the stem exclusion phase of stand development which may last for up to 150 years post-harvest (Alaback 1982). Young-growth provides very little winter forage, especially during the stem exclusion phase of stand development. The availability of digestible energy is potentially the greatest nutritional limiting factor for black-tailed deer in Alaska (Parker et al. 1999). Providing habitat for deer during winters with deep snow is important for deer survival (Doerr et al. 2005).

#### **MIS: Bald Eagle Habitat**

Eagles depend on old-growth trees typically around 97 feet tall and a breast height diameter of 47 inches for nesting (Anthony et al. 1982). The Tongass GIS database shows one historic bald eagle nest within the project area. It was located on the north side of the 1987 harvest unit (stand ID: 217001000). Site visits by district personnel in 2008, in relation to the Dove Tail Timber Sale (USDA 2009b), failed to locate this nest or any new nests within the project area. The historic nest is more than 330 feet from the proposed work area and no new eagle nests have been identified.

#### **MIS: Bear Habitat**

Riparian areas provide shelter and are important to bears, especially sows with cubs (Flynn et al. 2007). The majority of the riparian area of Kennel Creek is functioning properly and bears are seen in abundance throughout. Only the riparian portion located along stand 49 is

impacted, with the most heavily-impacted section located at the historic road crossing into this unit. The east side of stand 49 is entering the stem exclusion stage, with little to no understory present, while the west side (previously treated) is showing signs of improvement, multi-layered canopy and areas of good forage. Younger stands that have been thinned, contain heavy slash inhibiting movement and fragmenting the watershed.

### **Sensitive Species: Goshawk Habitat**

The Queen Charlotte goshawk is the only sensitive species that has been identified within the project area. However, goshawks have not been sighted in this watershed since the early 1990s. The Queen Charlotte goshawk is recognized as a distinct subspecies of the northern goshawk (*Accipiter gentilis*) that occurs only in coastal areas of British Columbia and in Southeast Alaska. For a complete description of goshawk habitat and life history requirements see the Forest Plan FEIS (USDA 2008c, p. 3-226).

Due to the current condition of the habitat within the project area, it is unlikely goshawks are present. The Tongass National Forest GIS and NRIS database shows no goshawk nests within or near the project area. Surveys conducted in 2008, in association with the Dove Tail Timber Sale (USDA 2009b), did not detect any goshawks or nests. Broadcast surveys in spring 2010 and 2011 failed to locate goshawks within the proposed activity area. Productive old-growth habitat is limited within the watershed and with lack of recent sightings it is possible goshawks are avoiding this area. Goshawks prefer old-growth forest with closed canopy, typically less than 800 feet in elevation and gentle slopes (USDA 1996). Over 600 acres of preferred habitat (south facing; less than 800 feet elevation) has been impacted by management practices. Restoration activities in 2002 on approximately 250 acres within the 1964 harvest unit has accelerated recovery of some of this preferred habitat, but 350 acres of young-growth remain untreated. An additional 725 acres of habitat has been harvested, causing a reduction in foraging habitat. Much of this habitat is too young to treat.

## **Environmental Consequences**

The following information summarizes the direct, indirect and cumulative effects of both alternatives to wildlife in the Kennel project area.

### **Direct and Indirect Effects – Bald Eagles**

#### Alternative 1

In the no action alternative, the proposed activities would not be implemented. Riparian conditions near the 1964 harvest unit would continue to lack dominant conifers used for nesting. Because there are currently no known eagle nests within the project area there would be no direct effects to bald eagles, there may be a slight indirect effect due to a lack of large old-growth conifers, but the small scale of degraded habitat makes indirect effects to bald eagles unlikely. The abundance of high quality coastal shoreline habitat, located 500 meters from the project area, makes it unlikely eagles would show preference towards this habitat for nesting, further reducing the likelihood of indirect effects.

#### Alternative 2

The proposed action could displace some eagles foraging for salmon during implementation of large wood placement and riparian thinning projects; however these activities will be small in scale and short in duration. Effects to bald eagles within the VCU would be

negligible. Performing these two projects during low flow periods and when salmon are not present would further reduce the likelihood of effects to bald eagles. Riparian thinning would slightly benefit eagles in the long-term by improving up to 19 acres of riparian habitat. Upland restoration activities and selection harvest would be short in duration, site specific and benefit eagles in the long-term with improvements to 250 acres of habitat. No negative direct or indirect effects to eagles are expected by implementing the proposed actions.

### **Cumulative Effects – Bald Eagles**

#### Alternative 1

Cumulative effects are unlikely because of the small scale of the degraded habitat, the lack of direct effects, the unlikelihood of indirect effects, the recovery of previously impacted habitat, and the absence of ongoing or future riparian harvest activities.

#### Alternative 2

Because there are no negative direct or indirect effects there will be no negative cumulative effects. There will be beneficial effects to bald eagles by moving the stands towards old growth conditions.

### **Direct and Indirect Effects – Sitka Black-tailed Deer**

#### Alternative 1

The proposed activities would not be implemented, and existing conditions would continue. By not implementing the proposed action, over 250 acres of densely stocked young growth stands may take up to 100 years to develop an understory (Alaback 1982). Over a hundred total acres of young stands will continue to impede movement, from heavy slash, allowing habitat fragmentation to continue. Because existing conditions will continue, there will be some direct and indirect effects to individual deer as they continue to avoid locations of poor browse and heavy slash, however due to the abundance of habitat surrounding these stands, direct and indirect effects to the population of deer as a whole are expected to be negligible.

#### Alternative 2

Some displacement of individual deer during project activities is possible during project activities but because of the wide valley and abundance of habitat surrounding project locations, especially summer habitat, effects to deer within this VCU will be negligible. Many deer utilize areas of high elevation in the summer and may leave the project area. Wildlife treatments will improve deer habitat in the short-term by decreasing the timeframe of browse development to 5-10 years, thereby increasing carrying capacity of the system. Treatments completed in 2002, on the west side of the 1964 harvest unit, are already showing signs of complexity, with multilayered canopy and development of browse in many of the gaps, and abundant signs of deer use. Treating the east side of this stand (250 acres) will allow understory development within 5-10 years as observed in the west side of the unit. In addition, a total of 100 acres of young growth containing heavy slash will be treated to create travel corridors which will increase habitat connectivity immediately and potentially browse within 5-10 years. The proposed selection harvest will not significantly alter habitat and will potentially allow for some increase in browse as well. Implementing Alternative 2 will have beneficial direct and indirect effects to deer.

## **Cumulative Effects – Sitka Black-tailed Deer**

### Alternative 1

Cumulative effects from implementing Alternative 1 are expected to be negligible because direct and indirect effects are negligible and ongoing sales associated with the Dove Tail Timber Sale (2009) will not significantly alter habitat, and no additional projects are anticipated in the near future.

### Alternative 2

Cumulative effects are expected to be positive due to the past wildlife habitat treatments. Negative cumulative effects are not expected because harvest from the Dove Tail Timber Sale (USDA 2009b) are selective and small in scope and scale, not significantly altering habitat and no additional activities are planned within this watershed. The increase in light from selection harvest may encourage growth of browse further benefitting deer.

## **Direct and Indirect Effects - Subsistence**

Consistent with section 810 of ANILCA, this project was evaluated to determine potential effects on subsistence opportunities and resources.

### Alternative 1

Because there would be no change in access to and competition for subsistence resources, the no action alternative would not result in a significant possibility of a restriction of subsistence use of wildlife, fish, or other resources. Therefore, there would not be any negative direct or indirect effects on the access to, and competition for subsistence resources. There will be no direct and indirect effects to subsistence resources, but there will be no beneficial direct or indirect effects either. See Sitka black-tail deer in the previous section.

### Alternative 2

Because there would be no change in access to and competition for subsistence resources, the proposed action would not result in a significant possibility of a restriction of subsistence use of wildlife, fish, or other resources. Therefore, there would not be any negative direct or indirect effects on the access to, and competition for subsistence resources. Alternative 2 has both positive direct and indirect effects to subsistence. The positive impact of the young growth treatments on deer winter condition should increase carrying capacity, and the distribution and abundance of deer.

## **Cumulative Effects - Subsistence**

### Alternative 1

Cumulative effects are expected to be negligible as ongoing activities associated with the Dove Tail Timber Sale (USDA 2009b) will not significantly alter habitat, and no additional projects are scheduled within the project area.

### Alternative 2

Since there are no negative direct and indirect effects, there would be no negative cumulative effects to subsistence activities. Due to the positive results of past restoration activities beneficial cumulative effects are expected with implementation of the proposed actions.

## **Direct and Indirect Effects - Brown Bear**

### Alternative 1

The proposed activities would not be implemented and existing conditions would continue. Development of habitat complexity seen in old-growth forests would take longer. It may take up to 100 years for shrubs and forbs to return (Alaback 1982). The densely stocked young growth stands will continue to provide poor herbaceous shrubs and forbs, and younger stands with heavy slash will continue to impede bear movement allowing habitat fragmentation to continue. Because existing conditions will continue, there will be some direct and indirect effects to individual bears as they continue to avoid locations of poor browse and heavy slash; however, due to the abundance of habitat surrounding these stands direct and indirect effects to the population of bear as a whole are expected to be negligible.

### Alternative 2

Some displacement of bears feeding on salmon during project activities is possible; however, due to instream timing restrictions along with the wide valley, effects to bears within this VCU will be negligible. Wildlife treatments will improve brown bear habitat within selected units by decreasing the timeframe of browse development, potentially decreasing time of development by as much as 60 years. Treatments in 2001 along the west side of harvest unit 49 are already showing signs of complexity, with multilayered canopy and development of browse in many of the gaps. Treating the east side of this stand (250 acres) will allow understory development within 5-10 years as observed in the west side of the unit. Slash treatments on 100 acres of young stands will increase habitat connectivity and improve migration throughout the watershed. If commercial salvaging of thinned trees is performed, machinery will use existing road (currently closed) to extract timber. Selection harvest will not significantly alter habitat and potentially allow for an increase in browse.

Human/bear interactions are possible anytime during implementation of the proposed action but potential is low. Typically, brown bears avoid interactions with people unless defending a kill, or if a sow has cubs in the area. The associated roads used with log haul on this project are open to private vehicles and get moderate to light use. These projects will result in beneficial direct and indirect effects to bears.

## **Cumulative Effects – Brown Bear**

### Alternative 1

Ongoing sales associated with the Dove Tail Timber Sale (USDA 2009b) will not significantly alter habitat. Cumulative effects from implementing Alternative 1 are expected to be negligible.

### Alternative 2

Cumulative effects are expected to be positive due to past habitat improvement projects and the potential for increase in browse associated with the Dove Tail Timber Sale (USDA 2009b).

## **Direct and Indirect Effects – Sensitive Species – Goshawks**

### Alternative 1

The proposed activities would not be implemented and existing conditions would continue. By choosing the no action alternative, managed stands could take 60 years or more to recover to preferred old-growth habitat and goshawk habitat will continue to be limited as well as fragmented in this watershed. It is likely goshawks are avoiding this area due to insufficient habitat conditions, as goshawks have not been sighted in this watershed, since the 1990s. Because there are no known goshawks within the watershed no direct effects to goshawks are expected, however nesting habitat as well as some foraging habitat will continue to be limited, so slight indirect effects to individual goshawks are possible as goshawks will continue to avoid this location until habitat is recovered.

### Alternative 2

The activities proposed for this project will improve goshawk habitat in the long term by enhancing over 350 acres of foraging habitat and accelerating stand recovery towards old-growth characteristics necessary for breeding. Wildlife treatments may accelerate recovery of foraging habitat by as much as 60 years. 2001 treatments in the west side of harvest unit 49 are already showing signs of complexity with multilayered canopy and development of browse in many of the gaps. Treating the east side of this stand (250 acres) will allow understory development within 5-10 years as observed in the west side of the unit. Because this project will not alter or reduce productive old-growth habitat, there will be no negative direct or indirect effects to goshawks. Because there are no known goshawks present within the project area, there will be no direct effects, however beneficial indirect effects are expected with implementation of the proposed actions.

## **Cumulative Effects – Sensitive Species – Goshawks**

### Alternative 1

Past restoration activities have improved portions of this watershed and have no doubt decreased the time frame for recovery. Ongoing sales associated with the Dove Tail Timber Sale (USDA 2009b) would not significantly alter habitat. Cumulative effects from implementing Alternative 1 are expected to be negligible.

### Alternative 2

Combined with past enhancement activities, beneficial cumulative effects are expected with implementation of the proposed action. Negative cumulative effects are not expected with this project because the proposed activities along with ongoing activities from the Dove Tail Timber Sale will occur in habitat that is low in value to goshawks. The Dove Tail Timber Sale is selective, small in scope and scale, and is not expected to significantly alter the existing habitat. Wildlife treatments listed above will improve upon existing conditions of past managed stands within this watershed, further minimizing negative cumulative effects from implementing the proposed action.

## References and Lists

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### List of Preparers

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The following is a list of contributors to the Kennel Creek Integrated Resource Project I Environmental Assessment. Other Forest Service employees contributed to the completion of this document through their greatly appreciated assistance in support functions.

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### Distribution List

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A copy of the Kennel Creek Integrated Resource Project I EA or letter with a link to the online copy was sent to the following parties. These parties either expressed interest in a similar project in the past, commented on the project, requested a copy of the EA during the scoping or at some other time during the NEPA process, or are part of the Tongass National Forest mandatory mailing list (Forest Service Handbook 1909.15, Sections 23.2 and 63.1).

#### Agencies

State of Alaska, Department of Environmental Conservation, Division of Water

State of Alaska, Department of Fish and Game (Division of Habitat; Fish and Game Advisory Committee;

State of Alaska, Department of Natural Resources (Commissioner's Office; Division of Coastal and Ocean Management; Division of Forestry; Division of Mining, Land and Water; Office of Project Management and Permitting)

State of Alaska, Department of Public Safety, Fish and Wildlife Protection Division

State of Alaska, Department of Transportation and Public Facilities

US Advisory Council on Historic Preservation

US Army Corps of Engineers, Juneau Regulatory Field Office

US Army Corps of Engineers, Pacific Ocean Division

US Army Corps of Engineers, Sitka Field Office

US Army Engineer District

US Coast Guard, Environmental Management

US Department of Commerce, NOAA, National Marine Fisheries Service, Habitat Conservation Division

US Department of Commerce, NOAA, Office of Policy and Strategic Planning

US Department of Commerce, NOAA, Protected Resources Management Division

US Department of Energy, Office of NEPA Policy and Compliance

US Department of Transportation, Federal Aviation Administration

US Department of Transportation, Federal Highway Administration

US Environmental Protection Agency

USDA Animal and Plant Health Inspection Service (APHIS), Policy and Program Development (PPD) and Environmental Analysis Development (EAD)

USDA Forest Service, Alaska Region

USDA Forest Service, Chugach National Forest

USDA Forest Service, National Director of Ecosystem Management Coordination

USDA Forest Service, Tongass National Forest (Admiralty National Monument; Juneau Ranger District; Petersburg Ranger District; Wrangell Ranger District;

USDA Forest Service, Tongass National Forest, Supervisor's Office

USDA National Resource Conservation Service

USDA Office of Civil Rights

USDI Bureau of Land Management, BLM Alaska State Office

USDI Fish and Wildlife Service

USDI National Park Service, Alaska Area Region

USDI Office of Environmental Policy and Compliance

### **Libraries**

Craig Public Library

Haines Public Library

Hollis Public Library

Hyder Public Library

Kake Public Library

Kasaan Community Library

Ketchikan Public Library

Kettleon Memorial Library

Pelican Public Library

Petersburg Public Library

Tenakee Springs Public Library

Thorne Bay Community Library

USDA National Agricultural Library

Wrangell Public Library

### **Organizations and Businesses**

Alaska Forest Products

Alaska Rainforest Campaign

C.A.R.E.

Cascadia Wildlands Project

Center for Biological Diversity

D & L Woodworks

Earth Justice

Greenpeace

Hoonah Indian Association

Huna Totem Corporation

Icy Straits Lumber and Milling Inc.

Little Wood Products

Resource Development Council of Alaska

Sealaska Corporation  
 Sierra Club, Alaska Chapter  
 Sitka Conservation Society  
 Southeast Alaska Conservation Council  
 (SEACC)  
 The Nature Conservancy  
 Tongass Conservation Society  
 Whitehorse Logging Company  
 Wilderness Society, Alaska Chapter

### **Public Officials and Offices**

Bert Stedman, Alaska State Senator  
 City of Angoon, Mayor  
 City of Gustavus, Mayor  
 City of Hoonah, Mayor  
 City of Pelican, Mayor  
 City of Tenakee Springs, Mayor

Don Young, United States Congressman  
 Elfin Cove Community Council  
 Ketchikan Gateway Borough  
 Lisa Murkowski, United States Senator  
 Mark Begich, United States Senator

### **Tribal Governments / Officials**

Central Council Tlingit-Haida Indian  
 Tribes of Alaska  
 Hoonah Indian Association

### **Individuals**

Barney Johnson  
 David Pluard  
 Gordon Chew  
 Steve Lewis  
 Vince Schafer

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## Unit Cards

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### Introduction

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Unit cards are used to explain site-specific proposed activities for each unit and any resource concerns and mitigation related to those concerns. Activities include timber harvest units and the building and use of proposed and existing roads for timber harvest. Both narratives and maps showing site-specific information are provided. Minor changes can be expected during implementation to better meet on-site resource management and protection objectives. Slight adjustments to unit boundaries are also likely during final layout for the purpose of improving logging system efficiency or for site conditions.

### Unit Card Header Information

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Each unit card has a header block with information used to generally describe the stand's size, location, and volume proposed for harvest. Each header block contains the following information:

- **Unit Number:** This is the number assigned to the unit block during the Logging Systems and Transportation Analysis development.
- **Alternatives:** This identifies the alternative(s) in which the unit is proposed.
- **Unit Acres:** This is an estimate of total acres within the unit using aerial photos and GIS information.
- **Timber Volume:** This is an estimated volume (sawtimber and utility) in thousand board feet to be harvested. This was derived from field estimates and the stand exam program. A cruise will be done during implementation to determine an accurate volume before the timber is sold.
- **Logging System, Silvicultural Prescription and Retention:** This provides information about harvest treatments, regeneration methods and the level of retention prescribed for each unit.
- **Transportation:** This identifies that portion of the existing or new transportation system needed for access.

### Harvest Treatments

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#### Silvicultural Systems

Silvicultural systems refer to a complete set of treatments used to manage forest stands and forest landscapes over long periods of time. This process includes the harvest or regeneration of the stand, intermediate cutting, and other treatments necessary for the development and replacement of the forest stand.

Silvicultural systems are applied through prescriptions, the written records of the examination, diagnosis, and treatment regimes prescribed for the stand. A diagnosis and draft silvicultural prescription has been prepared for all proposed harvest units. A final

prescription will be completed for units selected for harvest in the Decision Notice. The final silvicultural prescriptions will include detailed sale layout and marking instructions for each unit.

The Forest Plan (Chapter 4 Standards and Guidelines) and USDA Forest Service Manual 2400 (Timber Management) provide detailed information about the silvicultural systems recommended for the Tongass National Forest. The three systems recommended are: (1) even-aged, (2) two-aged, and (3) uneven-aged. The uneven-aged system is proposed for the Kennel Creek Integration Resource Project I. The post-harvest condition of the forest stand for all systems would be dependent upon the existing species composition, the retained canopy structure, and advanced regeneration. Species composition of the regenerated stand would be monitored to ensure that the mix of species is roughly the same as the composition on the existing site.

### **Uneven-aged Management, Single-tree Selection**

Uneven-aged management maintains or creates a stand with trees of three or more distinct age (size) classes, either intimately mixed or in small groups. The resulting stand may have small openings and or individual trees harvested throughout the stand. This remaining structure provides wildlife habitat and reduces visual impacts. The next entry into these stands would be in approximately 75 years, when approximately 33 percent of the stand's pre-harvest basal area would be removed in patches or in single trees.

## **Resource Concerns and Responses**

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In the Kennel Creek project area, most of the economic, wildlife, and watershed concerns are mitigated with the silvicultural system. Other resource concerns, such as soils, scenery, and aquatics, are mitigated by unit design and adherence to Forest Plan Standards and Guidelines (Forest Plan Standards and Guidelines) and Best Management Practices (BMPs).

### **Transportation**

The roads needed to directly access units, or for yarding by helicopter, are identified on the unit cards. No road construction is proposed.

### **Aquatics**

#### **Riparian Management Areas and Stream Buffers**

Forest Plan Standards and Guidelines and BMP 12.6 direct the design of Riparian Management Areas (RMAs) associated with each stream in the project area. The Standards and Guidelines prohibit programmed commercial timber harvest in RMAs associated with all Class I, Class II and most Class III streams, except for right-of-way clearing for road construction.

The Forest Plan recognizes four stream classes based on the following criteria:

**Class I:** Streams and lakes with anadromous or adfluvial fish or fish habitat; or high quality resident fish waters, or habitat above fish migration barriers known to be reasonable enhancement opportunities for anadromous fish.

**Class II:** Streams and lakes with resident fish or fish habitat and generally steep (6-25 percent or higher) gradient (can also include streams with a 0-6 percent gradient) where no anadromous fish occur, and otherwise not meeting Class I criteria.

**Class III:** Streams are perennial and intermittent streams that have no fish populations or fish habitat, but have sufficient flow or sediment and debris transport to directly influence downstream water quality or fish habitat capability. For streams less than 30 percent gradient, special care is needed to determine if resident fish are present.

**Class IV:** Other intermittent, ephemeral, and small perennial channels with insufficient flow or sediment transport capabilities to have immediate influence on downstream water quality or fish habitat capability. Class IV streams do not have the characteristics of Class I, II or III streams and have a bankfull width of at least 0.3 meter (1 foot).

RMA's vary in width from the edge of the stream channel according to process group and stream value class. Stream buffers are defined by the extent of the RMA, with additional protections provided for windfirmness and site specific conditions as needed (Table 15).

**Table 15. RMA Buffers for streams in or adjacent to proposed harvest units**

Process Group - Stream Class	RMA Stream Buffer
Alluvial Fan (AF) – Class I, II, III	The greater the distance of the active portion of alluvial fan or one site potential tree height from the active portion of the channel (140 feet)
Floodplain (FP) - Class I & II	The greater the distance of one site potential tree height (130 feet), the 100-year flood plain, riparian vegetation or soils, or the riparian associated wetland fens
High-gradient Contained (HC) – Class I & II	The greater distance of 100 feet or to the top of the V-notch (side-slope break)
High-gradient Contained (HC) – Class III	Within the v-notch to the break in the side-slope
Moderate-gradient Contained (MC) – Class I & II	The greatest distance of the area within 100 feet of the stream or to the top of the side-slope break
Moderate-gradient Contained (MC) – Class III	Area from the stream to the side-slope break
Moderate-gradient, Mixed –control (MM) – Class I & II	The greatest distance of one site potential tree height (120 feet), the 100-year flood plain, riparian vegetation or soils, or riparian soils, or riparian associated wetland fens
Large Contained (LC) – Class I & II	The greatest distance of the area within 100 feet of the stream or to the top of the side-slope break
Large Contained (LC) – Class III	Area from the stream to the side-slope break

Process Group - Stream Class	RMA Stream Buffer
Palustrine (PA) – Class I & II	The greater distance of 100 feet from the streambank, the 100-year flood plain, the extent of riparian vegetation, riparian soils, or riparian associated wetland fens
Lakes & Ponds – Class I & II	The greatest distance of 100 feet from the shoreline, the riparian vegetation, or associated wetland fens

Windthrow risk was evaluated for each unit considering prevailing wind direction, topography, evidence of windthrow within proposed units and along edges of previous harvest units, and the proximity to other wind-generated stands. All units are considered wind firm.

Unit card maps show the location and identification number of all known Class I, II and III streams within each unit. Class IV streams are not described in the unit card tables. All Class IV streams will be surveyed during unit layout and receive protection using the following techniques, depending on local site conditions:

- Directional felling along streams and full suspension of logs yarded across streams, immediate cleanout of logging debris. May include partial retention of standing trees along stream courses.
- Split yarding when practicable, partial log suspension when yarding across channels and stream cleanout once logging is completed.

Log yarding practices are based on slope stability, soil disturbance, process group, and stream class. Additional measures taken to protect RMAs from possible disturbance associated with tree felling and yarding are identified in the unit card tables where appropriate. The objective is to minimize soil erosion, mass movement, and formation of new channels.

**Process Groups and Channel Types**

The Tongass National Forest defines stream channel types according to the Channel Type User Guide (USDA Forest Service 1992), the foundation upon which aquatic habitat management prescriptions are developed. Channel types are defined within the context of fluvial process groups that describe the interrelationship between watershed runoff, landform relief, geology, and glacial or tidal influences on fluvial erosion and deposition processes. Individual channel type classifications are defined by physical attributes such as channel gradient, width, pattern, stream bank incision and containment (Table 16). See the Forest Plan, Figure D-1 (page D-4) for a visual representation of the typical distribution of channel process groups. The unit card maps and tables summarize the protections provided for particular units. Only stream classes I, II and III in proposed timber harvest units are depicted in the maps.

**Table 16. Channel Types in or adjacent to proposed harvest units**

<b>Process Group</b>	<b>Channel Type Code</b>	<b>Description</b>
Alluvial Fan	AF1	Moderate Gradient Alluvial Fan Channel
	AF2	High Gradient Alluvial Cone Channel
Floodplain	FP3	Narrow Low Gradient Floodplain Channel
	FP4	Low Gradient Floodplain Channel
	FP5	Wide Low Gradient Floodplain Channel
High-gradient Contained	HC1	Shallowly Incised Muskeg Channel
	HC2	Shallowly to Moderately Incised Footslope Channel
	HC3	Deeply Incised Upper Valley Channel
	HC5	Shallowly Incised Very High Gradient Channel
	HC6	Deeply Incised Mountain Slope Channel
Moderate-gradient Contained	MC1	Narrow Shallow Contained Channel
	MC2	Moderate Width and Incision Contained Channel
Moderate-gradient, Mixed - control	MM1	Narrow Mixed Control Channel
	MM2	Moderate Width Mixed Control Channel
Large Contained	LC1	Low Gradient Contained Channel
Palustrine	PA2	Moderate Width Placid Flow Channel
	PA5	Beaver Dam / Pond Channel

## Best Management Practices

The following best management practices (BMPs) will be applied in order to protect water quality in the project area as specified in the Forest Plan (pages C-1 to C-3). BMPs 12.6, 12.6a, 13.9, 13.14 and 13.16 will be implemented for all streams noted in the unit cards. Not all BMPs apply to every situation; protections are noted for site specific conditions in the unit cards where appropriate.

BMP 12.6 (Riparian Area Designation and Protection) – Identify riparian areas and their associated management activities.

BMP 12.6a (Buffer Design and Layout) – Design streamside buffers to meet objectives defined during the implementation of BMP 12.6.

BMP 13.2 (Timber Harvest Unit Design) – Incorporate site-specific soil and water resource considerations into integrated timber harvest unit design criteria.

BMP 13.5 (Identification and Avoidance of Unstable Areas) – Avoid triggering mass movements and resultant erosion and sedimentation by excluding unstable areas from timber harvest.

BMP 13.9 (Determining Guidelines for Yarding Operations) – Select appropriate yarding systems and guidelines for protecting soil and water resources.

BMP 13.14 (Completion of Erosion Control for Unit Acceptance and Sale Closure) – Assure that the required erosion control work is completed before unit acceptance.

BMP 13.16 (Stream Channel Protection – Implementation and Enforcement) – Provide the site-specific stream protection prescriptions consistent with objectives identified under BMPs 12.6 and 12.6a. Objectives may include the following:

- Maintain the natural flow regime.
- Provide for unobstructed passage of storm flows.
- Maintain integrity of the riparian buffer to filter sediment and other pollutants.
- Restore the natural course of any stream that has been diverted as soon as practicable.
- Maintain natural channel integrity to protect aquatic habitat and other beneficial uses.
- Prevent adverse changes to the natural stream temperature regime.

## Soils/Wetlands

### General mitigation guidelines for all units

Where shovel yarding is proposed, areas of poorly drained soils should be avoided when possible. The use of puncheon or a slash mattress to provide adequate bearing strength and prevent rutting on poorly drained organic soils is required. The puncheon mats should be scattered upon completion of yarding activities. Do not operate the shovel in muskeg or fen wetlands (BMPs 13.2 and 13.9). To prevent rutting, do not operate shovel on slopes greater than 25 percent. This guideline applies to areas where the shovel tracks are operated, not to adjacent steeper slopes. Utilize a boom, a short choker, or cable to remove logs from steeper slopes or directionally fall the trees instead.

## **Wildlife**

All units comply with required Forest Plan Wildlife Standards and Guidelines.

Any nests/animals dens discovered at any time will receive the necessary standard and guideline applications.

## **Old-growth Habitat**

Loss of old-growth habitat would result by harvesting proposed units. The use of 66 percent retention of the basal area with the retention of trees with differing sizes, and an emphasis on snags and dying trees, helps address this concern.

## **Sitka Black-tailed Deer**

Uneven-aged silvicultural treatments help maintain the habitat value to deer and other species and reduce habitat fragmentation, another important component of maintaining deer habitat.

## **Scenery**

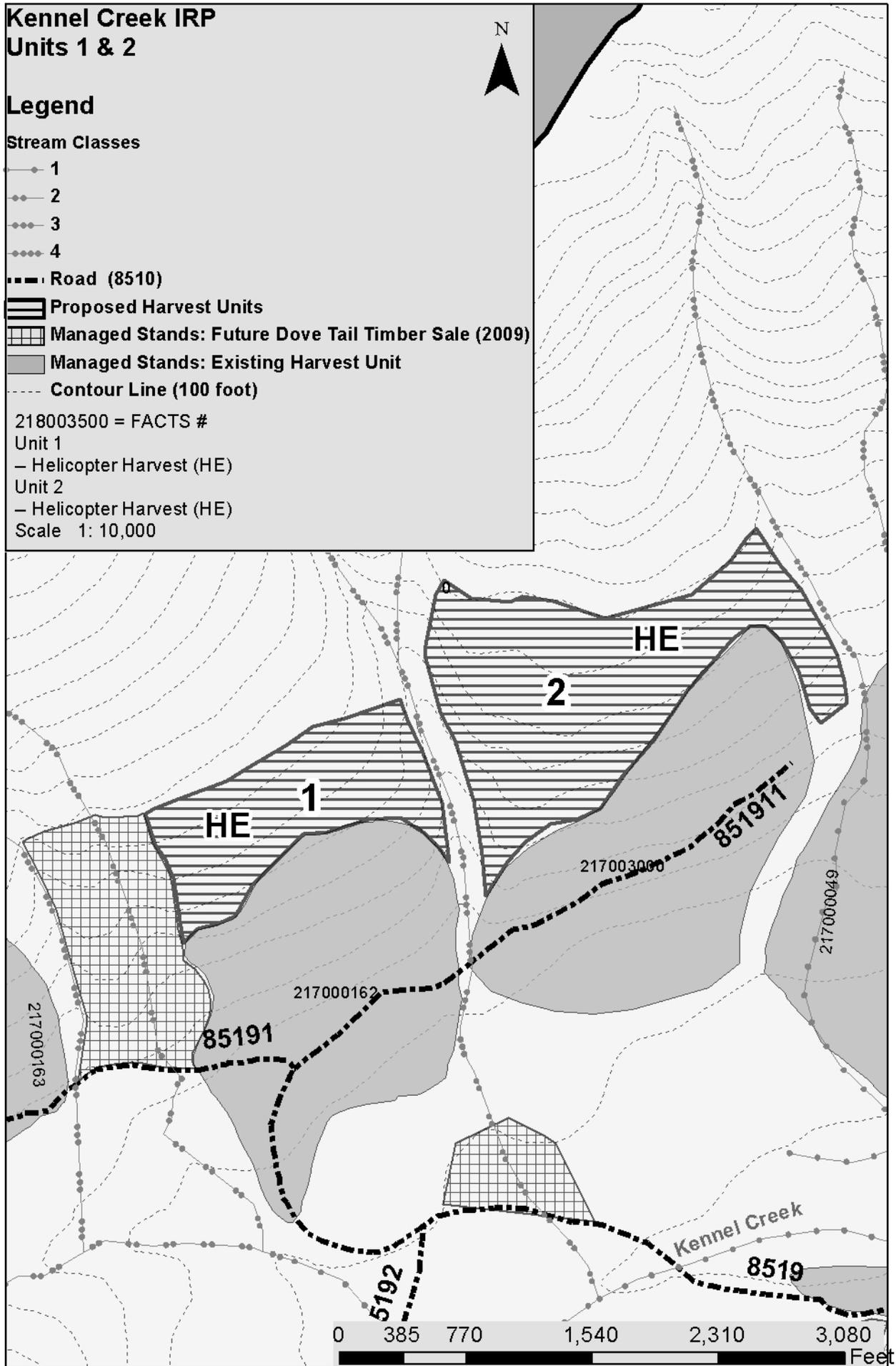
The scenic integrity objectives (SIOs) for the project area are very low for the Timber Production LUD.

## **Botany**

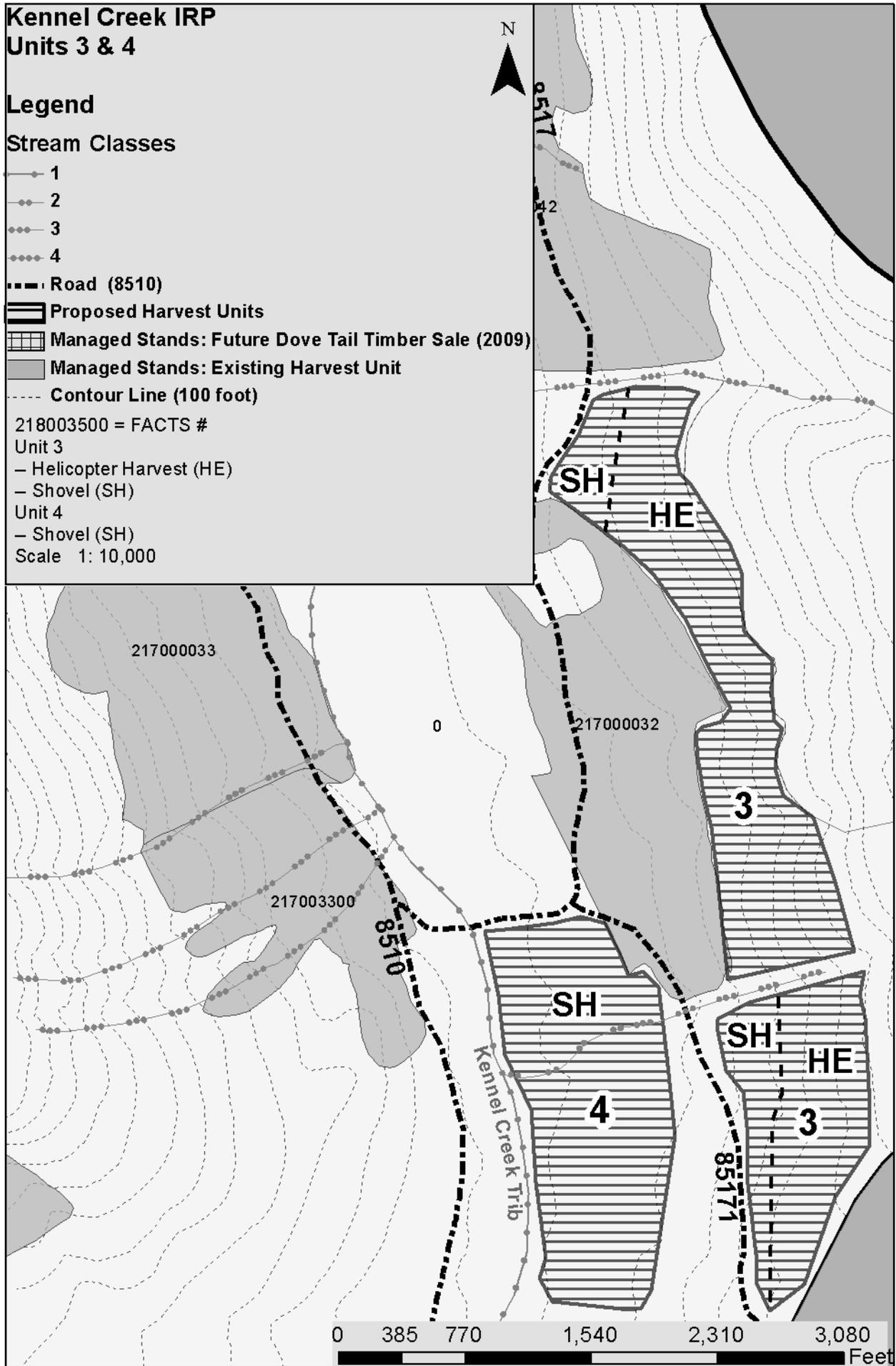
A biological evaluation was completed for sensitive species and one plant species, Alaska rein orchid (*Piperia unalascensis*), is suspected of occurring in the project area. Three rare plant species are known to occur within or near the project area (*Galium kamtschaticum*, *Listera convallarioides* and *Glyceria striata*). Habitat for all three species is open wetland or meadow settings, which will not be affected by project activities. Two of the species, *Galium kamtschaticum* and *Listera convallarioides*, are relatively common and widely dispersed on Chichagof Island. *Glyceria striata*, documented in two areas on Chichagof Island, is not currently known to be in the project area.

## Unit Cards

<b>Kennel Creek IRMP Unit Card</b>					<b>Resources</b>				
<b>Unit</b>	<b>Alt</b>	<b>Acres</b>	<b>Volume (MBF)</b>	<b>Logging System, Prescription, Retention</b>	<b>Transportation</b>	<b>Aquatics</b>	<b>Soils/Wetlands</b>	<b>Wildlife</b>	<b>Scenery (LUD)</b>
<b>1</b>	2	30	250	<ul style="list-style-type: none"> <li>▪ Helicopter</li> <li>▪ Uneven-aged</li> <li>▪ Partial cut – single tree selection</li> </ul>	Existing NFS roads 85191, 851911, 85192 and 8519	V-notch stream Process Group: HC6 Stream Class: III Buffer width: Top of v-notch. Wind firm	Full suspension will be obtained with helicopter yarding.	Travel corridors	Timber Production
<b>2</b>	2	30	250	<ul style="list-style-type: none"> <li>▪ Helicopter</li> <li>▪ Uneven-aged</li> <li>▪ Partial cut – single tree selection</li> </ul>	Existing NFS roads 85191, 851911, 85192 and 8519	V-notch stream Process Group: HC6 Stream Class: III Buffer width: Top of v-notch. Wind firm	Full suspension will be obtained with helicopter yarding.	Travel corridors	Timber Production



<b>Kennel Creek IRMP Unit Card</b>					<b>Resources</b>				
<b>Unit</b>	<b>Alt</b>	<b>Acres</b>	<b>Volume (MBF)</b>	<b>Logging System, Prescription, Retention</b>	<b>Transportation</b>	<b>Aquatics</b>	<b>Soils/Wetlands</b>	<b>Wildlife</b>	<b>Scenery (LUD)</b>
<b>3</b>	2	60	325	<ul style="list-style-type: none"> <li>▪ Helicopter and shovel</li> <li>▪ Uneven-aged</li> <li>▪ Partial cut – single tree selection</li> </ul>	Existing NFS roads 8517, 86171 and 8510	V-notch streams Process Group: HC6 Stream Class: III Buffer width: Top of v-notch. Wind firm	Full suspension will be obtained with helicopter yarding.  Partial suspension will be obtained with shovel yarding (BMPs 13.5 and 13.9).	Travel corridors	Timber Production
<b>4</b>	2	30	200	<ul style="list-style-type: none"> <li>▪ Shovel</li> <li>▪ Uneven-aged</li> <li>▪ Partial cut – single tree selection</li> </ul>	Existing NFS roads 8517, 85171 and 8510	Kennel Creek Tributary Process Group: FP3 Stream Class: I Buffer width: Min 130 feet Wind firm  V-notch stream Stream Class: II Buffer width: Min 100 feet Wind firm	Partial suspension will be obtained with shovel yarding (BMPs 13.5 and 13.9).	Travel corridors	Timber Production



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