

# CHAPTER 1. PURPOSE OF AND NEED FOR ACTION

## Document Structure

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

- *Chapter 1. Purpose and Need for Action:* The chapter 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.
- *Chapter 2. Alternatives, including the Proposed Action:* This chapter provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- *Chapter 3. Affected Environment and Environmental Consequences:* This chapter describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by [insert topic (i.e., resource area, significant issues, environmental component)].
- *Chapter 4. Consultation and Coordination:* This chapter provides a list of preparers and agencies consulted during the development of the environmental impact statement.
- *Appendices:* The appendices provide more detailed information to support the analyses presented in the environmental impact statement.
- *Index:* The index provides page numbers by document topic.

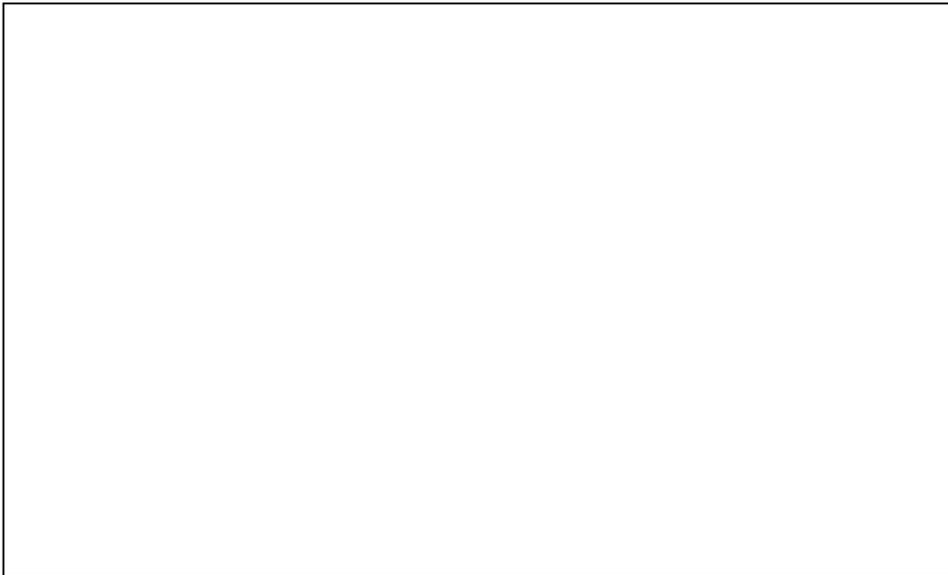
Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Mount Adams District office, 2455 Highway 141, Trout Lake, WA 98650.

## Background

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The project area is located within S27, T. 4N, R. 7E, W.M., Skamania County, Washington. Hemlock Dam was constructed at river mile 1.8 of Trout Creek, a major tributary to the Wind River. The 22-foot high dam was built in 1935 to provide power for the Wind River Ranger District and the associated fish ladder was added in 1936. The dam was later converted to provide irrigation water to the Wind River Nursery. Since the Wind River Nursery closed in 1996, the sole purpose for the dam has been to provide a reservoir for summer recreational use.

Upstream of Hemlock Dam are approximately 15 miles of Trout Creek and its tributaries that are accessed by Lower Columbia River steelhead, a fish listed as Threatened under the Endangered Species Act in 1998. Since the time of dam construction, Trout Creek has continued to produce steelhead due to a combination of hatchery outplanting in the upper watershed (which was discontinued in the mid-1980's), and natural migration past the dam via the fish ladder. Although both upstream-swimming adult steelhead (spawners) and downstream-swimming smolts are known to pass the dam and fish ladder, there continue to be concerns about the health affects these fish experience in their delayed attempts at finding a route past the dam via the fish ladder. In addition, juvenile steelhead who are moving both upstream and downstream in Trout Creek appear to be delayed in the lake and therefore, are exposed to the lake's high water temperatures for extended periods.



*[insert vicinity map]*

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**Figure 1-1. Vicinity map.**

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The Trout Creek run saw dramatic declines in the number of returning fish in the 1990's, coinciding with a regional decline in steelhead. Reaching a low of just 8 returning fish in 1997, returns have since increased to 75 fish in 2003. Although the source of the decline in the 1990's does not appear to be attributable to Hemlock Dam, the fact that fish levels reached such low

levels indicates the tenuous nature of this run, and the importance of taking any necessary actions to remedy known problems.

Hemlock Dam has been perceived as an impediment to steelhead based on a combination of engineering and hydraulic studies and visual observations made by agency personnel. Studies completed by Orsborn (1987) and Barber (1999) found deficiencies in the design of the fish ladder and dam equipment that would contribute to direct fish mortality and/or form impediments to fish passage. Forest Service and USGS biologists working around the dam have documented direct fish mortality at the dam, due to both impingement of fish on dam structures, and fall mortality to fish going over the dam crest. In addition, large numbers of juvenile fish annually congregate in the lake just above the dam, during the late summer months when discharge levels are low and water temperatures are high.

During summer months, Trout Creek has the highest water temperatures of any major tributary to the Wind River, frequently exceeding state water quality standards for maximum water temperature. Over the past ten years, the state water quality standard for water temperature has been exceeded on average 50 days per year in Trout Creek, just upstream of the reservoir. As these heated waters flow through the reservoir, temperatures continue to increase, at times reaching levels that are lethal to steelhead (USFS 1996). As a result of the high temperatures, Trout Creek was listed on the Washington State Department of Ecology's 303(d) list of impaired water bodies (WDOE 1998). Although the heating of water in Trout Creek begins in the wide, open channels in the upper Trout Creek drainage well above the influence of Hemlock Dam, the reservoir formed by the dam is an important contributor to the temperature problem in lower Trout Creek (USFS 2001). Moreover, the combined effect of the increased water temperature in the lake, and the potential delay of fish moving downstream may expose those fish to the higher water temperatures for long periods as they search for the reservoir outlet. The water temperature problem in the reservoir has been compounded by the continued infilling of the reservoir with sediments, which has nearly eliminated the deep pools where fish may once have found thermal refuge.

The prolonged exposure these fish receive to the high water temperatures in the lake could cause direct mortality to the fish, but may also indirectly affect their survival by impacting their health and vigor. In addition to the suspected delay in fish migration, the dam forms a barrier to downstream movement of sediment and other debris. In past years, the nursery has occasionally dredged the reservoir to maintain storage capacity, or used a sluice gate to periodically flush sediments from the reservoir downstream. These practices were curtailed decades ago, and the reservoir has subsequently filled with sediment. The dam's sediment buildup entirely blocks the downstream movement of any coarse sediments and other debris. This affects aquatic habitat and channel processes both in the lake and downstream of the dam. The resulting shallow, exposed reservoir is the primary reason for the high temperatures just upstream of Hemlock Dam.

Additionally, because sediments are deposited and trapped upstream of the dam, lower Trout Creek and to a lesser extent the Wind River downstream of the Trout Creek confluence have been depleted of sediments. Although these high gradient channels tend to transport sediment rather than store it, sediment is still an important component of the channel processes and fish habitat there. Coarser sediments reside on channel bottoms and margins, providing flow resistance, habitat, and retention of debris. Replenishment of sediments from upstream sources is important for building and rebuilding gravel bars and streambeds, and in maintaining and rebuilding streambanks. Stored sediments and organic debris throughout the channel provide habitat for aquatic life that provides food for fish and other aquatic organisms.

The Gifford Pinchot National Forest commissioned a study with Washington State University (WSU) in 1999 to evaluate options to improve fish passage at Hemlock Dam. This study was initiated after several years of particularly low returns of steelhead to Trout Creek, and because of the concern that fish passage through the ladder and over the dam was suboptimal. The low

steelhead runs of the late 1980's and 1990's—when fewer than ten fish passed upstream through the ladder—highlighted the tenuous nature of the run in Trout Creek, and the importance of taking any necessary actions to remediate known problems. The WSU report found that the most cost effective means of improving fish passage was to remove the dam. This preliminary study provides the basis for the agency proposal to remove the dam.

## Purpose and Need for Action

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The primary purpose of the action alternatives is to enhance opportunities for viable and healthy fish populations, particularly endangered Lower Columbia River steelhead, in the Hemlock Dam area of Trout Creek. This action responds to the goals and objectives outlined in the *Gifford Pinchot National Forest Land and Resource Management Plan* (1990), as amended, and helps move the project area towards desired conditions described in this plan.

Viable and healthy fish populations are evaluated from analysis of the following measurements:

- Sediment and turbidity
- Large woody debris and organic routing
- Water temperature
- Pool frequency and quality
- Riparian vegetation
- Fish migration
- Predation
- Recreation and harassment

This action is needed in order to:

- Improve upstream and downstream fish passage for all life stages of fish at the Hemlock Dam site.
- Improve aquatic habitat and water quality in Trout Creek.

The following objectives accompany the primary purpose:

### **Implement a safe, cost effective approach to managing the Hemlock site.**

Continued operation of the dam has with it a number of costs that are borne by the Forest Service. State law requires regular maintenance and clearing of the fishway, which entails daily visits to the dam by technicians to clear debris from the fish ladder, the traveling fish screen, and other places where fish could be impacted. In addition, older operational parts of the dam including the traveling fish screen, sluice gate, and their controls have the potential for breakage from normal usage or from being damaged by instream debris that is being carried downstream in Trout Creek. During summer months, dam flashboards must be managed to maintain a viable swimming lake for recreation, while maintaining sufficient downstream flow for fish. A long term solution to managing the Hemlock site must maintain or reduce the costs associated with managing and maintaining the dam and its facilities, while maintaining a safe work environment for employees.

### **Continue to support recreational opportunities at the Hemlock site.**

The Hemlock Lake recreational site has been popular since its inception in the 1930's. Currently, it is highly used by the public for swimming and water-oriented recreation, but also for picnicking, barbecuing, and other day use activities. This project may affect the types of uses

appropriate at the Hemlock recreational site, but must provide for continued public uses of the picnic area.

### **Terms used in this statement**

#### **Scale of the Analysis**

In this statement various terms are used to focus the scale of the entire planning area. **Activity area** refers to the area in the immediate vicinity of Hemlock Dam and Hemlock Lake, including the day-use recreation area. **Project area** includes the activity area but extends to the sediment disposal site, the adjacent Trout Creek Riparian Reserve and the surrounding former nursery fields. A discrete part of the project area is the dam concrete disposal site at the Carson-Guler quarry and route that will be used for truck access. The **planning area** is much broader and includes the area for which cumulative effects related to sediment release are considered. For the purposes of this analysis, the planning area extends from the upper reaches of Trout Creek to the mouth of the Wind River.

#### **Hemlock Lake**

The body of water impounded behind Hemlock Dam is correctly termed a reservoir, however as a result of the recreational use the reservoir has come to be known as Hemlock Lake. For the purposes of this statement these terms are equivalent.

## **Proposed Action**

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The proposed action would remove Hemlock Dam. Actions associated with the dam removal include:

- Dredge and remove a portion of sediment from the reservoir (estimated 2,500 cubic yards).
- Dispose of the dredged sediments
- Fully remove and dispose of the dam, including abutments
- Shape and stabilize the channel where necessary in the affected reach
- Make necessary alterations at the Hemlock recreational site to accommodate the new stream channel and loss of the reservoir and dam.

This action meets the purpose of enhancing opportunities for viable and healthy fish populations of Lower Columbia River steelhead within this portion of Trout Creek by removing a major obstacle to fish passage of all life-stages; improving habitat conditions and water quality by replacing a slow, warm body of water with a free flowing stream; removing accumulated sediments to permit unrestricted stream channel development.

The primary objectives for this proposal would be met. Removal of the dam would mean that costs associated with its management would be eliminated. There would be no facility or operational parts to maintain, thus no exposure of employees to potentially hazardous situations. Though the reservoir would be drained through this action, thereby removing water-oriented recreation, the day use area would be retained and potentially expanded to include interpretive viewpoints and trails.

## Management Direction

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This action is planned under the direction of *The Land and Resource Management Plan for the Gifford Pinchot National Forest* (1990), commonly referred to as the Forest Plan. The Forest Plan was amended by the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (ROD). This Amendment was signed May 20, 1994. Attachment A to the ROD, *S&Gs for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl* (S&Gs), sets forth the management direction intended to facilitate implementation of the ROD. Collectively, the ROD and Attachment A are referred to as the Northwest Forest Plan.

Amendment 11 to the Forest Plan was published in February 1995. It 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. It is available on the internet at [www.fs.fed.us/gpnf/](http://www.fs.fed.us/gpnf/).

## Northwest Forest Plan Direction

The Northwest Forest Plan includes direction aimed at restoring and maintaining the health of watersheds and aquatic ecosystems contained within them, specifically to protect salmon and steelhead habitat on federal lands. Termed the Aquatic Conservation Strategy, this conservation strategy set forth nine objectives that must be achieved at the watershed scale. Collectively, activities within a watershed must meet or not prevent attainment of the nine Aquatic Conservation Strategy objectives at the watershed scale. (Amendment 11, p. 2-2)

Components of the Aquatic Conservation Strategy include:

- Riparian Reserves, which are lands along streams and unstable and potentially instable areas where special standards and guidelines apply;
- Key Watersheds, which are a system of large refugia comprising watersheds that are crucial to at-risk fish species and stocks and provide high-quality water;
- Watershed Analysis, which evaluates geomorphic and ecological processes operating in specific watersheds;
- Watershed Restoration, which is a comprehensive, long-term program to restore watershed health and aquatic ecosystems.

Dam removal, channel restoration, sediment transport and disposal activities occur within Riparian Reserves. Riparian Reserves are portions of watershed where riparian-dependent resources receive primary emphasis and where special standards and guidelines apply. (Amendment 11, p. 2-4.) The standards and guidelines for Riparian Reserves prohibit or regulate activities that would retard or prevent attainment of the Aquatic Conservation Strategy objectives. (Amendment 11, p. 2-10.)

The Hemlock Dam planning area falls within a Key 1 Watershed emphasized as conservation and restoration areas for at-risk anadromous salmonid, bull trout, and resident fish. Identified as the highest priority for restoration, key watersheds “of lower quality habitat have a high potential for restoration and will become future sources of high quality habitat” (Amendment 11, p. 2-10).

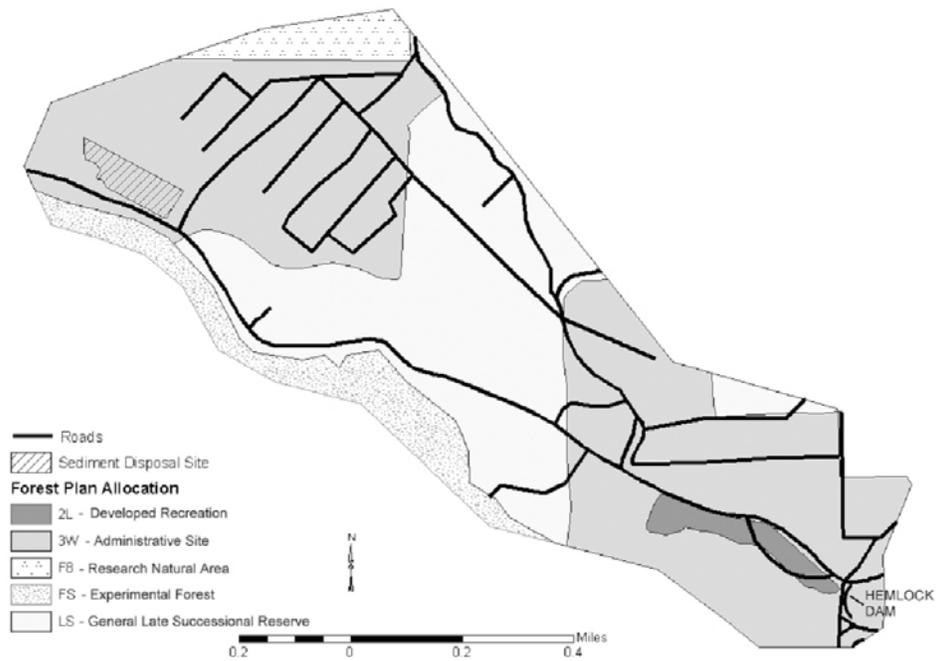
The second iteration of the Wind River Watershed Analysis was completed in 2002. It contains watershed restoration recommendations that are specific to Hemlock Dam and to Trout Creek.

*[WR WA recommendations...]*

There are several watershed restoration activities that have been approved or implemented in the Trout Creek subwatershed and the Wind River watershed. They are considered in relation to cumulative effects to fish habitat and water quality. Specific projects within the planning area are: **Upper Trout...**

## Forest Plan Land Allocations and Direction

Gifford Pinchot National Forest lands are allocated to a system of Management Areas according to the amended Forest Plan (Amendment 11). These Management Areas carry specific management goals for activities that would occur within them. The “desired future condition” and “standards and guidelines” detailed in the Forest Plan guide how these lands will be managed. Refer to Figure 1-1 for the Management Areas that are within the Hemlock Dam project area.



**Figure 1-2. Forest Plan Management Areas in the Hemlock Dam project area.**

Hemlock Dam and Hemlock Lake are within and, except for the north shore of Hemlock Lake, are included in the larger Wind River Administrative Site (3W) Management Area. The desired future condition for Administrative Sites include the evidence of ongoing administration of the National Forest through generally permanent structures, including buildings and roads. The Recreation Opportunity Spectrum assigned to Administrative Sites is “Rural” and the Visual Quality Objective is “Modification”. The Forest Plan states that “Recreational facilities should be few or absent” for administrative sites. (Amendment 11, p. 5-18) Public access may be provided when it does not conflict with the functions of the Administrative Site. The Forest Plan does not identify specific standards for managing the Hemlock Lake recreation site. Standards and guidelines appropriate to this analysis relate to recreation planning and inventory and require the inventory of cultural, biological, and other features of interest.

The north shore of Hemlock Lake is designated Developed Recreation (2L). The goal for this Management Area is to provide readily accessible, appropriately designed facilities that will provide for concentrated visitation by people seeking a convenient recreational experience. Developed recreation sites are usually close to water bodies, berryfields, and other areas of scenic or special interest. Except for winter recreation areas, they are usually located on relatively flat land with slopes of less than ten percent. Soils and vegetation must be able to absorb heavy use. Camp and picnic grounds, ski areas, recreation residences, viewpoints, boat launches, and other facilities may be accommodated. (Forest Plan, p. 5-21.)

The sediment disposal site is located in a portion of the former Wind River Nursery that is designated as Administrative Site (3W) by the Forest Plan. Under the proposed action, Forest Road 43 would access the disposal site approximately 3.5 miles from the dam. This road parallels Trout Creek and passes almost equally through Administrative Site and General Late-successional Reserve (LS).

The objective of Late-Successional Reserves is 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. (Amendment 11, p. 5-1.)

## Public Involvement

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Formal public involvement in the Hemlock Dam proposal began with a public outreach effort called *scoping* which endeavors to garner substantive comments and concerns from entities outside of the Forest Service to help the agency's interdisciplinary team better understand stakeholder issues. Though ongoing, public scoping has thus far occurred in two primary phases. The first scoping phase began with the Forest Service's Notice of Intent (NOI) published in the *Federal Register* on August 16, 2001. In response, approximately 150 contacts were received in the form of meetings, phone calls, letters, and emails. Various public meetings served as a forum for stakeholders and the Forest Service to discuss and learn about the proposed action and associated issues. These meetings included: Southwest Washington Advisory Committee meeting on May 30, 2001; an open house at Stevenson's Rock Creek Council meeting on May 31, 2001; a Watershed Council meeting on September 19, 2001, and a Yakima Nation scoping meeting on November 20, 2001.

After a delay in the project, a revised scoping notice was issued which precipitated another phase of public involvement. The reissued scoping notice informed the public that previously received comments would be retained and considered. In this most recent phase of public scoping, 162 contacts have occurred via meetings, phone calls, letters, and emails. Approximately 145 of these contacts were standardized emails originating from a website supporting the removal of this and all dams.

All comments received from private individuals, non-government organizations, and government officials and agencies have been considered in the interdisciplinary team's formulation of alternatives and potential effects determination. Throughout the public scoping process, the public's interest in the proposed action has spanned a spectrum ranging from taking no action to fully removing the dam to continuing with fact-finding and analysis. The issues supporting these various viewpoints can be broadly categorized as follows: (in alphabetical order)

- aesthetics
- community and government economics
- downstream property effects

ecosystem protection  
fish health and habitat  
historical preservation  
legal requirements  
public safety  
recreational opportunities  
scientific justification for project  
water quality  
water rights

## Issues

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Through a combination of public and internal scoping, the interdisciplinary team identified issues that describe the anticipated impacts and effects of the proposed action. In order to devise alternatives to the proposed action, the team then categorized these issues as significant or non-significant. Significant issues are defined as those concerns which, when initially analyzed, helped drive the formulation of a distinct alternative. Non-significant issues (i.e. those issues not influencing the formulation of an action alternative) may be mitigated by an action alternative or may already be resolved by law, regulation, or policy. An issue's categorization as significant or non-significant does not define the extent of its significance or impact on the human environment, and both types of issues undergo the requisite analysis and consideration in the decision making process. Included with each issue description are the Measurement Methods, which were identified as an indicator to assist the decision maker in the effects analysis and decision making process.

Still other issues that were raised during scoping could be categorized as either: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) NEPA regulations explain this delineation in Sec. 1501.7. These issues were not analyzed in this statement. A list of these other issues and reasons regarding their categorization may be found in the project record.

## Significant Issues

### ***ISSUE: Loss of Recreation Opportunities at Hemlock Lake***

Hemlock Lake—the impoundment cause by Hemlock Dam—is a very unique feature within the local area and on the Gifford Pinchot National Forest as a whole. The local community has used the Hemlock Lake area as a swimming, picnic, and day-use recreation since the dam was constructed in 1935. While the lake conditions and uses have changed over time, the lake currently provides a shallow, warm water play area popular with people of all ages during the summer months, particularly families with young children. Removing the dam could mean a direct loss of water-based recreation opportunities for residents and visitors as well as a loss of attachment to the lake area by its long-term users.

### **Measurement Methods**

Change in number of recreation sites and opportunities.

***ISSUE: Direct impacts to an historic structure***

The Hemlock Dam and its fish ladder have been determined to be eligible for listing on the National Register of Historic Places. Removal or further alteration of the dam and/or fish ladder would have an adverse effect on this historic property (36 CFR 800.5).

**Measurement Methods**

Number of historic structures altered or destroyed

Degree of alteration to historic properties

***ISSUE: Sediment Release into Trout Creek and Wind River***

Removal of Hemlock Dam, dredging operations, and lakeshore will cause increased sediment delivery to lower Trout Creek and the Wind River. Sediments would be released both during dam removal and during subsequent stream flow events that erode the bed and banks of the newly reformed Trout Creek as it crosses through the area now covered by Hemlock Lake. The coarser fraction of the sediment load will contribute to improved conditions in the channel downstream of the dam, as these areas have been depleted of sediments over the past several decades. The finer component of the sediments will be more rapidly transported further downstream. These fine sediments can have negative effects to fish, and will contribute to the ongoing buildup of sediments near the mouth of the Wind River.

**Measurement Methods**

Sediment transport compared against modeled conditions

Water quality compared against modeled conditions

**Non-significant Issues*****ISSUE: Direct impacts to archaeological sites***

Removal of Hemlock Dam and its fish ladder and the construction of equipment access routes could result in direct impacts to the archaeological remains of the Trout Creek Site, a site that has been determined eligible for listing on the National Register of Historic Places. Additionally, future restoration of lakeshore sediments and reconditioning of the picnic area could directly and indirectly impact recorded prehistoric and historic deposits. Dredging of sediments could result in direct impacts to remains of the Wind River Lumber Company's splash dam. Under federal regulations (36 CFR 800.5), damage to this site as a result of heavy equipment use and access constitutes an adverse effect to the site. The SHPO has concurred with a determination of adverse effect for this proposal.

**Measurement Methods**

Percentage of archaeological site disturbed

***ISSUE: Impacts to groundwater and local wells***

Removal of Hemlock Dam could affect recharge rates to local groundwater reservoirs, influencing well water levels in the vicinity of Hemlock Lake. The effect that Hemlock Lake has to recharge of wells in the area was not determined to be a significant issue based on the available data (Seescholtz, 1986).

**Measurement Methods**

Stream flow rates measured above and below Hemlock Lake

Groundwater level fluctuations measured over time

**ISSUE: Fish monitoring/mgmt options will be impacted by removal of the dam—Brian**

Removing trapping options

Increased risk of genetic interaction between hatchery/wild fish

**Measurement Methods**

**ISSUE: Loss of pond habitat--Mitch**

**Measurement Methods**

**ISSUE: Loss of wetland habitat—Mitch/Andrea**

**Measurement Methods**

**ISSUE: Colonization by noxious weeds—Andrea**

**Measurement Methods**

**ISSUE: Public Safety—Julie**

Heavy equipment, dust impacts during construction

Recreation in river vs pond

**Measurement Methods**

**ISSUE: Economic impacts --Julie**

Increased Rec / LEO costs resulting from increased dispersed use off-site

Business loss of revenue

**Measurement Methods**

**ISSUE: Project Cost and Long-term Maintenance - Brian**

**Measurement Methods**

## **Other Related Efforts**

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The conveyance of the Wind River Nursery to Skamania County included water rights for both use and storage of surface water impounded by Hemlock Dam. In July 2004, Skamania County applied to the State Department of Ecology for conversion of the surface rights to a subsurface water right. This may have an effect on how much water can be retained in the reservoir.