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Environmental Assessment

Government Mineral Springs Recreation Residence Special Use Permits Issuance

Mt. Adams Ranger District, Gifford Pinchot National Forest
Skamania County, Washington

T.5 N, R.7 E, Section 31 and T. 5 N. R 6. E. Section 25, W.M.

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Summary

This environmental assessment documents the environmental effects of a proposal to continue recreation residence use through the authorization of new 20-year recreation residence special use permits (SUPs) in the Government Mineral Springs tract located on the Gifford Pinchot National Forest. In addition to permit reissuance, several projects are proposed to bring current management and practices into compliance with the Gifford Pinchot National Forest Plan and other applicable laws and regulations.

There are 44 existing Government Mineral Springs Recreation Residence SUPs that expire on December 31, 2008.

In addition to the proposed action (referred to as Alternative 1 in the EA), the Forest Service also evaluated the following alternatives:

- Alternative 2 –Recreation Residence 20-year SUPs would be issued for all lots, with the exception of lot 55. The permit holder of the cabin on lot 55 would be offered lot 48 as an in-lieu lot.
- Alternative 3 - No Action Alternative: Recreation Residence would not continue. Permit holders would be offered 10-year non-renewable SUPs.

CHAPTER I: INTRODUCTION

Document Structure

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into four parts:

- **Introduction:** This section includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- **Comparison of Alternatives, including the Proposed Action:** This section provides a more detailed description of the agency's proposed action and alternatives. These alternatives were developed based on significant issues. This discussion also includes possible mitigation measures.
- **Environmental Consequences:** This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource area. Within each section, the affected environment is described first, followed by the effects of the alternatives.
- **Agencies and Persons Consulted:** This section provides a list of preparers and agencies consulted during the development of the environmental assessment.
- **Appendices:** The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project file located at the Mt. Adams Ranger District Office in Trout Lake, Washington**.**

Background

In 1915, the first recreation residence special use authorizations (permits) were issued under the Term Permit Act of 1915. The National recreation residence program issues approximately 14,500 permits. The Pacific Northwest Region of the Forest Service manages 19% of the National program with approximately 2,815 permits.

The recreation residence program gives private citizens the opportunity to own a single-family cabin in designated areas on the National Forests. These privately owned cabins are commonly called "summer homes" or "recreation residences." They are located within formally established areas known as "tracts" and are authorized on individual "lots" designated for a recreational residence purpose. The lots are authorized and administered under the terms and conditions of a special-use authorization called a term, special use

permit, which has a renewable authorization period of 20 years. The permit holder owns the improvements (structure) but not the land. The permit requires the payment of an annual rental fee based upon fair market value of the land, not including improvements, as determined by an appraisal.

Forest Service Manual (FSM) 2347.1 states that "recreation residences are a valid use of National Forest System lands. They provide a unique recreation experience to a large number of owners of recreation residences, their families, and guests. To the maximum extent practicable, the recreation residence program shall be managed to preserve the opportunity it provides for individual and family-oriented recreation. It is Forest Service direction to continue recreation residence use and to work in partnership with holders of these permits to maximize the recreational benefits of recreation residences."

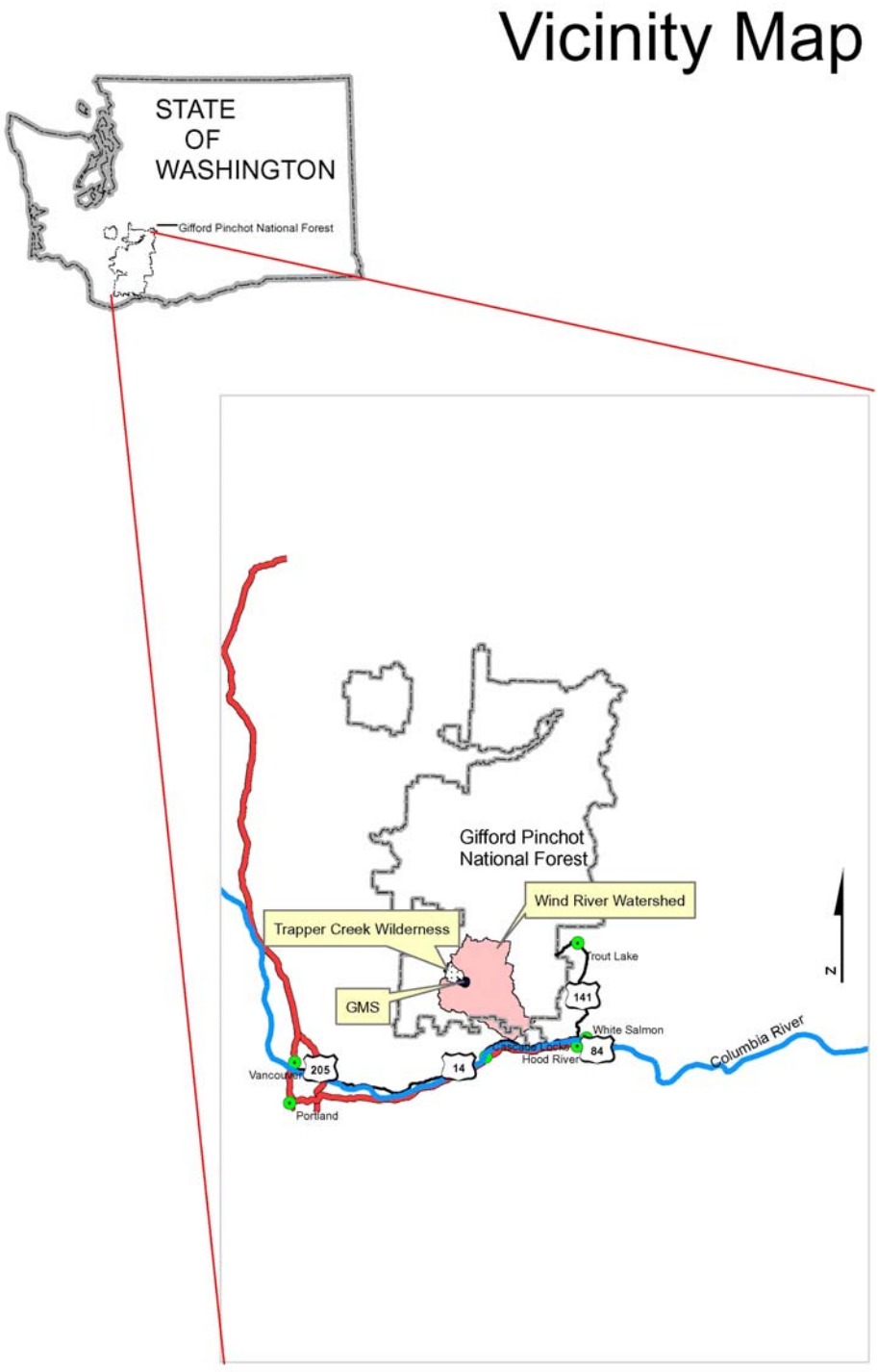

Figure 1. Vicinity Map of GMS on the Gifford Pinchot National Forest.

Government Mineral Springs Tract Overview

The Gifford Pinchot National Forest manages one recreation residence tract—Government Mineral Springs (GMS)—located on the Mt. Adams Ranger District. The tract is located along Trapper Creek, adjacent to the Trapper Creek Wilderness, within the Wind River Watershed, approximately 15 miles north of Carson, Washington in Skamania County. The legal description for the area is T.5 N, R.7 E, Section 31 and T. 5 N. R 6. E. Section 25.

The tract was established in 1919. The first twenty-six summer home lots were surveyed in 1919; the last new lot permits were issued in 1962. There are currently 44 lots authorized under current recreation residence special use permits that expire on December 31, 2008.

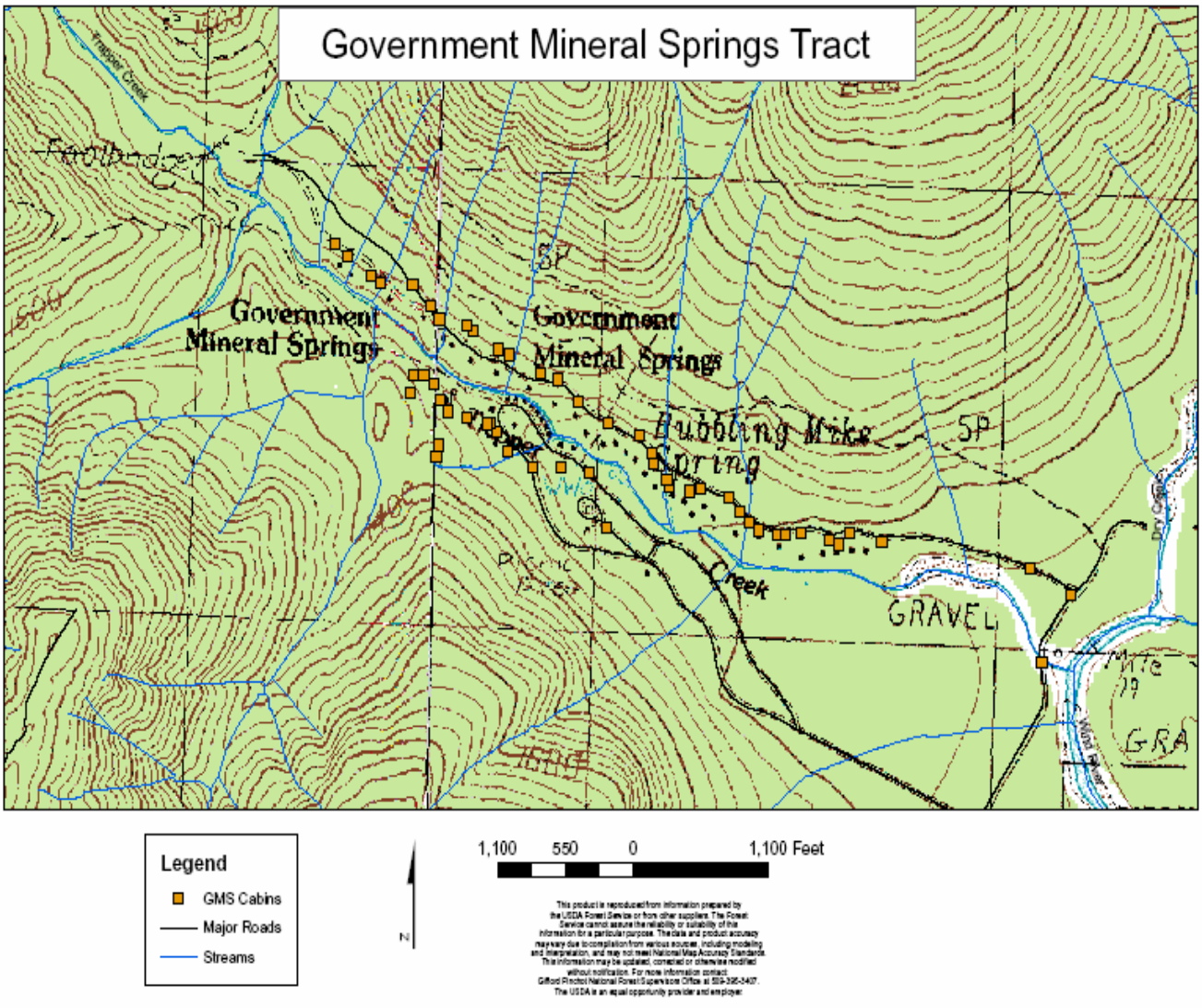

Figure 2. The Government Mineral Springs (GMS) Tract.

Management Direction

Forest Plan Direction

Management Direction is provided in the *Gifford Pinchot National Forest Land and Resource Management Plan (*Forest Plan), as amended by the *Record of Decision (ROD) for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl*. The GMS Tract lies within a "Developed Recreation 2L" Management Area, within a Late-Successional Reserve (LSR). In addition, all of the lots under permit lie within Riparian Reserves (RR). Amendment 11 of the Forest Plan, which describes these land allocations in detail is available on the Internet at www.fs.fed.us/gpnf.[1] Per the Forest Plan, Wind River is a Tier I Key watershed due to the presence of anadromous fish. Trapper Creek provides critical habitat for Lower Columbia River steelhead trout and Lower Columbia River Chinook salmon. Lower Columbia River steelhead were federally listed as Threatened under the federal Endangered Species Act in 1998, and Lower Columbia River chinook were federally listed as Threatened in 1999.

In brief summary, management objectives for these lands, as stated in the Forest Plan and ROD:

Developed Recreation (2L): To be managed for recreation. Camp and picnic grounds, recreation residences, viewpoints, and other facilities may be accommodated. Physical facilities are evident, but design and construction will repeat the color, shapes and lines of the surroundings.

Late-Successional Reserves: To protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth-related species, including the northern spotted owl.

Riparian Reserves: To protect the health of the aquatic system and its dependent species, and also provide incidental benefits to upland species.

Tier 1 Key Watersheds: To be managed for at-risk anadromous salmonids, bull trout, and resident fish.

Recreation Residence Consistency with the Forest Plan

Forest Service Manual (FSM) 2347.1 and 2721.23 and Forest Service Handbook (FSH) 2709.11, section 41.23, set direction for issuing new permits for recreation residences. Decisions to issue new recreation residence permits following expiration of the current permit require a determination of consistency with the current Forest Plan and a determination of continuance of recreation residence use through an environmental analysis. The Forest Service Handbook directs that recreation residence use be analyzed in an

[1] "Amendment 11" is a compilation of the applicable portions of the Northwest Forest Plan and Chapter IV of the 1990 Forest Plan, published to serve as a convenient reference document.

environmental document within five years of permit expiration (FSH 2709.11, Sec 41.23a (1) (a)) to determine if use is consistent with the Forest Plan and whether or not the permits can be reissued. The 1976 National Forest Management Act (NFMA) provides the basis for this direction, stating in section (i) that, "resource plans and permits, contracts, and other instruments for the use and occupancy of National Forest System lands shall be consistent with the land management plans" (Title 16, Chapter 36, Subchapter I § 1604).

A Consistency Review with the Forest Plan was completed for the GMS Tract in August 2007 and the Consistency Review Findings signed on August 21, 2007. These documents are located in Appendix A of this document.

In order to eliminate repetitive discussion and documentation, this environmental assessment tiers to the analysis in the Environmental Impact Statement for the Gifford Pinchot National Forest Land and Resource Management Plan (LRMP 1990), as amended by the Northwest Forest Plan (1994). The following documents prepared as a foundation for this analysis are incorporated by reference and are located in the project file:

- *Recreation Residence Consistency Review. (GPNF, August 2007).*
- *Heritage Resource Report. (Mack, 2007)*
- *Hydrologic Analysis. (Coffin, 2007)*
- *Biological Evaluation for Fisheries. (Caballero, 2008)*
- *Biological Evaluation for Wildlife. (Wainwright, 2007)*
- *Botanical Resource Report and Biological Evaluation. (Ruchty, 2008)*

Purpose and Need for Action

On December 31, 2008, all of the 20-year recreation residence special use permits within the Government Mineral Springs tract will expire. Where use is consistent, or can be made to be consistent with the Forest Plan and other policy, laws and direction, the permits will be renewed. In meeting the need for permit reissuance, the proposed action should achieve consistency with the Forest Plan and other laws and policy; and minimize impacts to existing resources such as threatened and endangered species or habitat, hydrology, soil, vegetation, cultural resources, etc. (FSH 2709.11, Sec. 41.23(a)(1)).

Consistency Review Findings

The proposed action is designed to address the Consistency Review findings. For the most part, the tract is consistent; however the findings indicate that the use of the tract for recreation residences *may not be consistent* with some applicable laws, policies and Forest Plan Standards and Guidelines. This review can be found on the Gifford Pinchot NF website at: http://www.fs.fed.us/gpnf/04projects/.

Use of the GMS Tract for Recreation Residence use may not be consistent with the following laws, policy and Forest Plan Standards and Guidelines identified in the Consistency Review. This list is followed by the associated current conditions that are inconsistent with the noted laws, policy and Forest Plan Standards and Guidelines.

- *Executive Order 11988 for Floodplain Management*

  The executive order instructs us to restore and preserve the natural and beneficial values of floodplains and floodprone areas. One of the key beneficial values of floodplains is that they allow the river to dissipate flow and stream energy during floods and high flow events, which is critical. Without the ability to dissipate flood flows within the GMS Tract, Trapper Creek will contain excessive volumes of flow within its banks, creating increased hydraulic forces on streambanks and streambed. The increased erosion of streambed and banks causes channel degradation and destabilization of streambanks, putting additional riparian values and infrastructure at risk.

  Following is an excerpt from the Executive Order pertinent to this analysis. (The full text can be found on the Gifford Pinchot NF website at http://www.fs.fed.us/gpnf/04projects/).

  Each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for (1) acquiring, managing. and disposing of Federal lands and facilities; (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities (EO 11988, Section 1).

- *Forest Service Manual (FSM) direction for threatened and endangered species critical habitat 2670.31*

  The FSM identifies and prescribes measures to prevent adverse modification or destruction of critical habitat and other habitats essential for the conservation of endangered, threatened, and proposed species. The Forest Service is required to protect individual organisms or populations from harm or harassment as appropriate.

- *Forest Plan Standards and Guidelines* for

  - *Floodplains*: Neither newly developed recreation sites or expansions to sites will be located on the riparian influence area of perennial and intermittent streams or floodplains. Developed or dispersed recreation sites should be located at least 100 feet from the edges of lakes, streams, ponds, wet meadows, marshes and springs. Existing sites will be made to comply with EOs 11988 and 11990 (Forest Plan, page II-52). (Executive Order 11988 pertains to floodplains and is discussed in detail throughout the document.)

  The capability of floodplains to contain floods should not be reduced (Forest Plan, page IV-74).

  - *Streamside Management*: All management activities will meet Forest Service

Region 6 Streamside Management Goals (FSM 2526.05) to protect or enhance water quality, fish, riparian vegetation, and other aquatic resources (Forest Plan page, II-58). (FSM in summary: Give preferential consideration to riparian-dependent resources when conflicts among land use activities occur.)

- *Riparian vegetation:* Whenever damage occurs due to recreational activities, streamsides and other riparian area should be promptly restored by revegetation and stabilization (Forest Plan, page II-52).

- *Fish passage:* Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams (Forest Plan, page II-23).

- *Natural Function of Large Woody Debris*: Logs and other debris that have become a natural part of a stream channel should not be removed. Large organic debris in lakes and streams will be allowed to function naturally (GP LMRP IV. 74).

Existing Conditions Found Inconsistent with Above Direction

A summary of the associated conditions within the GMS Tract that are inconsistent with applicable law, policy and Forest Plan Standards and Guidelines are described below. The conditions are described in more detail in the Aquatics Section in Chapter III of this document.

River Access to the Side Channel

(Consistency Review: Executive Order 11988 for Floodplain Management; Forest Plan Standards and Guidelines for floodplains; Forest Plan Standards and FSM for streamside management)

An existing berm near lot 55 prevents high flows from spilling into side channels and floodplains, obstructing access to the flood channel for floods larger than l-2-year return intervals. The effect of this obstruction is to increase stream power in Trapper Creek by up to 20-40% during 10-yr to 25-year floods. The increase allows for higher frequency of channel scour and substantially increased shear stress and erosion on the channel bed and streambanks.

Following the 1996 flood, the permit holders for cabin 55 submitted a proposal to build a "rock wall" to block high stream flows and to install a culvert in the overflow channel at the end of their "driveway." The Forest Service approved construction of the "rock wall" (although it is unclear whether the height of the wall is consistent with the original proposal). The Forest Service denied approval of the culvert installation, and instead recommended a ford at the site to be comprised of river cobble placed along the contour of the flood channel. Instead of following this guidance, the cabin owners imported crushed gravel to the site and constructed a parking area that occupies, fills and obscures the entire flood channel at this location. Holders of Cabin 53 also brought in unauthorized fill and installed two culverts at their driveway. Implementation of the flood "repair" work in this case went beyond what was authorized, and resulted in reduced river access and function of the floodway. Placement of fine crushed gravels

within the floodplain also exposes this non-native material to potential movement into the active channel of Trapper Creek.

Other structures (including cabins and associated improvements) within the tract may also be located within the floodplain; however, there are no other structures that currently obstruct the river's access to or impair the function of the floodplain.

Instream Habitat And River Function
(Consistency Review: FSM for critical habitat of endangered, threatened, and proposed species; Forest Plan Standards and FSM for streamside management)

The bank revetments previously installed in Trapper Creek to protect individual cabins are negatively affecting instream habitat and stream processes and causing secondary effects to adjacent stream reaches. The riprap and gabion walls on the banks near cabins 20 and 21 have constricted the channel, causing increased channel erosion and downcutting. As a result, channel incision has moved upstream and the river has begun undermining the upstream end of the gabion wall. The gabion baskets and rock are now partially filling the channel and reducing cross sectional area of the channel, degrading fish habitat and increasing velocities and erosion at this site and the downstream reach. Channel incision will continue to undermine the gabion wall and lead to additional gabion recruitment into the channel and subsequent bank failure.

Steamside Conditions
(Forest Plan Standards and Guidelines for Riparian Vegetation; Forest Plan Standards and FSM for streamside management)

Channel banks at cabins 2 and 25 are eroding, and without vegetative cover, will continue to erode during high flows. The channel bank at cabin 2 was severely eroded during the November 2006 flood, threatening the cabin; the cabin was subsequently moved away from the streambank. At cabin 25, the footings of an existing deck are within the bankfull channel and the channel banks are eroding around the deck piers.

Fish Passage on Tributaries Within The Tract
(Consistency Review: Forest Plan Standards and Guidelines and RCW for Fish Passage; Forest Plan Standards and FSM for streamside management)

A culvert (NC-3) on 5401 Road is undersized and does not allow for upstream fish passage.

Two existing small water diversion dams obstruct upstream passage for juvenile fish and other organisms. A small dam on an unnamed tributary to Trapper Creek was originally built in the early 1900s to provide water to the Government Mineral Springs Hotel and resort. It was taken over by the GMS Association in the 1940s, and in 1957 the Association installed a new dam on this tributary and made other improvements to the water drinking system. This dam is identified as a "diversion" on the Association's 1944 Certificate of Water Right.

A dam on Maidenhair Creek, upstream from the tract, was built in 1925 by the Forest

Service, in order to provide water to Government Mineral Springs Campground. It has long been abandoned for this use.

Natural Function of Large Woody Debris in Trapper Creek
(Consistency Review: Forest Plan Standards and Guidelines for retention of in-stream logs and other debris LWD; FSM for critical habitat of endangered, threatened, and proposed species)

Large woody debris is important for creation of pools, causing deposition of sediment, providing roughness in the channel, and habitat complexity. Over time, woody debris has been removed from Trapper Creek or relocated away from cabins to protect individual cabins from localized scour caused by the debris. GMS reach of Trapper Creek has <16% of the woody debris levels in upstream reaches of Trapper Creek. Loss of woody debris has degraded fish habitat by reducing pools, hydraulic variability and accumulation of spawning gravels; and has reduced stability of channels and overbanks. Continued depletion of large woody debris from the channels and overbank areas will over time contribute to increased channel instability, erosion and migration. Removal of woody debris from vicinity of cabins may have preferentially reduced channel stability there more than other parts of the system, making these areas more vulnerable to erosion.

The cabins are surrounded by old growth forest, and large trees and debris will continue to enter the channel from local banks and upstream. To be consistent with the Forest Plan, laws, regulations and policies, all current and future large woody debris should remain in place. There are no proposed activities to remove large woody debris in this analysis. Any future proposals to move or remove large woody debris will be analyzed in a separate NEPA analysis and considered to be consistent with the Forest Plan when benefits to river processes and fish habitat can be improved.

Proposed Action

The Gifford Pinchot National Forest proposes to authorize continued recreation residence use on 44 lots currently under permit within the GMS Tract for a 20-year period beginning January 1, 2009. In addition, actions to address uses/resource conditions inconsistent with the Forest Plan and other laws and direction would be implemented, including the reduction of the berm height at cabin 55 to allow streamflow access to the floodplain, and removal of portions of the existing gabions and riprap to restore fish habitat. A full description of the proposed action is detailed in Chapter II as Alternative 1.

Significant Issue with the Proposed Action

- **Reducing the berm and opening the side channel may undermine adjacent structures**

The following issue was identified through internal scoping. It provides the basis for an alternative to the proposed action.

Cabin 55 is located within the floodplain of Trapper Creek, situated between the creek and a side channel. The large berm and gabion wall previously constructed at the entrance to the side channel to protect the cabin, prevents streamflows from entering that channel during high flow events. Reducing the berm, as proposed**,** would allow high flows to access the side channel, and when this happens, the land on which the cabin is situated could become an "island," isolating the cabin and effectively reducing or eliminating access.

As this side channel is re-activated, and becomes a more dynamic part of the stream system, it would experience flooding, erosion, deposition of sediments, and accumulation of woody debris, as natural channels do. As these processes occur, they may influence flowpaths in the side channel and in that way could make the cabin more vulnerable to damage during high flow events. In the event of a large flood, the cabin could be undermined and severely damaged, resulting in the loss of holder improvements, potentially creating safety concerns (although limited), and degrading water quality from unwanted and potentially toxic (i.e. leaded paint) building and household materials that become entrained in the stream. This issue is addressed through the formulation of an alternative to the proposed action and can be tracked through the document as Alternative 2.

Decision Framework

Given the purpose and need, the deciding official will review the proposed action and the other alternatives in order to make the following decisions:

- Whether the on-going recreation residence use within the GMS Tract is consistent, or can be made to be consistent with the Forest Plan and other applicable laws and direction;
- Whether to renew some or all of the existing 20-year recreation residence special use permits;
- Whether identified resource conflicts can be mitigated to retain the existing use;
- Whether in-lieu lot(s) can accommodate recreation use where resource conflicts cannot be mitigated on existing lot(s); and,
- Whether new supplemental forest permit clauses are necessary for holders to be consistent with all current Forest Service regulations and all Federal, state, and county laws, regulations, and ordinances applicable to the permit area (FSM 2709.11- 41.23).

Public Involvement

The proposed action was included in the quarterly Gifford Pinchot National Forest (GPNF) Schedule of Proposed Actions, starting April 1, 2005, posted on the on the GPNF website. The Consistency Review checklist, findings, and proposed action were also available on the GPNF website.

Nancy Ryke, Mt. Adams District Ranger, and Forest Service staff met with permit holders for cabin 53 and cabin 55 to share the proposed action prior to any disclosure to the public on August 13, 2007. Acting Forest Supervisor Lynn Burditt, Nancy Ryke, and Julie Knutson met with the permit holders for cabin 55 again on July 10, 2008 to discuss their issues and concerns with the preliminary analysis and pending decision.

In addition, the Forest held a scoping meeting for holders and co-owners of recreation residence cabins on August 20, 2007 to review the preliminary consistency review findings and the proposed action. Twenty-nine individuals attended, representing 16 cabins.

A scoping letter dated August 31, 2007 was mailed to all recreation residence permit holders and to other interested persons and agencies. Copies of the scoping letter and all responses are located in the project file.

On October 26, 2006, representatives from the National Marine Fisheries Service and the US Fish & Wildlife Service visited the area with Forest Service representatives to discuss the existing gabions and berm and their potential effects on increasing stream power in Trapper Creek during flood events and subsequent channel scour and erosion on the channel bed and streambanks and impacts to listed species; as well as the effect of hazard tree removal and noise disturbance on the spotted owl.

A letter, dated April 24, 2008, was sent to the Forest mailing list notifying them of the availability of the proposed action and preliminary environmental analysis and the start of the 30-day comment period. A copy of the preliminary environmental analysis was sent to all recreation residence permit holders with the same information about the 30-day comment period. The Forest received 11 comment letters or emails during the comment period. Responses to each of the comments is included as part of Appendix A of the EA.

CHAPTER II: ALTERNATIVES, INCLUDING THE PROPOSED ACTION

This chapter describes and compares the alternatives considered for the Government Mineral Springs Recreation Residence Permit Re-Issuance. It includes a description of the proposals and a map of the proposed projects. This section also presents the alternatives in comparative form, defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based upon the design of the alternative and some of the information is based upon the environmental, social and economic effects of implementing each alternative.

Alternatives

Alternative 1 – The Proposed Action

The proposed action is to continue recreation residence use through authorizing new 20-year recreation residence special use permits (SUPs) to current permit holders who are found to be in full compliance with the terms and conditions of their existing permits by December 31, 2008.[2] The permits would be issued with an expiration date of December 31, 2028.

In addition to authorizing new permits, the actions outlined below would be implemented by the Forest Service and by individual permit holders or Government Mineral Springs Cabin Association (Association) for purposes of mitigating resource impacts from previous land management within the GMS Tract. The actions outlined below would be implemented to address specific inconsistencies with Forest Plan direction and other laws and policy. The Forest Service will be responsible for implementing all actions, unless noted otherwise, pursuing Agency allocated funding, grants and other sources to pay for the projects. Timeframes for implementation of the restoration actions listed below are expected within 1-5 years of the decision for Agency-responsible actions.

Future proposals by permit holders for new improvement or modifications to existing structures that occur in the floodplain would need to be in compliance with Executive Order 11988 for Floodplains and other applicable Forest Plan policies.

[2] Permit holders who are found not to be in compliance with the terms and conditions of their existing permits could lose all recreation residence privileges associated with the Term Recreation Residence special use permit on form FS-2700-5a. Permit holders may be offered a short term permit extension on form FS-2700-4 pursuant to FSM 2721.23(c)(2)(b) to address compliance deficiencies.

Restore River Access to the Side Channel at Cabins 55 and 53
(Consistency Review: Executive Order 11988 for Floodplain Management; Forest Plan Standards and Guidelines for floodplains; Forest Plan Standards and FSM for streamside management)

Forest Service Responsibility:

- Reduce height of the constructed berm at inlet to the side channel behind cabins 55 and 53.
    - Berm height would be reduced to the extent that bankfull and larger streamflow events access the side channel (approximately 3 feet in height—similar to other natural banks in the reach).
- Gabions immediately upstream and downstream of cabin to be left in place
- Remove all crushed gravel from parking areas at cabins 55 and 53 that are potentially exposed to erosion when the side channel is activated.
    - Fill material to be removed from the site or re-used on other approved sites
- Remove the culvert and associated fill in the driveway to cabin 53.
    - Flood channel widened to accommodate design flows
- Reconstruct side channel to specified dimensions for handling overflows.
    - Side channel to be designed to efficiently convey flood flows
- Construct grade controls through side channel reach to prevent excessive downcutting and capture of mainstem flows of Trapper Creek. Grade controls would consist of large river rock buried in the bed of the side channel to limit vertical erosion of the channel.
    - Construction would require approximately 4 trenches across the flood channel, spaced approximately 100 feet apart. Each trench would be approximately 3 feet deep. Trenches would be filled with large river rock and buried, and would serve to limit the extent of downcutting through the side channel.

Holder Responsibility:

- Remove all hazardous materials from floodprone areas in and near cabins 53 and 55 prior to implementation of the restoration actions.
- Adjust infrastructure to ensure it is not damaged during high water events. This may include removing and/or relocating water lines, propane tanks, septic systems, and other items out of the floodprone areas.
    - Inventory of infrastructure would be completed by cabin-owner and Forest Service.
    - Anything potentially mobile during floods would need to be removed or secured to stable features.
- Remove all improvements from lot 55 by the end of 10 years and restore lot to natural condition.

Improve Instream Habitat And River Function Near Cabins 20 and 21
(Consistency Review: FSM for critical habitat of endangered, threatened, and proposed species; Forest Plan Standards and FSM for streamside management)

Forest Service Responsibility:

- Remove failed wire basket gabions from the channel near cabin 20.
    - Remove baskets and dispose of them.

- Replace gabion baskets and riprap along channel margins at cabins 20 and 21 with more fish-friendly structure. This would entail re-positioning large rock to form barbs that would protrude from the streambank at the same location of existing riprap.
- Reshape slopes along the stream once the gabions are removed at cabins 20 and 21
    - Lower the angle on adjacent slopes to allow for revegetation of the upper banks.
    - Banks to be laid back to stable angle, approximately 2:1 slope
    - Reshaping the slopes along the stream would cause loss of approximately 20-30 feet of distance between cabins and stream that is currently occupied by gabions, riprap and fill material
- Re-open high flow channel on the far side of the creek to reduce volume and energy of flows currently directed at riprap wall.
    - Reposition debris that has accumulated in the high flow channel on the right bank.

Restore Fish Passage on Tributaries Within The Tract
(Consistency Review: Forest Plan Standards and Guidelines and RCW for Fish Passage; Forest Plan Standards and FSM for streamside management)

Forest Service Responsibility:

- Replace fish passage barrier culvert on 5401 Rd (NC-3).
    - Replace with a larger culvert that provides for the bankfull width of the stream or greater width.

- As part of a future action, the Forest Service intends to propose the removal of the small dam on Maidenhair Creek and provide fish passage on the unnamed tributary to Trapper Creek currently used for the GMS water system. Both the removal of the dams and the reissuance of the GMS water system will be addressed in a future NEPA analysis.

  In 1988, a decision was made to include the water transmission lines on individual Special Use Permits, covering the components of the system which were located on individual lots. There is no documentation in the Forest Service files as to why a SUP was not issued to the GMS Cabin Association (GMSCA) for the components of the water system not covered by the individual permits. A SUP is needed, and the GMSCA will be required to have a permit for the portions of the system not covered by individual permits, including the diversion dam. The GMS water system is not included in individual cabin permits and therefore not treated as a connected action. The effects of these actions will be addressed in the cumulative effects analysis in this document.

Restore Streamside Areas
(Consistency Review: Forest Plan Standards and Guidelines for riparian vegetation; Forest Plan Standards and FSM for streamside management)

Forest Service Responsibility:

- Plant and maintain vegetation along the disturbed stream edge of cabins 2 and 25.[3] (This

[3] During the Consistency Review it was determined that the deck at cabin 25 is located over and within the bankfull channel which has prevented vegetative growth and stabilization of the bank and contributing to

may include some re-contouring in conjunction with the vegetation to stabilize the slope at cabin 2.)

Restore Floodplain

(Consistency Review: Executive Order 11988 for Floodplain Management; Forest Plan Standards and Guidelines for floodplains; Forest Plan Standards and FSM for streamside management)

Holder Responsibility:

- Future proposals by permit holders for new improvements or modifications to existing structures that occur in the floodplain would need to be in compliance with Executive Order 11988 for Floodplains and other applicable Forest Plan policies.

Future Actions Associated with Holder Requests

- The Forest has received various requests from cabin permit holders in the past for associated activities such as removing hazard trees threatening their cabin or other structures; installing septic systems; and/or constructing improvements within their permitted lot. All of these actions are expected to occur in the future and will be analyzed in future analysis as requests are received. Any future septic systems would be permitted by Skamania County and would involve water quality monitoring. Consistent with Executive Order 11988 for Floodplain Management and Forest Plan Standards and Guidelines for floodplains, no new structures or improvements would be authorized in the floodplain. As part of this analysis, these projects have been included as reasonably foreseeable future actions and are addressed in the cumulative effects sections in Chapter III.

streambank erosion. The permit holder for cabin 25 has submitted a plan to reduce the deck size and redirect cabin access away from the stream, and is responsible for construction of the new deck.

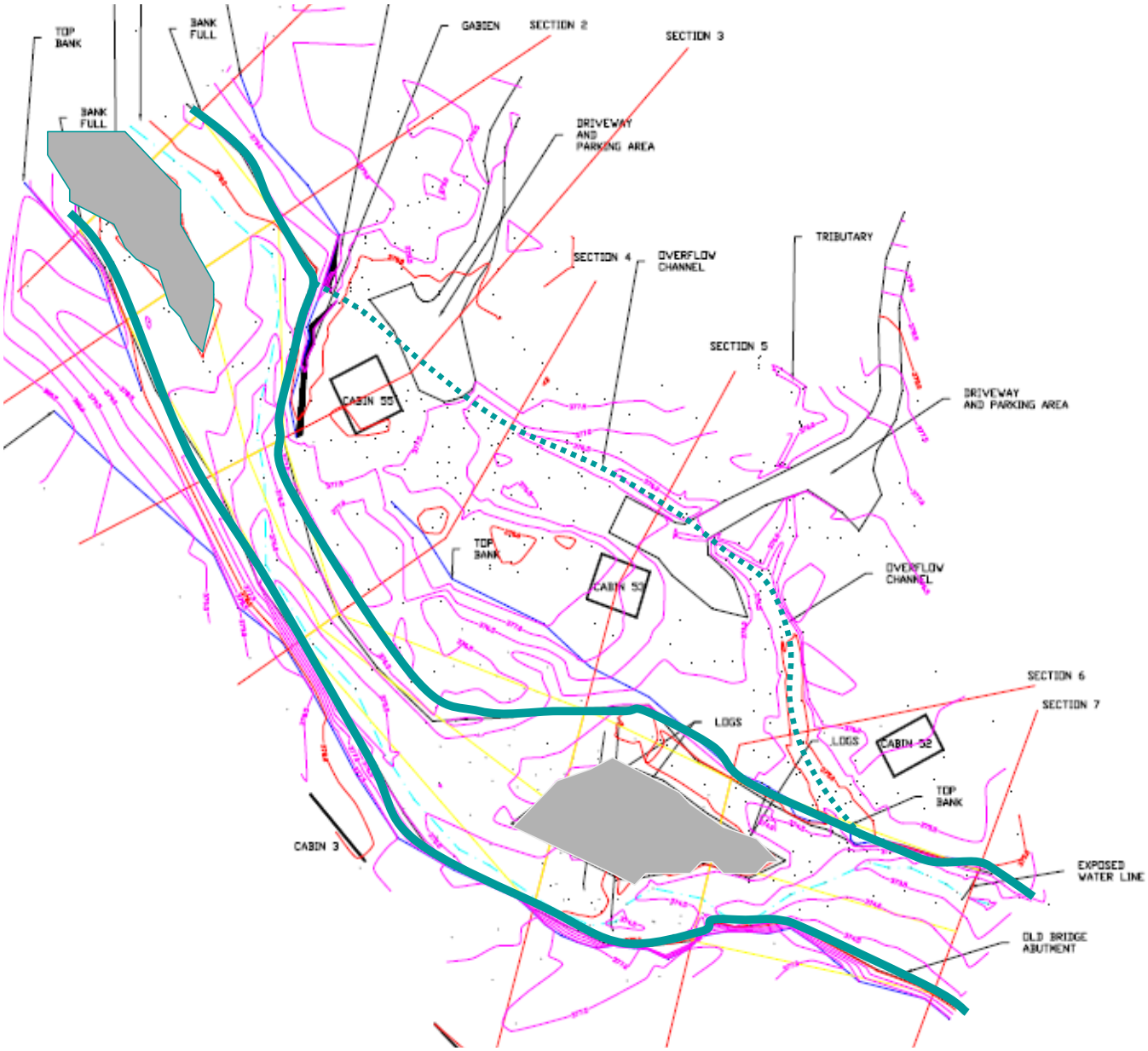

Figure 3. Plan view of area around Cabin 55. Current channel outline is a solid line. Side channel that would be re-opened is a dotted line. Cabins 55, 53, 52, are shown, and the streamside of cabin 3 is shown on the right bank. Downstream is to the right.

Alternative 2 – In-Lieu Lot for Cabin 55

This alternative was developed to address the significant issue identified during scoping (see Chapter 1). It was concluded that reducing the berm as part of the proposed action and opening the side channel may undermine adjacent structures, specifically the cabin located on lot 55. This alternative to the proposed action would authorize new 20-year recreation residence special use permits to current permit holders in full compliance with the terms and conditions of their existing permits with the exception of the permit holders of lot 55. As discussed previously, cabin 55 is located within the floodplain of Trapper Creek, situated between the creek and a side channel. Reducing the berm, as proposed**,** would allow high flows to access the side channel, and when this happens, the land on which the cabin is situated could become an "island," isolating the cabin and effectively reducing or eliminating access.

As this side channel is re-activated, the cabin and any existing improvements may become more vulnerable to damage during high flow events. In the event of a large flood, the cabin could be undermined and severely damaged, resulting in the loss of holder improvements, potentially creating safety concerns (although limited), and degrading water quality.

To avoid this potential consequence, the permit holder of lot 55 would not be issued a 20-year recreation residence permit. According to Forest Service Manual 2347.1(4) and 2721.23(a)(10), the Forest Service is mandated to give holders at least 10 years notice if a new permit will not be issued following expiration of the existing permit term. Therefore, the permit holder of lot 55 would be issued a 10-year, non-renewable permit for lot 55. In addition, the permit holder would be offered lot 48 as an in-lieu lot. The cabin and associated improvements on lot 55 would be removed prior to the expiration of the 10-year permit, in compliance with Forest Service Manual 2347.1 paragraph 6 and Forest Service Handbook 2709.11, section 41.23d. The holder would have the option to deconstruct and move the existing improvement from lot 55 to lot 48, or deconstruct the improvements on lot 55, remove them from the tract, and build a new cabin on lot 48. The permit holder would not have the option to move the existing intact cabin to lot 48. (Moving the cabin intact would have required downcutting the banks of the driveway and removing all vegetation within the width dimension of the cabin as well as cutting a minimum of 10 old-growth trees along the driveway and roadway.)

Lot 48 is located within the riparian reserves along Trapper Creek, but the "building" site is out of the floodprone width of the creek. There are currently no structures on this vacant lot. Lot 48 was abandoned in 1986 after a fire destroyed the existing cabin and the holders did not rebuild. An existing cabin site and access road are in place from the previous permit, albeit somewhat overgrown with ground vegetation. Constructing a cabin on this site would entail clearing the ground vegetation from the access road and building site, along with removal of 3-4 small trees (less than 10" in diameter) at the site to accommodate the cabin and associated improvements. Removal of additional trees to enhance the view of Trapper Creek would not be permitted. Hazard trees in the vicinity of the site are not evident at this time, allowing the immediate retention of large and/or old-growth trees.

Lot 55 would be restored to a natural condition by the permit holder: All non-native, man-made materials would be removed from the lot; any underground sanitation systems would be decommissioned (pumped/ flushed/filled with sand); the driveway scarified and any existing driveway culverts removed; and waterlines would be removed where they cross active or previously active channels.

In addition, all of the actions outlined in the proposed action to mitigate impacts from previous land management activities would be implemented as part of this alternative. It is expected that these actions would occur within 1-5 years as funding becomes available.

This includes:

- Reducing the height of the constructed berm at the inlet to the side channel behind cabins 55 and 53;
- Removing all crushed gravel from parking areas at cabins 55 and 53 that are potentially exposed to erosion when the side channel is activated, removing the culvert and associated fill in the driveway to cabin 53, and widening the flood channel to accommodate design flows;
- Reconstructing the side channel to specified dimensions for handling overflows;
- Constructing grade controls through side channel reach to prevent excessive downcutting and capture of mainstem flows of Trapper Creek;
- Removing all hazardous materials from floodprone areas in and near cabins 55 and 53 and adjusting infrastructure to ensure it is not damaged during high water events;
- Removing and disposing of failed wire basket gabions from the channel near cabin 20, and replacing gabion baskets and riprap along channel margins at cabins 20 and 21 with more fish-friendly structure;
- Lowering the angle on adjacent slopes to allow for revegetation of the upper banks of cabins 20 and 21;
- Re-opening high flow channel on the far side of the creek at cabins 20 and 21 to reduce volume and energy of flows currently directed at riprap wall;
- Replacing fish passage barrier culvert on 5401 Rd (NC-3);
- Planting and maintaining vegetation along the disturbed stream edge of cabins 2 and 25 which may require recontouring to stabilize the slope at cabin 2.

Alternative 3 – No Action

Existing recreation residence special use permits would be allowed to expire on December 31, 2008. Twenty-year, recreation residence permits would not be issued. According to Forest Service Manual 2347.1(4) and 2721.23(a)(10), the Forest Service is mandated to give holders at least 10 years notice if a new permit will not be issued following expiration of the existing permit term. Therefore, current holders would be issued a ten-year, non-renewable special use permit.

It is assumed that all recreation residence holders would use all 10 years of the non-renewable permit. According to the terms and conditions of the existing permit, holders would have a reasonable timeframe to remove their structures and/or improvements from

National Forest System lands and restore the site. Before removal of any structure or improvement, site-specific NEPA analysis would be completed.

The lots would be restored to a natural condition by the holders or Association, as applicable: All non-native, man-made materials would be removed from the lots; underground sanitation systems would be decommissioned (pumped/ flushed/filled with sand); the water system dam would be removed, driveways scarified and any existing driveway culverts removed; waterlines would be removed where they cross active or previously active channels.

In addition, all of the actions outlined in the proposed action to mitigate impacts from previous land management activities would be implemented as part of this alternative. It is expected that these actions would occur within 1-5 years as funding becomes available.

This includes:

- Reducing the height of the constructed berm at the inlet to the side channel behind cabins 55 and 53;
- Removing all crushed gravel from parking areas at cabins 55 and 53 that are potentially exposed to erosion when the side channel is activated, removing the culvert and associated fill in the driveway to cabin 53, and widening the flood channel to accommodate design flows;
- Reconstructing the side channel to specified dimensions for handling overflows;
- Constructing grade controls through side channel reach to prevent excessive downcutting and capture of mainstem flows of Trapper Creek;
- Removing all hazardous materials from floodprone areas in and near cabins 55 and 53 and adjusting infrastructure to ensure it is not damaged during high water events;
- Removing and disposing of failed wire basket gabions from the channel near cabin 20, and replacing gabion baskets and riprap along channel margins at cabins 20 and 21 with more fish-friendly structure;
- Lowering the angle on adjacent slopes to allow for revegetation of the upper banks of cabins 20 and 21;
- Re-opening high flow channel on the far side of the creek at cabins 20 and 21 to reduce volume and energy of flows currently directed at riprap wall;
- Replacing fish passage barrier culvert on 5401 Rd (NC-3);
- Planting and maintaining vegetation along the disturbed stream edge of cabins 2 and 25 which may require recontouring to stabilize the slope at cabin 2.

The need for additional restoration actions, including complete removal of the berm and the remaining gabions would be reevaluated when the permits expire or as conditions warrant.

Design Criteria/Mitigation Measures for all Alternatives

1. All projects implemented by the Forest Service and the GMSCA must comply with the April 28, 2007 Section 7, Endangered Species Act, Programmatic Biological Opinion for Fish Habitat Restoration Activities in Oregon and Washington, Calendar Years 2007-2012 (National Marine Fisheries Service, 2007). Project design criteria are described in

the Fisheries Biological Evaluation located in the Project File. Specifically, the following programmatic activity categories from the Biological Opinion would apply (the specifics of each of the categories and the associated measures are listed in the Fisheries Biological Evaluation in the project file):

- Category #1: Large Wood, Boulder, and Gravel Placement
- Category #2: Reconnection of Existing Side Channels and Alcoves
- Category #3: Head-cut Stabilization and Associated Fish Passage
- Category #4: Bank Restoration
- Category #5: Fish Passage Culvert
- Category #8: Floodplain Overburden Removal
- Category #16: Riparian Vegetation Plantings

2. Project actions must follow all requirements (including permits) of the Clean Water Act for maintenance of water quality standards as described by Washington Department of Ecology. Best Management Practices (BMPs) must be used when conducting any work that has the potential to affect water quality. BMPs are methods of work intended to protect water quality and minimize disturbance of aquatic systems. BMPs can be developed by the project proponent or taken from any number of established sources, but they must be tailored to the specific work proposed and the environment in which the work is occurring. Some basic BMPs that would likely be employed on work conducted in the vicinity of the GMS tract include:
    - Schedule work to occur during summer months at low water
    - Minimize disturbance of channel bed and banks when conducting work in or near streams
    - Minimize disturbance of vegetation near the stream edge
    - Do not place fill or debris within floodprone areas
    - Protect disturbed soils from erosion by application of weed-free straw mulch, native grass seed, and/or other approved erosion control measures

3. A Pollution and Erosion Control Plan (PECP) must be prepared for each project that includes methods and measures to minimize erosion and sedimentation. The PECP would be included in the construction contract or force account work plan. The PECP must be commensurate with the scale of the project and include a Spill Prevention Control and Containment Plan (SPCCP).

4. All disturbed areas must be treated for erosion control by application of native grass seed and weed-free straw mulch.

5. Each permit will contain a clause explaining the process for Inadvertent Discovery of heritage resources.

6. To prevent the introduction of noxious weeds into the GMS tract during restoration activities, all heavy equipment, or other off-road equipment used in the project will be cleaned to remove soil, seeds, vegetative matter, or other debris that could contain seeds. Cleaning will be done before entering National Forest lands, and when equipment moves

from or between project sites, or areas known to be infested into any other area, infested or otherwise. Cleaning of the equipment may include pressure washing.

Alternatives Considered but Eliminated from Detailed Study

Relocate Cabin 55 away from Trapper Creek on Lot 55
The permit holders of lot 55 had expressed their preferences to keep their cabin on lot 55, allowing them to move the intact cabin from its current location to an undetermined location on the same lot away from Trapper Creek. The majority of lot 55 is suitable habitat for the northern spotted owl, as well as habitat for many late-successional habitat dependent species. Many snags and dead-topped trees are present and would have to be removed to make space for the cabin. Additional hazard trees would also have to be removed.

A semi-open area in what is currently part of the driveway was also considered, but could be subject to flooding once the berm is reduced in size. Hence, neither option on lot 55 was considered viable.

Relocate Cabin 55 without Deconstructing
The permit holder on lot 55 was also interested in moving the *intact* cabin from its present location to an in-lieu lot (lot 48). The general width of the driveway to lot 55 and Forest Road 5401 is approximately 15 feet. The narrowest dimension of cabin 55 is 25 feet in width. Moving the cabin intact would have required downcutting the banks of the driveway and removing all vegetation within the width dimension of the cabin to provide for passage of the cabin, as well as cutting a minimum of 10 old-growth cedar, hemlock trees and grand fir along the driveway and roadway. Because of the habitat loss, it was not carried forward as an alternative.

Purchase Improvements for the Recreation Lodging Program
One public scoping comment proposed that the Forest Service not reissue any 20-year recreation residence permits and purchase all improvements with the intent of renting the cabins to the public as part of its public recreation lodging program. This alternative was not feasible at this time; and, therefore not carried further in detailed analysis. This approach would be contrary to the Forest Service policy to continue recreation residence use and would not meet the purpose and need of the Forest Service proposal (Forest Service Manual 2347).

The Forest Service typically utilizes the public recreation lodging program as a way to provide income to maintain desirable historic properties as well as provide the public with (fee-for-service) recreation opportunities. The program is often “subsidized” with allocated Forest Service funding.

The Gifford Pinchot National Forest has identified several future rental opportunities which include a small number of buildings across the Forest that offer unique experiences and have a broad appeal to the public. The GMS cabins have not been identified as fitting those needs and the Gifford Pinchot doesn’t have the current capacity to convert such a large tract of

cabins into public facilities, as the endeavor would be quite costly. When a property is converted to a public recreation lodging rental, it must meet specific safety codes, which for older buildings can be expensive to bring them up to current standards. Also, the Forest Service is responsible for cleaning the lodgings after use and maintaining the structures over time. Fees from the public for use of these properties usually only cover a small portion of the cleaning and maintenance needs.

Perhaps most notably, it is unlikely that if the recreation residence permits were not renewed due to resource issues, the Forest Service would convert them to rented cabins as part of the recreation lodging program. The Forest has identified resource concerns based on streamside cabin locations as part of the Consistency Review. These concerns would not be addressed or alleviated by simply converting these cabins into recreation rentals.

Reissue all Permits Without Implementing Restoration Actions
Another alternative that was not analyzed in detail would have been to reissue all of the permits without implementing any of the identified restoration activities. This status quo alternative would not have addressed the acknowledged need to bring the area into compliance with laws, regulations and policies nor address resource concerns. This was not considered a viable alternative because it would not meet the purpose and need of the project of bringing the GMS Tract into compliance and minimizing impacts to existing resources.

Comparison of Alternatives

Table 1 provides a summary of the alternatives and associated activities.

Table 1. Comparison of Alternatives

Action	Alternative 1 (Proposed Action)	Alternative 2 (In Lieu Lot for Cabin 55)	Alternative 3 (No Action)
Permit Reissuance	Issue 44 new 20-year recreation residence SUPs within the GMS Tract that would expire on 12/31/2028	Issue 43 new 20-year recreation residence SUPs within the GMS Tract that would expire on 12/31/2028 Issue a 10-year non-renewable permit to the holders of cabin 55 that would expire on 12/31/2018 Offer an in-lieu lot for permit holders of lot 55 and issue a 20-year recreation residence permit	Issue 44 10-year, non-renewable recreation residence permits within the GMS Tract that would expire on 12/31/2018
Removal of Structures/	All cabins and authorized	Permit holder would deconstruct structure and all	Permit holders would deconstruct and remove

Improvements	improvements would remain in place	improvements on lot 55 and restore lots to natural condition at the expiration of the non-renewable permit Current permit holder of lot 55 would have the option to reconstruct a cabin on lot 48 outside of floodplain area or floodprone width	all holder/ Association structures and improvements on all lots and restore lots to natural condition at the expiration of their non-renewable permit The need for additional restoration (such as the removal of septic systems, or revegetating sites) would be evaluated when the permits expire or as conditions warrant
River Access to the Side Channel	Reduce berm at inlet to the side channel behind cabins 53 and 55 Reconstruct side channel for handling overflows These activities would occur as funding is secured (within the next 1-5 years)	Reduce berm at inlet to the side channel behind cabins 53 and 55 Reconstruct side channel for handling overflows These activities would occur as funding is secured (within the next 1-5 years)	Reduce berm at inlet to the side channel behind cabins 53 and 55 Reconstruct side channel for handling overflows These activities would occur as funding is secured (within the next 1-5 years) Remainder of berm and gabions at cabin 55 would be removed when the permits expire.
Instream Habitat and River Function	Remove gabions and riprap at cabins 20 and 21 Reshape slope to allow for revegetation Re-open high flow channel on the far side of Trapper Creek near cabins 20 and 21	Remove gabions and riprap at cabins 20 and 21 Reshape slope to allow for revegetation Re-open high flow channel on the far side of Trapper Creek near cabins 20 and 21	Remove gabions and riprap at cabins 20 and 21 Reshape slope to allow for revegetation Re-open high flow channel on the far side of Trapper Creek near cabins 20 and 21

Streamside Conditions	Plant and maintain vegetation along stream edges of cabins 2 and 25	Plant and maintain vegetation along stream edges of cabins 2 and 25	Plant and maintain vegetation along stream edges of cabins 2 and 25
Fish Passage	Replace undersized culvert	Replace undersized culvert	Replace undersized culvert

CHAPTER III: ENVIRONMENTAL CONDITIONS AND CONSEQENCES

This section summarizes the physical, biological, social and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of alternatives presented in the chart above. Identified are the direct, indirect and cumulative effects of the alternatives. Past, present and reasonably foreseeable future activities that were considered in the cumulative effects analysis include (and are listed in the table below): tract-related proposals (removal of a small dam on Maidenhair Creek, provide fish passage on the unnamed tributary to Trapper Creek currently used for the GMS water system, new septic installations on individual lots, hazard tree removal, and potential new water system or treatment); on-going recreation in the area (recreation lodging at GMS guard station and GMS campground, dispersed recreation use, use of Trapper Creek Wilderness Trailhead and use of Camp Howe); improvements at Trapper Creek Trailhead (installation of a vault toilet); previous small timber sales; the proposed WinThin Timber Sale. Resources include Heritage, Aquatics (hydrology and fisheries), Wildlife, Botany, Fuels and Fire, and Social analyses.

Table 2. Past, Present, and Reasonably Foreseeable Future Activities Considered in the Cumulative Effects Analysis

Project Name	Project Description and Scale	Resource Areas Potentially Affected
GMS tract-related proposals	• Removal of a small dam on Maidenhair Creek • Provide fish passage on the unnamed tributary to Trapper Creek currently used for the GMS water system • New septic installations on individual lots • Hazard tree removal • Potential new water system or treatment	Heritage Resources; Hydrology/Fisheries; Soils; Wildlife; Botany
Actions taken by holders over the years	• The past removal of large woody debris in Trapper Creek • Vegetation alteration or removal around stream edges and near cabins	Hydrology/Fisheries; Botany; Social/ Recreational Impacts; Soils; Wildlife
On-going recreation in the area	• Recreation lodging at GMS guard station and GMS campground • Dispersed recreation use • Use of Trapper Creek	Hydrology/Fisheries; Social/ Recreational Impacts; Soils; Wildlife; Fire/Fuels

	Wilderness Trailhead and use of Camp Howe	
Improvements at Trapper Creek Trailhead	• Installation of a vault toilet	Hydrology/Soils; Fisheries; Social/Recreational Impacts; Soils
Past timber harvest	• Various small timber harvest projects	Hydrology/Fisheries; Soils (as part of existing condition); Wildlife; Botany; Fire/Fuels
WinThin Timber Sale	• Approx. 700-1,000 acres of thinning in the Wind River Watershed	Fisheries; Wildlife

Heritage

A comprehensive Heritage Resource Report is located in the project file and summarized below.

Existing Environment

The series of mineral springs situated along Trapper Creek, variously referred to in early historic documents as the Trapper Creek Soda Springs or the Government Mineral Springs, have long attracted people to the area. The springs were reportedly "discovered" in the late 1800s, and by the turn-of-the-century local residents of the Wind River valley were regularly visiting the springs and camping there in the summer. People were lured by the purported medicinal properties of the spring water.

In the spring of 1910 the Columbia National Forest (now the Gifford Pinchot National Forest) granted a special use permit to S. D. Fox of Portland, Oregon, permitting the construction of a 50-room hotel within the boundaries of the National Forest, at the Trapper Creek Soda Springs. The Government Mineral Springs Hotel opened in 1912. It was two stories high, and had a bath house and a stable. Fox owned a company in Portland called the Star Brewing Company, and for a short time in 1914 he bottled the mineral water from the springs and attempted to market it. The water was reported to have numerous health benefits. The Heritage Report in the GMS Project File contains additional information on the history of the hotel.

The Great Depression had a deleterious effect on recreation use throughout the area, and two of the less-profitable resort hotels near the Carson area were destroyed by fire in 1931. On June 9, 1935 the Government Mineral Springs Hotel burned to the ground, under what some people considered suspicious circumstances. Following the fire, Forest Service and Civilian Conservation Corps crews used a bulldozer to clean up the hotel site, burying much of the debris.

Government Mineral Springs Campground

Aside from hotel visitors, the soda springs at Trapper Creek, known as the Government Mineral Springs, were visited by campers in the summer, as well. A Forest Service inspector in 1909 noted 25 people camped near the springs (Knapp 1909), some of whom claimed to have visited the site annually for several years.

The Government Mineral Springs area became increasingly popular with forest visitors, and in 1920 the Forest Service set aside an area of about 40 acres adjacent to the hotel resort for a public campground. In 1921 it was estimated that 8000 people visited the new camp ground. The primary attractions were the mineral springs, fishing in Trapper Creek, and the natural beauty of the virgin stand of timber that grew in the area.

With the advent of the Great Depression and Roosevelt's New Deal, a Civilian Conservation Corps camp was established in the vicinity, and one of the early work assignments was improvement work at Government Mineral Springs Campground. Civilian Conservation Corps and Emergency Relief Act enrollee crews did a great deal of work developing the campground, beginning in 1934. They built a community kitchen, a registry booth, and 36 developed campsites. Many of these campsites had wooden camp cupboards, tables, and stone stoves/fireplaces. The crews also constructed an amphitheatre and play areas with teeter-totters, swing sets, and a sandbox. Other projects undertaken by the Civilian Conservation Corps crews in 1935 included felling and removal of snags throughout the Government Mineral Springs area, removal of down logs from wetlands to improve drainage, removal of log jams or "drifts" in Trapper Creek, straightening of the Trapper Creek channel, and construction of diversion walls in Trapper Creek to check erosion.

A new Forest Service guard station was constructed within Government Mineral Springs Campground in 1937, and the guard's primary duties were to oversee the campground and the summer home area. (The guard station is currently managed as a Recreation Lodging facility, available for the public to reserve to rent on a nightly basis.)

Frequent windstorms over the years caused large numbers of the old trees at Government Mineral Springs campground to blow over, prompting a decision to close the campground to overnight use in 1974. (It is currently managed as a five-site rustic campground, with a nominal fee charged--$5/site/night.) Iron Mike, the original mineral spring that was used by the hotel, is still visited by recreationists who desire to sample the mineral water. The site is currently covered with a gazebo, and mineral water is procured with a pump. Little Iron Mike and Bubbling Mike, two smaller mineral springs developed in the 1930s, are no longer developed for use.

Government Mineral Springs Summer Home Tract

At the national level, legislation was passed in 1915 which addressed public demand for recreation within National Forests. The Term Occupancy Act allowed for private use and development of public forest lands for terms of up to 30 years by persons or organizations wishing to erect recreation residences, summer camps, stores, hotels or other resorts. The popularity of the automobile, improved roads, and passage of the Term Occupancy Act spurred the construction of summer homes in National Forests between 1916 and 1930

(Throop 2003 and Trost 2003). The first summer home tracts to be platted on the Columbia National Forest were a group of 45 lots along the shore of Spirit Lake near Mount St. Helens, surveyed in 1917.

In 1918 the Washington Office of the Forest Service issued technical direction for subdividing summer home tracts, and in that same year the agency published *Landscape Engineering in the National Forest* by Frank Waugh, which included guidance for planning and design of summer home tracts (Atwood et al 2005). Waugh instructed that summer home tracts should be designed to retain a feeling of wildness, and that the architectural character of the homes must fit with the surrounding environment.

In 1919 the first twenty-six summer home lots at Government Mineral Springs (GMS) were surveyed by C. W. Boyce (USFS Forest Assistant), Fred W. Cleator (USFS Regional Recreation Examiner) and George H. Cecil (USFS Regional Forester). These lots were located along Trapper Creek, to the north and west of the hotel resort. By 1923 the Forest reported that sixteen of these lots had been leased, but only two had been improved. This was primarily due to the difficulty of getting building materials to the lots, since most were not yet accessible by road (White 1923).

An additional four lots were surveyed at GMS in 1946. By this time, a total of 63 summer home lots had been surveyed at the tract, and 36 of them were under permit. Only five new permits had been issued in the previous ten years (and three of these never had cabins built, and the permits were eventually dropped). There was a flurry of activity in the late 1950s and 1960s, when 12 new summer home permits were issued. The last new lot permits were issued in 1963. A decision was made to delete the 18 remaining unleased lots from the plan, leaving the tract with a total of 45 lots under permit. A decision was made in 1973 to issue no new permits.

Effects to Heritage Resources

Compliance with Section 106 of the National Historic Preservation Act
The Government Mineral Springs Summer Home Tract was evaluated in 2005 to determine its eligibility to the National Register of Historic Places (NRHP) as a potential historic district. Although the tract is associated with important national trends in the growth of outdoor recreation in the State of Washington, its historic integrity as an historic district has been compromised. The majority of the tract was found to lack integrity of design, materials and workmanship.

Although 31 cabins within the tract were built within the historic period of significance for Government Mineral Springs, the majority of these had been altered to a significant degree, and no longer possessed sufficient integrity to reflect their historic associations. Many cabins had a number of modifications to the historic fabric, including new window sashes, non-compatible replacement siding, loss of character-defining features (such as exterior stone chimneys) and/or major additions to the original structure.

Most of these alterations occurred without compliance with Section 106 of the National Historic Preservation Act. The loss of individual integrity in 13 of the 31 homes built within the period of significance compromised the overall integrity of the District. Cabins that were determined to contribute to the historic district were cabins #2, 4, 7, 8, 22, 22, 23, 24, 40, 41, 50, 51, 53, 55, 62, 67, 101 and 103. The 26 remaining cabins were determined to be non-contributing, either because they had been built outside of the historic period, or their historic integrity had been compromised. Since the majority of properties within the tract do not contribute to the historic qualities of the tract, the tract was found not eligible as an historic district.

Eight cabins (2, 4, 7, 8, 20, 22, 24 and 50) were determined to be individually eligible to the NRHP as outstanding embodiments of the significance, since they have been minimally modified, retain much of the original fabric, and embody the rustic vernacular style of architecture which characterized the original cabins built at GMS. These particular cabins embody the distinctive characteristics of the type of architecture found in recreation residences built in the 1920s through early 1960s on federally administered lands in the Pacific Northwest Region.

Cabin 62 will likely become eligible within the next five years.

Cultural resource surveys may still be required for portions of the proposed action or its alternatives. Survey completion and Heritage Resource Report approval is required prior to the implementation of ground disturbing activities.

Alternative 1

Direct and Indirect Effects

Reduction in size of the rock berm along the edge of Trapper Creek in the vicinity of cabin 55 could result in alterations to the cabin since the cabin could potentially be damaged during high water events. The reconstructed side channel, resulting in an alteration in driveway access to cabins 53 and 55, could have an effect on the historic setting of these cabins. Cabins 53 and 55 were evaluated in 2005 to determine their eligibility to the National Register of Historic Places (NRHP), and although they were considered contributing elements to a potential historic district, they were not determined individually eligible to the NRHP. The status of cabin 55 with respect to National Register eligibility would not likely change within the next five years. Therefore this action would not result in effects to historic properties. Although it is possible that the status of cabin 53 could be revised within the next five years, the reconstruction of a side channel on the lot would not likely alter the potential eligibility of the cabin.

Removal of wire basket gabions from the edge of the channel near cabins 20 and 21 could potentially have an effect on the historic setting of cabin 20, particularly if slopes are pulled back to within ten feet of the cabin. Cabin 20 was determined eligible to the National Register of Historic Places in 2005. Modification of the riprap near cabin 21 would not affect historic structures, since cabin 21 was determined ineligible to the NRHP in 2005.

None of the other actions proposed would have any effects to historic properties.

Cumulative Effects
The cumulative effects boundary for heritage resources is the GMS tract. Within the next twenty years, cabins 5, 10, 25, 42, 43, 44, 45, 47, 52, 58, 59, 60, 62 and 64 will reach 50 years in age, and will be evaluated to determine their eligibility status with respect to the National Register of Historic Places. Barring major modifications, cabins 10, 45, 58, 60, 62 and 64 would likely be determined eligible. All else remaining equal, a re-evaluation of Government Mineral Springs Summer Home Tract would likely result in its designation as an historic district, since over half of the properties would contribute to the historic qualities of the district.

A future foreseeable action is the removal of two small concrete dams, one on Maidenhair Creek and one on an unnamed tributary to Trapper Creek, could potentially have an adverse effect on these historic sites. The abandoned dam on Maidenhair Creek was built in 1925 by the Forest Service, in order to provide water to Government Mineral Springs Campground. The dam on the unnamed creek was originally built in the early 1900s, in order to provide water to the Government Mineral Springs Hotel and resort. The system was taken over by the Government Mineral Springs Homeowner's Association in the 1940s, and in 1957 they installed a new dam and made other improvements to the system. If the removal of these dams moves forward in a site-specific NEPA analysis, and if they are determined eligible to the National Register of Historic Places, removal of these structures would result in an adverse effect and future consultation with the National Historic Preservation Office would be necessary

Alternative 2
Direct and Indirect Effects
In the evaluation of the Government Mineral Springs tract, cabin 55 was considered to be a contributing element to a potential historic district. It was built in 1958, retains its historic fabric, and conveys the simple rustic vernacular style of architecture typical of recreation residences. It was not determined to be individually eligible to the NRHP; however, primarily because of its age and because of minor modifications to the roof on the main façade. Relocation of cabin 55 would therefore have no direct effect on historic properties.

Field surveys were completed on lot 48 and it was determined that no historic properties or archeological sites would be impacted by the proposal to rebuild a cabin on-site. There are currently no structures on this vacant lot. Lot 48 was abandoned in 1986 after a fire destroyed the existing cabin and the holders did not rebuild.

As discussed in Alternative 1, removal of wire basket gabions from the edge of the channel near cabins 20 and 21 could potentially have an effect on the historic setting of cabin 20, particularly if slopes are pulled back to within ten feet of the cabin. Cabin 20 was determined eligible to the National Register of Historic Places in 2005. Modification of the riprap near cabin 21 will not affect historic structures, since cabin 21 was determined ineligible to the NRHP in 2005.

None of the other actions proposed would have any effects to historic properties.

Cumulative Effects
As stated above under the proposed action, there is a potential for the Government Mineral Springs Summer Home tract to be determined eligible to the NRHP as an historic district within the next 20 years. Since cabin 55 was considered a contributing element, the relocation of this cabin could negatively impact the potential eligibility of the tract as an historic district.

The future foreseeable proposal to remove the two small concrete dams could potentially have an adverse effect on these historic sites. Refer to discussion under Alternative 1, above. Before the removal of either of the dams occurred, site-specific NEPA analysis would be completed and consultation with the National Historic Preservation Office would be conducted.

Alternative 3
Direct and Indirect Effects
This action would result in non-renewal of all 20-year permits at Government Mineral Springs Summer Home Tract. Cabin owners would be issued ten-year non-renewable permits, which would allow improvements to remain through December 31, 2018. Although there would be no short-term (within the next five years) impacts to historic properties, this action would directly result in an adverse effect to historic properties (i.e. the eight individually eligible cabins) within ten years.

This action would result in the removal of all cabins and improvements at Government Mineral Springs Summer Home Tract by the year 2018. The removal of the eight individually eligible cabins would result in alteration or destruction of historic properties, and would be considered an adverse effect. Before removal of any structure or improvement, site-specific NEPA analysis would be completed and consultation with the National Historic Preservation Office would be conducted.

None of the other actions proposed would have any effects to historic properties.

Cumulative Effects
No cumulative effects were identified.

The future foreseeable proposal to remove the two small concrete dams could potentially have an adverse effect on these historic sites. Refer to discussion under Alternative 1, above. Before the removal of either of the dams occurred, site-specific NEPA analysis would be completed and consultation with the National Historic Preservation Office would be conducted.

Aquatics

Existing Condition

The aquatics section of this document incorporates information from the Hydrology Report and Fisheries Biological Evaluation. Detailed information can be found in both reports which are located in the project file. The analysis focuses on site and reach-scale effects and summarizes conditions and effects at the subwatershed scale (Trapper Creek drainage).

The Trapper Creek subwatershed was selected as the primary analysis area due to its size, its function relative to beneficial uses, and because this scale provides better resolution for effects determinations for this proposal. Approximately 90% of the Trapper Creek drainage is designated Wilderness. As such, when aquatic conditions are summarized at the subwatershed scale, the characterization of conditions is largely driven by conditions within the Wilderness, because most of the stream and drainage area lie within it. However, the majority of critical habitat for fish is in the lower reaches of Trapper Creek where the GMS Tract is located. This analysis finds that aquatic conditions within the GMS Tract are often substantially different from those in Wilderness areas because of the historical management and development of summer homes along the reach of Trapper Creek that passes through the GMS Tract. At the subwatershed scale, aquatic conditions in the relatively small portion of Trapper Creek that lies within the GMS Tract may be masked or overshadowed by aquatic conditions further upstream. Specific to steelhead trout, the GMS Recreational Residence Tract stream reach accounts for approximately 5% of the total steelhead habitat in the Trapper Creek drainage.

General Project Area Description

The GMS Recreational Residence Tract is located between river mile 0.3 and 0.9 in the lower floodplain of Trapper Creek in the Wind River fifth field watershed (HUC #1707010512). Trapper Creek is a third order tributary within the Dry Creek (170101051203) sixth-field sub-watershed, draining an area of approximately 7,417 acres. Trapper Creek flows into Wind River at river mile 19. A majority of the Trapper Creek sub-watershed is designated as Wilderness.

Subwatershed Characterization

Upper elevations of the Trapper Creek drainage are characterized by steeply dissected drainages, avalanche chutes, talus slopes, and steep side-slopes. The GMS Tract is located along the toe of these steeper slopes and on the gently sloping valley bottom at the lower end of the drainage. As Trapper Creek flows from the steep upper watershed into the lower valley bottom, the slope of the channel declines and the ability of the stream to move sediment decreases substantially. The lower two miles of Trapper Creek, including the reach through GMS, typify this zone of decreasing stream power as Trapper Creek approaches and enters the Wind River valley.

Bed and streambank materials along this reach of Trapper Creek are formed of deposits from past debris flows, avalanche runout, overbank floods, and colluvium from adjacent slopes in the lower watershed. Presence of these materials provides evidence of the disturbance regimes of the watershed, and an indication of the physical forces that have created the landscape that the GMS summer homes now occupy. Over time, Trapper Creek has carved and deposited a complex mosaic of abandoned channels, side channels and wetlands in the lower watershed. These off- channel areas were developed and maintained as Trapper Creek moved across the valley bottom through a combination of channel migration that occurred via bank erosion, and more dramatic and episodic re-locations of the channel known as channel avulsions.

Flooding was and continues to be an important disturbance process that introduces and redistributes woody debris, sediments and other materials in the stream, and that maintains and re-establishes channel form. Prior to development of the lower valley, Trapper Creek spilled out of its banks and accessed floodprone areas across the valley bottom. Based on existing landforms on the valley floor, the slope of the channel and valley, and riparian forest type in lower Trapper Creek, it is likely that the stream had multiple side channels, adjacent wetlands and off-channel areas that were inundated during overbank flows. By spilling water into these out-of-channel areas, Trapper Creek would have been able to dissipate floodwaters and some of the erosive energy of the flood.

Human Involvement

Over the past century, development of the lower Trapper Creek valley has played a significant role in modifying riparian and instream conditions, and has altered some of the processes that previously developed and maintained the aquatic and riparian environment. Human development of the valley bottom is described in detail in the Cultural report for this project. In general, aquatic conditions have been affected by construction and maintenance of the GMS summer homes and associated infrastructure; removal of large woody debris from the riparian areas and stream channels; and construction of gabion walls along the stream. Because nearly the entire Trapper Creek drainage is in Wilderness designation, very little timber harvest or road construction has occurred in this drainage relative to other nearby systems.

Very few roads exist in the sub-watershed. The existing roads access the Government Mineral Springs area (Iron Mike, campground, guard station and the recreation residence tract), and the Trapper Creek Trailhead. The actual road density across the sub-watershed is 0.5 miles per square mile, the lowest road density of any sub-watershed within the Wind River watershed. Within the GMS Tract, there are two primary roads, one on either side of Trapper Creek. Both roads are entirely within Riparian Reserves, and each crosses at least one fish bearing tributary stream. There are numerous driveways off these main roads—some of which are simple spurs, and some are larger driveway loops servicing one or more cabins.

Fire suppression is another common practice that has broadly affected forest environments in the Pacific Northwest, and may have played a role in development of the forest conditions that are evident today in the GMS reach of Trapper Creek.

Two of the most significant anthropogenic disturbance factors that continue to affect aquatic conditions today in lower Trapper Creek are the removal of logs from riparian and instream areas, and diking of the channel to protect cabins from flooding. Removal of logs and trees from the stream and from areas adjacent to the stream has significantly degraded habitat conditions within Trapper Creek, but has also removed a significant source of stability, channel roughness and structural integrity in Trapper Creek. The diking of the channel by construction of gabion or riprap walls has reduced the stream's ability to access its floodplain in some areas, and has created quasi-permanent hardpoints along the channel that accelerate and direct streamflows to the more easily eroded native banks and streambed.

Fisheries and Habitat

Gifford Pinchot National Forest (GPNF) has a total of 8 fish species of local interest and 2 critical habitat designations. Three of these are on the January 2008 Regional Forester's Special Status Species list and 5 are either Threatened or Endangered fish species (Table 3). No fish species or habitat on GPNF are proposed for federal listing. A field review of fish species presence and suitable habitat presence was completed for the Trapper Creek drainage. Lower Columbia River steelhead trout and Lower Columbia River Chinook salmon are the only fish species of concern present within the Trapper Creek drainage. Steelhead and Chinook are under the jurisdiction of National Marine Fisheries Service (NMFS). Fish distribution data is from Washington Dept. Fish and Wildlife (WDFW) and local Forest Service fish biologists.

Table 3. Fish Species of Concern on Gifford Pinchot National Forest, as of January 2008.

Species Name	Species Status, Federal Register, Date of Listing	Field Review for TRAPPER CREEK DRAINAGE	
		Habitat Present?	Species presence and life stage
Columbia River Bull Trout *Salvelinus confluentus*	Threatened 64 FR 58910 11/01/99	No	No
Critical Habitat for Columbia River Bull Trout	Designated 70 FR 56212 09/26/05	No (not designated on NF lands)	N/A
Coastal Puget Sound Bull Trout *Salvelinus confluentus*	Threatened 64 FR 58910 11/01/99	No	No
Critical Habitat for Coastal Puget Sound Bull Trout	Designated 70 FR 56212 09/26/05	No (not designated on NF lands)	N/A
Lower Columbia River Steelhead Trout *Oncorhynchus mykiss*	Threatened 63 FR 13347 03/19/98	Yes 3.9 miles	Yes; Presence/Migration Known Juvenile Rearing, Known Spawning

Table 3. Fish Species of Concern on Gifford Pinchot National Forest, as of January 2008.			
Species Name	**Species Status, Federal Register, Date of Listing**	**Field Review for TRAPPER CREEK DRAINAGE**	
		Habitat Present?	**Species presence and life stage**
Critical Habitat for Lower Columbia River Steelhead Trout	Designated 70 FR 52629 09/02/05	Yes 3.9 miles	Yes
Lower Columbia River Chinook Salmon *Oncorhynchus tshawytscha*	Threatened 64 FR 14308 03/24/99	Yes 1.9 miles	Yes; Presence/Migration
Critical Habitat for Lower Columbia River Chinook Salmon	Designated 70 FR52629 09/02/05	Yes 1.9 miles	Yes
Lower Columbia River Coho Salmon *Oncorhynchus kisutch*	Threatened 70 FR 37160 06/28/05	No	No
Essential Fish Habitat for Coho and Chinook Salmon	N/A	No – Coho Yes - Chinook	No – Coho Yes -Chinook
Interior Redband Trout *Oncorhynchus mykiss*	USFS Sensitive	No	No
Pygmy Whitefish *Prosopium coulteri*	USFS Sensitive	No	No
Puget Sound Coastal Cutthroat Trout *Oncorhynchus clarki clarki*	USFS Sensitive	No	No

Fish species of concern listed above that are not found within the analysis area will no longer be discussed because either habitat or the species are not found within the action area or the Trapper Creek drainage. The analysis in this section will focus on Lower Columbia River steelhead and Lower Columbia River chinook due to their presence in the analysis area. Lower Columbia River steelhead and Lower Columbia River chinook are the only federally listed fish species found within the analysis area (lower Trapper Creek) where any project-related effects may be measured.

Below is a brief discussion on the status of Lower Columbia River steelhead and Lower Columbia River chinook within the action area. Additional information related to status and life history at the population scale can be found in the following resources:

- Fisheries Biological Evaluation for GMS Recreational Residence Tract Continuance Determination,
- NMFS Federal Register documents (http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/Index.cfm),

- Lower Columbia Salmon Recovery and Fish and Wildlife Plan (http://www.nwcouncil.org/fw/subbasinplanning/lowerColumbia/plan/)

Lower Columbia River Steelhead (Oncorhynchus mykiss)
The National Marine Fisheries Service listed steelhead trout as a threatened species on March 19, 1998 (50 F.R. 223 and 224) under the Endangered Species Act within the Lower Columbia River ESU (evolutionary significant unit; a "distinct" population of Pacific salmon). The Lower Columbia River ESU encompasses all steelhead runs in tributaries between the Cowlitz and Wind Rivers on the Washington side of the Columbia River, and the Willamette and Hood Rivers on the Oregon side.

Due to the status of this stock, the Wind River summer steelhead has the highest priority for restoration in the State of Washington's Lower Columbia Steelhead Conservation Initiative. (U.S.D.A. Forest Service, Wind River Watershed Analysis, 2nd iteration 2001). Wind River steelhead are the only anadromous salmonid fish species endemic to the Wind River watershed.

Steelhead distribution within the planning area includes the mainstem of Trapper Creek and the lower reaches of tributaries to Trapper Creek, from the confluence of Wind River up to a natural falls barrier (to all life stages of all salmonids) at river mile 3.9. Trapper Creek provides critical habitat for these fish and has been found to contain up to 25% of the steelhead/rainbow trout in the Upper Wind River watershed (personal communication from Ian Jezorek 9/26/06).

Lower Columbia River Chinook (Oncorhynchus tshawytscha)
The Lower Columbia River Chinook salmon was listed at threatened on March 24, 1999 (64 F.R. 14308), and includes all natural populations of Chinook salmon spawning below impassable natural barriers from the mouth of the Columbia River to the crest of the Cascade Range, just east of the Hood River in Oregon and the White Salmon River in Washington. The Lower Columbia River Chinook ESU excludes populations above Willamette Falls and in the Clackamas River and Hood River.

The Lower Columbia River Chinook ESU has been subject to intensive hatchery influence. Hatchery programs to enhance Chinook salmon fisheries in the lower Columbia River began in the 1870s, releasing billions of fish over time. Although most of the stocks have come from inside the ESU, more than 200 million fish from outside the ESU have been released since 1930 (Myers et al. 1998). In addition, the exchange of eggs between hatcheries in this ESU has led to the extensive genetic homogenization of hatchery stocks. The introduced spring Chinook salmon produced at the Carson National Fish Hatchery are considered part of the Lower Columbia River Chinook ESU.

Chinook distribution within the planning area includes the mainstem of Trapper Creek and the lower reaches of tributaries to Trapper Creek, from the confluence of Wind River up to a natural falls barrier to Chinook at river mile 1.9. Chinook presence within Trapper Creek, as well as its small tributaries during high flow events, is limited to adult migration. No Chinook juvenile rearing is known to occur within Trapper Creek.

Critical Habitat

NMFS designates critical habitat based on physical and biological features that are essential to the listed species. Essential features of designated critical habitat are: substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food for juveniles, riparian vegetation, space, and safe passage conditions (50 CFR 226.212). The physical or biological features essential to long-term conservation of ESA-listed salmon and steelhead are known as Primary Constituent Elements (PCEs), Table 4. There are three freshwater PCEs of critical habitat relevant to this project.

Table 4. Essential physical and biological features named as PCEs in all salmon critical habitat designations

Site	Essential Physical and Biological Features	Species Life Stage
Freshwater spawning	Water quality, water quantity, and substrate	Spawning, incubation, and larval development
Freshwater rearing	Water quantity and floodplain connectivity	Juvenile growth and mobility
	Water quality and forage	Juvenile development
	Natural cover	Juvenile mobility and survival
Freshwater migration	Free of artificial obstructions, water quality and quantity, and natural cover	Juvenile and adult mobility and survival

Critical habitat in Trapper Creek is designated for LCR steelhead and LCR Chinook, which includes the stream channels in each designated reach, and a lateral extent as defined by the ordinary high water line (Sept 2, 2005, 70 FR 52629).

PCEs listed above are habitat features of aquatic ecosystems and are also components of the Aquatic Conservation Strategy objectives under the Gifford Pinchot National Forest Land and Resource Management Plan, amended by the 1994 Northwest Forest Plan. The quality and functionality of the components of each PCE, such as water quantity and quality, cover, large wood, etc., are affected by natural processes that operate at multiple scales, both spatially and temporally. Because aquatic ecosystem functions and processes are interconnected, the state of each PCE is dependent upon a variety of processes. Therefore, the analysis of existing conditions with respect to the PCEs for the GMS consistency review will be used to support the analysis of the Aquatic Conservation Strategy under the Forest Plan. This approach will address the PCEs as a whole, rather than by individual PCE.

Water Quality and Quantity

Chemical Contamination/Nutrients

Little has been done to ascertain the chemistry of Trapper Creek. The Forest Service, Underwood Conservation District, and Department of Ecology have each taken water samples at some interval and analyzed for chemical and nutrient parameters. Based on the

very limited monitoring that has been done, Washington State's Water Quality Standards were not exceeded at any location. There is no clear trend in water quality from upstream to downstream of the GMS Tract. Intermittent monitoring done by the State of Washington Department of Ecology and the Forest Service over the past decade has been mainly focused upstream of the GMS Tract. However, Underwood Conservation District, during the same time period as the Department of Ecology and the Forest Service, sampled above and below the GMS Tract collecting six samples at each location, spread out over the course of approximately two years.

An estimated 56% of the cabins in the GMS Recreational Residence Tract have pit toilets and/or dry wells (and in one instance, a 55-gallon barrel drum). Many of these existing "facilities" are located on floodprone areas alongside Trapper Creek, and the associated mosaic of side channels and tributaries. Soils in these areas are a mix of colluvium and alluvium and as such can have relatively rapid rates of subsurface water transmission. The relatively high density of waste systems in proximity to the active stream network, combined with the coarse soils in the area, suggests a potential for movement of waste materials to the stream during peak flows experienced during storm events. It is possible for effluent from waste disposal systems to move into Trapper Creek on an annual basis during the winter months. During the 2005 field review, no chemical contaminant issues were observed**.**

Temperature
Maximum summer temperatures on Trapper Creek approximate the maximum summer temperatures in the Wind River. Hence, Trapper Creek is not seen as a source of either warm or cool water input to the Wind River (Wind River Watershed Analysis 2001). The Forest Service has monitored water temperatures on Trapper Creek for approximately 20 years near the footbridge at the wilderness boundary (upstream of the cabins). Through this time period, the average annual peak temperature in summer months is approximately 15.5°C. The peak temperature recorded at this station was 18°C measured in both 1981 and 1986. More recently, the Underwood Conservation District has monitored water temperatures in lower Trapper Creek near the mouth, and found that temperatures there typically exceed those measured upstream of the cabins by approximately one degree Celsius. Although Trapper has exceeded the state water quality standard of 16°C in the past, the excursions above that level have been minor and infrequent, so Trapper Creek has not been included on the State's 303(d) list for temperature limited streams. Spawning steelhead in Trapper Creek may be inhibited when temperatures exceed 16°C. The GMS Recreation Residence Tract reach of Trapper Creek is functioning at risk for water temperature.

Average riparian shade values correlate with Trapper Creek's average stream temperatures due to the relationship between streamside vegetation and rates of solarization in the stream. Average riparian shade values at the GMS Tract averaged 88% during a 2005 field review (USFS 2005). Streamside riparian shade values varied significantly between the Recreational Residence lots. Several lots exhibited >95% shade, while several others were in the 60% range. Therefore, stream temperatures are affected to different degrees between lots depending on the amount of streamside vegetation present and height.

Sediment
Sediment is naturally delivered to streams by a variety of mechanisms such as landslides and bank erosion. However, increased levels of sedimentation beyond natural background levels often have adverse effects on fish habitats and riparian ecosystems.

The historical removal of LWD within the GMS Tract and, to a lesser degree, road construction have accelerated bank erosion and increased sedimentation in lower Trapper Creek watershed. The lower portion of Trapper Creek has experienced a loss of access to its floodplains, which has increased the volume of flow carried in the main channel of lower Trapper Creek. This has probably increased bank and streambed erosion within lower Trapper Creek.

Preliminary data collected by Mt. Adams Ranger District Aquatics personnel for the 1996 and 2001 Wind River Watershed Analyses (USFS 1996, 2001), indicate that increases in turbidity within Trapper Creek are measurably lower than the average increases in turbidity for other streams within the Wind River watershed during the same time period. Because of the limited number of samples collected, it is important to note that this data may be more of a reflection of very localized, or short-term, inputs of sediment or disturbances in the stream channel rather than a picture of broader scale, or chronic, erosion/sediment processes in the sampled sub-watersheds. The data is used to provide a snapshot of stream conditions at the time of collection, and offer a starting point for comparing Trapper Creek with other systems within the same watershed.

Peak/Base Flows
Mean annual precipitation is 110 inches near the mouth of Trapper Creek. Approximately 80% of the precipitation occurs between October and March, in a combination of rain and snow. Annual low streamflows occur in August and September, and annual peaks generally occur during the fall and winter months. The largest floods occur from heavy rains and rain-on-snow, typified by the November, 2006 rainstorm and the February, 1996 rain-on-snow event. Warmer weather in the spring months can cause additional high flows during March, April and May. There is no reason to believe that peak or base flows have been altered in Trapper Creek as a result of human-caused disturbance. The wilderness area in Trapper Creek subwatershed has resulted in relatively low levels of forest cover removal and low road construction across the subwatershed.

Substrate

Spawning habitat is limited in lower Trapper Creek adjacent to the GMS Recreational Residence Tract because of the substrate composition in this reach. Trapper Creek is a low-to-moderate gradient stream with side channels, and is dominated by large cobble size substrate. Substrate samples from 1998 indicate that the quality of steelhead spawning habitat in lower Trapper Creek is not limited by fines, but may be from the large proportion of larger sized substrate. Pebble counts surveys were conducted by Forest Service personnel in a few cross-sections located within the GMS Recreational Residence Tract in the summers of 2006 and 2007. Due to the localized nature of these pebble counts, it is not prudent to extrapolate their results to the larger 7th field watershed. However, within the GMS

Recreational Residence Tract, these initial results show a need for a higher proportion of smaller gravel-cobble substrate composition that is ideal for steelhead spawners.

Floodplain Connectivity

Flood-prone widths have declined throughout much of lower Trapper Creek within the GMS Tract as a result of diking. The reduction in flood-prone width within the GMS Tract has forced Trapper Creek through narrower passageways during high flow events, generating increased velocities and greater erosional forces on streambanks (Bair 2007). As constructed dikes have reduced the river's access to side channels and floodplains, the capacity of the system to store and slow floodwaters has been reduced, and valuable off-channel habitats have been eliminated. Side channels associated with floodplains offer refuge areas to juvenile salmonids during high flow events (Roni et al. 2002).

There are two locations in lower Trapper Creek within the GMS Tract where the effects of diking are most evident and active. A gabion wall and riprap berm was constructed across the entrance to a side channel of Trapper Creek near cabin 55. The gabion wall and riprap berm does not allow Trapper Creek to access the side channel near cabin 55 during high flows. One of the effects of the gabion and riprap berm is that high flows are now confined within the main channel of Trapper Creek in this reach, and have greater capacity to erode the channel bed and banks. Figure 5 shows the berm and cabin 55 following the November 2006 flood (estimated to have a return interval of approximately 5 years). Notice that the flood elevation is just below the top of the berm and that Trapper Creek is forced into a relatively sharp bend to the right.

Figure 4. Trapper Creek at flood stage looking downstream toward berm and Cabin 55.

Modeling of streamflows at this site under two scenarios (with and without the berm in place) shows that the stream power has been increased by 25-40% in the mainstem of Trapper Creek due to its inability to spill water out into the side channel during high flows. This increase in stream power is at least partially responsible for downstream bank erosion and undercutting of the bank opposite cabin 55. As the stream power increases and the channel bed degrades, the erosive forces of the stream are directed at lower elevations on the streambanks. In this case, the stream is now beneath rooting level of trees growing on the banks opposite cabin 55, and is eroding the relatively uncohesive material beneath the trees that are no longer well-protected by woody root masses.

Because high flows are now pinched into the narrow main channel of Trapper Creek as it passes by cabin 55, the river is forced into an opening that is too small for the volume of flow. The result is a backwatering that occurs just upstream of the constriction. As the stream is backwatered during high flows, it loses some of the velocity and power to move larger sediments, and they are deposited in the channel, forming bars, raising the bed elevation and causing the stream to spread out across the upper banks. During the November 2006 flood, Trapper Creek re-occupied low lying areas to the north of the channel near cabin 57, and actually used the driveway at cabin 56 as a high flow channel to circumvent the

gabion wall obstruction. Figure 6 shows the driveway behind cabin 56 functioning as a side channel during the November 2006 flood.

Figure 5. Driveway behind Cabin 56 functioning as a side channel during the November 2006 flood

Water flowing down the driveway around cabin 56 ultimately entered the obstructed side channel, joining it at the parking area adjacent to cabin 55.

Riprap and gabion walls adjacent to cabin 20 were constructed decades ago to protect the cabins and their lots from erosion. The constructed wall of rock, possibly combined with placement of debris on the opposite banks has led to incision of the channel as it passes by these cabins. This incision has moved upstream and is currently undermining the very structures that in part caused a series of reactions.

As Trapper Creek became increasingly confined, it retains more and more of the flood flows in the main channel, and erodes the bed of the stream. The downcutting in Trapper Creek has progressed upstream to where it is now undermining the gabion walls at the upper end of the reach. As this material enters the stream, it leaves exposed a very unconfined and unprotected vertical bank that will rapidly erode as it receives direct flow from the stream. Figure 7 shows the gabions at the upstream end of this treatment that are currently in the process of failing and entering the stream.

Figure 6. Failing gabions at Cabin 20.

In addition to gabions that are currently leaning over the channel, much of the upright gabion section has also been undermined and has no solid footing. The vertical unprotected banks upstream of failing gabions are composed of uncohesive materials that are highly vulnerable to erosion during subsequent high flows. This entire section will be coming into the channel as the remaining material underneath is eroded out. As this happens, the unconsolidated banks behind the gabion wall will no longer be protected and will rapidly fail and erode into the stream.

Natural Cover (Large Wood)

Natural cover is provided by large wood, pool depth, overhanging banks, and crevices beneath large boulders. Large wood helps build complex habitats, such as pools, sediment storage, spawning gravel, and nutrient retainment. Large trees—standing and prone—have played an important role in development of the valley floor in lower Trapper Creek. Riparian forests have offered structure and stability to the channel, but have also been one of the catalysts of change, due to the significant effect they can exert on channel processes when they fall into the stream or across the valley floor. Trees growing along the banks of Trapper Creek are one of the key elements providing stability to streambanks, and natural cover. Large woody root masses not only provide natural cover but help to bind and protect

otherwise uncohesive banks from erosion by the stream, and when exposed by the stream help to dissipate near-bank stream energy. However, there is not enough large wood in Trapper Creek to provide adequate cover because of the previous management within the GMS Tract.

Removal of large woody debris from Trapper Creek began when the cabins were first constructed in the 1930s. The Forest Service continued to remove large wood from the stream through the 1980s because woody debris was seen as potentially blocking fish migration, and because it contributed to redirecting streamflows towards cabins, and promoted overbank flows. The objective of woody debris removal was to open the channel up to improve conveyance of flows and movement of fish. In some cases, there was commercial value in the woody debris that was removed from the stream. One Forest Service contract from the late 1970s describes a project to remove some 10,000 board feet of western redcedar from Trapper Creek in the GMS reach. The contractor was directed to burn or remove all material greater than 6 inches in diameter and over 6 feet in length. Gravel bars were approved burn sites under this contract, indicating that these areas were devoid—or would be devoid—of woody debris following the operation. This type of historical indiscriminate removal of large woody debris has severely degraded instream habitat, natural cover, and reduced the natural formation of bank stability and channel roughness.

Beginning in the late 1930s, gabion walls were constructed along some sections of Trapper Creek in efforts to contain flooding and limit channel migration. Construction of these gabion walls and riprap berms has continued over time in the tract, and increasingly confined and constrained the stream. In some locations the stream has moved well away from the constructed gabion walls through natural migration processes. In other areas within the tract, the stream has become incised right along the base of these constrictions, which has led to increased flow velocities and associated erosion of the channel.

Over time, the removal of woody debris and confinement of the stream with gabion walls have worked in concert to degrade the channel. Removal of the wood has reduced in-channel roughness and natural protection of the streambanks, allowing the stream to exert greater hydraulic forces on the bed and banks. This has led to a deepening and widening of the channel, allowing the stream to contain greater flow volumes before spilling out of its banks. This effect has been exacerbated substantially by the construction of dikes and gabion walls along the margins of the stream. By impeding the ability of the river to access overbank areas during high flows, the dikes have caused greater volumes of floodwater to be contained within the channel. Unable to dissipate energy by spilling out onto floodplains or into flood channels, the stream exerts greater erosive forces on the bed and banks, further downcutting and further disassociating itself from its floodplain. Through this process, Trapper Creek has incised down below some of the bank protections and gabion walls that were constructed along its edge, and the stream is now undermining some of those same protections and causing them to fail. This process can be seen at various locations in the GMS reach of Trapper Creek.

When trees are delivered to the channel by floods, windthrow, or other means, they provide significant roughness in the channel, reducing the amount of stream energy that is exerted on

streambeds or banks. In addition, old coniferous trees are large enough to provide significant alteration of stream hydraulics, creating pools, promoting deposition and sorting of sediments, and providing stability and physical armoring of nearby banks. Because of the relative size of Trapper Creek with respect to the old growth cedar, hemlock and Douglas fir forests along its banks, down trees can form significant obstructions in the channel, and can remain in place and influence channel processes for extended periods of time before rotting or getting washed out.

Trees falling into Trapper Creek can also act as sources for collection of other woody debris, forming large jams, and causing channel avulsions in which the stream jumps out of its channel and forms a new channel around the obstruction. While instream woody debris tends to both stabilize and create localized change in the stream, woody debris on floodplains and adjacent riparian areas helps to control the extent and significance of channel movements across the valley bottom, by slowing movement of floodwaters and providing resistance to erosion.

Stream LWD clean-outs, subsequent periodic LWD removals, felling of hazard trees, and, to a lesser extent, riparian timber harvest have all negatively impacted the LWD profile in the lower Trapper Creek stream reach. Fluctuating levels of instream LWD directly affect channel stability and sediment storage, as well as stream energies and flows (Harmon et al 1986, Bryant 1983, and Everest and Meehan, 1981). Forest Service stream surveys on the first 1.9 miles of Trapper Creek and in several reference reaches, show that the average pieces of LWD per mile found in lower Trapper Creek are deficient and do not meet standards for the western Cascades region (Forest Service 1990, 2001; Wind River Watershed Analysis, 2001). The lack of in-stream LWD is currently contributing to bank instability, bank erosion, possibly warmer stream temperatures, and poor quality fish habitat for the lower 1.9 miles of Trapper Creek, the stream reach adjacent to the GMS Recreational Residence Tract.

Pools are considered to be one of the most important habitat elements for salmonids, and pools are the preferred habitat type of most fish species (Bestcha and Platts 1986). Poor pool quality and quantity, as well as infrequent pool spacing, are currently contributing to negative stream habitat conditions in lower Trapper Creek. The lower reaches of Trapper Creek have become straighter with less pool habitat as the volume of in-stream woody debris has dwindled and stream velocities have increased. The section of Trapper Creek through the GMS Tract is characterized by relatively low sinuosity, abundant riffle, and, to a lesser extent, glide habitat, with poor quality pool habitat. The pools per mile in lower Trapper Creek are well below Forest Service standards (USDA 1996, 2001).

Physical Barriers

Historically there were no known fish passage barriers in the lower Trapper Creek system. All life stages of summer steelhead, adult only stage of spring Chinook, and resident fish (e.g. rainbow trout, sculpin) are present throughout the reach of Trapper Creek adjacent to the GMS Recreational Residence Tract, and their presence continues upstream into the Trapper Creek Wilderness reaches. At river mile 1.9 of Trapper Creek, there is a natural fish passage barrier for Chinook. At river mile 3.9 of Trapper Creek, there is another, larger,

natural fish barrier for steelhead. Currently there are three, man-made, anadromous and resident (primarily) fish passage barriers within the GMS summer homes tract: one culvert on FR 5401 accessing the north side of the tract and two small dams on tributaries entering the south side of Trapper Creek. The two dams will not be analyzed in this document because they are not part of the Proposed Action or Alternatives 2 or 3.

The culvert on Forest Road 5401 is located on a small, high gradient, intermittent tributary to Trapper Creek. The culvert became plugged during the flood of November 2006, and was overtopped. It is undersized and creates a velocity barrier to fish. The culvert blocks access to some 500 feet of moderately valuable habitat for resident fish and salmonids. Culvert replacement would primarily benefit resident fish, but benefits would also be seen in juvenile steelhead rearing and high-flow refugia for adult Chinook and juvenile and adult steelhead, particularly at the unnamed tributary's confluence with Trapper Creek.

Effects to Aquatic Resources

The following effects section is organized such that the direct, indirect and cumulative effects of actions associated with the GMS summer home consistency review (permit reissuance) under all three alternatives are briefly described and analyzed. The analysis of ACS objectives, effects to critical habitat and federally listed fish species, and Magnuson-Stevens Act are supported by information included under the direct and indirect effects of activities proposed. The Hydrology Report and Fisheries Biological Evaluation completed for this project are incorporated into this section and can be found in the project file. In this analysis, "short-term" refers to the qualitative and quantitative measures experienced during and immediately after (1-6 months) the actual project implementation (i.e. during instream work by heavy machinery); "long-term" refers to the qualitative and quantitative measures experienced thereafter.

Effects By Activities Proposed

Restore River Access to the Side Channel at Cabins 55 and 53

Alternatives 1, 2 and 3

Direct and Indirect Effects

Alternatives 1, 2 and 3 propose to reduce the size of the riprap berm that is blocking water movement through a side channel near cabin 55, along with associated actions described in Chapter II. Boulder placement may be used in the main creek to stabilize the channel and bring the entrance of the side channel into alignment (vertically and horizontally). Construction would involve use of heavy equipment, such as excavators, spyders, backhoes, and dump trucks. Reconnecting or restoring the existing side channel near cabin 55 would increase rearing habitat for juvenile fish and high flow refuge areas for all life stages of fish. The resulting functioning side channel may have inlet and outlet connections to the main channel and often flow only during bankfull or greater flood events.

The side channel at cabin 55 would become active during flows approximating the bankfull flow, estimated to be 750 cubic feet per second (cfs). The side channel would become accessible immediately following reopening of the channel. Actual use of the side channel

by the creek is more likely to occur in late fall or winter months during heavy rains or rain-on-snow events. On average, the side channel would be activated approximately once per year. Some years it may be accessed several times, and other years not at all. When activated, flow levels would range from just barely covering the bottom of the side channel, to spilling out over the banks of the side channel and inundating the entire surface on which cabin 55 is located.

Once active, this channel would experience all of the processes that normally occur in rivers and side channels. Sediment would be scoured and deposited in the side channel depending on flow levels. Woody debris may be routed through, or deposited within the side channel or at the entrance to the side channel. Through the processes of erosion, deposition, and transport or accumulation of woody debris, the side channel may over time begin to accommodate more or less flow than originally designed for. The side channel may also experience flows out of its banks, or have its flows redirected by woody debris that enters the channel from upstream or from nearby streambanks.

In addition, activities occurring in the main channel may influence the amount of water and debris that is routed into the side channel. For example, if a single large tree or debris jam becomes established in the main channel of Trapper Creek near cabin 55 or downstream and significantly reduces the effective cross sectional area of the channel, the side channel may receive increased flow volumes as the stream seeks a way to circumvent the main channel obstruction. Conversely, if woody debris sets up at the entrance to the side channel, it could limit the amount of water that is able to enter the side channel, and reduce its effectiveness for the period of time the debris remains in place and effective. There are innumerable permutations of these examples that could happen, and each has a series of potential secondary and tertiary effects.

Under Alternative 1, cabin 55 would remain in place, and would be subject to flooding or damage from any one of these secondary and tertiary effects. If the cabin is flooded or damaged, potentially toxic buildup or household materials could be introduced to the stream, degrading water quality.

Cabin 53 is not expected to be flooded or damaged during activation of the side channel since the cabin sits above floodprone elevations. It is possible that the lower slopes on the small rise that cabin 53 sits on could be eroded during some flows or through a sequence of disturbances in the main channel or side channel. It is also possible that over time, cabin 52 becomes at risk from erosion of its banks and channel migration. This eventuality is possible whether or not the side channel is activated, simply because the cabin is in close proximity to the mainstem and side channel. Both the mainstem and side channel will be adjusting to changes that have occurred recently just upstream of cabin 52, and that will occur as a result of this proposal.

Re-opening the side channel would increase the effective cross sectional area for flood flows at this location of Trapper Creek. This would result in lower velocities, water depth, and resultant stream power in the main channel of Trapper Creek. Stream power in the mainstem of Trapper Creek near cabin 55 would be reduced by an estimated 14-29% from current

levels during high flow events. As a result, the stream is likely to experience lower rates of erosion on the streambed and banks.

When the berm was lowered within the next 5 years, the right bank across from cabin 55 that is currently being undercut would likely experience a reduced rate of undercutting and the rate of retreat for the entire right bank downstream of cabin 55 would decline. Stability of these banks would be expected to increase. Upstream of the side channel, deposition of coarse and fine substrates within the mainstem of Trapper Creek would be reduced, as this area would experience less backwatering during high flows. Trapper Creek would incise through some of the deposits in this area which may allow for less frequent flooding on the access road to cabin 56.

Reactivation of the side channel would increase off-channel habitat for fish. This would be particularly valuable during high flows when velocities in the side channel may be slightly lower than in the main channel, and during low flow periods when the side channel may hold more water later into the year. Habitat quality in the side channel would similarly improve in the form of spawning substrate and woody cover, assuming there is some importing and accumulation of channel substrates and woody debris.

Reconstruction of the side channel would have some short term effects on turbidity in Trapper Creek. Actual construction at this site would be outside of the low flow channel, so there would be very limited—if evident—turbidity effects during the actual construction process. Turbidity effects would be greatest during the first high flows to access the newly constructed side channel, and would be reduced as flow levels decrease. These effects would be relatively short term, and would occur during each successively higher flow to access the channel in the first two years following construction. Turbidity increases occurring during first watering of the side channel would occur at a time of the year when turbidity levels normally increase in Trapper Creek (i.e. during high flow periods), so they would add to, but partly be masked by background turbidity levels.

Improving Instream Habitat and River Function Near Cabins 20 and 21
Alternatives 1, 2 and 3
Direct and Indirect Effects
Under all alternatives, failing wire basket gabions and cable would be removed from the channel near cabin 20 within the next 5 years, restoring the substrate to native gravel and cobble. Equipment proposed for use may include heavy machinery, such as excavators, spyders, backhoes, and dump trucks. Gabion baskets at risk of failure would be removed before they entered the stream. Relocation of channel debris from the right bank (opposite cabin 21) would provide increased area for flood flows. This would reduce some of the erosion that currently occurs on the channel bed, and that has caused the stream to downcut. Rock barb construction would cause the deepest point of the channel (thalweg) to be shifted away from the left bank, reducing erosional forces on that bank and creating lower velocity depositional areas in the downstream shadow of the structures. Vertical eroding slopes that currently exist upstream of the existing gabion wall and behind the failing gabions would be stabilized by regrading to a stable angle and revegetating them to provide long term stability through root development on the channel banks. The combined effects of this action would

be to improve bank stability on the left bank near cabin 20 and to reduce the downcutting and accelerated water velocities that now occur as the stream passes through this narrowed channel.

The benefits of debris removal and restoration of sustainable channel hydraulics at this reach would accrue immediately upon completion of construction activities. These changes would be persistent over long time periods. Stability of the treated banks would change from a condition of declining stability (as gabions fail and enter the creek) to an improving condition over time as vegetation on re-shaped slopes became more well established.

Because of the need to reshape slopes once the gabion walls are removed, lots 20 and 21 would lose some of the area between the cabin and creek. Reshaping of the slopes along the stream would cause loss of some 20-30 feet that is currently occupied by gabions, riprap, and fill material.

In the short term, construction activities would increase turbidity in Trapper Creek. Turbidity increases would be expected to occur while equipment is operating in the channel or disturbing the channel banks within the low flow channel during and following construction activities in late summer and fall. Maximum turbidity levels would potentially reach several hundred Nephelometric Turbidity Units (or NTUs--a measure of turbidity) during instream work. As work conducted by the heavy equipment is curtailed, turbidity levels would rapidly drop in the project area.

Restore Fish Passage on Tributaries Within the Tract
Alternatives 1, 2 and 3
Direct and Indirect Effects
Under all alternatives, the fish passage issue related to the culvert on FR 5401, located on the small, unnamed, intermittent, southern tributary to Trapper Creek, would be addressed. Ground disturbing activities that would occur as part of the culvert replacement would involve the use of manual labor, small mechanized equipment, and heavy machinery.

The FR 5401 culvert would be replaced with a larger pipe designed to provide fish passage. The culvert blocks access to some 500 feet of potentially suitable habitat for resident fish, steelhead, and Chinook, specifically for juvenile steelhead rearing and high-flow refugia for juvenile Chinook and juvenile and adult steelhead. Although this is a small tributary that has intermittent flow, it may provide valuable habitat during times of the year that Trapper Creek is less hospitable to the fish. All three alternatives address fish passage issue within the GMS Tract by replacing the current culvert with an appropriately sized culvert.

There would be short term increases in turbidity associated with the in-water work. Instream work would occur during summer months when these channels are dry or nearly dry. But there would be short term pulses of turbidity as the sites are first watered after construction, and during each subsequently higher flow. Each turbidity pulse is expected to be relatively short term (measured in hours), and would likely reflect turbidities of up to several hundred NTUs for very short periods.

Fish passage would be improved under all alternatives because all three alternatives call for fish passage barrier removal at Forest Service Road 5401 via replacing the current culvert with a larger culvert that provides for fish passage. Another benefit shared by all three alternatives is the improved routing of sediment and woody debris along this intermittent tributary to Trapper Creek.

The culvert removal is covered under the April 28, 2007 Section 7, Endangered Species Act, Programmatic Biological Opinion for Fish Habitat Restoration Activities in Oregon and Washington, Calendar Years 2007-2012 (National Marine Fisheries Service, 2007).

Restore Streamside Areas
Alternatives 1, 2 and 3
Direct and Indirect Effects
Riparian vegetation would be planted along disturbed streambanks and floodplain areas within the GMS Tract, specifically along cabins 2 and 25. Revegetating the streambanks would allow roots to establish and keep excessive streambank erosion from causing elevated instream turbidity and increased streambed sediment composition. Revegetating streambanks also positively affect instream temperatures via increased shading and decreased width to depth ratios.

Effects to Critical Habitat

The analysis of direct and indirect effects to designated critical habitat for Lower Columbia River (LCR) steelhead and LCR Chinook address those Primary Constituent Elements (PCEs) within the GMS Tract that are either degraded or improved in the short-term as a result of ground disturbing activities associated with each alternative. The analysis below compliments the analysis discussed previously in the direct and indirect effects sections to provide the basis for showing consistency with the Aquatic Conservation Strategy and the Magnuson-Stevens Act. This approach will address the PCEs as a whole, rather than by individual PCE.

Water Quality and Quantity
Of the parameters assessed for this PCE, sediment and turbidity are most impacted as a result of large heavy equipment proposed for use in reconnecting a side channel, gabion/riprap removal, and fish passage improvement. Water quality is most influenced by the existence of and probable future placement of septic systems within the riparian area of Trapper Creek. Temperature has the potential to be impacted by the removal of large trees deemed hazardous and that are currently providing shade.

Alternatives 1 and 2
Direct and Indirect Effects
As older pit toilets and other systems of waste management are replaced with septic systems, if desired by the cabin owners, there would be a shift toward more uniform waste treatment across the summer home tract. This would generally be a benefit because treatment of waste materials may be improved. Also, water effluent will be delivered to septic tanks and drainfields where it will percolate and be treated in the ground. Because so many of the cabins lie within close proximity to Trapper Creek or one of its many side channels or

tributaries, there may be some potential for increased transmission of waste materials to the stream because of the increased water effluent used by the flush toilets. If subsurface conditions are such that the rate of effluent transmission to the stream exceeds the rate of treatment of the effluent as it passes through the subsurface, there could be an increase in nutrients to the stream. Presumably this concern will be mitigated by the requirement to locate septics at least 100 feet from the stream and by oversight and review of septic proposals by the Skamania County Health Department.

There will be a slow reduction in the number of large, old growth trees, when they are removed for safety. However, there will also be continued development of younger trees and forest vegetation as permit compliance is more closely monitored, and as (presumably) fewer trees and shrubs are cut by cabin owners for purposes of creating or maintaining views of the stream or sky. Trees providing shade to Trapper Creek would be reduced over time as hazard trees are removed and the canopy is opened. At the same time, forest canopy development will continue to occur with the growth of existing trees and newly established vegetation. We cannot predict the rate of shade loss from hazard tree removal or the rate of shade improvement as young trees begin to provide or increase their shading of the stream. It is likely that the general trend will be toward increased shade as permit compliance is stepped up and existing vegetation is allowed to fully develop.

Alternative 3

Direct and Indirect Effects

Once improvements (i.e., cabins, septic tanks, etc) were removed/decommissioned, there would be no storage of contaminants nor further use of septics or other waste handling facilities in the tract. Hence, there would be no further risk of contamination to Trapper Creek. However, during the 10 year permit phase a low likelihood of water contamination would continue until all cabins are phased out.

Large trees would continue to be assessed for hazard during the 10 year permit period. However, there would no longer be hazard tree removals after the 10-year phase-out period (long-term). Temperature is expected to improve in the long-term because shade would increase as areas currently occupied by cabins or maintained in open conditions for parking or for fire hazard reduction would begin to revegetate and establish a canopy.

Sediment/Turbidity/Substrate

Alternatives 1, 2, and 3

Direct and Indirect Effects

Actions under all of the alternatives considered would cause short term increases in turbidity as described above. Over the long term, actions proposed under this analysis should reduce turbidity by improving hydraulic functions of the river, reducing erosion within the channel, and increasing bank stability.

For the in-stream work, heavy equipment crossing the stream and operating on the banks during excavation would generate turbidity pulses in the immediate vicinity of the disturbance. Monitoring of the 1997 Hatchery Reach Restoration project on the Wind River (a project far larger than the GMS project), showed that turbidity levels in direct vicinity of heavy equipment may exceed 200 times the upstream turbidity level. This elevated turbidity

dissipates rapidly as the suspended sediment settles out of the water column down stream. Monitoring data also indicated that turbidity pulses typically subsided in less than one hour and typically were not detectable one mile down stream.

Bank manipulation (including removal or adjustment of rip-rap and the old berm) and grade controls, consisting of large river rock buried in the bed of the side channel to limit vertical erosion of the channel is expected to improve bank stability and increase the availability of spawning substrate, as well as reduce fine sediment inputs following streambank restoration. Short-term turbidity and sediment delivery are expected to increase within the immediate project area as a result of heavy machinery working below the high water mark. The short-term effects of project actions on sediment and turbidity are expected to occur during construction periods when work was ongoing within the wetted channel. As work ceased, turbidity levels would rapidly decline. Turbidity would increase again during fall months as construction areas above the low flow channel are first watered by higher streamflows. Increased turbidity from project activities would be diluted to low levels as Trapper Creek enters the Wind River. The rehabilitation of eroding banks and improvements in fish passage will provide long-term benefits to aquatic organisms and the aquatic environment.

Actions under all alternatives will have short-term impacts on sediment, turbidity, and substrate because of heavy machinery and the manipulation of streambank conditions. These short-term impacts are expected to last during the time of actual ground disturbing activities and are mitigated through in-stream work windows. An increase in spawning substrate and decrease in fines is expected one year following the first winter flush. The long-term impacts are beneficial to the channel within the GMS Tract, habitat and aquatic organisms.

Floodplain Connectivity
Alternatives 1, 2, and 3
Direct and Indirect Effects
Floodplain connectivity and function would be improved under all alternatives considered in this analysis, specifically within the vicinity of cabin 55. Effects under Alternatives 1, 2, and 3 are described under the previous section entitled “Restore River Access to the Side Channel”.

Natural Cover (Large Wood/Pools)
Alternatives 1, 2, and 3
Direct and Indirect Effects
Under all alternatives, large wood levels would be expected to increase in Trapper Creek and its side channels by being consistent with the Forest Plan standards and guidelines for retaining wood debris. As large wood falls or is deposited in the stream, it may effect a wide array of direct and indirect changes to habitat, hydraulics and channel dynamics, including: protecting streambanks, redirecting flows, initiating and maintaining bed scour and pool creation, promoting sorting and deposition of sediments, increasing habitat quality and complexity. Increases in large woody debris within the channel will also add roughness, decrease water velocities, and absorb some of the stream’s energy.

As large woody debris is allowed to remain in place within Trapper Creek, it may also act as a collector of other debris, potentially building large debris jams. Debris accumulations may occur on gravel bars, side channels, and the main channel of Trapper Creek, and may occur such that they span the entire width of Trapper Creek. Once large single logs or debris complexes get set up, they may be stable enough to cause re-routing of Trapper Creek or diversion of its flows toward cabins. For example, woody debris has accumulated in a right bank side channel which has increased flow / velocity along the left bank adjacent to cabin 44. The bank adjacent to cabin 44 is composed of unconsolidated alluvium (cobble and gravel) and is highly erodable. The increase in velocity has undermined an old growth tree in 2003, which fell into the stream and now spans the channel. Additional wood has accumulated on the old growth tree; the growing log jam has reduced the bankfull width, reducing flood flow capacity. Lateral migration of the stream channel is likely to continue and it is possible that an additional 2-4 meters of bank (horizontal distance) could erode due to the highly erodable cobble and gravel bank. (See Figure 8 below). The rates of erosion will depend on future peak flow events (Bair 2007).

Figure 7. Left bank side channel near Cabin 44 showing old growth tree and unconsolidated alluvial bank eroding. Trapper Creek, Wind River watershed, Skamania County, Washington.

With a riparian area that is in part composed of very large and very old trees, it is likely that there will continue to be trees falling into the stream from local banks, and transported into the reach from upstream sources during high flows.

Pool quantity and quality would be improved by the mere presence of large wood in the channel and proposed restoration actions (e.g., removing specific sections of the berm and subsequent grade controls). Grade controls, consisting of large river rock buried in the bed of the side channel are designed to scour pools and decrease width/depth ratios.

There is no way to quantify risk to any particular cabin because of the complexity of events and sequences of events that could transpire. The effects would be pervasive across the GMS summer homes reach of Trapper Creek, as woody debris falls or enters the stream reach.

The result of leaving wood to function naturally in the stream suggests that the amount of LWD in the stream would increase over time. This would benefit stream processes and improve fish habitat, and therefore have a long-term benefit to the lower reaches of Trapper Creek and mainstem Wind River.

Physical Barrier

Alternatives 1, 2, and 3

Direct and Indirect Effects

One existing fish passage barrier would be replaced. Following completion of this passage improvement, there would be two anthropogenic fish passage barriers, namely the two small dams on two intermittent tributaries, remaining in the lower Trapper Creek system. These two dams are reasonably foreseeable future actions and are expected to be proposed in future NEPA and therefore analyzed in the cumulative effects section for aquatics.

Effects to Federally Listed and Forest Service Sensitive Fish Species

For purposes of the effects analysis to federally listed fish, the action area is defined as all areas to be affected directly or indirectly by the proposed action and not merely the immediate area involved in the action [50 CFR 402.02]. The action area is Trapper Creek beginning at the confluence with Wind River up to RM 0.9 and respective tributaries, including upland areas within the GMS Recreational Residence Tract boundary. The project location area includes Trapper Creek from RM 0.3 to RM 0.9, equaling 0.6 miles of stream within the GMS Tract.

Given the analysis provided above, Alternatives 1, 2, and 3 would **likely adversely affect the LCR steelhead, LCR Chinook, and their designated critical habitat** due to suspended sediment as a result of heavy equipment use within the stream channel (see the critical habitat analysis above). The likelihood of potentially trampling a juvenile fish is extremely low because of instream work windows established by WDFW and existing unfavorable habitat conditions for both Chinook and steelhead. Juvenile steelhead are more likely to be disturbed if present in the stream because they are known to rear in Trapper Creek. The associated ground disturbing actions are expected to have a long term benefit to steelhead and Chinook utilizing Trapper Creek because they are considered “recovery” actions that benefit the fish populations within Wind River. The “recovery” actions address the conditions inconsistent with Forest Plan direction and other laws and policy, and mitigate resource issues associated with recreation residence use. In this case, designated critical habitat will be restored to natural conditions by the removal of gabions and riprap, off-channel habitat improvement (reconnection of side channel), fish passage, streambank revegetation, future retention of in-stream LWD. The associated actions tied to the reauthorization of the GMS permit would have short-term adverse affects and a long-term benefit to LCR steelhead, LCR Chinook, and their designated critical habitat.

In Alternative 2, the permit holder of lot 55 would be allowed to use lot 48 as an in-lieu lot and rebuild a cabin onsite. Lot 48 is located outside the floodprone channel width of Trapper Creek and, due to the distance between the lot and Trapper Creek and other aquatic features (e.g. intermittent channels, swales), the construction of the new residence on lot 48 would not impact Federally listed fish or designated critical habitat located within the Trapper Creek 7th-field watershed.

Alternatives 1, 2, and 3 will have **no effect on bull trout, pygmy whitefish, interior redband trout, and Puget Sound coastal cutthroat trout** because they are not present within the Wind River watershed.

Section 7 ESA consultation for the actions listed and analyzed above for purposes of the GMS summer home consistency review is covered by the April 28, 2007 NMFS Biological Opinion for Fish Habitat Restoration Activities in Oregon and Washington, CY2007-CY2012.

All project design criteria for the following programmatic activity categories are thereby included as appropriate (the full text of the Biological Opinion and design criteria can be found in the project file):

- Large Wood, Boulder, and Gravel Placement
- Reconnection of Existing Side Channels and Alcoves
- Head-cut Stabilization and Associated Fish Passage
- Fish Passage Culvert Projects
- Floodplain Overburden Removal
- Riparian Vegetation Plantings

Cumulative Effects

Past and Present Actions Affecting the Current and Future Aquatic Resource

The cumulative effects boundary for aquatic resources is the 5th-field watershed, with particular attention paid to Trapper Creek. Over the last century, Trapper Creek has been moderately impacted by natural and human activity. The first substantive alterations to riparian areas and channel conditions began with the construction of roads and associated recreational development in the lower watershed and catastrophic fires in the upper watershed in the early 1900s. Periodic small-scale timber harvests began to remove easily accessible old growth trees from the valley bottom and riparian area. In the 1930s, LWD, including large instream jams, were removed in preparation for the GMS recreational residence development. Since that time, instream wood has been removed from lower Trapper Creek to protect to protect the recreational residences located near the streambanks. In the more recent past (1960s and 1970s), timber harvest occurred in the watershed along the floodplains and footslopes upstream of the GMS Tract. As a result of this, the volume of instream large woody debris has been significantly reduced, riparian vegetation has been altered, stream shading has decreased at some streamside lots, some streambanks are unstable, and channel morphology has been altered. Cabin owners have also altered the

riparian vegetation in order to improve views of the streams and to create footpaths, with similar consequences to the stream. Additionally, the riparian areas at some of the lots have been altered when the permittees have planted exotic plant species for landscaping purposes. Other past human activities that have compromised proper stream function and fish population viability within the Trapper Creek watershed are: berm construction; gabion and riprap placement; filling in of overflow channels; gray water and vehicle oil infiltration/runoff; road and parking lot creation and usage; pit toilet, barrel drum, dry well, and septic system installation and usage; fishing, small dam-building, and instream wading.

Reasonably Foreseeable Future Actions Affecting the Aquatic Resource

Septic Systems
Under *Alternatives 1 and 2*, cabin owners who do not currently have septic systems may request permission to install them. These riparian activities will occur primarily within the previously disturbed areas of the cabin sites, and involve about 500-1,000 square feet total for the cabin sites that don't currently have septic systems. Regarding instream water quality effects, although the small amount of water quality testing that has been done in the past decade in lower Trapper Creek has not found nutrient/chemical contamination, these possible future septic systems may lead to a measurable level of contaminants. However, the risk is reduced due to the requirement that septics be installed at least 100 feet from the active stream channel.

Under *Alternative 3*, it is not expected that any additional cabin owners would request permission to install septic systems on their lots because their permits would expire in 10 years. Therefore, the levels of ground disturbance within the riparian area and instream water quality would not be expected to change from their current condition during those 10 years. However, after the non-renewable permits expire in 2018, the cabins and all associated infrastructure would be removed and human occupation of the GMS Tract would cease. Therefore, there would no longer be a risk posed to the riparian area and the nutrient/chemical contaminant water quality parameter from the installation and use of new septic systems at the GMS recreational residences.

Water extraction/system
Under *Alternatives 1 and 2*, during the term of their 20 year permit, the GMS cabin association may request permission to improve their current water system. Possible future actions related to the GMS water system are: rerouting of water pipes within the riparian zone, installation of a water treatment system, removal of Maidenhair Dam, and modification of the small dam that currently serves as the GMS Tract water system in order to allow for fish passage. These actions would, in the short-term, have negative effects to the stream in the form of increased sediment during and immediately after implementation due to the use of heavy equipment instream and on the streambanks. With regard to the water extraction and usage by the cabin owners, there may be an increase in water demand as additional flush toilet septic systems are installed, as well as when a larger group of people utilize a single cabin, particularly during the summer months when Trapper Creek and its tributaries experience lower streamflows.

Under *Alternative 3*, the cabin owners are unlikely to request water system improvements or septic toilet installations because of the non-renewable permit issuance, so effects to the aquatic and riparian resources would remain the same as they are now. After the permits expire in 2018, the aquatic and riparian resource would begin to see improvement due to the removal of the two dams and any above-ground water pipes, as well as the cessation of water extraction from the Trapper Creek system by the permittees. There would be short-term, negative, instream effects from increased sedimentation due to the use of heavy equipment instream and in the riparian zone.

Hazard Tree Felling
With the implementation of *Alternatives 1 or 2,* hazard tree felling would continue as needed, reducing the number of large decadent trees in the tract over time. Over the 20-year permit period, it is estimated that as many as 100 large hazard trees would be felled (based on the average number currently felled per year). In the long-term, the character of the stand where the tract is located would probably change to include more young conifer trees, more hardwoods such as big-leaf maple, and fewer old-growth trees and snags and large wood inputs to the streams and floodplains. This reduction would occur on less than one-half of one percent of the analysis area, while the remainder of the analysis area will continue to develop late-successional and old-growth characteristics. Future large wood is expected to continue to be delivered from upstream sources due to the nature of the drainage being mainly wilderness area.

Under A*lternative 3*, cabin permits would expire after 10 years and the tract would no longer be occupied. Over time this would result in eliminating the need to cut hazard trees and to buck up trees on the ground for access. The riparian forest would retain greater numbers of old, dying and dead trees. The stream would benefit from higher levels of old trees and snags, some of which would enter the channel from windthrow or undermining by the creek.

Fish Passage and Habitat
With *Alternatives 1, 2, and,* both short- and long-term benefits to lower Trapper Creek are expected from the restoration of fish passage at the culvert on FR 5401 which will allow access to an estimated additional 500 feet of habitat to resident fish, LCR steelhead, and LCR Chinook. Improved channel conditions, and thus, improved migration, spawning, and rearing conditions, are expected due to gabion removal, the reopening of the high flow channel, the reconnection of the side channel due to the berm reduction, and the placement of instream structures. The short-term effect to the aquatic resource from these restorative actions is an increase in instream sediment from having heavy equipment working instream and on streambanks. The differences between Altenatives 1 and 2 and Alternative 3 are: (1) all of the proposed restoration actions will occur within 2-4 years under Alternatives 1 and 2 and mostly after the 10 year permits have expired under Alternative 3, and (2) the berm will be reduced under Alternatives 1 and 2 and it will be removed completely after the 10 year permit has expired under Alternative 3.

The restoration of passage at these sites would complement other fish passage barrier removals that have recently been accomplished in the Wind River HUC5 watershed, including the culvert removal and bridge installations on Mouse Creek, Trout Creek, and the

tributary to Trout Creek near the FR 43 Bridge. There is also the possibility of replacing a culvert to allow for fish passage and installing associated grade controls on Layout Creek, another stream within the Wind River HUC5 watershed. Fish passage in the Wind River watershed will be further enhanced by removal of Hemlock Dam which is scheduled to occur in the summer of 2008. Additionally, within the GMS Recreational Residence Tract, a culvert on FR 3065 was replaced on a small, unnamed, intermittent tributary to Trapper Creek in September 2007. A second culvert on the same tributary, also on FR 3065, is projected to be removed in summer 2008. Cumulatively, these projects combined will provide or improve passage in seven streams, enhancing access to over 20 miles of habitat.

Additionally, although not in the Trapper Creek sub-watershed, there have been extensive restoration activities undertaken within the Wind River HUC5 watershed during the past seventeen years, particularly under the Upper Trout Creek Restoration Project. For the most part, these restoration activities took place in near Trout Creek, Planting Creek, Layout Creek, Compass Creek, and Crater Creek, all of which are in the Trout Creek sub-watershed. These restoration actions include: instream and streambank LWD structure placement, LWD placement on the floodplains and gravelbars, riparian thinning, tree planting, side-channel reconnection, road decommissioning, bridge, culvert, and trail repair, and noxious weed treatments.

Recreation
There are several ongoing and future recreation-related activities within the Trapper Creek watershed that would possibly have cumulative effects to the aquatic and riparian resource when combined with *Alternatives 1, 2, or 3.*

Three of these activities are construction-related. They are (1) the installation of a vault toilet at the Trapper Creek Trailhead, (2) the modification or replacement of the 5 O'Clock Bridge within the GMS Tract, and (3) the removal of the Scrounger Bridge above the GMS Tract. Both of the bridge projects may require instream work, so there may be short-term, detrimental effects to the stream system in the form of increased sediment. The long-term benefit from the installation of the vault toilet would be reduced risk of water contamination from recreationists. The long-term benefit from the modification or replacement of the 5 O'Clock Bridge is safety-related, however, the benefit form the Scrounger Bridge removal would be in the form of Trapper Creek once again having access to the floodplain throughout the project area.

The other recreation-related activities which may have cumulative impacts, in addition to the GMS Recreational Residence Continuance Determination Project, are: the current and future recreational lodging at the Government Mineral Springs Guard Station, camping at the Government Mineral Springs Campground, dispersed camping in the Wind River HUC 5 watershed, use of Camp Howe, and use of the Trapper Creek Wilderness Trailhead. The short-term effects to the aquatic resource are expected to remain relatively low within the Trapper Creek drainage, however, these effects could include soil compaction at the trails and camping sites, fuel and oil leakage from vehicles, litter and inappropriate human waste disposal, fire risk, riparian vegetation removal, illegal firewood cutting, fish harassment, and egg and fish injury and mortality.

Timber Sales
Presently, there is one timber sale planned for the near future (within the next fiscal year) in the Wind River HUC5 watershed. The WinThin Timber Sale is located outside the Trapper Creek sub-watershed and will have units close to Trout, Layout, and Compass Creeks. Although there will be no effects to Trapper Creek, there is an instream sediment increase expected within Trout, Layout, and Compass Creeks as a result of the WinThin Timber Sale as a result of temporary road construction and upslope and outer riparian thinning. There are other timber sales foreseen for this watershed, however, at this time, the exact unit locations have not been decided.

Aquatic Conservation Strategy (ACS)
A primary component of the 1994 Northwest Forest Plan (NWFP) is the ACS. The ACS was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The NWFP states that the ACS is designed to protect salmon and steelhead habitat on Federal lands managed by the FS within the range of Pacific Ocean anadromy.

The ACS is intended to meet nine objectives applied over time at watershed and broader scales. These nine objectives include the habitat features of aquatic ecosystems addressed as PCEs above under the Critical Habitat section. To accomplish the nine objectives, the ACS contains four components: (1) Riparian Reserves, (2) Key Watersheds, (3) Watershed Analysis, and (4) Watershed Restoration. Specific standards and guidelines are associated with Riparian Reserves and Key Watersheds. All four of the ACS components are designed to operate together to maintain and restore the productivity and resiliency of riparian and aquatic ecosystems, and are therefore supported by the analysis of Critical Habitat.

Riparian Reserves
Within the GMS Tract, approximately 10% of the Riparian Reserves are occupied by primary access roads, driveways, cabins. The GMS tact parallels both sides of Trapper Creek for over ½ mile. Developed areas associated with the cabins, including parking areas, outbuildings, and heavy-use areas occupy additional area within the Reserves. Forest conditions in the vicinity of the cabins have a reduced level of snags, dying trees, and down logs due to their removal for hazard reduction, cutting of down wood for access and to acquire firewood. Small patches of timber harvest are also evident in the outer Reserves. As a result, these stands contribute fewer trees to the aquatic system, which is one of the reasons Trapper Creek is limited in large woody debris. In spite of these disturbances, Riparian Reserves within the GMS Tract continue to maintain a substantial old growth forest canopy comprised of western red cedar, hemlock and Douglas fir, along with an understory of red alder and big leaf maple.

Key Watersheds
The GMS Tract is located in the Trapper Creek drainage, which is located within the Wind River watershed. Wind River is a Tier I Key Watershed under the NWFP, highlighting its importance for protection and restoration of aquatic habitat. Tier 1 Key Watersheds were selected for directly contributing to anadromous salmonid conservation. Activities to protect

and restore aquatic habitat in Key Watersheds are higher priority than similar activities in other watersheds.

Watershed Analysis
A second iteration watershed analysis was completed for Wind River in 2001. Information in the Wind River watershed analysis was used to guide management prescription (restoration actions) and monitoring programs for activities associated with the GMS consistency review.

Watershed Restoration
Activities associated with the GMS consistency review are designed to restore watershed processes to recover degraded habitat in Trapper Creek. The proposed action and alternatives includes restorative actions that would be implemented by the Forest Service and Association, such as the removal of gabions and fish passage improvement.

The 9 ACS Objectives
Activities that would occur within the riparian reserve of the Wind River Tier I Key Watershed as a result of the proposed action are: reconnecting and reconstructing a side channel; removing gabions and rip/rap; restoring streamside areas via angling slopes, installing rock barbs at the streambanks, and revegetation; replacing a culvert; relocating a cabin; reopening a high flow channel; and potentially moving instream wood. The magnitude of the management of the GMS summer home tract in lower Trapper Creek within the Wind River watershed is small to the degree that the proposed action is considered neither a benefit nor a detriment at the watershed scale but a benefit at the local scale due to the restorative actions.

This section is supported by the analysis information provided above under the Direct and Indirect Effects for aquatics discussed above. Therefore, only brief summaries of effects are shown below in order to reduce redundancy of information.

Objective 1: Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

> *Alternatives 1, 2 and 3* are expected to maintain the current distribution, diversity, and complexity of watershed scale features. All alternatives improve stream and riparian conditions at the project scale by reconnecting a side channel and removing gabions and rip rap throughout lower Trapper Creek within the GMS Tract, approximating 0.6 miles. The reconnected side channel would be made accessible to aquatic organisms within the tract, thereby reducing velocity impacts to the main channel. Some existing gabion walls and riprap along Trapper Creek would be removed and streambanks revegetated.
>
> Riparian conditions at the watershed scale would be maintained. At the project scale riparian conditions have the potential to degrade over time given the possibility of shade providing trees being removed for safety.

In *Alternative 3*, riparian conditions would improve in the long term once the cabins are removed and hazard tree removal is no longer needed.

Objective 2: Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.

Alternatives 1, 2 and 3 will restore drainage network connectivity within the lower Trapper Creek drainage by reconnecting a side channel and improving fish passage. Spatial and temporal connectivity within and between watersheds will be maintained at current conditions. The reconnection of a side channel will provide additional refugia and complex habitat to migrating and spawning fish, as well as address hydrologic functions that have been limited within the GMS Tract reach of Trapper Creek. Revegetating streambanks with native early to mid seral components at cabins 2 and 25 would enhance shrub growth in previously disturbed streambanks.

A road crossing would be upgraded to provide full fish passage through a culvert. This fish passage barrier is located on a tributary to Trapper Creek and is primarily a resident fish bearing stream.

Objective 3: Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

Alternatives 1, 2, and 3 restore unstable streamside conditions within the GMS Tract that were created from gabions and riprap. These gabions and riprap, along with the removal of logs from riparian and instream areas, have removed a significant source of stability, channel roughness, and physical integrity of lower Trapper Creek. The removal of gabions and riprap will no longer result in Trapper Creek downcutting and will reduce erosional forces on streambanks. Bank stability will be improved near cabins 20 and 21. Leaving large wood in place will provide additional stability and increase area for flood flows. Alternative 1, 2, and 3 would reconnect the side channel that is currently disconnected from the mainstem Trapper Creek by cabins 53 and 55 through a reduction in the berm height located on lot 55. However, under Alternative 3, the berm would be removed when the permits expire at the end of 10 years. Alternatives 1 and 2 will restore the physical integrity of the aquatic systems in lower Trapper Creek and maintain conditions at the watershed scale through the proposed aquatic restoration actions to be implemented in the next 2-4 years. Alternative 3 would also restore the physical integrity of the aquatic systems in lower Trapper Creek and maintain conditions at the watershed scale, however, the aquatic restoration actions would not be fully implemented until the 10 year non-renewable term permits have expired.

Objective 4: Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

Alternatives 1 and 2 are not expected to cause any change to the current water quality due to impacts from waste water systems within the GMS Tract. Old pit toilets may, if desired by the cabin owners, be replaced in the future, with new septic systems located at least 100 feet from the stream under oversight from the Skamania County Health Department. The potential for increased transmission of waste materials to Trapper Creek because of the increased water effluent used by an increase in flushing toilets is expected to be mitigated by locating septic systems at least 100 feet away from the stream.

Under *Alternative 3*, the water quality impacts from waste water systems within the GMS Tract are expected to improve in the long-term (i.e. after the 10 year non-renewable term permits have expired and the cabins and septic systems have been removed).

Under *Alternative 1*, cabin 55 would remain in place and would be subject to flooding or damage. If the cabin is flooded or damaged, potentially toxic buildup or household materials could be introduced to the stream, degrading water quality. However, the likelihood of this happening is low.

Under *Alternative 2*, cabin 55 would be removed from the site along with its entire associated infrastructure. In the event of any site flooding under this alternative, there would be no risk of introducing hazardous materials to the stream.

Under *Alternative 3*, there would be a risk of cabin 55 being flooded, and of the introduction of hazardous and building materials to the stream since cabin 55 would remain in place for approximately ten years until the non-renewable term permit expired. The cabin would be removed following this 10 year permit period. During the ten year period, risks are similar to those under Alternative 1.

Under *Alternatives 1, 2, and 3,* stream temperatures in Trapper Creek are expected to be maintained because there is no scheduled treatment of riparian forests. Water quality within Trapper Creek is expected to be maintained at the project and watershed scale. The impacts of global climate change at the landscape scale are uncertain and it may be assumed that the availability of water will be limited in the future, thus making water quality much more sensitive.

Objective 5: Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

Alternatives 1, 2 and 3 would cause short term increases in turbidity and sediment as explained under the effects section. The heavy equipment used within the channel for the removal of gabions and riprap, fish passage improvements, small dam removal, and the reconnection of a side channel will generate notable sediment during actual implementation. Not all activities are expected to occur at the same time within the same year. Special instream work windows will be followed to reduce potential impacts to aquatic organisms. Streambanks that will be restored will more than likely result in some sediment delivery to the stream but it is expected to be diluted and move downstream in random pulses. Suspended sediment is expected to settle out of the water column downstream of the disturbed areas and dissipate by the time Trapper Creek merges with the mainstem of Wind River. Large wood placed along disturbed banks is expected to improve bank stability and reduce sediment inputs after installation. Suspended sediment is expected to be short-term and last approximately 1 month when fish are not spawning or eggs incubating in the gravel.

Sediment as a result of actions under *Alternative 1 and 2* will not be discernible against the range of variation of sediment processes at the watershed scale. Therefore, the sediment regime under which the aquatic ecosystem has evolved within the GMS Tract would be restored at the project scale and maintained at current conditions at the watershed scale.

Alternative 3 would have the long term benefits to the sediment regime via the removal of all cabins and their associated infrastructure. Once the permits expire, hazard trees would not be periodically removed, driveways would be scarified, driveway culverts would be removed, and recreation use would not occur at current use-levels during the summer months at the streambanks, within the stream channel, and within the floodplain-located lots. These actions would result in reduced soil compaction, road runoff, and streambank erosion, as well as in improved sediment routing.

Objective 6: Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

Alternatives 1, 2, and 3 do not include timber harvest or forest cover removal that would impact peak/base flows. However, the restorative actions outlined under each alternative all contribute to improved habitat conditions as a result of reduced erosive flows and the reconnection of a side channel. The reduction in erosive flows will help create and sustain riparian, aquatic, and wetland habitats in lower Trapper Creek. In-stream flows will be maintained at the watershed scale.

Under *Alternatives 1, 2, and 3*, there is uncertainty with regard to how the GMS water system is impacting the intermittent flows of Trapper Creek and its unnamed tributary containing the small dam, especially as water diversions and extraction have been taking place in the action area for the past century. The current water

right allows for a withdrawal of 0.01 cfs. With Alternative 1 and 2, the water extraction would continue until 2028, at least. With Alternative 3, the water extraction would continue until 2018.

Objective 7: Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

Alternative 1, 2, and 3 will restore the timing, variability, and duration of floodplain inundation and water table elevation at the project scale and maintain at the watershed scale. Actions under all alternatives will improve floodplain connectivity and function, specifically near cabin 55. The side channel at cabin 55 would become active during flows approximating the bankfull flow and become accessible to steelhead and Chinook immediately following reconnection. Reconnecting the side channel will increase the effective cross sectional area for flood flows, resulting in lower velocities, water depth, and reduced stream power in the main channel of Trapper Creek, and off-channel habitat for fish. Upstream of the side channel proposed for reconnection, deposition of coarse and fine substrates within the mainstem of Trapper Creek would be reduced, as this area would experience less backwatering during high flows. Trapper Creek would incise through some of the deposits in this area which may allow for less frequent flooding on an access road to cabin 56.

Stream power in the mainstem of Trapper Creek near cabin 55 is expected to be reduced by an estimated 14-29% from current levels during high flow events. The reduction in stream power is likely to result in lower rates of erosion on the streambed and banks, which would then increase bank stability.

Objective 8: Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

Under *Alternatives 1 and 2*, the possible future removal of hazard trees and installation of septic systems (approximately 10 X 30 ft. in size), which may require removal of trees in certain cases, would impact individual plants and shrubs within the riparian area. However, the reconnection of a side channel near cabinss 53 and 55, plus revegetating previously disturbed ground along Trapper Creek near cabins 2, 20, 21, and 25, would offset some of the immediate impacts to vegetation. The restored side channel is expected to serve as refugia during high flows, reduce bank erosion, and act as a wetland during low flow conditions, with native plants planted throughout the riparian area. Thus, the overall species composition and structural diversity of plant communities in riparian areas and wetlands would be maintained at the project and watershed scales under Alternatives 1 and 2.

Under *Alternative 3*, ten-year, non-renewable permits would be issued; thus, short-term, localized impacts similar to Alternatives 1 and 2 would be expected during the time that the permits are active. Conditions would be expected to improve within a short time period following removal of all cabins and associated improvements and the implementation of required restoration measures (i.e. driveway scarification and culvert removal). The continuing impacts of hazard tree felling and the current level of human presence in the GMS Tract would cease after the 10-year non-renewable permits expired.

Objective 9: Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.

Under *Alternatives 1, 2, and 3*, mature trees may be cut if they become hazards to the cabins and to users of the GMS Tract throughout the life of the permits, 20 years with Alternatives 1 and 2 and 10 years with *Alternative 3*. Trees that are cut down would remain in place or would be partially removed if they land on access routes or highly used areas within occupied lots. The supply of large woody debris available to the floodplains, streambanks, and stream from the immediate riparian area within the GMS Tract may be reduced over time as a result of the removal of old and dying trees for hazard mitigation. This impact may be offset by the delivery of large wood from reaches in wilderness areas above lower Trapper Creek and hazard trees that would be felled into the stream.

An overall improvement in the quality and type of habitat available to riparian dependent species would occur under all alternatives. However, *Alternative 3* provides the greatest benefit over a longer time period. All alternatives do not include any scheduled treatment of riparian forests, therefore populations of native plant, invertebrate and vertebrate riparian-dependent species would be maintained at the project and watershed scale.

Magnuson-Stevens Fishery Conservation and Management Act (MSA)

Federal agencies are required, under section 305(b)(2) of the MSA and its implementing regulations (50 CFR 600 Subpart K), to consult with National Marine Fisheries Service (NMFS) regarding actions that are authorized, funded, or undertaken by that agency that may adversely affect Essential Fish Habitat (EFH). The MSA section 3 defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." If an action would adversely affect EFH, NMFS is required to provide the Federal action agency with EFH conservation recommendations (section 305(b)(4)(A)).

The Pacific Fishery Management Council (PFMC) designated EFH for Pacific groundfish and coastal pelagic fish species in 1998, and they designated EFH for Pacific salmon in 1999 (http://www.pcouncil.org/). The action area does not include habitat for groundfish, coastal pelagic species, coho, or pink salmon. However, the action area does include habitat designated as EFH for adult migrating chinook. The geographic extent of EFH in Trapper Creek is defined as all currently viable waters and most of the habitat historically accessible to Chinook within the subwatershed. Salmon EFH excludes areas upstream of longstanding,

naturally impassable barriers. Therefore, EFH for Chinook for this project are the mainstem, and the tributaries to the mainstem, of Trapper Creek up to river mile 1.9.

Effects from actions under Alternatives 1, 2, and 3 will not impact those waters necessary for spawning, breeding, feeding, or growth to maturity for Chinook because the quantity of EFH will not be reduced and the quality of EFH will be maintained and not degraded. Project design criteria from the April 28, 2007 NMFS Biological Opinion for Fish Habitat Restoration Activities in Oregon and Washington, CY2007-CY2012, and Northwest Forest Plan standards would be met.

As described in detail under Direct and Indirect Effects for aquatic resources, the use of heavy machinery will result in suspended sediment during actual ground disturbance for purposes of implementing restoration activities. However, the duration of suspended sediment will not inhibit spawning, breeding, feeding, or growth to maturity for Chinook because:

- Implementation of instream work would not take place during the spawning period, therefore there would be no breeding or migration during the time suspended sediment is expected
- Only adult migrating Chinook use Trapper Creek; juveniles are not known to rear in Trapper Creek, therefore there would be no impact to feeding or growth to maturity

The assessment of potential adverse affects from elements of the proposed action on EFH is based on information in the above sections. Actions under all alternatives will have **no effect** on EFH for Chinook because the life stage of Chinook using Trapper Creek within the GMS Tract is limited to the migration period, and ground disturbance is expected to take place during the instream work window outside of the migrating/spawning period, and Chinook are not known to spawn in Trapper Creek.

Social, Economic and Recreation Impact Analysis

Existing Situation

The Government Mineral Springs Tract is located 14 miles from Carson, Washington. They are the last occupied residences in the area heading north on the Wind River Highway. The residences are located on either bank of the pristine Trapper Creek surrounded by old-growth trees.

Occupancy by recreation residence permit holders varies throughout the tract, from regular use throughout the year to minimal required use (or less). There has been an average of 2-3 cabin sales/year for the past several years, with a trend towards multi-family ownership of the cabins.

For the residences on the north side of Trapper Creek, merely crossing their access road leads them into the Trapper Creek Wilderness which was designated in 1984. Thus situated, the

Government Mineral Springs Tract is ideally suited for outdoor recreation that is just off the residents' door steps or a short drive away.

The Government Mineral Springs area has a long history of occupation and recreation. Popularity of the mineral springs situated along Trapper Creek led to the construction of the Government Mineral Springs Hotel in 1912. A campground followed, as did the establishment of the recreation residences. While the hotel burned in 1935 and the original campground closed in 1974, the recreation residences have remained as have several other facilities.

The following recreation facilities are in close proximity to the tract residences:

- **Government Mineral Springs Campground** - The current campground was relocated to the former site of the hotel. This fee campground offers five campsites.
- **Iron Mike** – Iron Mike is a public water pump that supplies mineral spring water. It is adjacent to Government Mineral Springs Campground and the gate leading into recreation residences on the south side of Trapper Creek.
- **Government Mineral Spring Guard Station** – This guard station was built in 1937. It was recently renovated and is now available for nightly public rental.
- **Government Mineral Springs Sno-Park** – This is a parking area on Road 3065 which is the terminus of public snow plowing into the Government Mineral Springs area.
- **Camp Howe** – This is an administrative camping site under permit to Skamania Saddle Club. It is located near the confluence of Trapper Creek and Wind River.
- **Trapper Creek Trailhead** - This is the primary public trailhead accessing Trapper Creek and Dry Creek Trails and the Trapper Creek Wilderness. It is a recreation fee site.
- **Government Mineral Springs Trailheads #1, #2, and #3** - These are three small trailheads for short connector trails leading to the main trails in Trapper Creek Wilderness. Each trailhead consists of a sign and wilderness registration box. They have virtually no parking space. Though they are public trailheads, they are behind the locked gates leading into the Government Mineral Springs Tract and used primarily by tract residents.

Effects to Social, Economic and Recreational Resources

Sense of Loss
Alternative 1
Direct and Indirect Effects

In this alternative, the permit holders of lot 55 would be authorized to remain on lot 55 and not experience the inconvenience and sense of loss of relocating to lot 48.

Lowering the berm at cabin 55 and implementing the associated actions within the overflow channel (removing gravel, culvert, and associated fill) would affect driveway access to and parking at cabins 53 and 55. Permit holders and their guests may be inconvenienced by longer walking distances to access the cabins. High water events that result in large wood debris deposition within the overflow channel could cause further difficulty in cabin access or cause damage to cabin 55 and associated improvements. Cabin 53 is situated on a small rise and would not likely be directly affected by large, woody debris in the overflow channel.

In the event of a large flood, the cabin could be undermined and severely damaged, resulting in the loss of holder improvements, potentially creating safety concerns. Safety concerns are expected to be limited as any large flood event would be expected and holder would have adequate time to leave (or avoid) the site. The permit holders for lot 55 could experience increased uncertainty with respect to cabin flooding whenever there is a major storm event that causes Trapper Creek to overflow the reduced berm. The decreased ease of access for cabins 53 and 55 and an increased possibility for flooding at cabin 55 could affect the holders' enjoyment while actually using the site, as well as general angst regarding the condition of their cabin, improvements and the immediate surroundings when they are away from the area.

For the permit holders throughout the tract, there may be concern over changes in and/or the Forest Service's adherence to laws, regulations and policy associated with in-stream habitat/conditions. Removal of existing gabions and retention of current and future large, woody debris would likely cause concern of permit holders with cabins in close proximity to Trapper Creek whenever a large storm event occurred that could affect the stream channel and/or facilitate recruitment and deposition of large, woody debris within the tract. There would be a level of uncertainly as to whether or not their cabin or the lot could be affected ultimately by flood waters.

Cumulative Effects
No cumulative effects would be expected.

Alternative 2
Direct and Indirect Effects

Until the cabin permit holders at lot 55 relocate to lot 48, they would experience the same effects as described in Alternative 1 above.

The permit holders for lot 55 have had their permit since 1987. The holder's siblings and their families all use the cabin. The permit holder and family members have expressed a deep sense of loss associated with the possibility of deconstructing the actual cabin and removal from the lot. Conversely, the permit holders would still be able to enjoy the recreation opportunities that the tract offers a permit holder and they have expressed optimism of the opportunity to retain a cabin within the tract.

For the permit holders throughout the tract, there may be concern over changes in and/or the Forest Service's adherence to laws, regulations and policy associated with in-stream

habitat/conditions. Removal of existing gabions and retention of current and future LWD would likely cause concern of permit holders with cabins in close proximity to Trapper Creek whenever a large storm event occurred that could affect the stream channel and/or facilitate recruitment and deposition of LWD within the tract. There would be a level of uncertainly as to whether or not their cabin or the lot could be affected ultimately by flood waters.

Cumulative Effects
No cumulative effects would be expected.

Alternative 3
Direct and Indirect Effects
In the first 10 years, until the term-permits expire, cabin permit holders would experience the same effects as described in Alternative 1 above.

Several of the cabins have been in the same family for over 50 years. A few existing permit holders have been owners of more than one cabin within the tract over time; one since 1937. While all permit holders and family members would feel a sense of loss with their recreation residence permit not being reauthorized, those with the longest history of use would likely experience the greatest loss.

Cumulative Effects
No cumulative effects would be expected.

Economic Effects
Alternatives 1
Direct and Indirect Effects

Economically, cabin permit holders would be responsible for paying for any cabin or lot improvements. Future proposals by permit holders for new improvement or modifications to existing structures that occur in the floodplain would need to be in compliance with Executive Order 11988 for Floodplains and other applicable Forest Plan policies. This may result in modifications to proposals, additional implementation costs, or the inability to implement a given proposal.

Direct costs associated with the need to modify existing infrastructure to accommodate the side channel reconstruction would be a further economic burden on the permit holders of lot 53 and 55.

Cumulative Effects
No cumulative effects would be expected.

Alternative 2
Direct and Indirect Effects
As in Alternative 1, cabin permit holders would be responsible for paying for any cabin or lot improvements. Future proposals by permit holders for new improvement or modifications to existing structures that occur in the floodplain would need to be in compliance with

Executive Order 11988 for Floodplains and other applicable Forest Plan policies. This may result in modifications to proposals, additional implementation costs, or the inability to implement a given proposal.

The permit holder of lot 55 would lose the value in their cabin and improvements, which have undoubtedly appreciated over time, and they would be responsible for paying for the cost of removing their cabin and any improvements on the leased lot. This could have a major financial burden on the holder. The permit holder would not be authorized to move the cabin intact along the road to lot 48 due to the need to remove large trees in suitable spotted owl habitat. Other options are likely more costly and would likely affect the holders financially. Conversely, the permit holders would still be able to enjoy the recreation opportunities that the tract offers a permit holder and they have expressed optimism of the opportunity to retain a cabin within the tract.

Cumulative Effects
No cumulative effects would be expected.

Alternative 3
Direct and Indirect Effects
As in Alternatives 1 and 2, cabin permit holders would be responsible for paying for any cabin or lot improvements. Future proposals by permit holders for new improvement or modifications to existing structures that occur in the floodplain would need to be in compliance with Executive Order 11988 for Floodplains and other applicable Forest Plan policies. This may result in modifications to proposals, additional implementation costs, or the inability to implement a given proposal.

In addition, permit holders would lose the value in their cabins and improvements, which have undoubtedly appreciated over time, and they would be responsible for paying for the cost of removing all their respective cabins and any improvements on the leased lots. This could have a major financial burden on the holders.

Cumulative Effects
No cumulative effects would be expected.

Occupancy
Alternatives 1 and 2
Direct and Indirect Effects
The expectation is that as recreation residence use continues, actual recreation use of the sites will increase with multiple-family ownership. The continued presence of the recreation residence program would not change the existing status of recreation opportunity or public use of the area. Under these alternatives, areas around the structures would still be accessible for recreation by the general public.

Cumulative Effects
Under Alternatives 1 and 2, recreation opportunities would not change as cumulative effects would be unquantifiable when added to the effects of other past, present and reasonably

foreseeable future actions. Therefore, there are no expected cumulative effects to recreation under these alternatives.

Alternative 3 (No Action)

Direct and Indirect Effects

The short term, (10 years) direct and indirect effects would be the same as Alternatives 1 and 2. In the long term, the No Action Alternative would directly affect recreation use since permit holders would no longer have access to structures or improvements under their SUP. Indirectly, opportunity for other public use may increase by removal of recreation residence structure and/or improvements. The general public might be more likely to recreate in the area where structures previously existed. The access roads would likely remain closed to motorized access by the public.

Cumulative Effects

In the short term there would be no cumulative effects as recreation residence use continues for the first 10 years. Following expiration of the permits and removal of the improvements, there likely would be a decrease in the overall effects of human use of the local environment. The diversity of recreation opportunity would be diminished within the tract area, yet when placed in the overall context of the cumulative effects area, the effects are immeasurable and do not affect the diversity of recreation on the forest as a whole.

Use of Adjacent Recreation Facilities

Alternatives 1 and 2

Direct and Indirect Effects

Use of nearby developed recreation facilities would not change. Tract residents would continue to be the primary users of Government Mineral Spring Trailheads #1, #2, and #3, and their short connector trails.

Tract residents would continue to comprise a large percentage of the people who park at Government Mineral Springs Sno-Park. In the winter, this sno-park represents the closest that tract residents can drive to their cabins. Tract residents then walk, snowshoe, ski, or snowmobile the remaining quarter to half mile.

Use at the other recreation facilities listed previously would not change. For the most part, tract residents do not use these other facilities much, having their own cabins to overnight and their own trailheads to access Trapper Creek Wilderness. These facilities typically serve the greater public.

Cumulative Effects

No cumulative effects would be expected.

Alternative 3

Direct and Indirect Effects

The issuance of a 10-year, non-renewable permits to the cabin owners would lead to a gradual reduction of recreation pressure in this area. It is assumed Forest Service Roads 5401 and 3065 leading into the tract would remain gated to reduce the potential of vandalism,

even after the 10-year permits expire. At that time, there would be no need to further maintain Government Mineral Springs Trailheads #1 and #2, or their connector trails. Government Mineral Springs Trailhead #3 would continue to be maintained due to its potential for use by people at Government Mineral Springs Campground and Guard Station.

Use of Government Mineral Springs Sno-Park would decrease following expiration of the 10-year permit. Users would likely be only the winter renters of the Guard Station.

Use at the other nearby recreation facilities would not change. Use of these facilities is largely independent of occupancy at the tract residences.

Cumulative Effects
No cumulative effects would be expected.

Recreation in Trapper Creek Wilderness

Alternatives 1 and 2
Direct and Indirect Effects
Trapper Creek Wilderness is rather small (6,050 acres) and not as visited compared to other federally designated wildernesses in the western U.S. On average only 2,000 people a year visit. The adjacent tract residents comprise 8-15% of these annual visitors, based on permit data from Government Mineral Springs Trailheads #1, #2, and #3. Their use may actually be higher, as frequent hikers may not always take the time to register.

Since 1998, visitation within Trapper Creek has hovered near the desired maximum limits established in the GPNF Wilderness Resource Protection Decision Notice. However, levels of solitude based on visitor encounters are well within standards. The physical impacts of camping are also within standards. Thus, past use of Trapper Creek Wilderness by tract residents has not contributed to overuse problems.

While future trends are difficult to predict, future visits by tract residents will not change much, as the number of residences would remain the same or nearly so. Overall use for Trapper Creek Wilderness would have to nearly double for visitor encounters to exceed standards. If a doubling of use occurred, physical impacts from overnight camping would likely exceed standards; however, little of this impact could be attributed to tract residents. Permits indicate nearly all tract residents are day hiking.

Cumulative Effects
No cumulative effects would be expected.

Alternative 3
Direct and Indirect Effects
Based on past wilderness permit numbers, termination of the SUPs for these recreation residences would reduce visitation in Trapper Creek Wilderness by 8-15%. Remaining visitors would experience slightly more solitude. Physical impacts from overnight camping are likely to be unchanged.

Without the contribution of tract residents, there would be greater capacity for additional use of Trapper Creek Wilderness. Current trends do not suggest this capacity would be utilized.

Cumulative Effects
No cumulative effects would be expected.

Other Recreation

Alternatives 1 and 2
Direct and Indirect Effects
Tract residents would continue to partake in other recreation in this corner of the Gifford Pinchot. Activities likely include fishing on the Wind River, deer and elk hunting, hiking on other trails or in the Indian Heaven Wilderness, berry and mushroom picking, and/or winter recreation in the Old Man Pass to Lone Butte corridor. This corridor is only ten miles further up Wind River Highway and has six Sno-parks that access miles of groomed trail for cross country skiing and snowmobiling. These Sno-parks are near capacity on the some winter weekends, but generally have space most all other times.

Cumulative Effects
No cumulative effects would be expected.

Alternative 3
Direct and Indirect Effects
Tract residents have probably developed an affinity for this area and would likely continue to recreate here, even after their 10-year permits expire. But without their nearby cabins, they would likely visit less. The diverse opportunities for recreation in this area would be less realized by a segment of the public.

Cumulative Effects
No cumulative effects would be expected.

Soils

Existing Condition and Effects to Soils

The GMS Tract is situated within a Forest Plan Management Area designated as "Roaded Recreation without Timber Harvest" (2L). A Forest Plan standard and guideline for soil (FP Amendment 11, p. 2-61) states that "no more than a total of 20 percent of an activity area may be compacted, puddled, displaced or subjected to a severe burn as a result of activity." An "activity area" is defined as the total area for which a ground-impacting activity is planned. For this analysis, the 2L management area is considered the activity area. The acreage for the 2L management area is estimated as 214 acres. The campground, dispersed recreation use areas and existing roads within the 2L management area account for approximately 12 acres of disturbed area based on geographic information system (GIS) calculations. For the tract, a one-quarter acre figure is used for each lot of the existing 45 lots (including the currently unoccupied in-lieu lot), consistent with the special use permits, for a

total of 11 acres of disturbed acreage under permit. This assumes that the entire one-quarter acre area associated with each permit is disturbed, which is typically not the case. Some lots do exceed this amount, generally due to expanded parking areas and driveways, and permit holders would be required to discontinue use of these areas and/or actively revegetate areas, based on required inspections for permit reissuance. A few of the lots have very little soil disturbance, commensurate with the existing use.

Based on these figures, a total of 23 acres are currently disturbed, below the 20 percent threshold and within the Forest Plan standard for soil disturbance. Table 5 displays the disturbed soil calculations for the existing condition.

Table 5 Current acres and percent of total Management Area 2L soil disturbance.

2L Area Disturbed	Acres	% of total
Roads and Campground	12	5.6%
Lots Under Permit	11	5.1%
Total	23	10.7

Effects Analysis

Alternative 1, 2 and 3

Direct, Indirect and Cumulative Effects

For all alternatives, the total amount of soil disturbed is not expected to exceed the current estimated acreage for any of the alternatives during the time of occupancy (i.e. one-quarter acre per lot). The cumulative effects analysis boundary is the GMS tract. Discontinued use of excessive parking and driveways along with revegetation efforts would reduce some disturbance. Increased use at lots that currently receive little use would be expected as cabins are sold and use increases, consistent with the trend witnessed during the last decade. New septic systems would be constructed within the one-quarter acre permitted area and not increase the total area impacted.

For Alternative 2, lot 55 would revegetate over time once the existing improvements were removed and use discontinued. Lot 48 (in-lieu lot), would be more disturbed than the present, once new improvements were constructed on the lot.

For Alternative 3, currently disturbed areas associated with the lots would be rehabbed upon removal of all permit holder improvements once the permits expire. The existing system campground and system roads would remain in place.

There are no known future projects that would be implemented with the 2L management area that would cumulative add to soil disturbance.

Wildlife

Existing Condition and Effects to Wildlife Resources

This section documents the continuing effects of the recreation residence tract on federally-listed species, and their critical habitats, and determines the need for consultation or conferencing with the U.S. Fish and Wildlife Service. This examination also includes analysis of and impacts to the Forest Service Pacific Northwest Region Sensitive species and wildlife species covered under the Forest Plan and compares effects by alternative.

Table 6 summarizes the effects to the Threatened, Endangered, and Sensitive species where species habitat is present within or adjacent to the project area. The Wildlife analysis, located in the Project File, identifies a complete list of species evaluated.

Table 6. Summary of Effects to TES Species

Species Name	Species Status	Species habitat present within or adjacent to the project area?	Species documented in the project area?	Effect Determination
Pacific Fisher *Martes pennanti pacifica*	Candidate	Yes	No	No Impact (Thought to be extirpated from Washington)
Townsend's Big-eared Bat *Corynorhinus townsendii*	USFS Sensitive	Yes	No	No Impact
Northern Spotted Owl *Strix occidentalis caurina*	Threatened	Yes	Yes	May Affect, Not Likely to Adversely Effect Beneficial Effect (Alt. 3)
Critical Habitat for the Northern Spotted Owl	Designated	Yes	Yes	May Affect, Not Likely to Adversely Effect Beneficial Effect (Alt. 3)

Table 6. Summary of Effects to TES Species				
Species Name	**Species Status**	**Species habitat present within or adjacent to the project area?**	**Species documented in the project area?**	**Effect Determination**
VanDyke's Salamander *Plethodon vandyke*i	USFS Sensitive	Yes	No	May impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.
Cope's Giant Salamander *Dicampton copei*	USFS Sensitive	Yes	No	May impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.
Cascade Torrent Salamander *Rhyacotriton cascadae*	USFS Sensitive	Yes	No	May impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.
Puget Oregonian *Cryptomastix devia*	USFS Sensitive	Yes	No	May impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.
Burrington's Jumping Slug *Hemphillia burringtoni*	USFS Sensitive	Yes	No	May impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss

Table 6. Summary of Effects to TES Species				
Species Name	**Species Status**	**Species habitat present within or adjacent to the project area?**	**Species documented in the project area?**	**Effect Determination**
				of viability to the population or species.
Warty Jumping Slug *Hemphillia glandulosa*	USFS Sensitive	Yes	No	May impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.
Malone's Jumping Slug *Hemphillia malonei*	USFS Sensitive	Yes	No	May impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.
Blue-gray Taildropper *Prophysaon coeruleum*	USFS Sensitive	Yes	No	May impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Federally Listed Species

Northern Spotted Owl Habitat Conditions

The northern spotted owl (*Strix occidentalis caurina*) was listed as a threatened species throughout its range in Washington, Oregon and northern California effective July 23, 1990 (USDI, 1990a). Loss of late-successional forest habitat from timber harvest was the primary reason for the listing.

The GMS Tract is located within spotted owl Critical Habitat within an old growth stand. It is not mapped in the Forest's Geographic Information Systems (GIS) database as suitable spotted owl habitat, probably due to the cabins and associated human activity. However, the recreation residence tract is immediately adjacent to suitable nesting habitat on the south and west sides, suitable foraging habitat on the north side, and dispersal habitat on the east side. Although the human activity likely precludes nesting by spotted owls within the developed recreation tract, spotted owls could probably forage there, especially at times when human activity is low, such as in the spring, fall, and winter months, and during the summer when cabin occupancy is low.

Important elements of suitable spotted owl habitat are large snags or decadent green trees, and large logs. These structures provide habitat for the owls prey base (flying squirrels and wood rats) and large snags and decadent green trees often provide nest sites in woodpecker cavities and mistletoe brooms. Ongoing hazard tree management within the developed recreation tract has affected spotted owl habitat, and will continue to do so as long as the cabins and other improvements are there. An average of between 2 and 5 large-diameter hazard trees are felled annually (J.Knutson per. com.). (Additional smaller-diameter trees may also be cut if determined to be a hazard.) The old-growth stand surrounding the tract contains many large decadent Douglas-fir, hemlock and red cedar trees that are either totally dead or have dead tops. Many that were present near the cabins have been felled in previous years, but felling hazard trees will continue to be necessary as more trees die. Hazard trees are felled generally when 1) the amount of defect in the tree indicates that failure is likely, 2) the potential for failure and relationship to targets indicates damage is likely, and 3) target value is moderate or high. Given that each lot is about one-half acre, and given the height of the potential hazard trees in the stand, about 42 acres of the tract and adjacent area are subject to hazard tree felling, including the campground and access roads (estimate 22 acres in the cabin tract, and 20 acres for the roads and campground).

The percent cover of down wood was estimated in the developed recreation tract (see discussion below for cavity excavators). The amount of down wood present is equivalent to habitat used by up to 50 percent of flying squirrel and bushy-tailed woodrat populations (From DecAID). These two species are important prey species for spotted owls.

The developed recreation tract is located within spotted owl Critical Habitat Unit (CHU) WA-41, which covers approximately 173,847 acres, with 169,421 acres (97%) on federal lands. Critical Habitat Unit WA-41 was designated to provide essential breeding habitat connectivity across the Columbia River in order to provide opportunities for genetic exchange between owls in Oregon and Washington; to provide essential nesting, roosting, and foraging habitat for support for 33 or more spotted owl pairs; and to consolidate large blocks of suitable habitat to help offset adjacent habitat fragmentation. The wildlife analysis, in the GMS Project File, discusses the CHU WA-41 in more detail.

Effects to the Northern Spotted Owl

The analysis area used for this effects analysis includes all land within 1.82 miles of the Forest Plan Developed Recreation (2L) Management Area. This distance is the average radius of a home range for spotted owls in the western Cascades of Washington. It is

assumed that any spotted owls that nest outside of the analysis area would not be affected by any activity that occurs at the recreation home tract. The analysis area encompasses 10,500 acres.

The analysis area contains five historic spotted owl activity centers: #805, #811, #823, #826, and #837. Activity center #811 is the closest one to any of the cabins, and it is about 250 yards from the nearest cabin. The analysis area contains 2,068 acres (20%) of nesting habitat, 4,694 acres (45%) of foraging habitat, and 2,143 acres (20%) of dispersal habitat. The entire spotted owl analysis area is within the LSR and Critical Habitat. Figure 9 below shows spotted owl habitat in the analysis area.

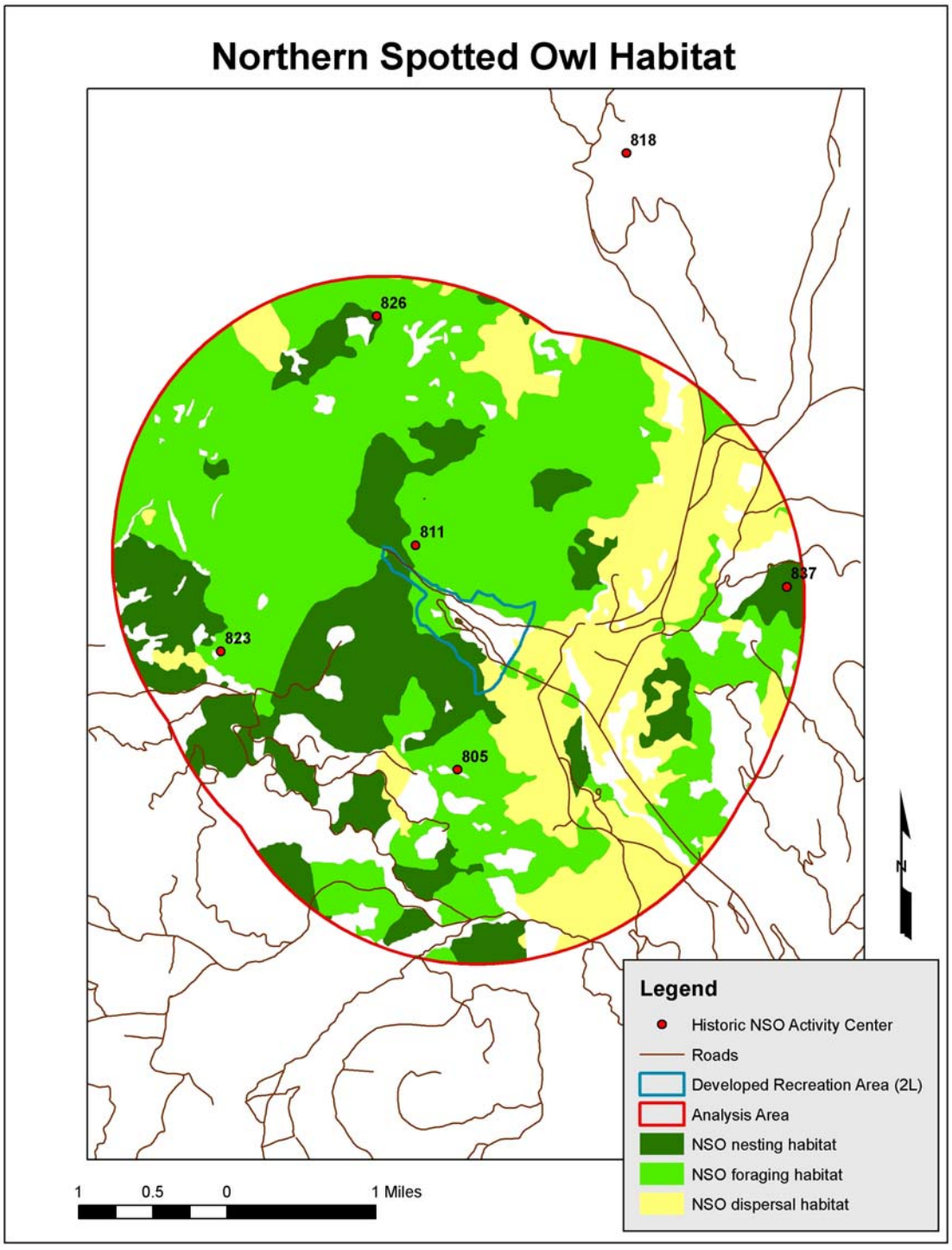

Figure 8. Spotted owl habitat in the vicinity of Government Mineral Springs.

Alternative 1

Direct and Indirect Effects

There would be no new effects to spotted owls or to designated Critical Habitat with this alternative. The continuing effects of having the cabins in place would include felling of trees determined to be hazards to structures at the existing cabin sites, and continued human presence, which likely precludes spotted owls from making full use of the habitat within the tract.

Heavy equipment needed to do the stream restoration work would be restricted to working in late summer, so would not cause noise disturbance to nesting spotted owls. Firewood removal would generally only be allowed when trees fall in the immediate use area around the cabins. This would result in slightly increased levels of large woody debris in the vicinity of the cabins over time, as well as increased levels throughout the Forest Plan-designated Managed Recreation (2L) Management Area.

The entire analysis area for spotted owls is within either Wilderness or Late-Successional Reserve. In the long-term, assuming there are no large fires, the amount of suitable nesting habitat will increase as stands that are currently foraging or dispersal habitat continue to develop late-successional characteristics.

Cumulative Effects

Over the next permit period (20 years), it is expected that all permit holders who don't currently have septic systems will install them, and it is likely that improvements will be made to the water system. These disturbances would occur primarily within the previously disturbed areas of the cabin sites and disturb anywhere from 500-1,000 square feet for each septic system installed. These improvements will have no effect on spotted owls or habitat.

As stated above, hazard tree felling will continue as needed, reducing the number of large decadent trees in the tract over time. Over the 20-year permit period, it is estimated that as many as 100 large-diameter hazard trees would be felled (based on the average number currently felled per year). In the long-term the character of the stand where the tract is located would probably change to include more young conifer trees, more hardwoods such as big-leaf maple, and fewer old-growth trees and snags. This reduction would occur on less than one-half of one percent of the analysis area, while the remainder of the analysis area will continue to develop late-successional and old-growth characteristics.

Since this alternative would result in no new impacts to suitable habitat, and the continuing impacts would be to less than 0.5 percent of the analysis area, implementation of this alternative **may affect, but is not likely to adversely affect** spotted owls and Critical Habitat.

Alternative 2

Direct and Indirect Effects

Alternative 2 is similar to Alternative 1 except the possible relocation of cabin 55. This action would cause minimal disturbance to surrounding spotted owl habitat features. If the cabin was torn down and rebuilt using the existing materials on lot 48 there would be no net

loss of habitat features and no new effects to Critical Habitat. Similar to Alternative 1, these actions **may affect, but are not likely to adversely affect** spotted owls and Critical Habitat.

Cumulative Effects
The cumulative effects of rebuilding on lot 48 would be the same as in Alternative 1 because it would not require any net loss of spotted owl habitat features.

Alternative 3
Direct and Indirect Effects
The continuing impacts of hazard tree felling and the current level of human presence in the tract would cease after the 10-year non-renewable permits expired and all of the improvement were removed. These activities would continue, however, in the vicinity of the campground and the historic Forest Service guard station. Approximately 22 acres currently subject to hazard tree felling would no longer need this treatment, and after ten years, spotted owls would be able to make full use of the habitat in the cabin tract. This alternative would have a **beneficial effect** to spotted owls and to Critical Habitat. There would be no cumulative effects.

Cumulative Effects
No cumulative effects were identified.

Sensitive Species

Van Dyke's Salamander
Van Dyke's salamanders are often associated with rocky, steep-walled stream valleys. In the Cascade Range they are usually found within a few meters of a stream under cobble and sometimes wood. They are most often in loose rock piles, seeps in the valley wall with loose rock or gravel, splash zones at the base of waterfalls, or adjacent to chutes and cascades.

There are no known sites for this species in the vicinity of the developed recreation tract. The developed recreation tract is mostly flat and doesn't have talus or other rock piles associated with their habitat. There is a lot of rock along Trapper Creek, but the creek and its tributaries are fairly low gradient. For these reasons, Van Dyke's salamander is not likely to be found in the developed recreation tract, and surveys are not required.

Alternatives 1, 2 and 3
There would be impacts to existing rock cover in the vicinity of cabin 55 when the rock berm is reduced in size to reopen the overflow channel, and with the removal of the gabions at cabins 20 and 21. These impacts would only occur at small discrete sites and would not impact habitat in general along Trapper Creek or its tributaries.

In the long-term, all alternatives would require that large down wood be retained along Trapper Creek and the smaller streams in the developed recreation tract, improving habitat for Van Dyke's salamander if they occur there. Since there is a low likelihood of impacts to this species, these alternatives may impact individuals or habitat but would not likely

contribute to a trend toward federal listing, or cause a loss of viability to the population or species.

Disturbance caused by reducing the size of the rock berm is similar and would be cumulative to disturbance caused by other stream restoration activities, such as culvert replacement. These impacts generally disturb only small discrete locations and pre-disturbance surveys are not required. These alternatives would result in minor short-term cumulative impacts.

Alternative 3

Direct and Indirect Effects

After the 10-year non-renewable permits expired, all of the remaining rock gabions would be taken out. In the short-term these activities would potentially impact more habitat than the action alternatives, but more habitat would be restored in the long-term. This alternative may impact individuals or habitat but would not likely contribute to a trend toward federal listing, or cause a loss of viability to the population or species.

Cumulative Effects

The cumulative effects would be similar to the action alternatives, but since more area would be disturbed initially, the overall short-term effects would be greater. In the long-term, the cumulative effects would cease after the improvements are removed.

Cope's Giant Salamander and Cascade Torrent Salamander

There are no known sites for these species in the developed recreation tract but Trapper Creek and its tributaries appear to be suitable habitat. Over the years, occupation of the cabin sites has led to modification of the Trapper Creek channel. Removal of large logs that fell into the creek as well as construction of gabions have reduced habitat quality for aquatic salamanders by reducing the number of pools as well as cover provided by logs and other woody debris. The Wildlife analysis in the Project File describes their habitat in detail.

Alternatives 1, 2, and 3

Direct and Indirect Effects

The impacts from these alternatives would be similar to those described for Van Dyke's salamander. Reducing the size of the rock berm would require the use of heavy equipment in the floodplain and probably cause a short-term increase in sediment, as well as disturbance to the rock. In the long-term the amount of large down wood in the floodplain and in the creeks would increase, thereby increasing instream and streamside cover. Due to the long-term restoration of the floodplain with increases in large down wood, and removal of the gabions, these alternatives may impact individuals or habitat but would not likely contribute to a trend toward federal listing, or cause a loss of viability to the population or species.

Cumulative Effects

As described for Van Dyke's salamander, the effects of the action alternatives would be cumulative to other instream work, such as culvert replacement and fish habitat improvement projects. These impacts generally disturb only small discrete locations, and the majority of habitat is unaffected. In addition, instream work would include mitigations to control the

amount of sediment released. These alternatives would result in minor short-term cumulative impacts.

Alternative 3

Direct and Indirect Effects

After the 10-year permits expire, the remaining gabions and berms would be taken out, if warranted. In the short-term these activities would potentially impact additional habitat, but more habitat would be restored in the long-term. Over time, more trees will fall into Trapper Creek creating more pool and streamside woody cover. This alternative may impact individuals or habitat but would not likely contribute to a trend toward federal listing, or cause a loss of viability to the population or species.

Cumulative Effects

The cumulative effects would be similar to the action alternatives, but since more area overall would be disturbed, the effects would be greater. In the long-term, the cumulative effects would cease after the improvements are removed.

Terrestrial Mollusks

Under the 2001 Survey and Manage Record of Decision the following species are Category A (pre-disturbance surveys, manage known sites): *Cryptomastix devia, Cryptomastix hendersoni, Hemphillia burringtoni, Monadenia fidelis minor,* and *Prophysaon coeruleum*. The following species is Category C (pre-disturbance surveys, manage high-priority sites): *Hemphillia malonei,* and *Hemphillia glandulosa.*

Based on the habitat present around the developed recreation tract, and based on results of previous surveys in the area, the following species are likely present: Warty Jumping slug (H*emphillia glandulosa*), Malone's jumping slug (*H. malonei*), keeled jumping slug (*H. burringtoni*), and Puget Oregonian snail (*Cryptomastix devia*). The habitat is also similar to habitat where blue-gray taildropper (*Prophysaon coeruleum)* was found on the Cowlitz Valley District. However, those three sites are the only known sites on the Forest, so the likelihood that this species exists at Government Mineral Springs is low.

The jumping slug species that are likely to occur at Government Mineral Springs are all dependant on large woody debris on the forest floor, especially large well-decayed logs, and bark piles. Habitat where they are found also often supports a well-developed understory of various shrubs including sword fern (*Polystichum munitum*), and a thick duff layer.

Puget Oregonian is nearly always found closely associated with big-leaf maple (*Acer macrophyllum*), and is usually found in the leaf litter within the drip line of the canopy, or within the moss on the trunk. There are many big-leaf maple trees in the floodplain of Trapper Creek, including the area around the cabins.

The developed areas immediately around the cabins, and roads and driveways are generally the only places in the analysis area that are not suitable habitat for these species. This is due to removal or modification of shrub and native herbaceous vegetation, removal of woody debris around the cabins, and soil compaction. An exception might be old firewood piles

near the cabins that are in shaded locations. In the past, cutting and removal of large logs in the analysis area for firewood or lumber has impacted habitat for these species.

Alternative 1

Direct and Indirect Effects

Renewing the permits for the cabins would result in no new impacts to these species. In addition, modification of the firewood cutting policy to retain more large logs in the vicinity of the cabins would improve habitat and connectivity within the floodplain.

Cumulative Effects

As more septic systems are installed over the next 20 years there is a possibility that habitat for these species would be disturbed on 500-1,000 square feet for each septic system installed. However, generally the sites where septic systems would be installed are areas near the cabins that have previously disturbed and where large wood is lacking. Very little of the best habitat outside of the immediate use areas around the cabins would be disturbed.

This alternative may impact individuals or habitat but would not likely contribute to a trend toward federal listing, or cause a loss of viability to the population or species.

Alternative 2

Direct and Indirect Effects

Removing the cabin from lot 55 and rebuilding on lot 48 would require the disturbance of small patches of habitat that are suitable for the jumping slug species and for Puget Oregonian snails. Assuming that a new cabin built on lot 48 would be the same size as the current cabin, the total area disturbed would likely be about 1,200 square feet, which is about equal the footprint of the existing cabin, decks and outbuildings. The areas that would be disturbed are currently occupied by vine maple and small conifer and hardwood trees (less than 10 inches dbh). The best habitat that currently exists between the cabins and elsewhere in the tract would be improved in the long-term with the increase levels of large down wood.

Cumulative Effects

The cumulative effects would be same as described for the action alternatives.

This alternative may impact individuals or habitat but would not likely contribute to a trend toward federal listing, or cause a loss of viability to the population or species.

Alternative 3

Direct and Indirect Effects

Once the improvements are removed, the developed sites would be restored or gradually recover naturally as native vegetation fills in the sites. All trees that fall would be left to decompose. In the long-term, this alternative would restore habitat on about 11 acres that currently are dedicated to the building sites and associated yards and driveways. In the short-term the process of removing the cabins may result in ground disturbance if heavy equipment is used to dismantle and haul away the buildings and other materials. However the areas affected would be the heavily used areas around the cabins that are not currently good habitat.

Due to the potential for short-term impacts, this alternative may impact individuals or habitat but would not likely contribute to a trend toward federal listing, or cause a loss of viability to the population or species.

Cumulative Effects
There would be no cumulative effects.

Townsend's Big-eared Bat and Forest Bats
The habitat present at Government Mineral Springs in ideal for many of the forest dwelling bat species, including silver-haired bat (*Lasionycteris noctivagans*), big brown bat (*Eptesicus fuscus*), little brown bat (*Myotis lucifugus*), Yuma myotis (*Myotis yumanensis*), and Townsend's big-eared bat (*Corynorhinus townsendii*). These bats are known to roost on old buildings, and in the crevices and holes of large trees and snags. They forage for insects either by catching them on the wing, often over water, or gleaning them off of trees and shrubs. They are known to use multiple roost sites within their home ranges and are not dependant on a given site.

The many old cabins and woodsheds, as well as the many large snags and hollow trees provide many excellent roost sites, and Trapper Creek probably provides an excellent foraging corridor through the developed recreation area. The cabins frequently have crevices under shingles and siding, and numerous other nooks and crannies where bats can roost. Some probably have openings into attics and most have open crawl spaces where bats could be found also.

Alternative 1
Direct and Indirect Effects
This alternative would have no new impacts on bats in the area. Hazard tree felling that would occur with the continued presence of the cabins would remove some structures likely used by bats for roosting, but there would be many other similar large trees and snags available in the vicinity that are not hazards.

There would be no changes to the cabins or other human-made structures with this alternative.

Cumulative Effects
The cumulative effects associated with the continued felling of hazard trees would be similar to the effects described for cavity excavators. Overall these impacts would be minor in that there will continue to be numerous roost structures available.

Alternative 2
Direct and Indirect Effects
Cabin 55 would be removed from its current location. A casual observation of cabin 55 did not reveal any attic holes, but the eaves and chimney may provide roost sites. Only if this cabin was a maternity site or important hibernacula would bats be significantly affected if it

was removed. There is no indication of this and removing this cabin would not impact bats. All other potential impacts would be the same as Alternative 1.

Alternative 3

Direct and Indirect Effects

Removing all the cabins and associated improvements would eliminate potential roost sites. Some species that more commonly roost in buildings may be reduced or eliminated from the area. Conversely, there would be less hazard tree felling so more potential tree roosts would be protected. Without extensive surveys to determine use of the building by bats, it is impossible to quantify the impacts of this alternative.

Affected Forest Management Indicator Species

Cavity Excavators

Cavity excavators represent species requiring snags and down logs. The Forest Plan contains standards and guidelines for retention of snags and logs and where hazard reduction and salvage are appropriate. The Late-Successional Reserve (LSR) Assessment for the Gifford Pinchot National Forest prescribes snag and down wood levels that are desired in LSRs.

During the summer of 2005 an estimate was made of down wood cover in the 213-acre Developed Recreation (2L) Management Area. A survey to estimate the percent cover of down wood with a minimum size of 6 inches diameter and 5 feet long was conducted using a line-intercept method as described in Bate et al. (2004). A total of thirteen 100-meter transects were established within the Developed Recreation (2L) Management Area. The Wildlife analysis in the Project File describes this process in more detail.

A snag survey was not conducted since the felling of hazard trees to protect improvements in the area is non-discretionary, and snags elsewhere in the Developed Recreation Management Area are allowed to fall naturally. The decision to dispose of down logs or retain them in place is discretionary however, so a survey to estimate the existing cover of down wood was conducted.

When all of the transects are averaged together the estimated down wood cover is 6.7 percent. The maximum on any transect was 13.1 percent and the minimum was 1.7 percent. The down wood cover for the seven transects that occurred near the cabins or campground averaged 4.8 percent. This reduced amount probably reflects the fact that firewood has traditionally been gathered in these areas, or that hazard trees in these areas have been sold for lumber after they were felled. These percentages are significantly below what is called for in the LSR Assessment (about one-third of what is needed), and also below what is indicated for this area by the data from a study by Spies et al. in 1988 in stands greater than 200 year old, that showed that the average percent cover of down wood (minimum 4 inches diameter) was 10.6 percent, with eighty percent of the plots having 13.9 percent cover or less.

However, it is not significantly different from what is indicated for this stand in the Decayed Wood Advisor (DecAid, Mellen et al. 2006). Data from DecAID show that, in stands with

larger trees in westside lowland conifer-hardwood forests, the percent of down wood (minimum 5 inches diameter and 10 feet long) in unharvested inventory plots ranges from 0 to 21.3 percent.

The surveys intercepted a total of 131 pieces of down wood that met the minimum size criteria. Of these, 13 were determined to be Class I or Class II, 16 pieces were Class III, and 102 pieces were Class IV or V. This distribution is similar to what is called for in the LSR Assessment. Since a large majority of the logs are in the highly decayed classes, retention of new hard logs will be required to replace these logs over time.

These figures indicate that the down wood levels called for in the Gifford Pinchot National Forest LSR Assessment may not be practical. The LSR Assessment calls for 20 percent cover of down wood averaged across the LSRs, whereas the DecAID data show that the highest percent cover measured in the inventory plots from unharvested large tree stands was 21 percent, and that eighty percent of the inventory plots had 12 percent cover or less.

Alternative 1

Direct and Indirect Effects

With this alternative there would be no new impacts to snags and down wood, since no previously undeveloped in-lieu lots would be disturbed. In the long-term, the percent cover of large down wood would increase in the area around the cabins, as well as throughout the Developed Recreation Management Area and the analysis area for the northern spotted owl. The current firewood policy, requiring retention of large logs, has resulted in more down wood cover in the area around the cabins. In addition, as the stands within the analysis area continue to age and develop more decadent wood, the amount of down wood as well as snags will increase. The Forest Plan standard for the Developed Recreation (2L) would be met with this alternative.

Cumulative Effects

There would be cumulative impacts that result from continuing use of the cabins, which requires the continued felling of hazard trees, as well as a minor loss of down wood from within the immediate use areas around the cabins. It is estimated that over the next 20-year permit period as many as 100 large-diameter snags or decadent trees would be felled as hazard trees. This figure is based in the estimate that normally 2 to 5 are felled each year. This would occur across about 42 acres of stands that are in the Large Tree structure stage, out of a total of 3,205 acres in the Large Tree structure stage that are in the analysis area (1.3%). While this would reduce snag density somewhat, most of the felled hazard trees would likely be able to be kept onsite adding to the cover of down wood.

Since the analysis area is entirely within LSR or Wilderness, the number of snags and down wood cover will increase over time area-wide. The effects of hazard tree felling on less than 2 percent of the analysis area would not be significant.

Alternative 2

Direct and Indirect Effects

The effects from removing the improvements from lot 55 and (re)constructing a cabin on lot 48 would have the similar effects to snags and down wood as Alternative 1. No new felling of existing large trees or potential hazard trees would be needed. One large hemlock tree that has fallen and is hung up near the driveway to lot 48 would probably have to be felled, but could then be left onsite. There would be potential hazard trees on lot 48 that may have to be felled over time, but the potential hazard trees currently on lot 55 would likely not have to be felled in the future if the cabin was moved, so the net effect is minimal.

Cumulative Effects

The cumulative effects would be the same as in Alternative 1. There would be cumulative impacts that result from continuing use of the cabins, which requires the continued felling of hazard trees, as well as a minor loss of down wood from within the immediate use areas around the cabins. It is estimated that over the next 20-year permit period as many as 100 large snags or decadent trees will be felled as hazard trees. This figure is based on the estimate that, normally 2 to 5 are felled each year. This would occur across about 42 acres of stands that are in the Large Tree structure stage, out of a total of 3,205 acres in the Large Tree structure stage that are in the analysis area (1.3%).

Alternative 3

Direct and Indirect Effects

Under this alternative the cabins and other improvement would be removed following expiration of the 10-year non-renewable permit. Up until that time, hazard trees would likely still need to be felled. The total likely to be felled in ten years would be 20 to 50. After that time snags and decadent trees on about 42 acres of the analysis area would no longer be subject to felling, and density of snags, as well as down wood cover would increase.

Cumulative Effects

No cumulative effects were identified.

Pileated Woodpecker and Pine Marten

Pileated woodpecker and pine marten represent species that require old-growth and mature forest conditions. As such, suitable habitat for these species is similar to suitable spotted owl habitat. The analysis area contains about 2,068 acres (20%) of suitable spotted owl nesting habitat. These stands would equate to optimal habitat for pileated woodpeckers and marten. Spotted owl foraging habitat occurs on about 4,694 acres (45%). Generally these stands contain large trees, high canopy cover, and a moderate number of logs and snags. These stands would also be used by pileated woodpeckers and marten.

Numerous large snags are important for both these species to provide nesting/denning and roosting sites. Large down logs are important as a foraging substrate for pileated woodpeckers, and as cover for marten.

There are numerous sightings of pileated woodpeckers reported in the developed recreation area in the NRIS Fauna database. There are no pine marten sightings in the database,

however they are more commonly found at higher elevations on the Forest. Also, the human activity that occurs around the cabins may preclude use of the habitat by marten.

Alternatives 1 and 2

Direct and Indirect Effects

Impacts to these species would be similar as those described for spotted owls and for cavity excavators. These alternatives would have no new impacts because no large trees would have to be cut other than those that would have to be cut as hazard trees. The existing firewood policy would result in a gradual increase in the percent cover of hard logs when hazard trees are felled, or fall naturally, and retained in place. In addition, since the analysis area is entirely within LSR or Wilderness, habitat will improve as younger stands continue to develop late-successional characteristics.

Cumulative Effects

There would be cumulative impacts that result from continuing use of the cabins, which requires the continued felling of hazard trees, as well as a minor loss of down wood from within the immediate use areas around the cabins. It is estimated that over the next 20-year permit period as many as 100 large snags or decadent trees will be felled as hazard trees. This figure is based in the estimate that normally 2 to 5 are felled each year. This would occur across about 42 acres of stands that are in the Large Tree structure stage, out of a total of 3,205 acres in the Large Tree structure stage that are in the analysis area (1.3%). While this would reduce snag density somewhat, most of the felled hazard trees will likely be able to be kept onsite adding to the cover of down wood, and there would be negligible changes in the canopy cover within the developed recreation area.

Since the analysis area is entirely within LSR or Wilderness, the number of snags and down wood cover will increase over time area-wide. The effects of hazard tree felling on less than 2 percent of the analysis area would not be significant.

Alternative 3

Direct and Indirect Effects

After all the cabins and other improvements are removed, there would be a gradual increase in decadent trees and snags on about 22 acres since hazard tree felling would no longer be needed. These species are more likely to be able to make full use of the habitat now occupied by the cabins.

Cumulative Effects

There would be no cumulative effects.

Deer and Elk

The standards and guidelines in the Forest Plan that address elk and deer address winter range and special features such as mineral licks and calving/fawning areas. The developed recreation tract is within biological winter range and provides thermal cover and optimal thermal cover, as well as forage in the form of understory shrubs and herbaceous plants. Since the access roads to the cabin areas are gated and open only to the residents, it is likely

that elk and especially deer make use of the habitat near the cabins in the late fall through early spring when the cabin occupancy is low, and less use during the summer months.

Witmer (1981) found elk use of areas within 400 feet of primary roads and within 200 feet of secondary roads to be significantly less than expected. In order to quantify the area around the developed recreation tract where elk use is likely less than expected, the Developed Recreation (2L) Management Area was buffered by 400 feet. The resulting polygon is about 390 acres. Since the area occupied by the cabins is flat and within optimal thermal cover, it would likely be important habitat in the absence of the developments.

Alternatives 1 and 2

Direct and Indirect Effects

These alternatives would have no new impacts to elk and deer. There would be no increase in the number of cabins or in the road density, and no immediate increase in the rate of use of the cabins. The habitat suitability on about 390 acres of habitat in winter range would remain lowered due to the continued presence of the cabins and associated human activity.

Cumulative Effects

Potential cumulative effects of continued use of the cabins may occur if the occupancy rate increases, especially during the winter. Many of the cabins are being bought by multiple families, which leads to the possibility that the cabins would be used for more days during the year that what has occurred historically. Increased activity around the cabins during the late fall through early spring would further reduce the ability of elk and deer to use the area.

Since the analysis area is entirely within LSR or Wilderness, no new system roads are anticipated and optimal thermal cover will increase in the long-term.

Alternative 3

Direct and Indirect Effects

Removing the cabins and the associated human presence would allow deer and elk to make more use of winter range habitat that is currently occupied by the cabins and associated roads. Continued presence of the campground and human activity associated with those improvements would prevent elk and deer form making full use of the area. If the existing gates were left in place and kept closed, the density of roads that are currently used by motorized vehicles would be reduced slightly. This alternative would improve habitat suitability on about 390 acres.

Cumulative Effects

There would be no cumulative effects.

Other Management Indicator Species

There would be no impacts to any other Management Indicator Species including wood duck and goldeneye duck, and mountain goat since habitat for these species is not present in the developed recreation area.

Neotropical Migratory Birds

A conservation strategy for land birds in coniferous forests in western Oregon and Washington was prepared in 1999 by Bob Altman of American Bird Conservancy for the Oregon-Washington Partners in Flight. The strategy is designed to achieve functioning ecosystems for land birds by addressing the habitat requirements of 20 "focal species." By managing for a group of species representative of important components of a functioning coniferous forest ecosystem, it is assumed that many other species and elements of biodiversity will be maintained.

The following table displays the focal species potentially positively or negatively affected changes in habitat, and the forest conditions and habitat attributes they represent.

Table 7. Focal Bird Species

Forest Conditions	Habitat Attribute	Focal Species
Old-growth	Large snags	Vaux's swift *
Old-growth/Mature	Large trees	Brown creeper *
Old-growth/Mature	Conifer cones	Red crossbill
Mature	Large snags	Pileated woodpecker
Mature	Mid-story tree layers	Varied thrush *
Mature/Young	Closed canopy	Hermit warbler
Mature/Young	Deciduous canopy trees	Pacific-slope flycatcher
Mature/Young	Open mid-story	Hammond's flycatcher
Mature/Young	Deciduous understory	Wilson's warbler
Mature/Young	Forest floor complexity	Winter wren
Young/Pole	Deciduous canopy trees	Black-throated gray warbler
Pole	Deciduous subcanopy/understory	Hutton's vireo
Early-seral	Residual canopy trees	Olive-sided flycatcher *
Early-seral	Snags	Western bluebird
Early-seral	Deciduous vegetation	Orange-crowned warbler
Early-seral	Nectar-producing plants	Rufous hummingbird *

* Significantly declining population trends in the Cascade Mountains physiographic areas.

All of these species, with the exception of the early seral species are likely represented at Government Mineral Springs.

A study done in Wyoming to try to determine if human intrusions cause cumulative declines in avian richness and abundance found that, although there was no detectable cumulative or yearly declines is seasonal species richness, mean richness, or mean total abundance for all species, three comparisons for relative richness of the most common species showed declines (Riffell et al. 1996). They found that the small number of effects detected indicated however,

that repeated human intrusion did not cause widespread impacts on avian community structure.

Alternatives 1 and 2
Direct and Indirect Effects
Important habitat elements at Government Mineral Springs that are most at risk are large hollow trees and snags that are important for Vaux's swift and pileated woodpecker. These are the trees that are most likely to be felled as hazard trees. The effects of this are the same as those discussed for the cavity excavators.

Human activity associated with the cabins has probably had an effect on birds by reducing nesting opportunity in the vicinity of the cabins. However, there has probably been no reduction in the number of species found in the area. There would be no new impacts with these alternatives since there would be no net increase in the number of cabins.

Cumulative Effects
Increased use of the cabins that may result from multi-family ownership may increase the described effects slightly in the vicinity of the cabins.

Alternative 3
Direct and Indirect Effects
After the cabins are removed, the resident and migratory birds would be able to make full use of the available habitat currently occupied by the cabins. Increased nesting success may lead to very small local population increases.

Cumulative Effects
There would be no cumulative effects.

Botanical Resources

Existing Condition

An invasive species risk assessment and re-vegetation plan was completed as part of the Consistency Review. It can be found in the project file. Additionally, a Botanical Resource Report was completed that included a discussion of threatened, endangered and sensitive species. The results are summarized below.

The Regional Forester currently lists 88 Threatened, Endangered, Proposed and Sensitive (TEPS) botanical species documented or suspected to occur on the Gifford Pinchot National Forest. This list was updated in July 2004 and includes 52 vascular plants, 18 lichens, 4 bryophytes and 14 fungi.

A complete list of TEPS and botanical species occurring on the Gifford Pinchot National Forest can be found in the appendices to the Botanical Resource Report in the project file.

Botanical surveys were conducted in Government Mineral Springs Summer tract in 2005 and 2007 for 1) Sensitive botanical species, based on the Regional Forester's July 2004 list (USDA Forest Service 2004b); and 2) for Survey and Manage based on the 2001 Survey and Manage Record of Decision (USDA & USDI 2001a,b) (but inclusive of changes implemented through Annual Species Reviews through 2004). The methodology and complete survey documentation are described in the Botany Biological Resource Report, in the project file. A list of all of the Regional Forester's Sensitive Botanical Species Documented or Suspected to Occur within the Government Mineral Springs Summer Home Tract can be found in the Botanical Resource Report in the project file.

FIELD SURVEY RESULTS

Threatened, Endangered & Proposed Plant Species: None were located within the project area.

Sensitive Plant Species: Multiple sites for four Sensitive species were found at GMS, including *Pseudocyphellaria rainierensis*, *Dendriscocaulon intricatulum*, *Tetraphis geniculata*, and *Peltigera pacifica*. In addition, there were a number of occurrences previously documented from GMS. Species included *Leptogium rivale*, *Nephroma bellum*, and *Nephroma occultum*. All occurrences are listed in Table 8.

Table 8. Sensitive Species Occurrences within Government Mineral Springs

Species	Description of occurrence(s)	Databased?
Dendriscocaulon intricatulum	Multiple occurrences for this species were found in the western portion of GMS. It is likely that there are many more occurrences in GMS and adjacent Trapper Creek Wilderness.	Y
Leptogium rivale	Known to occur within Trapper Creek (this species is an aquatic lichen).	Y
Nephroma bellum	Multiple occurrences for this species are known from GMS. It is likely that there are many more occurrences in GMS and adjacent Trapper Creek Wilderness.	Y
Nephroma occultum	Multiple occurrences for this species are known from GMS. It is likely that there are many more occurrences in GMS and adjacent Trapper Creek Wilderness.	Y
Peltigera pacifica	Multiple occurrences for this species were found throughout GMS. It is likely that there are many more occurrences in GMS and adjacent Trapper Creek Wilderness.	Y

Pseudocyphellaria rainierensis	Multiple occurrences for this species were found throughout GMS. It is likely that there are many more occurrences in GMS and adjacent Trapper Creek Wilderness.	Y
Tetraphis geniculata	Multiple occurrences for this species were found throughout GMS. It is likely that there are many more occurrences in GMS and adjacent Trapper Creek Wilderness.	Y

Survey and Manage Plant Species:

In addition to being Sensitive Species, *Peltigera pacifica* and *Leptogium rivale* are Category E Survey and Manage Species, with a mandate to manage all known sites, *Dendriscocaulon intricatulum*, *Pseudocyphellaria rainierensis*, *Tetraphis geniculata* are Category A Survey and Manage Species, with a mandate to survey and manage all known sites, while *Nephroma occultum* is a Category C Survey and Manage Species, with a mandate to manage high priority known sites.

Other Botanical Resources of Concern:

Pseudocyphellaria mallota, a rare epiphytic lichen, was also found within GMS. This lichen is not currently considered Sensitive or Survey and Manage. This site is the only occurrence of this species known on the Gifford Pinchot National Forest.

Effects to Botanical Resources

Threatened, Endangered & Proposed Plant Species

At this time there are no federally listed (proposed, endangered, threatened) plant species known to occur on the Forest, however one federally threatened species (*Howellia aquatilis*) is suspected. *Howellia aquatilis* has an extremely narrow habitat tolerance, generally confined to palustrine emergent wetlands with seasonal drawdown. Potential habitat areas to be impacted by this project were surveyed and no TEP species were located. Thus, project action alternatives will have ***no effect*** on federally listed botanical species.

Sensitive Species

A determination of impact for each species potentially impacted by the project is documented, below (summarized in Table 9). Many resources were referenced in developing the rationale for effects determinations and recommended mitigations and are cited in the Botanical Resource Report in the project file.

Tetraphis geniculata

Tetraphis geniculata is a bryophyte (moss) that grows on rotten stumps and logs, in shady, humid forests at low to middle elevations. Threats to this species include disturbance of the coarse woody debris substrate, and alteration of the microclimate of the site through opening

of the surrounding forest canopy (i.e. increasing solar and wind penetration, with subsequent dessication of coarse woody debris substrate.) (Harpel and Helliwell 2005).

Alternatives 1 and, 2 and 3
Direct and Indirect Effects
Activities permitted under all three project alternatives, including trail/path/driveway maintenance and hazard tree removal, have the potential to disturb individuals or habitat for this species in the areas immediately surrounding the cabins, and along access roads to the cabins. Since the species is well distributed throughout the area, with copious down wood substrate (occupied and potential habitat), it is very unlikely that this scale of disturbance would substantially impact the occurrence, as a whole, at GMS. In addition, the adjacent Trapper Creek Wilderness is likely to host this species. For this reason, all three alternatives ***may impact*** individuals or habitat for this species, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species as a whole.

Following the removal of all cabins and improvements after 10 years under Alternative 3, there would be no need for future hazard tree removal, septic installation, or various other maintanence actions, and would (after complete implementation) cause ***no impact*** to this species.

Peltigera pacifica

Peltigera pacifica is a foliose lichen species that often grows on soil, duff or woody debris, and occasionally on tree bases. It is generally a distinctive species with copious lobules produced at the edge of lobes, giving the species the appearance of "frilly" edges. Surveys on the Gifford Pinchot National Forest have located this species in abundance spread throughout stands regenerated after fire, growing on mineral soil and woody debris – it seems to be fairly well distributed across the Forest.

Alternatives 1, 2 and 3
Direct and Indirect Effects
Activities permitted under all three project alternatives, including trail/path/driveway maintenance and hazard tree removal, have the potential to disturb individuals or habitat for this species in the areas immediately surrounding the cabins, and along access roads to the cabins. Since the species is well distributed throughout the area, with abundant suitable habitat, it is very unlikely that this scale of disturbance would substantially impact the occurrence, as a whole, at GMS. In addition, the adjacent Trapper Creek Wilderness is likely to host this species. For this reason, all three alternatives ***may impact*** individuals or habitat for this species, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species as a whole.

Following the removal of all cabins and improvements after 10 years under Alternative 3, there would be no need for future hazard tree removal, septic installation, or various other maintanence actions, and would (after complete implementation) cause ***no impact*** to this species.

Leptogium rivale

Alternatives 1, 2 and 3

Direct and Indirect Effects

Leptogium rivale is an aquatic lichen species that grows submerged on rocks. Near GMS, it grows within Trapper Creek. This species could potentially be affected by stream temperature increases, water pollution, or in-stream work. All three alternatives will prevent degradation of stream temperature and water pollution, and in-stream work is not planned in close proximity to the known occurrence of this species. For this reason, the determination was made that all three alternatives will have ***no impact*** on *Leptogium rivale*.

Nephroma bellum

Nephroma bellum is an epiphytic cyanolichen. It tends to grow on the boles and lower branches of hardwood trees, but can be found on conifers. It often grows in riparian zones.

Alternatives 1, 2 and 3

Direct and Indirect Effects

Over time, allowed activities may impact/extirpate individuals, destroy habitat, and/or fragment habitat. These activities include hazard tree removal of large, old snags or leaning trees that may host this epiphytic species, in order to protect cabins, and other improvements (public safety), as well as installation of septic systems, which may require removal of trees in certain cases, and does require that the septic fields (approximately 500-1,000 square feet in size) be maintained tree and shrub free (precluding re-growth of potential host trees).

In addition to directly impacting individuals, removal of overstory trees may impact create a lighter, drier environment in the understory that could impact individuals of this species. However, such individuals are part of a greater population[4] of the species that is well distributed throughout the old growth stand that comprises and surrounds the GMS summer home tract, and extends into the Trapper Creek Wilderness. So, although Alternative 3 is anticipated to cause fewer negative impacts to the species than Alternatives 1 and 2 (short term vs. long term), the determination was made that Alternatives 1, 2, and 3 ***May Impact*** *Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing Or Cause A Loss of Viability To the Population Or Species.*

Following the removal of all cabins and improvements after 10 years under Alternative 3, there would be no need for future hazard tree removal, septic installation, or various other maintanence actions, and would (after complete implementation) cause ***no impact*** to this species.

Dendriscocaulon intricatulum

Dendriscocaulon intricatulum is a minute, cryptic lichen found at multiple sites within GMS. Since it is quite small, it is probably under-detected/reported, and there are likely many more individuals of the species within GMS, and adjacent Trapper Creek Wilderness.

[4] A population is used in this context throughout this section to describe a contiguous distribution of a species throughout a stand (in this case the old-growth riparian stand that comprises and surrounds the GMS summer home tract), which implies functional continuity (distribution/exchange of reproductive material).

Alternatives 1, 2 and 3
Direct and Indirect Effects
Activities permitted over the long term under Alternatives 1 and 2, and over the short term under Alternative 3 (10 years) may impact/extirpate individuals, destroy habitat, and/or fragment habitat. These activities include hazard tree removal of large, old snags or leaning trees that may host this epiphytic species, in order to protect cabins, and other improvements (public safety), as well as installation of septic systems, which may require removal of trees in certain cases, and does require that the septic fields (approximately 500-1,000 square feet in size) be maintained tree and shrub free (precluding re-growth of potential host trees).

In addition to directly impacting individuals, removal of overstory trees may create a lighter, drier environment in the understory that could impact individuals of this species. However, such individuals are part of a greater population of the species that is well distributed throughout the old growth stand that comprises and surrounds the GMS summer home tract, and extends into the Trapper Creek Wilderness. Since the species is well distributed throughout the area, it is very unlikely that this scale of disturbance will substantially impact the occurrence or population, as a whole, at GMS.

So, although Alternative 3 is anticipated to cause fewer negative impacts to the species than Alternatives 1 and 2 (short term vs. long term), the determination was made that Alternatives 1, 2, and 3 ***May Impact*** *Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing Or Cause A Loss of Viability To the Population Or Species.*

Following the removal of all cabins and improvements after 10 years there would be no need for future hazard tree removal, septic installation, or various other maintenance actions, and would (after complete implementation) cause ***no impact*** to this species.

Pseudocyphellaria rainierensis
Pseudocyphellaria rainierensis is an epiphytic foliose lichen species found in humid, late successional/ old-growth forests on conifer trees, generally in the Western Hemlock or lower Pacific Silver Fir Zones. This species is endemic to the Pacific Northwest and is found in southeastern Alaska, British Columbia, Washington and Oregon in areas with oceanic influence (west of the Cascades in Washington and Oregon). Threats to this species, described in Lesher et al. 2003, is loss of populations resulting from activities that affect the habitat or the population, including changes in microclimate and removal of colonized substrate. It is also sensitive to air pollution. The limited distribution and abundance of older age-classes in the landscape limit potentially suitable habitat, as well as contributing to the isolation of populations. For these reasons, it is highly likely that populations of this species and suitable habitat for this species will continue to decline across the majority of its range during future decades.

Alternatives 1, 2 and 3
Direct and Indirect Effects
Over time, activities permitted over the long term under Alternatives 1 and 2, and over the short term under Alternative 3 (10 years) may impact/extirpate individuals, destroy habitat, and/or fragment habitat. These activities include hazard tree removal of large, old snags or

leaning trees that may host this epiphytic species, in order to protect cabins, and other improvements (public safety), as well as installation of septic systems, which may require removal of trees in certain cases, and does require that the septic fields (approximately 500-1,000 square feet in size) be maintained tree and shrub free (precluding re-growth of potential host trees).

In addition to directly impacting individuals, removal of overstory trees may create a lighter, drier environment in the understory that could impact individuals of this species. However, such individuals are part of a greater population of the species that is well distributed throughout the old growth stand that comprises and surrounds the GMS summer home tract, and extends into the Trapper Creek Wilderness. Since the species is well distributed throughout the area, it is very unlikely that this scale of disturbance will substantially impact the occurrence or population, as a whole, at GMS.

So, although Alternative 3 is anticipated to cause fewer negative impacts to the species than Alternatives 1 and 2 (short term vs. long term), the determination was made that Alternatives 1, 2, and 3 ***May Impact*** *Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing Or Cause A Loss of Viability To the Population Or Species.*

Following the removal of all cabins and improvements after 10 years under Alternative 3, there would be no need for future hazard tree removal, septic installation, or various other maintenance actions, and would (after complete implementation) cause ***no impact*** to this species.

Survey Impractical Sensitive & Survey and Manage Species

Within GMS, there is high quality potential habitat for a number of Pacific Northwest Region Sensitive species, including 13 fungi species and 1 lichen species, that were not specifically targeted during surveys. These species are all thought to be associated primarily with late-successional/old growth forests (USDA & USDI 1994, 2001), though some of these species have been located in forests less than 80 years old. Because fungi "fruit" (produce visible sporocarps) unpredictably (i.e. may not fruit each year, vary in fruiting timing from year to year), surveys are not reliable indicators of presence or absence (absence of evidence is not evidence of absence). In addition, many fungi species require laboratory examination by a taxa expert for reliable identification. As a result, it is probable that many Sensitive fungi species are under-reported and under-collected across their ranges. In addition, the habitat requirements for many of the species are too broad or too poorly understood to allow for reasonable mitigations at a project scale, particularly when no sporocarps have been located within the project area.

It is unknown whether the survey impractical Sensitive species occur within GMS. For the purpose of analysis, we assume that there is potential for occurrence within the project area and estimate whether the likelihood of occurrence is low, moderate or high, using guidelines set by Region 6 of the Forest Service (USDA Forest Service 2004c); the impact analyses (see below) reflect this assumption.

Lichens

Chaenotheca subroscida

Habitat Descriptions

This species is an epiphytic "pin lichen". It grows deep in the furrows of the bark of mature and old-growth conifers. On the Gifford Pinchot National Forest, there is one known site for this species on the Cowlitz Valley Ranger District (ISMS Query, 2005), at 4600 ft. in elevation, in a mixed stand of *Picea englemannii*, true firs and pine in an area of the 1918 Cispus Burn. The species was found growing on a mountain hemlock (*Tsuga mertensiana*) at this site.

Government Mineral Springs is located at a little more than ~1100 ft. in elevation, and the plant community type is quite different from the site which hosts this species on the Cowlitz Valley District, i.e. dominated by old growth conifers, including western redcedar, Douglas-fir and western hemlock (*Thuja plicata*, *Pseudotsuga menziesii* and *Tsuga heterophylla*). Because the habitat within GMS is dissimilar to the site from which the species is known on the Gifford Pinchot National Forest, and the project area is located at considerable distance from any known site for this species, the potential for occurrence within the project area is estimated to be low.

Since *Chaenotheca subroscida* is a small, cryptic species that takes specialized knowledge to identify accurately (for these reasons this species is considered survey impractical), it is likely under-reported and under-collected. Based on the known site habitat description from the Gifford Pinchot National Forest, it is presumed that the montane habitat located within the mountain hemlock zone will continue to provide undisturbed habitat for this species outside of the GMS (if the species is there).

Alternatives 1, 2 and 3

Direct and Indirect Effects

Activities that could impact the species include removal of hazard trees, and installation of septic systems, which may require removal of trees in certain cases, and does require that the septic fields (approximately 500-1,000 square feet in size) be maintained tree and shrub free (precluding re-growth of potential host trees). Trimming of understory tree limbs, if permitted in certain cases, could also potentially impact individuals and/or habitat. These activities are permitted over the long term under Alternatives 1 and 2, and over the short term (10 years) under Alternative 3.

So, although Alternative 3 is anticipated to cause fewer negative impacts to the species than Alternatives 1 and 2 (short term vs. long term), the determination was made that Alternatives 1, 2, and 3 ***May Impact*** *Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing Or Cause A Loss of Viability To the Population Or Species.*

Following the removal of all cabins and improvements after 10 years under Alternative 3, there would be no need for future hazard tree removal, septic installation, or various other maintanence actions, and would (after complete implementation) cause ***no impact*** to this species.

Fungi

Habitat Descriptions

Albatrellus ellisii

This species is a mycorrhizal fungus that grows solitary, scattered, gregarious, or in fused clusters on the ground in forests. It fruits in late summer and autumn. Very little is known about the habitat needs of this species, except that it is a forest dwelling species. The one site currently recorded from the Gifford Pinchot National Forest in ISMS (2005) is located at 3680 ft. elevation. It is unknown whether the area encompassing GMS hosts this species, but the likelihood of occurrence within the area is estimated to be low, since the habitat from which it has been reported on the Gifford Pinchot National Forest is dissimilar to that found within the project area, and located at great distance from the known site. The footprint of the GMS summer home cabins and improvements (including homesites, firepits, driveways, paths, roads) is comparatively small in the context of the old growth forest that comprises GMS and the adjacent Trapper Creek Wilderness.

Cordyceps capitata

This species is a fungus that grows as a parasite on *Elaphomyces* species (another fungus); *Elaphomyces* are sequestrate (below ground) fungi. *Elaphyomyces* spp. may be mycorrizally associated with various conifer spp. It is known from one site on the Gifford Pinchot National Forest, from a 1997 collection from Skamania County (Forest Sciences Laboratory (FSL) database query 2005); no additional habitat information is available for this site. It is unknown whether the area encompassing GMS hosts this species, but the likelihood of occurrence within the area is estimated to be low. In addition, the footprint of the GMS cabins and improvements (including homesites, firepits, driveways, paths, roads) is comparatively small in the context of the old growth forest that comprises GMS and the adjacent Trapper Creek Wilderness.

Gomphus kauffmanii

This species is a mycorrhizal fungus that fruits in autumn, and grows closely clumped to caespitose, partially hidden in deep humus, and appears to be associated with *Pinus* and *Abies* spp. The only member of the *Pinus* or *Abies* genera observed in GMS is *Abies grandis* (grand fir). This species is a minor component of the Douglas-fir, western redcedar, western hemlock dominated stand. For these reasons, the likelihood of occurrence for this species within GMS is estimated to be low. In addition, few sites for this species have been located on the Gifford Pinchot National Forest.

Gyromitra californica

This species is a saprobe on wood and litter, and normally fruits in June (late April – early July) on or adjacent to well-rotted conifer stumps or logs, or on soil that incorporates a lot of well rotted woody debris. On the Gifford Pinchot National Forest, the species is known from one site on the Cowlitz Valley District, in an old-growth riparian forest near East Canyon Creek, at 2400 ft. Based on the apparent rarity of this species, but taking into account that the habitat of the known sites are similar to the habitat available within GMS, there is a low - moderate likelihood of occurrence for this species within the GMS. Because GMS is located

within the Late-Successional Reserve land allocation under the Northwest Forest Plan (1994), there are restrictions regarding the removal of large woody debris from the area. In addition, the footprint of the GMS cabins and improvements (including homesites, firepits, driveways, paths, roads) is comparatively small in the context of the old growth forest that comprises GMS and the adjacent Trapper Creek Wilderness, which we presume to have similar habitat.

Leucogaster citrinus

This species is a Pacific Northwest endemic, fall fruiting, sequestrate fungus that is a mycorhizzal associate of conifer species including *Abies concolor, A. lasiocarpa*, *Pinus contorta, P. monticola, Pseudotsuga menziesii*, and *Tsuga heterophylla,* from 280 to 2,000 m elevation. Current Vegetation Survey (CVS) random grid surveys detected this species at 52 sites, 10 of which occurred on the Gifford Pinchot National Forest – these locations are scattered across the forest (CVS query 2005). One known location for this species is found within the Wind River Watershed, suggesting that the species may be fairly well distributed across the Gifford Pinchot National Forest. Because it is a sequestrate (below ground) fungus, it is likely under-reported. If *Leucogaster citrinus* grows within the project area, it is likely associated with the *Pseudotsuga menziesii*, *Tsuga heterophylla* or other conifer species that grow there. Based on the high level of random grid detections, and the apparent availability of suitable habitat, there appears to be a moderate likelihood of occurrence within the project area.

Mycena monticola

This species is mostly fall fruiting. It is a sabrobe on wood or litter, and is generally restricted to conifer forests (especially with *Pinus* spp. present) above 1,000 m in elevation. CVS random grid surveys detected this species at 16 sites across California, Oregon and Washington; two of these detections occurred on the Gifford Pinchot National Forest. Based on the habitat attributes of known sites on the Gifford Pinchot National Forest, and dissimilarity to the habitat available within GMS, a low likelihood of occurrence for this species is estimated within the project area. Because GMS is located within the Late-Successional Reserves, there are restrictions regarding the removal of large woody debris from the stand. In addition, the footprint of the GMS summer home cabins and improvements (including homesites, firepits, driveways, paths, roads) is comparatively small in the context of the old growth forest that comprises GMS and the adjacent Trapper Creek Wilderness, which is presumed to have similar habitat.

Otidea smithii

This species grows as a saprobe on wood and litter, and grows solitary to gregarious, often under *Populus trichocarpa*, *Pseudotsuga menziesii*, and *Tsuga heterophylla*. The species fruits in late summer and fall. On the Gifford Pinchot National Forest, this species has been located on the Cowlitz Valley District. It is unknown whether GMS provides suitable habitat for this species. Based on the habitat attributes of the Cowlitz Valley District sites, dissimilarity to the habitat available within GMS, and substantial distance of known sites from the project area, there appears to be a low likelihood of occurrence for this species within the project area. Because GMS is located within the Late-Successional Reserves there are restrictions regarding the removal of large woody debris from the stand. In addition, the

footprint of the GMS summer home cabins and improvements (including homesites, firepits, driveways, paths, roads) is comparatively small in the context of the old growth forest that comprises GMS and the adjacent Trapper Creek Wilderness, which is presumed to have similar habitat.

Ramaria cyaneigranosa

This species is a Pacific Northwest endemic, fall fruiting fungus (mostly in October). On the Gifford Pinchot National Forest, the species is known from a single site within the Cispus River drainage (within the Cispus burn area), at 1900 ft. It is likely a mycorrhizal species. It is generally associated with conifer species, including *Abies* spp., *Pseudotsuga menziesii*, and *Tsuga heterophylla*. It is unknown whether the project area provides suitable habitat for this species. The habitat attributes of the Cowlitz Valley District site (damp, west Cascades, in an area where extensive burns had occurred early in the century) is superficially somewhat dissimilar from the old-growth forest at GMS. In addition, the known occurrence for this species on the Forest is widely disjunct from GMS. Based on this information, we estimate that there is a low likelihood of occurrence for this species within GMS.

Ramaria gelatiniaurantia

This species is a Pacific Northwest endemic, fall fruiting mycorrhizal fungus. It is generally associated with conifer species, including *Abies* spp., *Pseudotsuga menziesii*, and *Tsuga heterophylla*. The FSL database records one site from Skamania County, on the Gifford Pinchot National Forest (Forest Sciences Laboratory database query 2005). CVS random grid surveys failed to detect this species. It is unknown whether the project area provides suitable habitat for this species. Since little is known about the habitat characteristics of the site in Skamania County, it is impossible to know whether it corresponds closely with habitat found within GMS. However, most of the sites reported for this species seem to be from moist westside conifer forests. Lacking further information about this species, and the Skamania County site where it is found, it is estimate that the likelihood of occurrence is low to moderate. The footprint of the GMS summer home cabins and improvements (including homesites, firepits, driveways, paths, roads) is comparatively small in the context of the old growth forest that comprises GMS and the adjacent Trapper Creek Wilderness, which is presumed to have similar habitat.

Ramaria rubrievanescens

This mycorrhizal species fruits in humus or soil, and matures above ground in June, September and October. It is associated with Pinaceae spp. On the Gifford Pinchot National Forest, this species is reported from one site, near Takhlakh Lake, at 4300 ft. in elevation, on the western foot of Mt. Adams. At this site, the species is probably associated with *Pinus contorta* (lodgepole pine). It is clear that the habitat from which this species is known to occur on the Forest is quite different from that located within the project area. For this reason, the likelihood that this species occurs within the project area is low.

Sarcodon fuscoindicus

This mycorrhizal species fruits on soil, in autumn and winter. In the Pacific Northwest, the species is most often found in conifer forests, and appears to associate with hemlock and pine. On the Gifford Pinchot National Forest, this species is known from the Cowlitz Valley

District, at LaWisWis Campground, and from two sites in Skamania County (one on the Mt. St. Helens National Volcanic Monument). It is unknown whether the project area provides suitable habitat for this species; little is known about the specific habitat characteristics. Lacking more detailed information, but based on the the fact that sites have been found in Skamania County, and a high number of random grid detections on the Forest, the likelihood of species occurrence within the project area is estimated to be low to moderate. The footprint of the GMS summer home cabins and improvements (including homesites, firepits, driveways, paths, roads) is comparatively small in the context of the old growth forest that comprises GMS and the adjacent Trapper Creek Wilderness, which is presumed to have similar habitat.

Sowerbyella rhenana

This species in a saprobe on litter. Its habitat appears to be moist duff in relatively undisturbed, older conifer forests, a description that corresponds closely with the habitat found at GMS. Known occurrences of this species on the Gifford Pinchot National Forest are quite disjunct from GMS. Based on these factors, the likelihood of this species occurring in GMS is low-moderate. The footprint of the GMS summer home cabins and improvements (including homesites, firepits, driveways, paths, roads) is comparatively small in the context of the old growth forest that comprises GMS and the adjacent Trapper Creek Wilderness, which is presume to have similar habitat.

Spathularia flavida

This species is a saprobe on litter, and grows in clusters or fairy rings on woody debris in forests, fruiting in summer-fall. ISMS reports this species from 38 sites across the Northwest Forest Plan area (ISMS query 2005). From the wide variety of reported areas where this species has been found, this species appears to have a rather wide ecological amplitude and environmental tolerance. It is unknown whether GMS provides suitable habitat for this species, but based on habitat information from records of known sites, and the high number of random grid detections on the Forest, the likelihood of species occurrence within the project area is estimated to be low to moderate. Because GMS is located within the Late-Successional Reserve, there are restrictions regarding the removal of large woody debris from the stand. In addition, the footprint of the GMS cabins and improvements (including homesites, firepits, driveways, paths, roads) is comparatively small in the context of the old growth forest that comprises GMS and the adjacent Trapper Creek Wilderness, which is presumed to have similar habitat.

Alternatives 1 and 2

Direct and Indirect Effects

Activities that could impact the species fungi species listed above include removal of hazard trees, and installation of septic systems, which may require removal of trees in certain cases, and does require that the septic fields (approximately 500-1,000 square feet in size) be maintained tree and shrub free (precluding re-growth of potential host trees). Trimming of understory tree limbs, if permitted in certain cases, could also potentially impact individuals and/or habitat. These activities are permitted over the long term under Alternatives 1 & 2, and over the short term (10 years) under Alternative 3.

So, although Alternative 3 is anticipated to cause fewer negative impacts to the species than Alternatives 1 and 2 (short term vs. long term), the determination was made that Alternatives 1, 2, and 3 ***May Impact*** *Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing Or Cause A Loss of Viability To the Population Or Species.*

Following the removal of all cabins and improvements after 10 years under Alternative 3, there would be no need for future hazard tree removal, septic installation, or various other maintanence actions, and would (after complete implementation) cause ***no impact*** to this species.

Table 9. Summary of Conclusion of Impacts for Sensitive Plant Species in Government Mineral Springs

Species	Alt A: Proposed Action	Alternative B	Alternative C: No Action
Dendriscocaulon intricatulum	May impact individuals or habitat, but will not likely lead to a trend towards federal listing (MIIH)	MIIH	NI
Leptogium rivale	No impact (NI)	NI	NI
Nephroma bellum	MIIH	MIIH	NI
Nephroma occultum	MIIH	MIIH	NI
Peltigera pacifica	MIIH	MIIH	NI
Pseudocyphellaria rainierensis	MIIH	MIIH	NI
Tetraphis geniculata	MIIH	MIIH	NI
Survey impractical species (likelihood of presence estimated, as described above).	MIIH	MIIH	NI

Survey and Manage Botanical Species:

As a result of Judge Pechman's court order dated January 6, 2006, Forests are directed to resume implementation of the 2001 Survey and Manage Record of Decision (as amended by

annual species' reviews) (USDA & USDI 2001a). The Botany analysis, in the project file contains more detail on the requirements.

Within the old growth forest that comprises and surrounds the GMS summer home tract, *Pseudocyphellaria rainierensis* (Category A), *Peltigera pacifica* (Category E), *Dendriscocaulon intricatulum* (Category A), and *Nephroma occultum* (Category C), are well distributed, with apparently healthy 'populations'. The various individual thalli or groups of thalli that have been located (detections as used in the quote above) within this stand likely comprise functionally contiguous populations of these species. For this reason, impacts to single thalli are not considered the destruction of a 'site' in this particular instance. *Leptogium rivale* is also a Category E Survey and Manage species, requiring management of all known sites. The existing occurrences of this species will not be impacted by any of the alternatives. All three alternatives will prevent degradation of stream temperature and water pollution.

Other Botanical Species of Concern:

Since *Pseudocyphellaria mallota* is considered quite rare within the Pacific Northwest, it is important to protect occurrences of the species. The single occurrence known from the Gifford Pinchot National Forest is located at GMS. The site is located along a roadside, but not in close proximity to any cabins. Normal administrative procedures – in particular, consultation with a Forest Service botanist prior to any potentially habitat-disturbing activities, will prevent impacts to this occurrence.

Cumulative Effects for all Species

Alternatives 1, 2 and 3

The cumulative effects analysis area is the GMS tract. A number of large, old trees (estimate of 2-5/year for the next 20 years) would likely be identified and removed as hazards over the term of the permits. This ongoing action would gradually remove the old-growth canopy in the areas directly adjacent to the cabin sites, other improvements, and along access roads, degrading the old-growth habitat as a result. In addition, installation of new septic systems would continue to occur, with a septic eventually installed on every lot. This would have the cumulative effect of creating maintained openings where trees and shrubs would not be allowed to regenerate. In combination with hazard tree removal, this would creates a situation where the overstory is gradually removed, while the understory is prevented from reaching full growth potential (young trees that would take the place of the old trees in the long term) in the areas directly adjacent to cabins and other improvements. Implementation of project design features as a part of permit compliance would help to ameliorate these effects, but would not prevent them. It is important to understand, however, that within the context of the old-growth riparian stand where GMS is located, and the adjacent Trapper Creek Wilderness, the footprint of these impacts would be relatively small.

In summary, none of the Sensitive botanical species that were located within GMS, or that are (for the sake of analysis) presumed to exist within GMS (survey impractical species) are either so limited in distribution, habitat, or number that project activities (with incorporated

design features), in combination with past or reasonably forseeable future actions on nearby federal land and adjacent private land, are likely to lead to a trend towards federal listing for these species, or threaten the viability of entire populations or species as a whole.

Fuels and Fire

Existing Condition

The GMS Tract has not been impacted by wildland fire for several centuries. Tree species ranging in age from 400-700 years old are mainly Douglas fir, western red cedar and western hemlock. Although many of these majestic giants have fallen due to age, and some were cut because they posed a hazard to recreationists and improvements, there is little on-the-ground evidence of LWD of the older ages classes. Most likely, these logs were used by cabin owners and other forest visitors for fire wood since there is relatively little dead and down vegetation in the immediate and surrounding areas of the cabins.

The climax species is western hemlock, which currently dominates the landscape where the overstory is open or absent. These young hemlock stands are scattered and relatively small in size; $\leq$.10 acres. Where the overstory is somewhat intact, vine maple dominates the understory. Vine maple is not known to assist in the spread of wildfire and is well adapted to low and moderate intensity fires.

This stand type would normally be considered a Fire Behavior Prediction (FBP) Fuel Model (FM) 10 with heavy surface fuel loading due to the decomposing stage of the stand, but this is not the case in GMS. Fuel loading in the tract is minimal and fuel bed depth is nearly non-existent. Both fuel loading and fuel bed depth are significant fuel properties for predicting whether a fire will be ignited, its rate of spread and its intensity. The conditions at GMS are consistent with the characteristics of FM 8, where fires are generally slow burning, and flame lengths are low except where the occasional jackpot of fuel is encountered. Only under severe weather conditions involving high temperatures, low humidities, and high winds do the fuels pose a fire hazard. These extreme conditions occur $\leq$ three percent of the time during the established fire season from June 15 thru October 15. Late summer and early fall are more likely to experience these conditions after a prolonged dry period and before the fall rain begins.

This area is not prone to lightning due to the flat terrain and low elevation of the cabin locations. The Trapper Creek Wilderness which is located to the north and west has only had two fire ignitions caused from lightning in the last 30 years and these were single tree fires which did not spread. Rainfall generally accompanies these lightning storms, which have naturally retarded fire starts. Human caused ignitions are also a rare event and have not been an issue in recent history. The majority of the Wilderness is a FPB FM 10 where heavy accumulations of dead and down are present, particularly in the Observation Peak and Soda Peaks Lake areas. This FM may burn with greater intensity with potential for individual tree torching, crowning and spotting.

The Forest Plan states that the appropriate management response for all wildland fires within the Late Successional Reserve will be "Control." A control strategy means that the fire will be suppressed until there is zero to little probability for escape. In the GMS Tract this means that all wildland fires would be dead out before they are left unattended. If a fire started in one of the structures within the tract, the local rural fire department would respond. If the wildland was threatened from the burning structure, Forest Service wildland fire resources would be dispatched to the scene to protect the wildland.

Effects Analysis

Alternatives 1, 2 and 3

Direct, Indirect and Cumulative Effects

If future fires occur within GMS Tract they will most likely be of low intensity with a high probability of success at initial attack. Attack would be "direct" due to the low flame lengths and intensity allowing fire suppression resources near the flaming front. Even in moderate to high fire danger conditions with low relative humidity and high temperatures, fires are likely to be caught in the initial attack phase. These fires may be of greater intensity requiring the use of heavy equipment and aerial resources but it is unlikely they develop into project fires.

Periods of extreme fire danger do not generally last for periods of more than a few days, and as stated above only occur $\leq$ three percent of the time. If an ignition were to occur and high winds were sustained, a crown fire could develop. A crown fire may spread rapidly through the dense canopy in the areas immediately adjacent the home tract and in areas within the tract where same conditions exist. This type of fire would mean high intensities, long flame lengths, long range spotting and would be difficult to control. It would be a stand replacing event where the majority of the vegetation would not survive and existing structures probably could not be protected.

Other Effects

Environmental Justice

Executive Order 12898 (February 11, 1994) directs federal agencies to focus attention on the human health and environmental condition in minority and low-income communities. The purpose of the Executive Order is to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects on minority and low-income populations. The principle behind Environmental Justice is that people should not suffer disproportionately because of their ethnicity or income level.

The reissuance of recreation residence permits does not create or sustain jobs or cause any human health or environmental concerns; therefore none of the alternatives would have a disproportionately high or adverse human health or environmental effect on minority and low-income populations.

Chapter IV: CONSULTATION AND COORDINATION

The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes and non-Forest Service persons during the development of this environmental assessment:

Interdisciplinary Team Members:

Julie Knutson, Recreation Residences Permit Administrator and EA Team Leader
Jon Nakae, Recreation Specialist
Cheryl Mack, Archeologist
Bengt Coffin, Hydrologist
Stephanie Caballero, Fisheries Biologist
Diana Perez, Fisheries Biologist
Mitch Wainwright, Wildlife Biologist
Andrea Ruchty, Botanist
Gail Bouchard, Fire and Fuels Specialist
Erin Black, NEPA Planner

Federal, State, and Local Agencies:

National Marine Fisheries Service (NMFS)
The projects associated with the GMS Recreation Residence Residence Special Use Permits EA fall under the April 28, 2007 *Section 7, Endangered Species Act, Programmatic Biological Opinion for Fish Habitat Restoration Activities in Oregon and Washington, Calendar Years 2007-2012* (National Marine Fisheries Service, 2007). To meet obligations of the Biological Opinion, the Forest Service presented this project to NMFS representatives at the May 2008 interagency Level 1 meeting and completed a project consistency form. This documentation can be found in the project file.

US Fish & Wildlife Service (USFWS)
The Forest Service conducted informal consultation with the USFWS for the GMS Recreation Residence Special Use Permit proposal. A Forest Service Biological Assessment, dated April 28, 2008 was sent to the USFWS, detailing the effects of the project to listed species. A US Fish & Wildlife Service Letter of Concurrence with the determination that the proposed action "may affect, but is not likely to adversely affect" the northern spotted owl and designated spotted owl critical habitat was received on June 2, 2008. No further consultation is required. The Biological Assessment and Letter of Concurrence can be found in the project file.

The National Historic Preservation Officer (NHPO)
The Forest Service consulted with the Washington State Department of Archaeology and Historic Preservation (DAHP) under the provisions of Section 106 of the National Historic Preservation Act of 1966 (as amended). The State Historic Preservation Officer concurred that "no historic properties will be affected" by the GMS proposal. No additional

reconnaissance or consultation is needed at this time. Documentation of consultation can be found in the project file.

Tribes:

The Confederated Tribes and Bands of the Yakama Nation received both the scoping and 30-day public comment letters. No issues were identified with this proposal that may affect historic tribal use or interests.

Others:

A list of everyone who received information on this project can be found in the project file.

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