



United States  
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Forest  
Service

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# Final Environmental Impact Statement

## Fish Passage and Aquatic Habitat Restoration at Hemlock Dam

Mount Adams District, Gifford Pinchot National Forest  
Skamania County, Washington

S. 27, T. 4N, R. 7E, W.M.



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To view/download FEIS: <http://www.fs.fed.us/gpnf/04projects/hemlock-dam/index.shtml>

## EXECUTIVE SUMMARY

### Background

Hemlock Dam was constructed in 1935 originally to generate electricity for the U. S. Forest Service Wind River District, Wind River Nursery, and a Civilian Conservation Corps camp. It was later re-tooled to provide irrigation water for the Wind River Nursery. Since the reservoir has been in existence, it has provided recreational opportunities. The site was developed soon after the dam was constructed to include a picnic area, boat launch, and a swimming area and became known as Hemlock Lake. Recreational use of the reservoir continues to this day however, the dam no longer serves the purposes of hydroelectric power generation or water storage for irrigation.

### Need for Action

Declines in the number of Lower Columbia River (LCR) summer steelhead returning to Trout Creek in the mid-1990's focused attention on fish passage and habitat conditions throughout the watershed. Listing of the LCR steelhead as Threatened under the Endangered Species Act occurred in 1998 and further heightened awareness of the need to improve conditions for these fish. Since the mid-1990's, when fewer than ten fish returned to Trout Creek, the U. S. Forest Service (USFS) and partner agencies including U.S. Fish and Wildlife Service, Bonneville Power Administration, Underwood Conservation District and others have identified and treated numerous areas within the Trout Creek watershed to improve conditions for these fish. Projects have included: instream enhancements, woody debris placement, riparian planting, road decommissioning and culvert upgrades, and incremental improvements in attraction flow to the fish ladder at Hemlock Dam. In spite of the improvements to the fish ladder, Hemlock Dam has continued to function as a bottleneck for fish and other aquatic organisms in lower Trout Creek. It

also causes water temperatures to increase to lethal levels in Hemlock Lake, and contributes to poor habitat conditions in the lower reaches of Trout Creek.

### **Proposal**

To improve upstream and downstream fish passage for all life stages of fish at the Hemlock Dam site and to improve aquatic habitat and water quality in Trout Creek, the Mount Adams District of the Gifford Pinchot National Forest proposes to remove Hemlock Dam and to dredge and construct a new channel in the area which is now occupied by the reservoir behind Hemlock Dam. The proposed action developed under the draft environmental impact statement (DEIS) would have removed the dam and allowed the river to erode sediments from the reservoir to form the new channel. The preferred alternative in the final environmental impact statement (FEIS) is different than the proposed action described in the DEIS in response to findings in the analysis of alternatives in the DEIS that the project would significantly affect fisheries if sediments were allowed to be flushed downstream.

The area affected by the proposal includes the immediate vicinity of Hemlock Dam, reservoir, and fish ladder (within S. 27, T. 4N, R. 7E, W.M.); the disposal site for the concrete dam structure in a location known as the Carson-Guler quarry; the disposal site for the excess channel sediments in a portion of the former Wind River Nursery that is still under federal ownership; the haul routes between these two disposal sites (Forest Roads 30, 43, 60 and 60-031); the channel of Trout Creek and Wind River downstream from the dam; and the confluence of Wind River with the Columbia River.

### **Project History**

This project was initiated in 2000. The Notice of Intent (NOI) was published in the *Federal Register* on August 16, 2001. In response to this notice and local public outreach (“scoping”), approximately 150 comments were received. Various public meetings served as a forum for stakeholders and the USFS to discuss and learn about the proposed action and associated issues. After an interruption in the project, a second scoping notice was issued on May 24, 2004 that informed the public that the project had been resumed and that previously received comments would be retained and considered along with any new comments. In both 2001 and the more recent phase of public scoping, 162 comments were received from individuals, organizations, agencies, and tribes via meetings, phone calls, letters, and emails.

Several issues were raised as a result of these comments and the concerns for the adverse effects of the proposed action. The USFS identified eight significant issues that would be used to formulate alternatives to the proposed action. The significant issues are:

- Increase in water temperature
- Sediment release into Trout Creek and Wind River
- Barriers to fish migration
- Loss of recreational opportunities at Hemlock Lake
- Direct impacts to an historic structure
- Direct impacts to prehistoric sites
- Impacts to the local economy from expenditures by recreation visitors
- Economic impacts to the USFS

These issues led the agency to develop and analyze the following alternatives to the originally proposed action:

- Remove the dam, dredge 35,000 – 60,000 cubic yards of accumulated sediments from proposed channel location
- Retain the dam, improve deficiencies, and modify or replace the fish ladder
- Retain the dam, improve deficiencies, do not modify or replace the fish ladder

Pursuant to the National Environmental Policy Act (NEPA, at 40 CFR 1502.14) the “no action” alternative will also be evaluated.

A DEIS was issued for public comment on October 1, 2004. A total of 65 individuals, representatives of organizations, tribes, and agencies submitted comments during a formal 45-day comment period. The substantive comments received through this process have been addressed either in the text of this FEIS, or in direct responses included in Appendix A of the FEIS. Analysis in the DEIS quantified the effects of the proposed action, and through this process it was determined that the proposed action (Alternative B) would result in unacceptable short term impacts to fish, as a result of the large volume of sediments that would be eroded downstream. For that reason, Alternative C, the alternative that would remove the dam, dredge most of the accumulated sediments, and construct a designed channel through the area now occupied by the lake has become the USFS’s preferred alternative.

### **Analysis Findings**

The results of the analysis in this FEIS are summarized in the following table.

The responsible official will consider all effects and decide whether or not to remove and dispose of Hemlock Dam and the fish ladder and if so, whether or not to remove and dispose of all of the sediments from the proposed channel. If the decision will be to retain the dam, the disposition of the fish ladder will be a part of this decision.

**Fish Passage and Aquatic Habitat Restoration at Hemlock Dam – Final Environmental Impact Statement Summary of Effects**

**Comparison of Effects by Alternative**

<b>Issue</b>					
<b>Measure</b>	<b>Alt. A</b>	<b>Alt. B</b>	<b>Alt. C</b>	<b>Alt. D</b>	<b>Alt. E</b>
<b>Water temperature and effects to fish</b>					
Predicted peak temperatures	No change. Peak temperatures in the reservoir exceed levels that are lethal to steelhead.	Temp increases associated with Hemlock Lake are eliminated.	Same as Alt. B.	Temperature increases in Hemlock Lake are reduced following dredging. Persistence of improved temperatures is dependent on the rate the reservoir refills with sediment.	Same as Alt. D.
Predicted temperature effects to fish	Fish may be harmed or die from exposure levels and duration.	Exposure levels and duration are reduced.	Same as Alt. B.	Exposure levels reduced for same period following dredging; duration of exposure is unchanged.	Same as Alt. D.
<b>Sediment release into Trout Creek and Wind River and effects to fish</b>					
Predicted changes in turbidity	No change. Dam plays imperceptible role in turbidity levels downstream.	Turbidity levels extremely high during first year of channel incision and expansion.	Short term increase in turbidity during re-watering of the constructed channel and in initial high flow events.	Short term increases during construction, annual sluicing, and recreational use.	Same as Alt. D.
Predicted turbidity effects to fish	Minor effects to fish in reservoir due to recreational uses.	High steelhead mortality downstream during first year of implementation.	Minor, short term effect to fish during construction and during fall freshets.	Minor short-term effect to fish during construction, during annual sluicing, and during recreational use of the reservoir.	Same as Alt. D.
Predicted sediment deposition timing, location, and thicknesses downstream of the dam	Continued sand and silt deposition across the reservoir. No large sediment routed past dam. Continued depletion of isolated spawning gravels and cobble downstream.	Up to 1.5 feet of sand deposits in lower Trout Creek immediately following dam removal. Annual sediment load in the Wind River doubled during first year of project. Long term increase in coarse sediment downstream of dam site.	Minor project-related increase in sediment deposition downstream. Long term increase in coarse sediment deposition downstream of the dam site.	Minor project-related increase in sediment deposition downstream. No increase in coarse sediment deposition downstream.	Same as Alt. D.

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<b>Issue</b>					
<b>Measure</b>	<b>Alt. A</b>	<b>Alt. B</b>	<b>Alt. C</b>	<b>Alt. D</b>	<b>Alt. E</b>
Predicted effects of sediment deposition to fish and fish habitat	Continued poor habitat within reservoir due to sand and silt bottom.  Continued lack of coarse sediment downstream, limiting spawning, hiding cover, food production for steelhead.	Improved substrate within the reservoir area and downstream due to reduction in sand/silt deposits and increased routing and deposition of coarse sediment, which will improve habitat.	Same as Alt. B.	Same as Alt. A.	Same as Alt. A.
<b>Barriers to fish migration</b>					
Upstream migration success	Continued exposure to delay in upstream migration.  Numbers of returning adult steelhead influenced by passage, habitat, harvest pressures.	Migration delays resulting from the dam are eliminated.  Short term decline in number of adult steelhead returning to Trout Creek.  Over the long term, adult steelhead returns projected to increase by 20% to 66% as a result of dam removal.	Migration delays resulting from the dam are eliminated.  Adult steelhead returns projected to increase by 20% to 66% as a result of dam removal.	Continued exposure to upstream delays.  Adult steelhead returns are projected to increase slightly.	Similar to Alt. A.
Downstream migration success	Continued delay in the reservoir.  Potential for mortality from fall impact over dam.	No delay or mortality associated with the dam.	Same as Alt. B.	Continued delay in the reservoir.  Fall mortality is reduced by construction of downstream fish bypass.	Same as Alt. D.
Impingement potential	Continued exposure of smolts to impingement on screen or flashboards.	No exposure to impingement related to the dam.	Same as Alt. B.	Reduced exposure to impingement.	Same as Alt. D.
Predation potential	Predation opportunities are increased by ladder, trap, shallow lake.	Increased predation opportunities are eliminated.	Same as Alt. B.	Some reduction in predation opportunities due to increased lake depth.	Same as Alt. D.

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<b>Issue</b>					
<b>Measure</b>	<b>Alt. A</b>	<b>Alt. B</b>	<b>Alt. C</b>	<b>Alt. D</b>	<b>Alt. E</b>
Harassment potential	Harassment of steelhead (intentional or inadvertent) continues due to recreational uses of the reservoir.	Reduced harassment and greater opportunities for fish to avoid recreationists.	Same as Alt. B.	Slightly reduced harassment due to increased depth.  Potential long term increase in harassment as recreational use increases.	Same as Alt. D.
<b>Loss of recreation opportunities at Hemlock Lake</b>					
Predicted changes in use (numbers of visitors and types of experiences)	3,173 local parties; 3,330 non-local parties annually.	1,586 – 2,380 local parties; 793 non-local parties annually.	Same as Alt. B.	Same as Alt. A.	Same as Alt. A.
<b>Direct impacts to an historic structure</b>					
Historic structures altered or destroyed and degree of alteration	No impact.	Destruction of the historic dam and fish ladder.	Same as Alt. B.	Destruction of a portion of an historic property (fish ladder); modification of an historic property (dam).	Modifications to an historic structure (dam and ladder).
<b>Direct impacts to archaeological sites</b>					
Percentage of archaeological site disturbed	No impact.	Impacts > or = 0.2% of Trout Creek archaeological site.	Same as Alt. B.	Impacts > or = 0.05% of archaeological Trout Creek site.	Same as Alt. D.
<b>Impacts to the local economy from expenditures by recreation visitors</b>					
Predicted change in expenditures by Hemlock Lake visitors	\$17,600 – \$61,400 annually.	Estimated at \$8,400 – \$34,000 annually.	Same as Alt. B.	Same as Alt. A.	Same as Alt. D.
<b>Economic impact to the USFS</b>					
Estimated 20-year cost (present net value)	\$255,764	\$1,142,497	\$1,917,547	\$2,691,512	\$2,393,572