UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to NOAA Fisheries No.:
2004/00615

October 7, 2004

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Joe Krakker
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Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery and Conservation Management Act Essential Fish Habitat Consultation on the Effects the Northeast Oregon Hatchery Project, Imnaha, Upper Grande Ronde, and Wallowa Subbasins, Wallowa and Union Counties, Oregon

Dear Mr.Carter, Mr. Markley, and Mr. Krakker:

Enclosed is a document prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7 of the Endangered Species Act (ESA) on the effects of the Northeast Oregon Hatchery (NEOH) Project. This project will be funded by the Bonneville Power Administration (BPA). The USDA Forest Service, Wallowa-Whitman National Forest, proposes to issue a special use permit for the NEOH project. This document will also serve as ESA section 7 consultation on the issuance of this special use permit. This consultation is limited to an analysis of the habitat-related effects of the construction, operation and maintenance of the NEOH project; and adverse effects of the artificial fish propagation program itself will be evaluated in a separate consultation as part of the section 10 permit process.

NOAA Fisheries concludes in the biological opinion included in this document that the proposed actions are not likely to jeopardize Snake River (SR) spring/summer Chinook salmon (*Oncorhynchus tshawytscha*), SR fall Chinook salmon (*O. tshawytscha*), or SR steelhead (*O. mykiss*). NOAA Fisheries also concludes that the proposed actions will not adversely modify designated critical habitat for SR spring/summer Chinook salmon or SR fall Chinook salmon. As required by section 7, NOAA Fisheries also includes reasonable and prudent measures with

non-discretionary terms and conditions that NOAA Fisheries believes are appropriate to minimize the impact of incidental take associated with this action.

This document also includes the results of our consultation on the action's likely effects on essential fish habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and its implementing regulations (50 C.F.R. Part 600). NOAA Fisheries concludes that the proposed action may adversely affect designated EFH for Chinook salmon and coho salmon (*O. kisutch*). As required by section 305(b)(4)(A) of the MSA, included are conservation recommendations that NOAA Fisheries believes will avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from the proposed action. As described in the enclosed document, 305(b)(4)(B) of the MSA requires that a Federal action agency must provide a detailed response in writing within 30 days of receiving an EFH conservation recommendation.

If you have any questions regarding this consultation please contact Eric Murray of my staff in the Eastern Oregon Habitat Branch of the Oregon State Habitat Office, at 541.975.1835 ext. 222, or Debbie Martin in the Salmon Recovery Division at 208.321.2959.

Sincerely,

For Michael R Crouse

D. Robert Lohn
Regional Administrator

cc: John Stephenson, USFWS
Becky Ashe, NPT
Scott Patterson, ODFW
Dan Herrig, USFWS

Endangered Species Act - Section 7 Consultation
Biological Opinion

&

Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Northeast Oregon Hatchery Project
Imnaha, Upper Grande Ronde, and Wallowa Subbasins
Wallowa and Union Counties, Oregon

Agency: Department of Energy, Bonneville Power Administration

Consultation Conducted By: NOAA's National Marine Fisheries Service, Northwest Region

Date Issued: October 7, 2004

For Michael R Crouse

Issued by: _____
D. Robert Lohn
Regional Administrator

NOAA Fisheries No.: 2004/00615

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INTRODUCTION

The Endangered Species Act (ESA) of 1973 (16 USC 1531-1544), as amended, establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with NOAA's National Marine Fisheries Service (NOAA Fisheries) and U.S. Fish and Wildlife Service (USFWS), as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their designated critical habitats. This biological opinion (Opinion) is the product of an interagency consultation pursuant to section 7(a)(2) of the ESA and implementing regulations 50 C.F.R. 402.

The analysis also fulfills the essential fish habitat (EFH) requirements under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan. Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (section 305(b)(2)).

The Bonneville Power Administration (BPA) proposes to fund the Northeast Oregon Hatchery (NEOH) project. The purpose of the NEOH project is to construct new hatchery facilities for Snake River (SR) spring/ summer Chinook salmon on the Lostine River and improve existing facilities on Lookinglass Creek and the Imnaha River. This consultation will address the construction, operation, and maintenance of these facilities for a period of 10 years; from 2004 to 2014. The BPA is proposing this action according to its authority under the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Public Law 96-501) and will serve as the lead Federal action agency for this consultation. Because portions of the NEOH facilities will be on National Forest lands, the U.S.D.A. Forest Service, Wallowa-Whitman National Forest (WWNF), plans to issue special use permit for the NEOH facilities. The administrative record for this consultation is on file at the Eastern Oregon Branch Office.

Background and Consultation History

In August 2001, the BPA contacted NOAA Fisheries to request early consultation and participation in the planning process for the NEOH Project. From August 2001 to August 2003, NOAA Fisheries attended several site visits to the proposed project locations and attended public meetings about the NEOH Project. The Oregon Department of Fish and Wildlife (ODFW), USFWS, Nez Perce Tribal Fisheries (NPT), and the consulting firms Montgomery Watson Harza and FishPro were also involved in the planning of this project.

The artificial propagation programs for Imnaha River and Lostine River stocks of the SR spring/summer Chinook salmon are ongoing operations that are addressed by ESA section 10(a)(1)(A) permits which allow direct take of listed salmon for scientific purposes and

enhancement of the propagation of these species. The Imnaha program was initiated in 1982, with the dual purpose of rebuilding natural spawning populations and providing fishery mitigation. The hatchery operation has been covered by a series of section 10 permits since 1992. Current operation is described in permit 1128 which expired December 31, 2003, and is currently under consultation for renewal. Details of the hatchery operation and the history and effects of the program are contained in a Hatchery and Genetic Management Plan (HGMP) submitted as part of a section 7 consultation with the funding agencies and as an application for a renewed section 10 permit (ODFW 2002). The effects of fish propagation on SR spring/summer Chinook salmon will be addressed in the consultation on the issuance of this section 10 permit. This consultation will address the habitat related effects of construction, operation, and maintenance of the propagation facilities.

The Lostine River Chinook salmon propagation program is one of four Chinook salmon conservation hatchery operations currently underway in the Grande Ronde Basin. This production has been housed at Lookingglass Hatchery and covered by section 10 permits 973 and 1011 issued to ODFW and permit 1149 issued to the Columbia River Inter-Tribal Fish Commission (CRITFC). The NPT, Fisheries Management Department operates the artificial propagation programs as a cooperator with ODFW and CRITFC. Coordination of the state and Tribal co-manager actions is consistent with management agreements under the continuing Federal Court jurisdiction of *U.S. v. Oregon*, and a Grande Ronde Spring Chinook Hatchery Management Plan (Zimmerman *et al.* 2002). The complete Grande Ronde program is described in a HGMP submitted as part of a section 7 consultation with the funding agencies and as an application for a renewed section 10 permit (ODFW 2002a). The Lostine portion of the program is specifically described in an HGMP prepared by the NPT (NPT 2004).

After attending site visits and reviewing preliminary design plans for the NEOH project, staff from NOAA Fisheries Hydropower Division met with engineers from Montgomery Watson Harza on September 12, 2002, to review preliminary design drawings for the project. On November 6, 2002, staff from NOAA Fisheries Hydropower Division and Habitat Conservation Division provided comments and suggestions to FishPro to aid in development of the biological assessment (BA) for this project. NOAA Fisheries received a biological assessment (BA) and EFH assessment on the NEOH Project on May 28, 2004, and consultation was initiated at that time.

On September 20, 2004, NOAA Fisheries received a letter from the USFWS Lower Snake River Compensation Plan Office (LSRCP). The letter stated that the LSRCP is currently consulting with NOAA Fisheries on operations of existing LSRCP facilities in Eastern Oregon. Currently, the LSRCP is the Federal agency overseeing operation of the Lookinglass and Imnaha hatchery facilities. The letter also states that the LSRCP office will be responsible for ensuring the implementation of some, and potentially all, of the proposed operation components proposed in the BA for this project. As such, NOAA Fisheries will consider the BPA responsible for actions associated with construction of the facilities and LSRCP as responsible for operation and maintenance of the facilities for the purpose of this consultation.

On October 6, 2004, NOAA Fisheries received a letter from the BPA identifying additional conservation measures that had been added to the NEOH Project proposed action. These measures include reducing the drop between steps in all fish ladders to six inches or less to facilitate juvenile fish passage and moving the adult fish trap off the fish ladder. These changes will make the design of the NEOH facilities consistent with the NOAA Fisheries fish passage criteria.[1]

NEOH Project would likely affect Tribal trust resources. Once the Imnaha and Lostine facilities are constructed and upgrades to the Lookinglass Creek facility are complete, the NPT will assume responsibility for daily operation and maintenance of the facilities. NOAA Fisheries has been in communication with the NPT regarding this project throughout the early involvement and planning process and during formal consultation.

The objective of the Opinion in this document is to determine whether the NEOH Project is likely to jeopardize the continued existence of SR steelhead, SR spring/summer Chinook salmon, or SR fall Chinook salmon or adversely modify designated critical habitat for SR spring/summer and fall Chinook salmon. The objective of the EFH consultation is to determine whether the NEOH Project may adversely affect designated EFH for relevant species, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects on EFH resulting from the action.

Proposed Action

Proposed actions are defined in the Services' consultation regulations (50 C.F.R. 402.02) as 'all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas.' Additionally, U.S. Code (16 USC 1855(b)(2)) further defines a Federal action as 'any action authorized, funded, or undertaken or proposed to be authorized, funded, or undertaken by a Federal agency.' Because the BPA determined that funding this action is likely to adversely affect ESA-listed species and critical habitats and may adversely affect EFH, it must consult under ESA section 7(a)(2) and MSA section 305(b)(2).

Upgrades and Modifications to the Imnaha River Satellite Facility

The Imnaha Satellite Facility is an existing rearing facility completed in 1988, and is on approximately 4 acres of WWNF land in the Upper Imnaha Subbasin near river mile (RM) 46. The site is bounded by the Imnaha River and Forest Service road 3955. The USFWS owns the facility and holds a WWNF special use permit for the facility. The facility is currently operated by ODFW and is used to collect and hold SR spring/summer Chinook salmon adults and to acclimate smolts before release. The facility has deficiencies that limit its ability to collect and hold adult fish safely and efficiently, and acclimate smolts at preferred densities. The Imnaha

[1]Available at: http://www.nwr.noaa.gov/1hydrop/hydroweb/docs/Passagecriteria.extrevdraft.pdf

Satellite Facility is proposed to be in operation from March through September. One full-time operator will be at the facility when in operation. All construction will take place within the existing site area.

The upgrades and modifications to the Imnaha Satellite Facility will require the following actions.

- An existing weir will be replaced with a new hydraulically operated weir that operates safely and effectively at higher river flows.
- An auxiliary water supply pipeline and diffuser box will be constructed that discharges at the base of the fish ladder to supplement attraction flow at the fish ladder entrance. The auxiliary pipe will be behind the existing fish ladder wall.
- The septic drainfield will be modified to replace the drainfield area disturbed by construction activities.
- An extended fish crowder will be added to the adult trapping and holding area. Improvements to the holding area will be made, including new jump panels and a new spray bar system.
- Modifications will be made to the existing water intake structure to provide additional flows for acclimation and to improve adult attraction to the fish ladder and 24-inch conveyance pipeline. Improvements to the existing intake will include a better debris screen and fish screen.
- A rock sluiceway will be added where sand and silt settle out of the river water before entering the acclimation ponds.
- New juvenile Chinook salmon acclimation ponds will be constructed to provide more space for rearing fish at acceptable densities.

Modifications to the proposed intake structure will allow for an additional 11.3 cubic feet per second (cfs) of river water (for a total of 20.3 cfs) to be diverted from the Imnaha River for acclimation of smolts and adult holding and collection during peak use periods. This is a nonconsumptive water use that will be regulated to ensure that adequate instream flow to provide fish habitat and fish passage is maintained at all times between the point of diversion and the point of return flow discharge. Up to 100 gallons per minute of ground water will be pumped from a new well for domestic use and use in the adult holding spray systems.

The proposed construction will occur from late April to early November due to the remote location and deep snowfalls at the site. The new acclimation pond, sluiceway, modifications to the adult holding facility, and other miscellaneous site improvements will be constructed from June through November. All instream work will occur from July 15 to August 15, ODFW's recommended in-water work window for the Imnaha River. The existing acclimation facility will operate from March 15 through April 15, and adult collection and spawning will occur from June through September. All construction activities will be planned to maintain facility operations during these periods. However, installation of the new hydraulically-operated weir and the addition of the auxiliary pipe and diffuser box at the fish ladder entrance will require that

migrating fish be temporarily trapped below the site for broodstock collection or for release above the site.

Modifications at the intake structure will occur immediately next to the existing intake. Construction will disturb an area approximately 30 feet by 30 feet of bed and bank upstream from the existing intake. About 100 cubic yards of riprap will be used to stabilize the bank around the expanded intake. Impacts on riparian vegetation are not anticipated at this location because the existing intake area, which is disturbed and devoid of vegetation, appears to be large enough to accomplish the necessary improvements.

A new 24-inch water supply pipeline will be installed from the new intake to the hatchery facility. Approximately 650 feet of pipe will be buried next to the existing water supply pipeline beneath the existing gravel road.

A portable, picket-style weir has been used to direct fish to the existing ladder. It does not direct fish effectively to the ladder because the ladder entrance is too far downstream for fish to locate it easily. The poorly placed ladder entrance causes some fish to drop back downstream, where they may spawn. Picket installation during high flows is difficult and hazardous, and a portion of the run can be missed when the weir cannot be installed. This can result in a broodstock shortage and a broodstock that does not represent the entire run-timing. Construction of the proposed weir will alleviate some of the collection difficulties of the existing weir. The new weir will require expanded concrete abutments on both sides of the river. Construction impacts will occur within the area of the existing weir and concrete sill.

An auxiliary water supply line at the fish ladder entrance will be installed to increase attraction to the fish ladder. Realignment of the weir and the additional attraction water should alleviate most of the problems that fish currently have in locating the ladder entrance.

Site development activities will add a small amount of new, impervious surface to the site (0.12 acres). Temporary erosion and sedimentation will be managed through the use of runoff control devices such as silt fences and hay bales.

Lostine River Hatchery (to operate year-round)

SR spring/summer Chinook eggs are currently incubated at the Lookingglass Hatchery. Smolts are reared and acclimated at a temporary facility along the Lostine River near the proposed hatchery. These facilities consist of two aboveground rearing units, a portable pump, and piping. This temporary facility does not provide the desired rearing capacity or densities. The proposed Lostine River Hatchery will be a full-scale, multi-function facility, with permanent staff and on-site housing, designed to culture SR spring/summer Chinook from spawning through final rearing. The Lostine River Hatchery will also hold and spawn all Imnaha River broodstock, and incubate eggs to the eyed stage. Upon reaching the eyed stage, half of the Imnaha eggs would be transferred to Lookingglass Hatchery for final rearing. The remaining half of Imnaha eggs would continue to be held at the Lostine facility for final rearing. In March, the age 1+ Imnaha

juveniles will then be transferred from Lookingglass and Lostine Hatcheries to the Imnaha Satellite Facility for acclimation and release.

Construction of the proposed Lostine River Hatchery will occur on an approximately 6-acre site near the Lostine River Acres residential community, approximately 4 miles upstream (south) from the proposed Lostine Adult Collection Facility. The proposed Lostine River Hatchery will operate year-round. Three new groundwater wells are proposed and will provide up to 2.9 cfs of water to the facility.

A surface water intake structure will be approximately ½ mile south of the hatchery site, just upstream from a Wallowa County bridge. This structure will divert up to 17.8 cfs of water to the facility. The intake will include a weir structure to control the water surface elevation to ensure that the screens are submerged, a fish ladder for passage, a sluiceway for periodic downstream sediment removal past the weir, a log boom to protect the screen panels, and a compressor building to house the air receiver and compressor. The air system will provide air burst cleaning to the screen panels and to inflate the pneumatically-controlled weir (maintaining weir height).

To provide adequate fish habitat and passage, a minimum depth of 0.8 feet of water will be maintained in the Lostine River. According to the BA, approximately 10 cfs of water is required to achieve this depth, but to ensure passage, a 20% buffer would be added and a minimum flow of 12 cfs would be maintained. This normal flow strategy will be used when less than 50% of instream flow is utilized by the hatchery and when the 12 cfs minimum flow is achieved. An effluent pump-back system and/or low flow strategy will ensure that a minimum of 50% of the total flow remains in the Lostine River through the diversion reach, or a minimum of 12 cfs, whichever standard results in higher flow through the diversion reach. Flows will be measured at the hatchery headbox and compared to real-time surface water data from the USGS gage (#13330000) near Lostine, Oregon.

Flows will be returned to the base of the fish ladder. Table 4.2-19, of the BA, summarizes the percentage of water years on record when pump-back would be employed to: (1) Maintain a minimum of 50% of the total flow within the diversion reach; and (2) maintain a minimum of 12 cfs in the diversion reach, as well as the average and maximum amount of water that will be returned to the intake via the pump-back station. The BA estimates that the highest incidence of employment of the pump-back system will occur from September through February. Employment of the pump-back system is not anticipated from April through July.

The proposed site development activities are expected to begin in September 2004. Primary buildings will be constructed through late January, with foundation and exterior work occurring first and interior work done in the winter months. Severe weather conditions may occasionally stop outdoor work activities. Major groundwork and construction of raceways, incubation and spawning building and holding ponds, cleaning waste ponds, and related structures and piping will occur from April through November of the following year. Though normal work hours would be 8 a.m. to 5 p.m., 5 days a week, 12-hour work days 6 days a week will be needed

during crucial instream work window periods (July 15 to August 15) to accomplish necessary work while minimizing impacts on aquatic species.

Construction of the Lostine Hatchery Facility will require the following actions.

- A surface water supply intake will be constructed approximately one-half mile upstream from the proposed hatchery site. The intake will include fish screen panels and baffles, log boom, about 20 feet of cobble bank protection, and a de-icing well water supply.
- A pneumatically-controlled weir (inflatable air bladder) will be installed to raise the surface water elevation to provide sufficient flow to the intake. The weir will contain a sluiceway to periodically allow sediment to pass below the weir structure.
- A 24-inch pipeline will be installed from the water intake to the hatchery site along existing roads.
- A 6-inch, de-icing pipeline will be installed to deliver groundwater, when necessary, to the water intake during periods of instream icing.
- A vertical slot fish ladder will be constructed to provide upstream fish passage at the intake.
- The effluent pump-back return line and pump station will be installed to return water to the base of the water intake structure during periods of low stream flow. The pipe will be buried beside an existing road.
- A 12-foot-wide gravel access road will be constructed for permanent access and temporary construction staging and access.
- An air receiver and compression building will be constructed above ordinary high water mark.
- Several 12-inch pipelines will be installed from three existing groundwater supply wells to provide required pathogen-free water for the facility. Small buildings will be constructed at each well site to protect the wellhead, pumps, and other equipment.
- An overflow system from the rearing facilities including surface water strainers, headbox, and valve vaults will be constructed. Overflow will be directed to either the hatchery outfall pipeline/volitional release pipeline, or the effluent return pump station.
- Adult fish holding and spawning rooms will be constructed, including six holding ponds and isolation tanks.
- Egg incubation and early rearing buildings for both Lostine and Imnaha stocks will be constructed as well as a wet room for fish sampling.
- Two banks of five smolt-rearing raceways will be built (outdoor, rectangular concrete ponds) for use by Lostine and Imnaha stocks of SR spring/summer Chinook salmon.
- An operations building will be constructed, with office space, bunkhouse for personnel, shop, garage, electrical room, and generator room.
- A single-family residence will be constructed for hatchery personnel.
- A waste basin for smolt raceway cleaning will be constructed. A sump pump will be installed in the cleaning basin to drain it so that the waste will be periodically removed and trucked to an appropriate off-site disposal facility.
- A concrete outfall/release line downstream from the hatchery will be constructed and protected with riprap. Water from the hatchery's final rearing raceways and cleaning

basin will be conveyed via a buried 24-inch pipe and released into a side channel to the river through the partially submerged outfall. Smolts will also be released via the pipe and outfall. The outfall's small valve opening will prevent adult fish from entering the pipe.

- A new septic system will be constructed to serve residences, operations building, and incubation and early rearing building.
- The electrical power supply to the hatchery will be upgraded. A transformer will be installed at the site's main operations building. A diesel generator will provide emergency backup power.
- Access roads (Lostine River and Granger) to the hatchery will be paved, when hatchery construction is completed.
- An existing temporary acclimation facility will be removed when the new facility is fully operational.

Pages 17 and 18 of the BA contain schematic drawings of the proposed Lostine River Hatchery.

All instream work would be completed between July 15 and August 15, and will require two instream construction seasons to complete. The first instream work window will be used to construct the surface water intake, east bank weir abutment, fish ladder and sluiceway. The second instream work window will be used to install the pneumatically-controlled weir (including west bank abutment) and intake pipeline, as well as the downstream hatchery outfall. Upstream and downstream fish passage will be maintained during the instream work period as water would be diverted to the opposite side of the river.

The proposed surface water intake and fish ladder will be cast-in-place concrete structures on the east bank of the river. Installation of the intake, fish ladder, sluiceway, and conveyance pipeline will result in the removal of approximately 100 feet of the riverbank and associated riparian vegetation. Construction of the compressor building and access road (12 feet wide) will remove approximately 0.06 acres of riparian vegetation. One or two mature black cottonwoods (*Populus balsamifera*), and several saplings and shrubs will be removed. River cobbles will be placed in the stream at the intake structure to stabilize the river channel and minimize sedimentation. Large cobbles will be utilized to stabilize the weir and substrate. The buried 24-inch gravity pipeline, which will convey surface water from the intake to the hatchery site, will be installed within the existing road right-of-ways. Approximately 10 trees now standing immediately beside the roadway will be removed during installation of the pipeline.

Construction of the proposed facilities at the hatchery site will result in approximately 1.9 acres of new, impervious surface at the currently undeveloped site. The site will be graded and filled with 5,000 to 6,000 cubic yards of rock from a nearby quarry to level it in preparation for facility construction and to provide flood protection for the hatchery facility. Approximately 20 large trees, primarily grand fir (*Abies grandis*), Englemann spruce (*Picea englemannii*), and black cottonwood, will be removed as a result. A small number of diseased trees, snags, and downed wood will also be removed from this area. Temporary erosion and sedimentation during construction is expected to be minimal due to the relatively flat nature of the site. Most upland

construction will occur away from the river channel and will be managed through the use of erosion control devices, preservation of as much riparian vegetation as possible ,and revegetation of the site immediately following construction.

Construction and subsequent maintenance of the hatchery outfall structure will require the installation of a gravel access road approximately 290 feet long and 15 feet wide with a parking/turnaround area at the outfall. Trees and the dense woody understory will be removed from this corridor. Excavation of approximately 150 cubic yards of bank material and removal of associated woody riparian vegetation, including a limited number of trees, will occur at the outfall location. Approximately 35 cubic yards of basin cobbles will be placed around the outfall to stabilize the structure and prevent erosion and sedimentation.

Bank armoring with riprap is proposed for the existing meander side channel, where it approaches the raceways, to protect the hatchery facility from high water events that may cause bank erosion. In-channel habitat will be slightly altered, but original meanders will be maintained and riprap placement is not anticipated to affect river configuration. Vegetation at this location is sparse and is comprised predominantly of common and weedy species.

Lostine River Adult Collection Facility (operated April - September)

Currently, fisheries managers use a portable picket weir on the Lostine River near its confluence with the Wallowa River to collect adult SR spring/summer Chinook salmon for hatchery spawning. The picket barrier panels are installed in a fixed position and require considerable labor to keep the barrier panels clean and the barrier operational. The portable weir does not allow safe operation at the higher river flows (>800 cfs) typical during early spring to early July when many adult Chinook salmon are migrating upstream. Chinook salmon adults passing through the site during these high water flows cannot be captured effectively, restricting the number and genetic variety of adults collected to meet hatchery production goals. A new collection facility is proposed approximately one mile south of the town of Lostine, Oregon, downstream from historic SR spring/summer Chinook salmon spawning areas. The new facility would be designed to operate effectively during higher flows (800 to 1,200 cfs), while the existing downstream portable weir would continue to be used during lower flow periods.

The proposed Lostine Adult Collection Facility is on property operated as a private trout farm. There is an existing fish ladder and irrigation diversion complex at this site. The fish ladder is comprised of five concrete sills that span the width of the river channel. The irrigation diversion is on the east bank, directly opposite the proposed new ladder entrance. Two small outbuildings, a small gravel access area, and private trout holding ponds are in the vicinity of the proposed ladder. The proposed adult collection facility would operate from early April through September of each year. Fish that are trapped for broodstock would then be hauled by tank truck upstream approximately 4 miles to the proposed Lostine River Hatchery for spawning. At the end of adult collection period, trapping equipment would be removed and the proposed structure would function only as a ladder to facilitate fish passage. No water withdrawals from either the Lostine River or from groundwater wells are required for this facility.

The proposed fish ladder is anticipated to improve fish passage over a wider range of river flow conditions than does the existing ladder. During periods of low flow, instream water in excess of that required for diversion by irrigators would be routed through the new fish ladder to improve fish passage during low flows. Flow-monitoring equipment would be installed at the new fish ladder.

Constructing the proposed adult collection facility will require the following actions.

- Portions of the existing fish ladder will be removed.
- A hydraulic velocity barrier and a new pool and weir-type fish ladder (west bank), trap and hopper for adult collection and fish passage will be constructed.
- A new power line will be installed.
- A flood-proofing levee along the west bank, upstream from the fish ladder release channel, will be constructed.
- Large rocks will be placed in front of the hydraulic barrier to protect it from high streamflows.
- An existing bridge will be replaced with an Acrow bridge that currently spans the Imnaha River at Marks Ranch. The abutments will be outside the normal high water mark.
- Clearing, grading, and filling of riparian areas for equipment staging, ladder access, loading and parking will occur.

All instream work will take place in one construction season during the instream work window for the Lostine River (July 15 to August 15). Levee construction and other activities will be completed through August and September, with revegetation occurring the following year.

The existing ladder's most upstream and downstream concrete sills will be dismantled using a backhoe-mounted jackhammer, followed by removal with an excavator. The remaining sills will be kept in place and allowed to fill with river bedload over time. Installation of the flow velocity barrier will require construction of concrete abutment walls (outside of ordinary high water levels) and the removal of up to 20 feet of streambank, including associated riparian vegetation. Abutments along the east bank will require excavation of approximately 3,000-6,000 square feet of material. A flood-proofing levee will be constructed on the west bank of the river to stabilize the bank and protect the site from damage during high flow conditions. The levee will be constructed using fill and riprap along approximately 360 feet of the river channel upstream from the fish ladder exit. A temporary access road will be required for equipment access along the west bank during construction of the levee. Construction of the levee will isolate small, intermittent, spring-fed side channels that occur on the west bank of the river. French drains will be incorporated into the levee structure to convey side channel flows and spring water originating in the upland portions of the site back to the Lostine River.

A permanent gravel road will be constructed to provide access to the ladder and trap structure. Parking and turn-around space is also required to accommodate the fish-hauling vehicles utilizing the collection facility. Approximately 8,000 to 10,000 square feet will be cleared and

graded on the west bank for permanent access to the fish ladder for SR spring/summer Chinook salmon collection and transport and for construction access and staging. Areas temporarily disturbed by construction will be revegetated with native species early the following growing season for the best plant growth and survival. The permanent access road, loading and turn-around areas will be constructed using open cells backfilled with soil and planted with grass. This will result in a more natural setting and will allow for better stormwater infiltration than paved areas. A temporary construction access road will also be installed from Lostine River Road to the Lostine River, just upstream from the existing irrigation diversion. The existing bridge will be replaced with the Acrow panel bridge that currently crosses that Imnaha River at approximately RM 26 in the lower Imnaha Subbasin. New electrical service will be provided from the existing power line on the Lostine River Road. The power line will run across the replaced bridge to a pad-mounted transformer beside the existing small hatchery building. The existing above-ground power line feeding the private trout farm will be removed and included in the new service.

Removal of Acrow Panel Bridge in the Imnaha Subbasin

An Acrow panel bridge proposed for use at the Lostine Adult Collection Facility spans the lower Imnaha River at RM 26. The bridge provides access to 10 acres of agricultural land, referred to as Marks Ranch, on the western side of the Imnaha River in Section 11, Township 1S, Range 48E. The existing bridge and associated abutments at this location will be removed via crane during the ODFW in-water work window (July 15 through August 15). The panel bridge will then be transported for use at the Lostine Adult Collection Facility. Riparian vegetation removal at this location will be minor, and the site will be revegetated with native species when removal activities are complete.

Improvements and Upgrades to Lookinglass Creek Facility (operates year-round)

The Lookingglass Hatchery has been operated and maintained year-round since 1982. The facility is on Lookingglass Creek, a tributary to the Grande Ronde River in the Upper Grande Ronde Subbasin. Proposed modifications to the facility are relatively minor and are primarily upgrades to the electrical supply system. Improvements to the surface water treatment facility, including a new ultraviolet system with new housing piping, were previously consulted on and are not considered part of this project. No additional water withdrawals are proposed for this project beyond those already authorized. Electrical upgrades will occur within one season, from approximately April through November. All proposed improvements will occur within the existing, developed area and in areas already altered by past use as a wood products mill, gravel pit, and a hatchery. No instream work is proposed at this location.

The upgrades and improvements to the Lookingglass Hatchery include the following actions.

- The electrical power supply will be upgraded, including standby generator replacement and new standby generator at the water intake.

- The hatchhouse electrical supply will be upgraded, including improvements to alarm and instrumentation system, and upgrades to Well T-2 instrumentation.
- Additional improvements to the hatchhouse will include new early rearing troughs, formalin distribution system, boiler/chiller system modifications, and revised piping.

Page 11 of the BA displays schematic drawings of the proposed improvements to the Lookingglass River Hatchery. Because the upgrades and improvements to the Lookingglass Hatchery will take place within the existing footprint of the facility, will not require any instream work, and will not result in any operational changes which may affect listed salmonids, these actions will not be analyzed further in this Opinion.

Monitoring and Evaluation

NEOH proposes to monitor and evaluate the effectiveness of the project through the following actions.

- Collect and analyze abundance and spawning distribution/success of upstream migrant jack and adult SR spring/summer Chinook salmon pre-, during, and post-supplementation of indigenous SR spring/summer Chinook salmon in the Imnaha and Lostine River systems.
- Collect and analyze information on abundance, selected life history characteristics/patterns, and spatial distribution of Imnaha and Lostine Rivers juvenile SR spring/summer Chinook salmon pre-, during, and post-supplementation of indigenous SR spring/summer Chinook salmon.
- Collect and analyze baseline information of genetic characteristics/patterns of supplementation vs. natural SR spring/summer Chinook salmon pre-, during, and post-supplementation.
- Evaluate operation of the adult collection and holding facility for adverse impacts on resident and/or anadromous fish populations in the Imnaha and Lostine Rivers (includes daily discrete bank observations during periods of low flow at the Lostine River and ongoing daily monitoring of the bypass reach at the Imnaha River Satellite Facility during low flow).
- Monitor smolt production in the hatchery to evaluate health status, growth rates, and condition factors to compare supplementation fish with natural fish.
- Determine effectiveness of acclimation of hatchery SR spring/summer Chinook salmon to increase the overall population of Imnaha and Lostine Rivers SR spring/summer Chinook salmon.
- Collect baseline information on environmental conditions in the Imnaha and Lostine Rivers, with special attention to smolt emigration and adult spawning migration periods.

Construction activities will be monitored for negative environmental effects through the following actions.

- All in-water work will be in compliance with the conditions of the Joint Permit issued by the U.S. Army Corps of Engineers and the ODEQ, under the Clean Water Act (CWA).
- On-site observers will visually monitor the river for delays to upstream or downstream migrating fish.

Operations of the constructed project facilities will be monitored through the following actions.

- The following water quality monitoring will be completed: Temperature, dissolved oxygen, and pH.
- According to National Pollution Discharge Elimination System (NPDES) permit 300J, during normal operations the following parameters are required to be monitored weekly, at a minimum: flow, total suspended solids (TSS), and settleable solids. Temperature will be monitored monthly. Total phosphorus, ammonia, and pH are to be monitored quarterly.
- During cleaning operations, the following parameters are monitored in effluent: Flow, TSS, settleable solids, total phosphorus, ammonia, and temperature.
- Temperature of the receiving stream will be monitored monthly.
- Visual habitat monitoring of weirs will occur to verify that fish passage is successful during facility operation.
- In-river flows will be monitored through gages (U.S. Geological Survey real-time data as available) to determine when low flow strategies would be implemented at the Lostine River Hatchery. When instream flows are less than 12 cfs, the low flow or effluent pump-back strategies will be implemented.
- Weirs and ladders will be visually inspected by hatchery personnel for debris accumulation during migrational periods.

Conservation Measures

The following conservation measures have been included in the proposed action and are intended to reduce the potential impacts to listed species and their habitats.

- Sedimentation and erosion control measures such as silt fencing, straw bales, and covering exposed soils with plastic sheeting, jute matting or mulching to minimize erosion, will be utilized to prevent sediments from entering waterways and wetland habitats.
- All required work below the bankfull stage will be completed during the in-water work window for protection of salmonids.
- Construction equipment operation instream or beside the river will use synthetic hydraulic oil. All equipment will be free of petroleum or hydraulic fluid leaks and will be serviced outside the riparian corridor.

- Disturbance of riparian vegetation will be limited to the minimum amount necessary to achieve construction objectives, to minimize habitat alteration, and limit the effects of erosion and sedimentation.
- Clearing limits will be adequately identified on all construction drawings and will be fenced off with silt fences or orange construction fencing before initiating staging or construction activities. The fence will clearly define the clearing limits and will protect non-project areas from vehicle intrusion.
- Temporary sediment ponds will be constructed as a first step in grading and should be made functional before any additional soil disturbance occurs.
- A grading plan and a temporary erosion and sedimentation control plan will be implemented before site preparation to ensure soil-related impacts are minimized. Cut and fill volumes should be balanced to the extent feasible within each site to eliminate the need for either imported or exported earth material.
- During all clearing, grading, and construction activities, all exposed areas at final grade or remaining bare for more than 30 days between July 1 and October 31, will be protected from erosion using weed-free straw mulch, plastic covering, or a similar method.
- All snags (dead trees) and perch trees (trees with broken tops or limbs) will be left in place to the extent possible, as an important wildlife habitat component in the project vicinity.

Description of the Action Area

An action area is defined by the Services' regulations (50 C.F.R. Part 402) as 'all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.' The action areas affected by the proposed action are summarized in Table 1.

ENDANGERED SPECIES ACT

Biological Opinion

Biological Information

The BPA determined that the NEOH Project is likely to adversely affect the SR spring/summer Chinook salmon, SR fall Chinook salmon, and SR steelhead evolutionarily significant units (ESUs). Information on listing status and critical habitat for these ESUs can be found in Table 2. Based on the life histories of these ESUs, the action agency determined that it is likely that incubating eggs, juveniles, smolts, and adults of these three listed species would be adversely affected by the NEOH project. The presence of the different life stages of these three ESUs in the action areas is summarized in Figure 1.

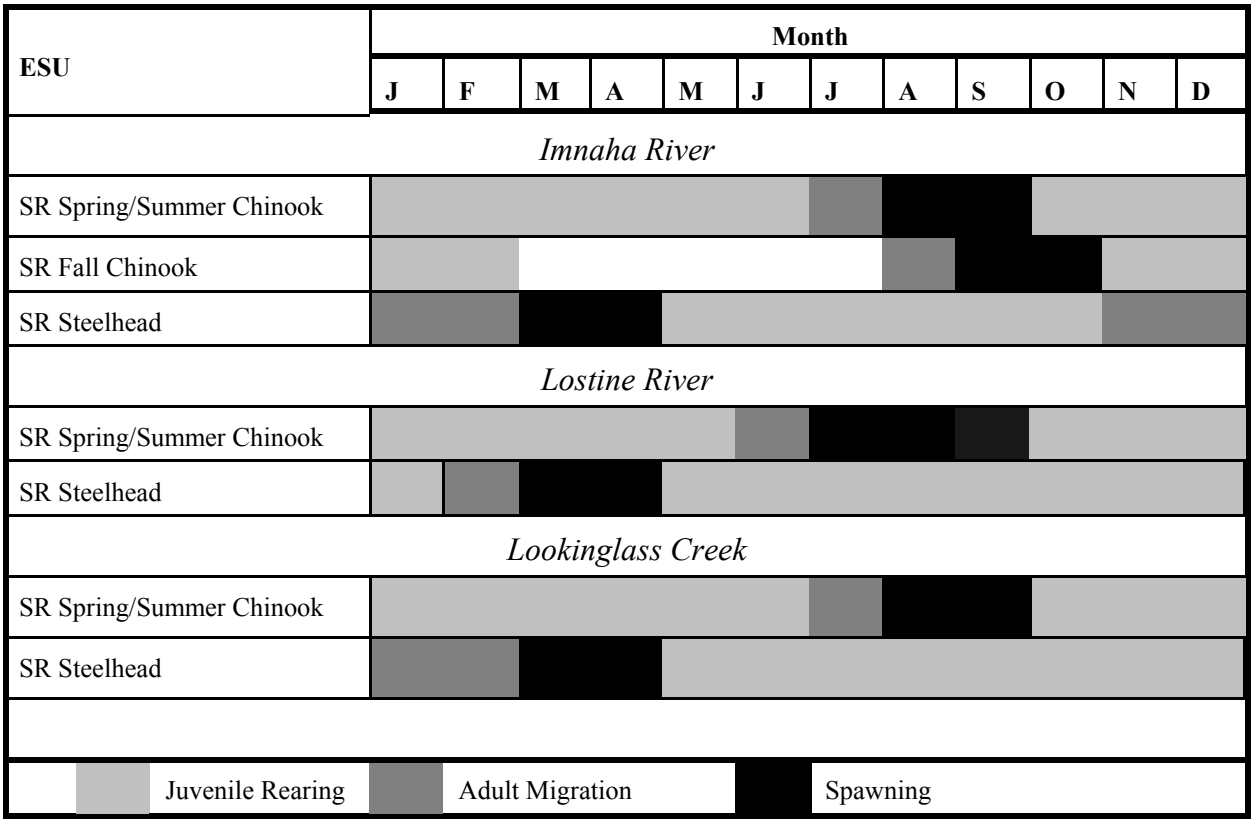
Table 1. Location, Extent of Downstream Effects, and Species Affected by the NEOH Project

Facility	Location	4th Field HUC	Extent of Downstream Effects	Species Affected
Imnaha Satellite	Imnaha River at RM 46	Imnaha Subbasin	2 miles	SR spring/summer Chinook salmon SR steelhead, SR fall Chinook salmon
Lostine River Hatchery	Lostine River at RM 10	Wallowa Subbasin	2 miles	SR spring/summer Chinook salmon SR steelhead
Lostine Adult Collection Facility	Lostine River at RM 7	Wallowa Subbasin	1 mile	SR spring/summer Chinook salmon SR steelhead
Acrow Bridge Removal	Imnaha River at RM 26	Imnaha Subbasin	500 feet	SR spring/summer Chinook salmon SR steelhead
Looking-glass	Looking Glass Creek just upstream from confluence with the Grande Ronde River	Upper Grande Ronde Subbasin	no downstream effects expected	SR spring/summer Chinook salmon SR steelhead

Table 2. References for Additional Background on Listing Status, Critical Habitat Designation, and Protective Regulations for the ESA-listed Species Considered in this Consultation.

ESU	Listing Status	Critical Habitat	Protective Regulations
SR fall Chinook	Threatened 4/22/1992 57 FR 14653	12/28/1993 58 FR 68543	7/10/2000 65 FR 42422
SR spring/summer Chinook	Threatened 4/22/1992 57 FR 14653	10/25/99 64 FR 57399	7/10/2000 65 FR 42422
SR steelhead	Threatened 8/18/1997 62 FR 43937	withdrawn	7/22/2000 65 FR 42422

Figure 1. Presence of Life Stages of ESUs in the Action Area.



SR Steelhead

Recent counts of upstream migration at Lower Granite Dam show at least some short-term improvement in the numbers of adults returning to spawn. The Grande Ronde River is one of the principal basins in the Snake River drainage contributing to salmon and steelhead production. Interim abundance targets for SR steelhead in the Grande Ronde River include a total population of 12,700 (Table 3).

Table 3. Interim abundance targets for Snake River steelhead in the Grande Ronde River spawning aggregation (Adapted from NOAA 2003).

ESU/Spawning Aggregations	Interim Abundance Targets	Interim Productivity Objectives
Snake River Steelhead ESU		Snake River ESU steelhead populations are currently well below recovery levels. The geometric mean Natural Replacement Rate (NRR) will therefore need to be greater than 1.0.
Grande Ronde		
Lower Grande Ronde	2600	
Joseph Creek	1400	
Middle Fork	2000	
Upper Mainstem	4000	
Imnaha	2700	

The SR steelhead ESU occupies streams in southeastern Washington, northeastern Oregon, and north/central Idaho. The environmental conditions within this ESU are generally drier and warmer than in other steelhead ESUs. The SR steelhead run is considered a summer run based on adult upstream migration. The adults enter the Columbia River in the summer, migrating upriver until they spawn in the spring between March and May. Runs found in the Grande Ronde system are generally A-run fish, or fish that have spent one year in the ocean.

Very few annual estimates are available of steelhead returns throughout the Snake River Basin. Returns over the Lower Granite Dam were low during the 1990s, however, run estimates in the Grande Ronde and Imnaha have improved since the 1990s (NOAA 2003). The long-term population trends have remained negative, while the short-term population trends for the ESU have improved in comparison to the time frame analyzed in the last status review (NOAA 2003). The median long-term population growth rate (λ) is 0.998 based on the assumption that only natural-origin spawners are returned from wild stock (NOAA 2003). The short-term λ based on the same assumption is 1.013 (NOAA 2003). Assuming that both hatchery and wild fish contribute to the natural production in proportion to their numbers, the long-term λ is 0.733 and short-term λ is 0.753 (NOAA 2003). In spite of the recent increases in numbers, the majority of populations in the ESU with abundance data are still well below the interim abundance targets (Table 3).

Important features of the adult spawning, juvenile rearing, and adult and migratory habitat for this species are: Substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food (juvenile only), riparian vegetation, space, and safe passage conditions. (Bjornn and Reiser 1991; NOAA Fisheries 1996b; Spence *et al*. 1996). The habitat features that the proposed projects may affect are: Substrate, water quality, water temperature, water velocity, cover/shelter, food, riparian vegetation and safe passage conditions.

SR Fall Chinook Salmon

SR fall Chinook spawn above Lower Granite Dam in the mainstem Snake River and in the lower reaches of the larger tributaries. Adult fall Chinook enter the Columbia River in July and August. Spawning occurs from October through November. Juveniles emerge from the gravels in March and April of the following year, moving downstream from natal spawning and early rearing areas from June through early fall. SR fall Chinook return from the ocean between two and five years of age and typically enter the Columbia River in July and August, reaching the mouth of the Snake River between late August and early October. Spawning then occurs during the latter part of October and into November.

Fall Chinook returns to the Snake River generally declined through the first half of the 1900s (Irving and Bjornn 1981). In spite of the declines, the Snake River Basin remained the largest single natural production area for fall Chinook in the Columbia drainage into the early 1960s (Fulton 1968). Spawning and rearing habitat for SR fall Chinook was significantly reduced by construction of a series of Snake River mainstem dams which blocked passage to historical spawning areas on the upper Snake River. Currently, natural spawning is limited to the area from the upper end of Lower Granite Reservoir to Hells Canyon Dam and the lower reaches of the Imnaha, Grande Ronde, Clearwater, and Tucannon Rivers.

The SR fall Chinook population was estimated to be approximately 72,000 spawners in the 1930s and 1940s (NOAA Fisheries 1998). The population suffered a severe decline in the 1970s (Meyers *et al*. 1998 and Waples *et al*. 1991). There were several reasons for this decline, including loss of spawning and rearing habitat, increase of hatchery production, and over-harvest. Recently the population abundance has been improving. From 1997 to 2001, the geometric mean of naturally-spawning fish returning over the Lower Granite Dam was 817. In 2001, the number of natural spawners returning over Lower Granite was 2,600, which is the first time that the number of naturally-spawning fish has met or exceeded the interim abundance target. The long- and short-term trends in natural returns are positive 1.013 and 1.188, respectively (NOAA Fisheries 2003). If hatchery spawners have been equally as effective as natural-origin spawners in contributing to brood year returns, the long-term λ estimate is 0.899 and the associated probability that λ is less than 1.0 is estimated as 98.7% (NOAA Fisheries 2003).

Critical habitat was designated for SR fall-run Chinook salmon on December 28, 1993 (58 FR 68543). This critical habitat encompasses habitat within the Columbia River and its estuaries, as well as the Snake and Salmon Rivers and all tributaries of the Snake and Salmon Rivers presently or historically accessible to SR fall-run Chinook salmon (except reaches above

impassible natural falls, and Dworshak and Hells Canyon Dams). This includes the Clearwater, Hells Canyon, Imnaha, Lower Grande Ronde, Lower Salmon, Lower Snake-Aostin, Lower Snake-Palouse, and Lower Snake-Tuconnon hydrological units below impassable natural falls and Dworshak and Hells Canyon Dams. The riparian zone beside these waterways is also considered critical habitat. This zone is defined as the area that provides the following functions: Shade, sediment and nutrient/chemical regulation, streambank stability, and input of large woody debris/organic matter.

SR fall Chinook salmon do not use the Lostine River or Lookingglass Creek. Critical habitat has been designated for 23 miles along the Imnaha River (from the mouth of the river to RM 23.) Historically, SR fall Chinook may have spawned up to the town of Imnaha (RM 23) on the Imnaha River but now only use the lower five miles of the Imnaha River for spawning.

Essential features of critical habitat for SR fall-run Chinook salmon are: (1) Substrate (especially spawning gravel), (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food (juvenile only), (8) riparian vegetation, (9) space, and (10) migration conditions (58 FR 68543).

SR Spring/Summer Chinook

SR spring/summer Chinook enter the Columbia River in late February and early March. The fish hold in cool, deep pools until the late summer and early fall when they return to their native streams and begin spawning. The eggs incubate through the fall and winter and emergence begins in the early winter and late spring. Juvenile SR spring/summer Chinook exhibit a stream-type life history. The fish rear for one year in fresh water before they migrate out to the ocean in the spring of their second year. The fish return from the ocean after two or three years. Interim abundance targets for SR spring/summer Chinook salmon include a total population of 4,500 fish (Table 4).

Table 4. Interim abundance and productivity targets for SR spring/summer Chinook in Oregon (adapted from NOAA 2003).

ESU/Spawning Aggregations	Interim Abundance Target	Interim Productivity Target
Snake River Spring/Summer Chinook		'For delisting to be considered, the eight-year (approximately two generation) geometric mean cohort replacement rate of a listed species must exceed 1.0 during the eight years before delisting. For spring/summer Chinook salmon, this goal must be met for 80% of the index areas available for natural cohort replacement rate estimation.' (Proposed Snake River Recovery Plan; NMFS 1995)
Grande Ronde River	2000	
Imnaha	2500	

Several factors, including habitat loss from hydroelectric development, habitat degradation from land use activities, and impacts from hatcheries, have all contributed to the decline of SR spring/summer Chinook salmon. Recent abundance for the ESU has increased. The geometric mean return of naturally-reproducing spawners from 1997 to 2001 was 3,700, which is still well below the interim abundance targets for the ESU. The 2001 run was estimated to be 17,000 naturally-reproducing spawners (NOAA Fisheries 2003). The short-term and long-term productivity estimates (λ) remain below the interim productivity target for the ESU (Table 4).

Critical habitat was designated for SR spring/summer Chinook salmon on December 28, 1993 (58 FR 68543), and was revised on October 25, 1999 (64 FR 57399). The proposed actions discussed in this Opinion are within designated critical habitat for SR spring/summer Chinook salmon. Critical habitat for SR spring/summer Chinook salmon encompasses the major Columbia River tributaries known to support this ESU including the Salmon, Grande Ronde, Imnaha, and Snake Rivers as well as the Columbia River and estuary. Critical habitat consists of all waterways below long-standing (more than 100 years duration) naturally-impassable barriers, and therefore includes the NEOH Project area. The riparian zone beside these waterways is also considered critical habitat. This zone is defined as the area that provides the following functions: Shade, sediment, nutrient/chemical regulation, streambank stability, and input of large woody debris/organic matter.

Essential features of the adult spawning, juvenile rearing, and adult migratory habitat for the SR spring/summer Chinook salmon are: Substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food, riparian vegetation, space, and safe passage conditions. The essential features that the project may affect are: Substrate, water quality, water temperature, water velocity, cover/shelter, food, and riparian vegetation.

Evaluating the Proposed Action

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 C.F.R. Part 402 (the consultation regulations). In conducting analyses of habitat-altering actions under section 7 of the ESA, NOAA Fisheries uses the following steps: (1) Consider the status and biological requirements of the species; (2) evaluate the relevance of the environmental baseline in the action area to the species' current status; (3) determine the effects of the proposed or continuing action on the species; (4) consider cumulative effects; and (5) determine whether the proposed action, in light of the above factors, is likely to appreciably reduce the likelihood of species survival in the wild or adversely modify its critical habitat. In completing this step of the analysis, NOAA Fisheries determines whether the action under consultation, together with all cumulative effects when added to the environmental baseline, is likely to jeopardize the continued existence of the ESA-listed species or result in adverse modification of designated critical habitat, or both.

Biological Requirements

The first step NOAA Fisheries uses when applying ESA section 7(a)(2) to the listed ESUs considered in this Opinion is to define the species' biological requirements within the action area. Biological requirements are characteristics necessary for the listed ESUs to survive and recover to naturally-reproducing population sizes, at which time protection under the ESA would become unnecessary. The listed species' biological requirements may be described as characteristics of the habitat, population or both (McElhany *et al.* 2000).

The projects will occur within designated critical habitat for the SR spring/summer Chinook salmon ESUs. Freshwater critical habitat can include all waterways, substrates, and adjacent riparian areas below longstanding, natural, impassable barriers (*i.e.*, natural waterfalls in existence for at least several hundred years) and dams that block access to former habitat.

Essential features of critical habitat for the listed species are: (1) Substrate, (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food (juvenile only), (8) riparian vegetation, (9) space, and (10) safe passage conditions. For this consultation, the essential features that function to support successful adult and juvenile migration, adult holding, spawning, incubation, rearing, and growth and development to adulthood include substrate, water quality, water temperature, cover/shelter, and riparian vegetation. All of these essential features of critical habitat are included in the 'matrix of pathways and indicators' (MPI) (NOAA Fisheries 1996).

Environmental Baseline

The 'environmental baseline' includes past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 C.F.R. 402.02). For projects that are ongoing actions, the effects of future actions over which the Federal agency has discretionary involvement or control will be analyzed as 'effects of the action.'

In general, the environment for listed species in the Columbia River Basin, including those that migrate past, or spawn upstream from the action area, has been dramatically affected by the development and operation of the Federal Columbia River Power System (FCRPS). Storage dams have eliminated mainstem spawning and rearing habitat, and have altered the natural flow regime of the Snake and Columbia Rivers, decreasing spring and summer flows, increasing fall and winter flows, and altering natural thermal patterns. Power operations cause fluctuation in flow levels and river elevations, affecting fish movement through reservoirs, disturbing riparian areas and possibly stranding fish in shallow areas as flows recede. The four dams in the migration corridor of the Columbia River kill or injure a portion of the smolts passing through the area. The low velocity movement of water through the reservoirs behind the dams slows the

smolts' journey to the ocean and enhances the survival of predatory fish (Independent Scientific Group 1996; National Research Council 1996).

Formerly complex mainstem habitats in the Columbia, Snake, and Willamette Rivers have been reduced, for the most part, to single channels, with floodplains reduced in size, and off-channel habitats eliminated or disconnected from the main channel (Sedell and Froggatt 1984; Independent Scientific Group 1996; Coutant 1999). The amount of large woody debris in these rivers has declined, reducing habitat complexity and altering the rivers' food webs (Maser and Sedell 1994).

Other human activities that have degraded aquatic habitats or affected native fish populations in the Columbia River Basin include stream channelization, elimination of wetlands, construction of flood control dams and levees, construction of roads (many with impassable culverts), timber harvest, splash dams, mining, water withdrawals, unscreened water diversions, agriculture, livestock grazing, urbanization, outdoor recreation, fire exclusion/suppression, artificial fish propagation, fish harvest, and the introduction of non-native species (Henjum *et al.* 1994; Rhodes *et al.* 1994; National Research Council 1996; Spence *et al.* 1996; and Lee *et al.* 1997). In many watersheds, land management and development activities have: (1) Reduced connectivity (*i.e.*, the flow of energy, organisms, and materials) among streams, riparian areas, floodplains, and uplands; (2) elevated fine sediment yields, degrading spawning and rearing habitat; (3) reduced large woody material that traps sediment, stabilizes streambanks, and helps form pools; (4) reduced vegetative canopy that minimizes solar heating of streams; (5) caused streams to become straighter, wider, and shallower, thereby reducing rearing habitat and increasing water temperature fluctuations; (6) altered peak flow volume and timing, leading to channel changes and potentially altering fish migration behavior; and (7) altered floodplain function, water tables and base flows (Henjum *et al.* 1994; McIntosh *et al.* 1994; Rhodes *et al.* 1994; Wissmar *et al.* 1994; National Research Council 1996; Spence *et al.* 1996; and Lee *et al.* 1997).

To address problems inhibiting salmonid recovery in Columbia River Basin tributaries, the Federal resource and land management agencies developed the *All H Strategy* (Federal Caucus 2000). Components of the *All H Strategy* commit these agencies to protecting and restoring habitat.

Environmental baseline habitat conditions within the action area were evaluated for the subject actions at the watershed scale. The results of this evaluation, based on the MPI described in *Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NOAA Fisheries 1996), follow. This method assesses the current condition of instream, riparian, and watershed factors that collectively provide properly functioning aquatic habitat essential for the survival and recovery of the species. Information on water quality and streamflow is also presented for each action area.

Lostine River

The Lostine River is a 54-mile tributary of the Wallowa River in Wallowa County, Oregon. The Lostine River originates from Minam Lake, in the high elevation mountains of the Eagle Cap Wilderness. Minam Lake is the source of both the Lostine and Minam Rivers, major tributaries of the Wallowa River. A dam built at Minam Lake in 1917 has altered the flow regime of the Lostine River by directing a larger amount of flow down the Lostine River than historically occurred. This dam has also reduced flows in the Minam River.

Much of the Lostine River is in the Eagle Cap Wilderness area and is undeveloped. Once the river leaves the wilderness, it flows through a narrow valley containing ranches, farms, and small housing developments. Stream flows are heavily diverted through this stretch for irrigation, and the Lostine River above the confluence with the Wallowa River sometimes experiences very low flows.

Habitat Conditions

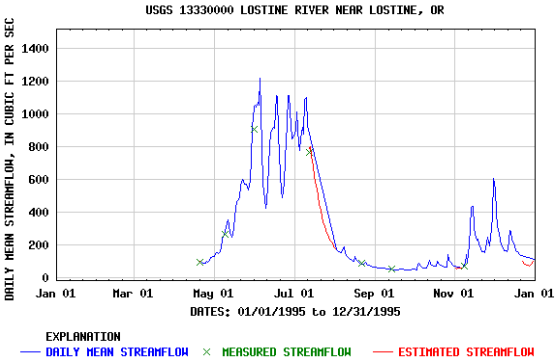
The BA rated 12 of 19 habitat indicators as 'properly functioning.' These include: Temperature, sediment, chemical contaminants/nutrients, substrate embeddedness, large woody debris, pool frequency, pool quality, large pools, width/depth ratios, streambank condition, road density and location, and riparian reserves. Five habitat indicators were rated as 'functioning at risk.' These include: Physical barriers, off-channel habitat, refugia, floodplain connectivity, and drainage network increase. Change in peak/base flow was rate as 'not properly functioning.' Disturbance regime was not rated.

Streamflow

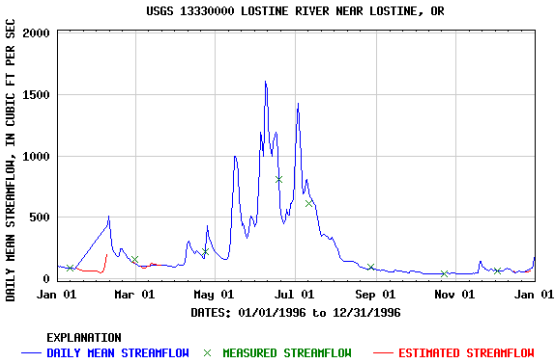
Peak streamflows in the Lostine River coincide with snowmelt and typically occur from May through July. During late July and August, stream flows decrease, with base levels normally reached by September. Recent maximum flows have ranged from less than 900 cfs to just under 1,400 cfs, with maximum levels correlated with winter snowfall levels. Base flows are typically less than 50 cfs, with flows as low as 10 cfs observed. Flows lower than this have been observed during freeze-up events. Fall storms or rain-on-snow events may result in short-term spikes in streamflow. Hydrographs for the Lostine River measured near the town of Lostine, Oregon, for the period from 1995 to 2000 can be found in Figure 2.

Figure 2. Hydrographs of Lostine River near Lostine, Oregon, 1995-2000 (Source: USGS)

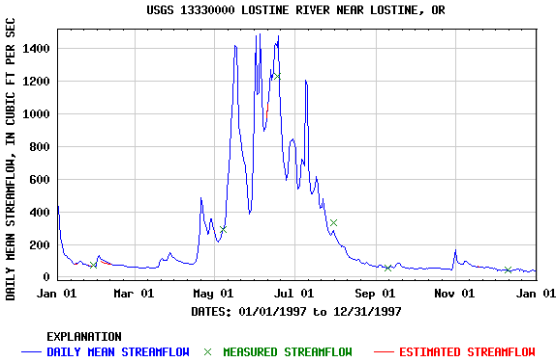
1995



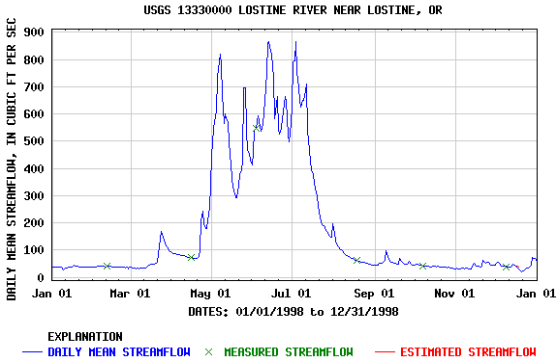
1996



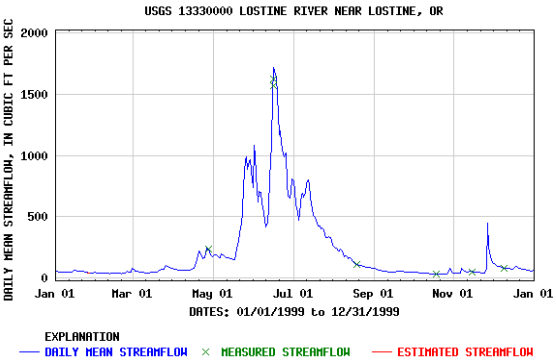
1997



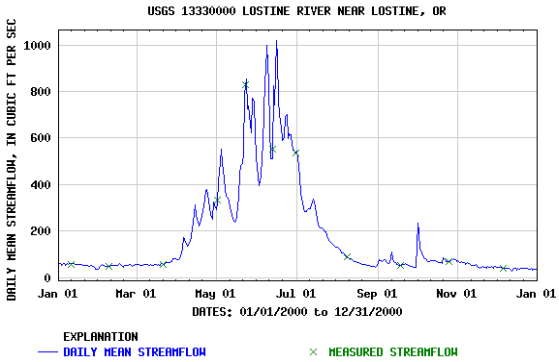
1998



1999



2000



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Water Quality

Water quality in the Lostine River where it leaves the wilderness area is excellent. However, as the river travels through the agricultural area, runoff from fields degrades water. The Lostine River is on the CWA Oregon 303(d) list for increased sedimentation. Cleaning irrigation ditches by running high flows through them in the spring carries large amounts of fine sediment into the river. Water quality data for the Lostine River is sparse. Results from an ODEQ survey near the town of Lostine are presented in Table 5.

Table 5. Water quality parameters for the Lostine River (1991) (source: ODEQ[2])

Parameter	Result	Unit
Field Alkalinity	101	milligrams/liter
Dissolved Ammonia	0.040	milligrams/liter
Biochemical Oxygen Demand 5 day undiluted	1.5	milligrams/liter
Biological Oxygen Demand undiluted	4	milligrams/liter
Total Organic Carbon	1	milligrams/liter
Chemical Oxygen Demand	<5	milligrams/liter
Chlorophyll *a*	3.6	milligrams/liter
Field Conductivity	216	milligrams/liter
Total Kjeldahl Nitrogen	0.800	milligrams/liter
Dissolved Nitrate/nitrite	0.28	milligrams/liter as N
Un-ionized Nitrogen, Ammonia Calculated	0.003	milligrams/liter
Dissolved Orthophosphate	0.029	milligrams/liter as P
Field Dissolved Oxygen	8.9	milligrams/liter
Field Percent Saturation Oxygen	107	%
Field pH	8.3	SU
Total Phosphate	0.050	milligrams/liter as P
Total Solids	150	milligrams/liter
Total Suspended Solids	5	milligrams/liter
Field Temperature	20.5	°C
Turbidity	1	NTU

[2] Available at: http://www.deq.state.or.us/wq/lasar/ParameterDetailListTxt.asp

Imnaha River

The Imnaha River is in the northeast corner of Oregon in Wallowa County. The headwaters originate in the Eagle Cap Wilderness, and the Imnaha River flows into the Snake River approximately 48 miles upriver from Lewiston, Idaho. The subbasin is composed of three watersheds: Lower Imnaha River, Upper Imnaha River, and Big Sheep Creek.

The Imnaha Subbasin consists of 543,220 acres of land. Approximately 383,390 acres (71%) is National Forest land, 550 acres (less than 1%) is administered by the Bureau of Land Management, 340 acres (less than 1%) is administered by the State of Oregon, and 158,940 acres (29%) is privately owned.

Elevations in the subbasin range from over 9,700 feet to 958 feet at the mouth of the Imnaha River. Stream gradients range from 1% to 3% at the mouth of the river to 4% to 21% in the headwater areas. The headwater areas are typified by U-shaped glacial valleys. The valley forms quickly change to V-shapes with steep side slopes and narrow valley floors. The last five miles of the river flow through a narrow gorge with nearly vertical sidewalls. Cobbles are the dominant stream substrate, with gravels being the subdominant substrate type. Some reaches have significant bedrock, boulders, and sand. The overall sinuosity of the mainstem Imnaha River is low.

Habitat Conditions

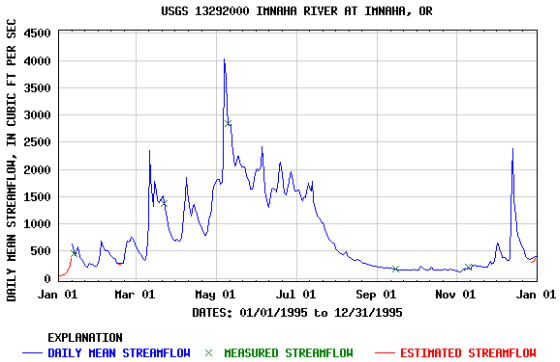
The BA rated 13 of 19 habitat indicators as 'properly functioning.' These include: Sediment, chemical contaminants and nutrients, physical barriers, large woody debris, pool quality, large pools, refugia, width to depth ratios, floodplain connectivity, increase in drainage network, road density and location, and disturbance regime. Three habitat indicators were rated as 'functioning at risk.' These include: Substrate embeddedness, change in peak/base flow, and riparian reserves. Streambank condition was rated as 'functioning appropriately' in some areas and 'functioning at risk' in other areas. Temperature and pool quality were rated as 'not properly functioning.'

Streamflow

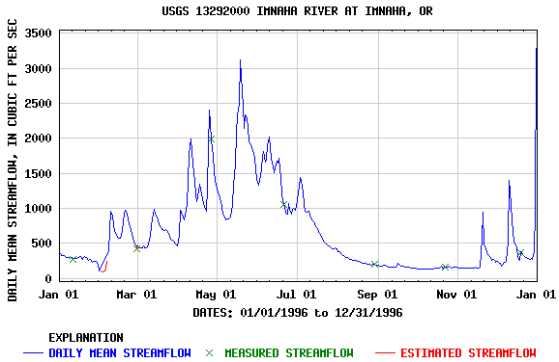
Flows in the Imnaha River typically peak during spring snowmelt in May and June. Peak flows range from over 10,000 cfs to less than 2,000 cfs, with peak levels depending heavily on winter snowfall. By July, flows begin to recede and by August, base flows have been reached. Minimum flows are typically between 50 and 100 cfs, but flows as low as 16 cfs have been observed during freeze-up events of winter. Fall storms or rain-on-snow events may result in short-term spikes in streamflow. Hydrographs for the Imnaha River measured near the town of Imnaha, Oregon, for the period of 1995-2000 can be found in Figure 3.

Figure 3. Hydrographs of Imnaha River near Imnaha, Oregon, 1995-2000 (Source: USGS)

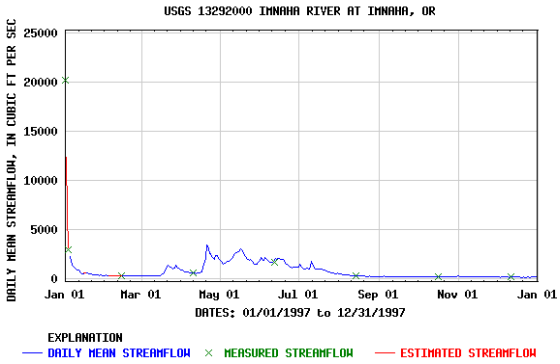
1995



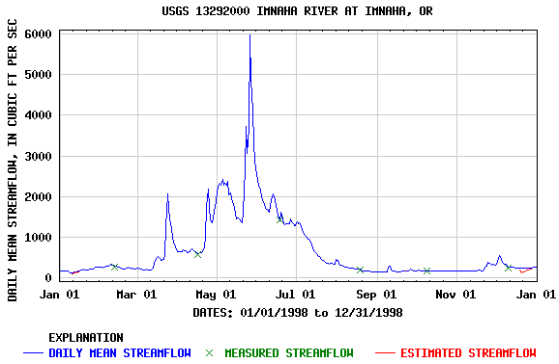
1996



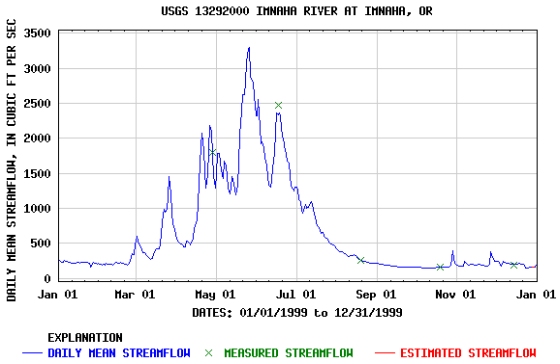
1997



1998



1999



2000

Reprinted from USGS website (available at: *www.usgs.gov*)

Water Quality

Water quality data for the Imnaha River is sparse. The stretch of the mainstem Imnaha below Lightning Creek is on the CWA Oregon 303(d) list for temperature. Although summer stream temperatures in the stretch between Lightning Creek and Cow Creek may be higher than ideal for rearing juvenile salmonids, summer temperatures are not likely a major limiting factor. Below Cow Creek, however, summer temperatures reach 75° F or more and stream temperatures limit salmonid distribution. Because many of the headwaters are in a wilderness area, water quality is considered excellent above the Satellite Facility location.

Effects of the Proposed Action on ESUs and Critical Habitat

Effects of the action are defined as 'the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with the action, that will be added to the environmental baseline' (50 C.F.R. 402.02). Direct effects occur at the NEOH Project site and may extend upstream or downstream based on the potential for impairing the value of habitat for meeting the species' biological requirements. Indirect effects are defined in 50 C.F.R. 402.02 as 'those that are caused by the proposed action and are later in time, but still are reasonably certain to occur.' They include the effects on listed species or habitat of future activities that are induced by the proposed action and that occur after the action is completed. 'Interrelated actions are those that are part of a larger action and depend on the larger action for their justification' (50 C.F.R. 402.02). 'Interdependent actions are those that have no independent utility apart from the action under consideration' (50 C.F.R. 402.02).

Activities Involving Instream Work and Riparian Disturbance

Activities involving in-water and near water construction will cause short-term adverse habitat effects and potentially result in harassment or harm of SR steelhead and SR Chinook salmon juveniles. Due to the timing of the instream construction activities, adult SR steelhead will not be present in the action area.

The construction activities proposed as part of this project will require instream operation of heavy machinery and exposure of large quantities of bare soil. This will produce sediment plumes sufficient to harm or harass ESA-listed anadromous salmonids present during construction activities and potentially during subsequent high flow events. Possible direct effects include injury or mortality from exposure to suspended sediments (turbidity) and contaminants resulting from construction. Potential indirect effects include behavioral changes resulting from elevated turbidity (Sigler *et al.* 1984; Berg and Northcote 1985; Whitman *et al.* 1982; Gregory and Levings 1993) during in-water construction.

Suspended sediment and turbidity influences on fish reported in the literature range from beneficial to detrimental. Elevated TSS have been reported to enhance cover conditions, reduce piscivorus fish/bird predation rates, and improve survival, but elevated TSS have also been reported to cause physiological stress, reduce growth, and adversely affect survival. Of key importance in considering the detrimental effects of TSS on fish are the frequency and the duration of the exposure, not just the TSS concentration. Juvenile salmonids tend to avoid

streams that are chronically turbid, such as glacial streams or those disturbed by human activities, unless the fish need to traverse these streams along migration routes (Lloyd *et al.* 1987). Although fish that remain in turbid waters experience a reduction in predation from piscivorus fish and birds (Gregory and Levings 1998), chronic exposure can cause physiological stress responses that can increase maintenance energy and reduce feeding and growth (Redding *et al.* 1987; Lloyd 1987; Servizi and Martens 1991).

Increased sedimentation may also lead to increased embeddedness of spawning substrates downstream from the NEOH Project. Fine, redeposited sediments also have the potential to adversely affect primary and secondary productivity (Spence *et al.* 1996), and reduce incubation success (Bell 1991) and cover for juvenile salmonids (Bjornn and Reiser 1991). Instream work scheduled for these projects will take place during the ODFW in-water window for the area (July 15 to August 15). Due to the typically low flows in the NEOH Project area during this time, sedimentation rates are expected to be minimized. However, due to the large scale of the NEOH Project and the large amount of bare soil to be exposed, some sedimentation of substrates in downstream reaches will occur. Operation of heavy machinery near the stream will disturb riparian vegetation and could lead to decreased shade, increased water temperatures, and decreased streambank stability until riparian vegetation is re-established.

Fuel or other contaminants may leak from heavy equipment in or near the stream. Operation of back-hoes, excavators, and other equipment requires the use of fuel, lubricants, *etc.*, which, if spilled into the channel of a waterbody or into the adjacent riparian zone, can injure or kill aquatic organisms. Petroleum-based contaminants, such as fuel, oil, and some hydraulic fluids, contain polycyclic aromatic hydrocarbons, which can be acutely toxic to salmonids at high levels of exposure and can cause mortailty and have acute and chronic sublethal effects on aquatic organisms (Neff 1985). Instream construction will elevate the risk for chemical contamination of the aquatic environment within the action area. Because the potential for chemical contamination will be localized and brief, the probability of direct mortality is negligible. In-water work timing during the preferred in-water work period will minimize the risk from chemical contamination during in-water work activities.

<u>Effects of Reduced Streamflow</u>

Removing water for hatchery operations and adult salmon collection at the Imnaha Satellite Facility will result in decreased streamflow in the Imnaha River for approximately 970 feet between the water intake and the effluent outfall. According to the BA, the Imnaha Satellite Facility will use 9.6 cfs of water in March and April, 6 cfs in May, and 26.3 cfs in June through September. From March through July, the amount of water withdrawn for hatchery operations would typically be 10% or less of mean monthly streamflow and can be expected to have minimal effects on ESA-listed salmonids and their habitats.

As flows in the Imnaha River decrease in August and September, the amount of water withdrawn will represent 25% to 30% of mean monthly streamflow. During these months, the withdrawal of water for hatchery operations will reduce habitat quality for salmonids in the stretch between the hatchery water intake and effluent outfall. Some amount of spawning habitat for SR

spring/summer Chinook salmon will be lost and rearing habitat for juvenile salmonids will be reduced. The stretch of the Imnaha River to be impacted by water withdrawal is short, however, and due to the availability of high quality, properly functioning salmonid habitat throughout the Imnaha Subbasin, no population level effects on SR steelhead or SR spring/summer Chinook are expected. SR fall Chinook salmon use habitat many miles downstream and will not be affected by water withdrawal for hatchery operations.

The Lostine River Hatchery will operate year-round, and will require water to operate at all times. In most cases, a reduction in streamflow in the Lostine River will occur between the water intake and the effluent outfall, a linear distance of 3,200 feet. According to the BA, maximum water demand for hatchery operations will be 17.8 cfs with an additional 5 cfs needed to operate the fish ladder at the water intake structure. During certain times of the year, the hatchery may be able to operate solely on water provided by wells.

The BPA has proposed three water withdrawal scenarios: Normal flow strategy, low flow strategy, and pump-back system. During periods of low flows in the Lostine River, proposed the low flow strategy or pump-back system will be used to maintain a minimum streamflow of 12 cfs or 50% of streamflow, whichever is greater. An Instream Flow Incremental Methodology (IFIM) study conducted during the preparation of the BA concluded that a minimum depth of 0.8 feet will allow fish passage through the stream reach impacted by the water withdrawal for the hatchery and that this depth could be achieved with a flow of 10 cfs. The BPA is proposing to maintain this flow with a 20% buffer (12 cfs).

During periods of high flow in the spring, water withdrawn for hatchery operations will represent less than 1% of mean monthly streamflow, and little to no effect on listed salmonids is expected. However, during low flow periods in the summer and winter, up to 50% of mean monthly streamflow could be withdrawn for hatchery operation. Table 4.2-18 of the BA summarizes the amounts of water to be withdrawn during different months, the typical mean monthly flows, and the historic low flows in the Lostine River. Based on the information provided in this table, the greatest potential for impacts on salmonids and their habitat will exist from August through March. Effects on fish will be greatest during the late summer months when reduced flows, combined with the warmest stream temperatures of the year, will cause stress to aquatic organisms.

Some loss of fish habitat will occur due to the proposed withdrawal of water. The total amount of habitat available to salmonids for spawning and rearing will be less. Although the BA states that de-watering of SR spring/summer Chinook salmon will be avoided to the extent possible, some reduction in available spawning habitat due to decreased streamflow will occur. The BA states that under the normal flow strategy, the amount of weighted usable area (WUA) for SR spring/summer Chinook salmon spawning will decrease from 44% to 30%. Minimum depths needed by Chinook salmon for spawning have been estimated to be between 5 centimeters (approximately 2 inches) and 52 centimeters (20.4 inches), with more recent studies indicating a minimum depth of approximately 30 centimeters (approximately 12 inches) (Spence *et al*. 1996). The current proposed action includes maintaining a minimum depth of 9.6 inches through the

reach impacted by the water diversion. Although the BA states that weighted usable area decrease due to the water withdrawal is small, it is likely that considerable reduction in the amount of suitable SR spring/summer Chinook salmon spawning habitat will occur. Employing the low flow strategy, or pump-back system, will limit this reduction in available spawning habitat.

A reduction in habitat quantity for juvenile rearing salmonids will occur in the 3,200-foot stretch of the Lostine River impacted by water withdrawal for hatchery operations. The effects of reduced streamflow on these fish may be partly mitigated by the properly functioning condition of temperature in this stream reach. Due to the generally cool water temperatures throughout the summer in this reach, fish will not suffer additional stress due to water temperatures beyond those which are suitable for salmonid rearing. Adverse effects from the reduced flows will include reduced pool habitat, reduced cover, and a general reduction in available aquatic habitat. Employing the low flow strategy or pump-back system will limit these adverse effects.

Effects of Bank Armoring

Placement of rock bank armoring is proposed at several locations to protect NEOH facilities and structures. Rock armoring is proposed at Imnaha Satellite Facility water intake, Lostine River Hatchery water intake and effluent outfall, along the Lostine River streambank at the Lostine River Hatchery, and at the Lostine River adult collection facility site.

The placement of riprap is known to have adverse effects on stream morphology, fish habitat, and fish populations (Schmetterling *et al.* 2001; Garland *et al.* 2002; USFWS 2000). Schmetterling *et al.* (2001) and Bjornn and Reiser (1991) summarize the importance of natural streamside vegetation to streambank integrity and healthy fish habitat. Rock armoring can preclude the establishment of natural streamside vegetation. Loss of riparian vegetation can lead to less complex aquatic habitat, loss of large woody debris recruitment, and reduced shade. Riparian vegetation provides habitat for insects that become food for juvenile salmonids. Although large rock can provide some habitat features used by salmonids, such as inter-rock space, evidence is growing that compared to natural banks, fish densities at rocked banks is lower (Schmetterling 2001; USFWS 2000).

A relatively small amount of rock will be placed to protect water intakes and effluent outfalls. Armoring at these sites is not expected to alter stream morphology or natural hydrologic processes. The armoring here will prevent a minor amount of riparian vegetation from growing on the streambank. Placement of rock armoring along the streambank at the Lostine River Hatchery site will have some minor impact on natural hydraulic stream processes by slowing channel migration rates.

Effects of New Impervious Surface

Construction of the Lostine River Hatchery will result in the creation of 1.9 acres of new impervious surface in the riparian corridor beside the Lostine River and 0.12 acres at the Imnaha Satellite Facility. This will disrupt normal hydrologic processes and preclude riparian vegetation from growing in the newly impervious area. Stormwater will collect and eventually

run off the new impervious surface rather than infiltrating the soil. However, the amount of impervious surface in the Lostine Rver watershed is very low and the amount of new impervious surface is not likely to be large enough to impact streamflow in the Lostine or Imnaha Rivers.

Effects of Hatchery Effluent Discharge

A review of the available information on water quality and ecological effects of discharging hatchery effluent into streams reveals that most studies have been done on hatcheries or fish production facilities that raise salmonids or other fish at relatively high densities. A review of this information is summarized below; however, the densities of fish to be raised at the NEOH facilities will be lower than the hatchery facilities investigated during these studies.

In a study of fish culture facilities in Washington state, Kendra (1998) found water quality generally degraded below hatchery outfalls. Benthic invertebrate communities below hatchery outfalls were typically different from those upstream or further downstream. Temperature, pH, suspended solids, ammonia, organic nitrogen, and chemical oxygen demand were significantly higher in effluent as compared to influent. No significant difference in dissolved oxygen levels was found, likely due to aerators and photosynthetic gains within the hatcheries. Effects on receiving water were pronounced when dilution was low and effluent was discharged to oligiotrophic water. This study also revealed that some invertebrate taxa, including diptera, planarians, dytiscid beetles, and mollusks were enhanced by hatchery discharge while other taxa, such as some mayflies and stoneflies, were eliminated below the hatchery outfall. The affected taxa recovered within a relatively short distance downstream.

The findings of this study led Kendra (1998) to conclude that the fate of hatchery discharge is a function of the quality and quantity of both effluent and receiving water and that stream invertebrates experience moderate change upon exposure to hatchery effluent but generally recover with 0.5 kilometers downstream from the discharge site. Results of this study led to minimum requirements in Washington for hatcheries to allow sedimentation of waste solids.

In a study of fish culture facilities in Texas, Fries and Bowles (2002) found that hatchery effluent generally had higher levels of pH, suspended solids, ammonia, colorphyll-*a*, and phosphorus. Water quality measurements generally recovered to upstream levels within 175 meters downstream from the effluent outfall. In a result similar to Kendra's (1991), Fries and Bowles found that dissolved oxygen levels did not differ between influent, effluent, mixing zone, and downstream sites. They did find that levels of un-ionized ammonia may be present, for a short distance downstream from the outfall, at levels to cause sublethal adverse effects on aquatic organisms. In this study, minor differences were observed in invertebrate community structure above and below the hatchery outfall, but the authors attribute the difference to clumped distribution rather than differences in water quality.

Fries and Bowles (2002) conclude that hatchery effluent examined in their study did not substantially affect downstream water quality or benthic community despite the relatively high levels of TSS and colorphyll-*a* levels in the effluent. They conclude that sportfish hatchery

operations can have negligible effects on receiving waters, even in environmentally sensitive areas.

Selong and Helfrich (1998) studied trout culture facilities in Virginia and found that settleable solids were never above detection levels (0.1 milliliters/liter) during sampling but stream substrate embededness was elevated below outfalls at most hatcheries studied. Total ammonia-N and nitrate-N concentrations were significantly increased in effluents and downstream water during both summer and fall and remained elevated 400 meters downstream from most hatcheries. In a result dissimilar to that of the previously mentioned studies, Selong and Helfrich (1998) found that dissolved oxygen levels were significantly reduced at some hatcheries in the fall but dissolved oxygen levels in effluents typically did not fall below 7 milligrams/liter.

Selong and Helfrich (1998) also compared macroinvertebrate communites of upstream reference sites with communities downstream from the hatchery outfalls and found that macroinvertebrate community metrics reflected moderately impaired environmental conditions downstream from one hatchery, and slightly impaired or unimpaired conditions at the other hatcheries. Total species richness of invertebrates decreased below three hatcheries, primarily due to a reduction in abundance of mayfly, stonefly, and caddisfly taxa. Similar results were reported by Loch *et al.* (1996).

The results of this study led Selong and Helfrich (1998) to conclude that comparisons at locations upstream and downstream from hatcheries suggest that effluent diminished some water quality characteristics and altered benthic macroinvertebrate community structure. However, they also conclude that although water quality was somewhat degraded during low flow conditions of summer and fall, few unacceptable levels of ammonia, nutrients, solids, dissolved oxygen, water temperature, or pH were observed. Similarly, impacts on the macroinvertebrate communities appeared to be localized, with partial recovery observed 400 meters below hatchery outfalls. They did note that increased substrate embeddedness measured below most hatcheries indicate the need for improved solids removal.

In Europe, several studies of the effects of effluent from trout culture facilities on water quality have been conducted. Trojanowski (1990) examined water quality at various sites along the Lupawa River in Poland. Three trout hatcheries are present along the river and are separated by several kilometers. These facilities rear trout at relatively high densities and effluent did not receive any treatment before discharge. Most indicies of pollution (suspended matter, chemical oxygen demand (COD), biological oxygen demand (BOD), nitrogen, and phosphorus, *etc*.) increased downstream from each hatchery's effluent outfall. As with the other studies, dissolved oxygen remained similar in influent and effluent at each hatchery and levels of pollution indices were similar to influent levels at sampling stations several kilometers downstream from each hatchery.

Trojanowski (1990) concludes that an analysis of the pollution indices clearly testifies to the adverse effects of the hatcheries on the aquatic environments where the effluent was discharged. However, the author also concludes that the Lupawa River's ability to self-purify is fairly high

and levels of most pollutants return to levels similar to those observed in hatchery influents within several kilometers below hatchery effluent outfalls. For this study, loadings of chemical components are correlated with relatively high total trout production and feeding rates at the three hatcheries. The NEOH facilities are conservation hatcheries and will not raise salmonids nor feed them at rates examined by this study.

In a study of a trout culture facility in Spain, Camargo (1992) found that about 650 grams of dry solid matter is formed for each kilogram of trout produced. This study also found that benthic macroinvertebrates appear to be more adversely affected than fish by salmonid hatchery effluents; primarily by siltation of suspended solids on the stream bottom. As in the other studies discussed, Camargo (1992) found that a diverse assemblage of macroinvertebrates was present in the site upstream from the hatchery, but directly below the hatchery diversity was markedly reduced, with community structure dominated by dipterans and oligochaetes. A gradual and partial downstream recovery of the macroinvertebrate community was observed at downstream sampling stations (0.15 kilometer and 1 kilometer below outfall), however, community structure still appeared to be significantly affected at the downstream-most site in this study. These results led Camargo (1992) to conclude that trout culture effluent generates effects on the trophic structure of downstream benthic macroinvertebrate communities and the stream self-purification ability was insufficient to assimilate the organic discharge from the hatchery, at least within the one kilometer downstream from the site sampled.

Alabaster (1982) examined water quality of effluent and receiving streams of numerous fish culture facilities throughout Europe. This comprehensive study yielded several results of interest, including the fact that cleaning and washing operations can lead to 20- to 50-fold increases in concentrations of effluent components. Low concentrations of dissolved oxygen in effluent were reported for two situations in Norway where dilution rates of effluent were 4.4 and 5.2 liters/second/ton of fish produced. Fisheries appeared to be little affected by fish hatchery effluents, with no change observed in 13 of 17 reported cases. In contrast, a quality salmonid fishery in Finland was changed to a poor, non-salmonid fishery at a dilution rate of 42 liters/second/ton of fish produced. In the United Kingdom, pollution incidents were associated with farms using less than the 8 liters/second/ton of fish produced.

These results led Alabaster (1982) to conclude that the environmental impact of any effluent depends very largely on the dilution it receives when discharged. Alabaster (1982) also concludes that fisheries were observed to be affected at dilution rates at or lower than 2.8 liter/second/ton of fish produced. Generally, fisheries were unaffected at dilution rates greater than 5 liter/second/ton of fish produced. However, in some cases, deposition of solids, low DO, and the presence of 'sewage fungus' were reported in cases where dilution rates were less than 6 liters/second/ton of fish produced per year. Based on flow rates and production estimates provided in the BA and from the NPT,[3] dilution rates for the Lostine River Hatchery were

[3] Telephone conversation with Rick Zollman, NPT, regarding fish production at the Lostine River Htachery (June 16, 2004).

calculated at approximately 35.3 liters/second/ton of fish produced for effluent alone. This does not take into account the receiving water which would further dilute the effluent by another order of magnitude within a short distance downstream. This dilution rate is well above levels at which adverse effects were reported by Alabaster (1982).

In Alabaster's (1982) study, the following average changes in water quality between influent and effluent were observed: DO decreased 0.3 milligrams/liter at a dilution rate of 38.1 liters/second/ton of fish produced annually (the dilution rate most similar to Lostine River Hatchery dilution rate); average increases in kilogram/day/ton of fish produced of about 3.4 for settleable solids, 1.7 for BOD, 0.3 for ammonia, and 0.14 for total phosphorus. On average, effluents contained 8 milligram/ liter DO, 9 milligram/liter of solids, 0.3 milligram/liter total ammonia, 0.2 milligrams/liter phosphate-P, and 4 milligrams/liter BOD.

The BA contains waste product calculations based on production estimates from the Draft Preliminary Production Plan referenced in the BA. During periods of greatest feeding and lowest flows in the Lostine River, approximately 45 pounds of solids, 1.1 pounds of total phosphorus, and 5.5 pounds of ammonia would be discharged in effluent daily. This would result in approximate effluent concentrations of 0.5 milligrams/liter of solids, 0.13 milligrams/liter of total phosphorus, and 0.06 milligrams/liter of ammonia. Total BOD for effluent was calculated at approximately 0.6 milligrams/liter for this period. Concentrations of effluent waste products for the Lostine River Hatchery are calculated to be considerably less than those reported by Alabaster (1982). Again, these calculations do not take into account the additional dilution provide by Lostine River water within a short distance downstream from the hatchery effluent outfall.

In conclusion, discharge of effluent into the Lostine River is expected to have some minimal effects to water quality in the river. Due to the excellent water quality in the Lostine River at the hatchery site and low concentrations of effluent waste products, these water quality effects are not expected to have a significant impact on SR steelhead or SR spring/summer Chinook salmon or their habitats. Water quality parameters are expected to recover within one to two miles downstream from the effluent outfall. Due to the discharge of solids, some sedimentation of stream substrates downstream from the effluent outfall can be expected. This will result in a minor degradation of spawning habitat for SR spring/summer Chinook salmon. Yearly high flows in the Lostine River will mobilize fine sediments, consequently, the sedimentation in reaches below the effluent outfall are likely to be flushed from the system each year rather than accumulating over time. The best information available indicates that sedimentation of substrates and waste product discharge will also alter benthic macroinvertebrate community structure. This will likely lead to some reduced abundance of palatable salmonid prey items such as mayflies, stoneflies, and caddisflies. This disturbance should be localized and recover shortly downstream from the effluent outfall.

Effluent discharge from the Imnaha Satellite Facility during acclimation is expected to have similar effects. However, actual impacts on SR spring/summer Chinook salmon and SR

steelhead will be less due to the low feeding rates, cold water temperatures, and increasing stream flows during March and April when acclimation is occurring.

Other Effects Hatchery Operations

Potential adverse effects of the management of hatchery facilities include the impacts of water withdrawals and release of hatchery effluent which are addressed above, and the physical barriers and hazards that are created by weirs and intakes. The nature of adult traps is that a barrier to migration is created which forces migrating adults into a trap for collection of biological samples and brood stock. Some fish may be injured by the trap or may fail to enter the trap and simply drop back and cease upstream migrations. Intakes may entrain migrating juveniles or adults and smaller juveniles may become impinged on screens and trash racks. However, adequately designed screens on intakes and outlets minimized these impacts.

Summary of Effects

The proposed NEOH Project will have direct and indirect effects on SR steelhead and SR spring/summer Chinook salmon and their habitats in the action areas. Direct effects will occur as a result of construction activity and may include harm or harassment of listed salmonids due to instream operation of heavy machinery, generation of sediment plumes, and possible introduction of contaminants into the water column. Indirect effects of construction include sedimentation of downstream substrates and riparian disturbance. The addition of impervious surface and riprap will result in a minor disruption of natural hydrologic processes.

Operation and maintenance of the NEOH facilities will cause reduced streamflows for 3,200 feet in the Lostine River and 970 feet in the Imnaha River. Discharge of hatchery effluent will result in some degradation of water quality below the effluent outfall, sedimentation of stream substrates, and alteration of benthic invertebrate community structure. Water quality is expected to recover within in one to two miles below the outfall.

An incremental change in the conservation value of SR spring/summer Chinook salmon critical habitat within the action area due to the proposed action cannot be quantified. However, based on the effects described above, it is reasonably likely that the proposed action will cause a small but long-term reduction in that conservation value.

The construction and use of adult collection and juvenile acclimation facilities may have short-term, limited effects on listed fish. Migrating adults will be diverted upstream by weirs into holding areas used to sort, count, and identify origin. Potential effects from the operation of the adult collection and juvenile acclimation facilities include fish entrainment and impingement, delayed migration, transport stress and physical injury to fish that encounter the weir or are held in the trap. Juvenile and adult migration and use of the tributary habitats by natural fish is designed into the proposed program.

Cumulative Effects

'Cumulative effects' are defined in 50 C.F.R. 402.02 as those effects of 'future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation.'

Activities that are reasonably certain to occur in the action area include timber harvest, livestock grazing, agriculture, and tourism. Water use for agriculture will continue to result in low stream flows for the foreseeable future. Recreational and Tribal fishing for SR steelhead and Tribal fishing for SR spring/summer Chinook occurs and will continue in the future.

Most future actions by the state of Oregon are described in the Oregon Plan for Salmon and Watershed measures, which includes a variety of programs designed to benefit salmon and watershed health.

Conclusion

NOAA Fisheries has determined that, when the effects of the action addressed in this Opinion are added to the environmental baseline and cumulative effects occurring in the action area, they are not likely to jeopardize the continued existence of SR steelhead, SR spring/summer Chinook salmon, or SR fall Chinook salmon. NOAA Fisheries' conclusion is based on the following considerations: (1) All instream work will occur during the ODFW in-water work window for this area (July 15 to August 15), and instream work will be limited to the amount described in the BA; and (2) fish passage for all salmonid life stages will be maintained through the stream reaches impacted by water withdrawal. Thus, the proposed action will not appreciably reduce the functioning of already impaired habitats, and will not appreciably reduce the likelihood of survival of the ESUs. This consultation is limited to an analysis of the habitat-related effects of the construction, operation and maintenance of the NEOH project; and adverse effects of the artificial propagation program itself will be evaluated in a separate consultation as part of the section 10 permit process.

NOAA Fisheries has determined that the proposed actions will not result in destruction or adverse modification of designated critical habitat for SR spring/summer Chinook salmon or SR fall Chinook salmon. NOAA Fisheries' conclusion is based on the following considerations: (1) All instream work will occur during the ODFW in-water work window for this area (July 15 to August 15), and instream work will be limited to the amount described in the BA; (2) disturbed areas will be replanted with native vegetation; (3) effects on natural hydrologic process caused by bank armoring and addition of impervious surface are expected to be minor; (4) the effects of water withdrawal for hatchery operations will be limited to short stretches on the Imnaha and Lostine rivers (900 and 3,200 feet respectively); (5) fish passage for all salmonid life stages will be maintained through the stream reaches impacted by water withdrawal; (6) effects on fish habitat and water quality from effluent discharge are expected to be minor and limited to an area one to two miles downstream from the outfall. Thus, the proposed action will

not retard the long-term progress of impaired habitat toward properly functioning condition and will not diminish the conservation value of critical habitat.

Reinitiation of Consultation

As provided in 50 C.F.R. 402.16, reinitiation of formal consultation is required if: (1) The amount or extent of taking specified in the incidental take statement is exceeded, or is likely to be exceeded; (2) new information reveals the action may affect listed species in a way not previously considered; (3) the action is modified in a way that causes an effect on listed species that was not previously considered; or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operation causing such take must cease, pending conclusion of the reinitiated consultation. To reinitiate consultation, the BPA must contact the Habitat Conservation Division of NOAA Fisheries, Oregon State Habitat Office and refer to NOAA Fisheries No.: 2004/00615.

Incidental Take Statement

Section 9(a)(1) and protective regulations adopted pursuant to section 4(d) of the ESA prohibit the taking of listed species without a specific permit or exemption. Among other things, an action that harasses, wounds, or kills an individual of a listed species or harms a species by altering habitat in a way that significantly impairs its essential behavioral patterns is a taking (50 C.F.R. 222.102). Incidental take refers to takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 C.F.R. 402.02). Section 7(o)(2) exempts any taking that meets the terms and conditions of a written incidental take statement from the taking prohibition.

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

Amount or Extent of the Take

NOAA Fisheries expects the proposed action to cause minor water degradation that will adversely affect habitats for SR fall-run Chinook salmon that occur downstream of the project areas, but does not expect those effects to result in the injury or death of any individuals of that species. However, habitat-related effects of the construction, operation and maintenance of the proposed hatchery facilities, are likely to result in injury or death of SR steelhead and SR spring/summer Chinook salmon that live in the action area as follows.

Riparian disturbance and instream work will temporarily increase sediment, turbidity, and other pollutants in the water. This will cause most of the fish to avoid the action area. Some juvenile fish displaced from the action area are likely be injured or killed due to reduced feeding and growth rates and, ultimately, impaired juvenile migration and growth to maturity.

Construction of the project, including bank armoring, is likely to modify or destroy riparian vegetation, stream banks, and channel conditions that presently provide shade, organic matter contributions, large wood, bank stability, and seasonally suitable microhabitats for holding, feeding, and resting, thus reducing the likelihood of successful juvenile rearing. Vegetation and streambank characteristics in the action area will require many years to recover and become favorable for rearing and migration. It is unlikely that habitat conditions where project features will be placed at within the functional riparian zone or below ordinary high water line, such as the new hydraulic weir, will ever completely recover preferred habitat characteristics. Operation and maintenance of the hatchery facilities, including local streamflow reductions and effluent discharge are likely to further reduce local productivity.

Take caused by these habitat-related effects cannot be accurately quantified as a number of fish, in part because the long-term loss of habitat resulting in the injury or death of individuals may be more deleterious than the direct loss of a certain number of individuals. In such circumstances, NOAA Fisheries provides a habitat surrogate to quantify the extent of incidental take. For this project, the extent of take will be limited to that caused by habitat-related effects that are roughly proportionate to the amount of instream rearing habitat that will be altered or destroyed by the project. This will be limited to a streamside area approximately 500 feet by 80 feet at the Lostine Adult Collection Facility site, 1,100 feet by 450 feet at the Lostine River Hatchery site, 150 feet by 200 feet at the water intake site for the Lostine River Hatchery, 150 feet by 50 feet at the bridge removal site on the Imnaha River, and 1000 feet by 300 feet at the Imnaha Satellite Facility site. Additional take caused by the project's turbidity plume generated, a disturbance that is likely to extend at least one mile. Additional incidental take is expected if a work area isolation and fish relocation operation is conducted, as required by the terms and conditions of this Incidental Take Statement. The number of fish captured may not exceed 500 juvenile SR spring/summer Chinook salmon and steelhead. The number of fish killed by the work area isolation and relocation may not exceed 15 juveniles.

This exemption from the take prohibition includes only habitat-related take caused by the proposed action as described in the BA and above, within the action area as defined in this Opinion. Any additional take associated with the ecological effects of hatchery production will be evaluated in a separate consultation on issuance of the 10(a)(1)(A) permit to authorize hatchery operations.

Reasonable and Prudent Measures

NOAA Fisheries believes that the following reasonable and prudent measures are necessary and appropriate to minimize the impact of incidental taking on the above species. The BPA and LSRCP, with respect to their proposed activities addressed in this Opinion, shall:

1. Avoid or minimize the amount and extent of take resulting from general construction activities, riparian disturbance, and in-water work required to complete the proposed NEOH Project addressed in this Opinion.

2. Avoid or minimize the likelihood of incidental take from contaminant leaks and spills associated with the use of heavy equipment near and within watercourses.

3. Avoid or minimize the amount and extent of take resulting from operation of the NEOH facilities.

4. Monitor the effects of the proposed action to determine the NEOH Project's actual effects on listed fish. Monitoring should detect adverse effects of the proposed action, assess the actual levels of incidental take in comparison with anticipated incidental take documented in the Opinion, and detect circumstances where the level of incidental take is exceeded.

Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the action must be implemented in compliance with the following terms and conditions, which implement the reasonable and prudent measures described above for each category of activity. These terms and conditions are non-discretionary.

1. To implement Reasonable and Prudent Measure #1 (general construction, riparian disturbance, and in-water work), the BPA shall ensure that:

    a. Minimum area. Construction impacts must be confined to the minimum area necessary to complete the project.
    b. Timing of in-water work. Work below ordinary high water must be completed using the most recent ODFW in-water work period, as appropriate for the project area, unless otherwise approved in writing by NOAA Fisheries.
    c. Cessation of work. Project operations must cease under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage.
    d. Fish screens. A fish screen must be installed, operated and maintained according to NOAA Fisheries' fish screen criteria[4] on each water intake used for project construction, including pumps used to isolate an in-water work area. Screens for water diversions or intakes that will be used for irrigation, municipal or industrial purposes, or any use besides project construction are not authorized by this Opinion.
    e. Fish passage. Passage must be provided for any adult or juvenile salmonid species present in the project area during construction, unless passage did not previously exist, or as otherwise approved in writing by NOAA Fisheries.

[4] National Marine Fisheries Service, Juvenile Fish Screen Criteria (revised February 16, 1995) and Addendum: Juvenile Fish Screen Criteria for Pump Intakes (May 9, 1996) (guidelines and criteria for migrant fish passage facilities, and new pump intakes and existing inadequate pump intake screens) (http://www.nwr.noaa.gov/1hydrop/hydroweb/ferc.htm).

Requests for approval should be submitted with the project notification. After construction, adult and juvenile passage must be provided for the life of the project.

f. Treated wood. Lumber, pilings, or other wood products that are treated or preserved with pesticidal compounds (including, but not limited to, alkaline copper quaternary, ammoniacal copper arsenate, ammoniacal copper zinc arsenate, copper boron azole, chromated copper arsenate, copper naphthenate, creosote, and pentachlorophenol) may not be used below ordinary high water, or as part of an in-water or over-water structure, except as described below.

i. Visual inspection. Each piece of treated wood must be visually inspected to ensure that no visible residues and/or bleeding of preservative is present.

ii. Pilings. Pilings treated with ammoniacal copper zinc arsenate, chromated copper arsenate, or creosote may installed below ordinary high water according to NOAA Fisheries' guidelines.[5] Note, however, that these guidelines do not apply to pilings treated with any other preservative, and do not authorize use of treated wood for any other purpose.

iii. Abrasion. All treated wood structures, including pilings, must have design features to avoid or minimize impacts and abrasion by livestock, pedestrians, vehicles, vessels, floats, *etc.*, to prevent the deposition of treated wood debris and dust in riparian or aquatic habitats.

iv. Leaching. Treated wood may be used to construct a bridge, over-water structure or in-water structure, provided that all surfaces exposed to leaching by precipitation or overtopping waves have a waterproof seal or barrier that will be maintained for the life of the project. Surfaces that are not exposed to precipitation or wave attack, such as parts of a timber bridge completely covered by the roadway wearing surface of the bridge deck, are exempt from this requirement.

v. Removal. Projects that require removal of treated wood must use the following precautions.

(1) Ensure that, to the extent feasible, no treated wood debris falls into the water. If treated wood debris does fall into the water, remove it immediately.

(2) Dispose of all treated wood debris removed during a project, including treated wood pilings, at an upland facility approved for hazardous materials of this classification. Do not leave a treated wood piling in the water or stacked on the streambank.

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[5] Letter from Steve Morris, National Marine Fisheries Service, to W.B. Paynter, Portland District, U.S. Army Corps of Engineers (December 9, 1998) (transmitting a document titled Position Document for the Use of Treated Wood in Areas within Oregon Occupied by Endangered Species Act Proposed and Listed Anadromous Fish Species, National Marine Fisheries Service, December 1998).

g. Preconstruction activity. The following actions must be completed before significant[6] alteration of the project area.

i. Marking. Flag the boundaries of clearing limits associated with site access and construction to prevent ground disturbance of critical riparian vegetation, wetlands and other sensitive sites beyond the flagged boundary.

ii. Emergency erosion controls. Ensure that the following materials for emergency erosion control are on-site.

(1) A supply of sediment control materials (*e.g.*, silt fence, straw bales).[7]

(2) An oil-absorbing, floating boom whenever surface water is present.

iii. Temporary erosion controls. All temporary erosion controls must be in place and appropriately installed downslope from project activity within the riparian area until site restoration is complete.

h. Temporary access roads. All temporary access road pads must be constructed as follows.

i. Existing ways. Use existing roadways, travel paths, and drilling pads whenever possible, unless construction of a new way or drilling pad would result in less habitat take. When feasible, eliminate the need for an access road by walking a tracked drill or spider hoe to a survey site, or lower drilling equipment to a survey site using a crane.

ii. Soil disturbance and compaction. Minimize soil disturbance and compaction whenever a new temporary road or drill pad is necessary within 150 feet[8] of a stream, waterbody or wetland by clearing vegetation to ground level and placing clean gravel over geotextile fabric, unless otherwise approved in writing by NOAA Fisheries. Requests for approval should be submitted with the project notification.

iii. Temporary stream crossings.

(1) Minimize the number of temporary stream crossings.

(2) Design temporary road crossings as follows.

(a) Survey and map any potential spawning habitat within 300 feet downstream from a proposed crossing.

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[6] 'Significant' means an effect can be meaningfully measured, detected or evaluated.

[7] When available, certified weed-free straw or hay bales must be used to prevent introduction of noxious weeds.

[8] Distances from a freshwater stream or waterbody are measured horizontally from, and perpendicular to, the bankfull elevation, the edge of the channel migration zone, or the edge of any associated wetland, whichever is greater. 'Bankfull elevation' means the bank height inundated by a 1.5 to 2-year average recurrence interval and may be estimated by morphological features such average bank height, scour lines and vegetation limits. 'Channel migration zone' means the area defined by the lateral extent of likely movement along a stream reach as shown by evidence of active stream channel movement over the past 100 years (*e.g.*, alluvial fans or floodplains formed where the channel gradient decreases, the valley abruptly widens, or at the confluence of larger streams).

(b) Do not place a stream crossing at known or suspected spawning areas, or within 300 feet upstream from such areas if spawning areas may be affected.

(c) Design the crossing to provide for foreseeable risks (*e.g.*, flooding and associated bedload and debris) to prevent the diversion of streamflow out of the channel and down the road if the crossing fails.

(d) Vehicles and machinery must cross riparian areas and streams at right angles to the main channel wherever possible.

iv. Obliteration. When the project is complete, obliterate all temporary access roads that will not be in the footprint of a new bridge or other permanent structure, stabilize the soil, and revegetate the site. Abandon and restore temporary roads in wet or flooded areas by the end of the in-water work period.

i. Heavy Equipment. When heavy equipment will be used, the equipment selected must have the least adverse effects on the environment (*e.g.*, minimally-sized, low ground pressure equipment).

j. Site preparation. Native materials must be conserved on site for site restoration.

i. If possible, leave native materials where they are found.

ii. If materials are moved, damaged or destroyed, replace them with a functional equivalent during site restoration.

iii. Stockpile all large wood[9] taken from below ordinary high water and from within 150 feet of a stream, waterbody or wetland, native vegetation, weed-free topsoil, and native channel material displaced by construction for use during site restoration.

iv. All large wood taken from the riparian zone must be placed back in the riparian zone or stream as part of site restoration.

k. Work area isolation. If adult or juvenile fish are reasonably certain to be present, or if the work area is 300 feet upstream from spawning habitats, the work area must be completely isolated from the active, flowing stream using inflatable bags, sandbags, sheet pilings, or similar materials, unless otherwise approved in writing by NOAA Fisheries. Requests for approval should be submitted with the project notification.

i. Work area isolation plan. Prepare and carry out a work area isolation plan for all work below ordinary high water requiring flow diversion or isolation. Submit an electronic copy of this plan with the project notification.

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[9] 'Large wood' means a tree, log, or rootwad big enough to dissipate stream energy associated with high flows, capture bedload, stabilize streambanks, influence channel characteristics, and otherwise support aquatic habitat function, given the slope and bankfull channel width of the stream in which the wood occurs. See, Oregon Department of Forestry and ODFW, A Guide to Placing Large Wood in Streams, May 1995 (www.odf.state.or.us/FP/RefLibrary/LargeWoodPlacemntGuide5-95.doc).

ii. Contents. The work area isolation plan must contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations.

(1) A plan view of all isolation elements.

(2) A list of equipment and materials that are necessary and that will be available on site to provide appropriate redundancy of key plan functions (*e.g.*, operational, properly-sized, back-up pumps and generators).

(3) The sequence and schedule of dewatering and rewatering activities.

l. Capture and release. Before and intermittently during pumping to isolate an in-water work area, fish trapped in the area must be captured using a trap, seine, electrofishing, or other methods as are prudent to minimize risk of injury, then released at a safe release site.

i. The entire capture and release operation must be conducted or supervised by a fishery biologist experienced with work area isolation and competent to ensure the safe handling of all ESA-listed fish.

ii. Do not use electrofishing if water temperatures exceed 18ºC.

iii. If electrofishing equipment is used to capture fish, comply with NOAA Fisheries' electrofishing guidelines.[10]

iv. Handle ESA-listed fish with extreme care, keeping fish in water to the maximum extent possible during seining and transfer procedures to prevent the added stress of out-of-water handling.

v. Ensure water quality conditions are adequate in buckets or tanks used to transport fish by providing circulation of clean, cold water, using aerators to provide dissolved oxygen, and minimizing holding times.

vi. Release fish into a safe release site as quickly as possible, and as near as possible to capture sites.

vii. Do not transfer ESA-listed fish to anyone except NOAA Fisheries personnel, unless otherwise approved in writing by NOAA Fisheries. Requests for approval should be submitted with the project notification.

viii. Obtain all other Federal, state, and local permits necessary to conduct the capture and release activity.

ix. Allow NOAA Fisheries or its designated representative to accompany the capture team during the capture and release activity, and to inspect the team's capture and release records and facilities.

x. Earthwork. Earthwork, including drilling, excavation, dredging, filling and compacting, must be completed as quickly as possible. Stabilize all disturbed areas, including obliteration of temporary roads, following any break in work unless construction will resume within four days.

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[10] National Marine Fisheries Service, Backpack Electrofishing Guidelines (December 1998) (http://www.nwr.noaa.gov/1salmon/salmesa/pubs/electrog.pdf).

m. Stormwater management. A stormwater management plan must be prepared to address the effects of new impervious surface and land cover conversion that will slow the entry of water into the soil. Submit an electronic copy of this plan with the project notification.

i. Contents. The goal is to avoid and minimize adverse effects due to the quantity and quality of stormwater runoff for the life of the project by maintaining or restoring natural runoff conditions. The plan must meet the following criteria and contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations.

(1) A system of management practices and, if necessary, structural facilities designed to complete the following functions.

(a) Minimize, disperse and infiltrate stormwater runoff on site using sheet flow across permeable vegetated areas to the maximum extent possible without causing flooding, erosion impacts, or long-term adverse effects on groundwater.

(b) Pretreat stormwater from pollution generating surfaces, including bridge decks, before infiltration or discharge into a freshwater system to minimize any nonpoint source pollutant (e.g., debris, sediment, nutrients, petroleum hydrocarbons, metals) likely to be present in the volume of runoff predicted from a 6-month, 24-hour storm.[11]

(c) Ensure that the duration of post project discharge matches the pre-developed discharge rates from 50% of the 2-year peak flow up to the 50-year peak flow.

(2) For projects that require engineered facilities to meet stormwater requirements, use a continuous rainfall/runoff model, if available for the project area, to calculate stormwater facility water quality and flow control rates.

(3) Use permeable pavements for load-bearing surfaces, including multiple-use trails, to the maximum extent feasible based on soil, slope, and traffic conditions.

[11] A 6-month, 24-hour storm may be assumed to be 72% of the 2-year, 24-hour amount. See, Washington State Department of Ecology (2001), Appendix I-B-1.

(4) Install structural facilities outside wetlands or the riparian management area[12] whenever feasible; otherwise, provide compensatory mitigation to offset any long-term adverse effects.

(5) Document completion of the following activities according to a regular schedule for the operation, inspection and maintenance of all structural facilities and conveyance systems, in a log available for inspection on request by NOAA Fisheries.

(a) Inspect and clean each facility as necessary to ensure that the design capacity is not exceeded, heavy sediment discharges are prevented, and determine whether improvements in operation and maintenance are needed.

(b) Promptly repair any deterioration threatening the effectiveness of any facility.

(c) Post and maintain a warning sign on or next to any storm drain inlet that says, as appropriate for the receiving water, 'Dump No Waste - Drains to Ground Water, Streams, or Lakes.'

(d) Dispose of sediment and liquid from any catch basin only in an approved facility.

ii. Runoffs/discharge into a freshwater system. When stormwater runoff will be discharged directly into fresh surface water or a wetland, or indirectly through a conveyance system, the following requirements apply.

(1) Maintain natural drainage patterns and, whenever possible, ensure that discharges from the project site occur at the natural location.

(2) Use a conveyance system comprised entirely of manufactured elements (*e.g.*, pipes, ditches, outfall protection) that extends to the ordinary high water line of the receiving water.

(3) Stabilize any erodible elements of this system as necessary to prevent erosion.

(4) Do not divert surface water from, or increase discharge to, an existing wetland if that will cause a significant adverse effect on wetland hydrology, soils or vegetation.

(5) The velocity of discharge water released from an outfall or diffuser port may not exceed 4 feet per second, and the maximum size of any aperture may not exceed one inch.

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[12] 'Riparian management area' means land: (1) Within 150 feet of any natural water occupied by listed salmonids during any part of the year or designated as critical habitat; (2) within 100 feet of any natural water within 1/4 mile upstream from areas occupied by listed salmonids or designated as critical habitat and that is physically connected by an above-ground channel system such that water, sediment, or woody material delivered to such waters will eventually be delivered to water occupied by listed salmon or designated as critical habitat; and (3) within 50 feet of any natural water upstream from areas occupied by listed salmonids or designated as critical habitat and that is physically connected by an above-ground channel system such that water, sediment, or woody material delivered to such waters will eventually be delivered to water occupied by listed salmon or designated as critical habitat. 'Natural water' means all perennial or seasonal waters except water conveyance systems that are artificially constructed and actively maintained for irrigation.

n. Site restoration plan. Carry out all site restoration plans described in the BA.

o. Pesticides and fertilizer. Do not apply fertilizer, herbicides, or other pesticides within 200 feet of any stream channel.

2. To implement Reasonable and Prudent Measure #2 (pollution control), the BPA shall ensure that:

a. Pollution Control Plan. Prepare and carry out a pollution and erosion control plan to prevent pollution caused by surveying or construction operations. The plan must be available for inspection on request by NOAA Fisheries.

i. Plan Contents. The pollution and erosion control plan will contain the pertinent elements listed below and meet requirements of all applicable laws and regulations.

(1) The name and address of the party(s) responsible for accomplishment of the pollution and erosion control plan.

(2) A description of any regulated or hazardous products or materials that will be used for the project, including procedures for inventory, storage, handling, and monitoring.

(3) A spill containment and control plan with notification procedures, specific cleanup and disposal instructions for different products, quick response containment and cleanup measures that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.

(4) Practices will be carried out to prevent construction debris from dropping into any stream or waterbody, and to remove any material that does drop with a minimum disturbance to the streambed and water quality.

ii. Vehicle and material staging. Store construction materials and fuel, operate, maintain, and store vehicles as follows.

(1) To reduce the staging area and potential for contamination, ensure that only enough supplies and equipment to complete a specific job will be stored on site.

(2) Complete vehicle staging, cleaning, maintenance, refueling, and fuel storage in a vehicle staging area outside riparian areas, unless otherwise approved in writing by NOAA Fisheries.

(3) Inspect all vehicles operated within riparian areas daily for fluid leaks before leaving the vehicle staging area. Repair any leaks detected in the vehicle staging area before the vehicle resumes operation. Document inspections in a record that is available for review on request by NOAA Fisheries.

b. Construction discharge water. Treat all discharge water created by construction (*e.g.*, pumping for work area isolation, vehicle wash water) as follows.

i. Water quality. Design, build and maintain facilities to collect and treat all construction discharge water using the best available technology

applicable to site conditions. Provide treatment to remove debris, nutrients, sediment, petroleum hydrocarbons, metals, and other pollutants likely to be present.

ii. Discharge velocity. If construction discharge water is released using an outfall or diffuser port, velocities may not exceed 4 feet per second, and the maximum size of any aperture may not exceed one inch.

iii. Pollutants. Do not allow pollutants including green concrete, contaminated water or silt to contact any wetland or the two-year floodplain.

3. To implement Reasonable and Prudent Measure #3 (facility operation), the LSRCP shall ensure that:

a. Water withdrawal. All conservation measures listed in the BA, including the low flow strategy and pump-back system are implemented at streamflow levels identified in the BA.

b. Screening. All diversion and pump intakes and outfalls will comply with NOAA Fisheries standards for screening.

c. Passage Facilities and Traps. All fish passage facilities, adult traps, and holding facilities will be staffed and monitored as identified in the BA.

4. To implement Reasonable and Prudent Measure #4 (monitoring), the BPA and LSRCP shall:

a. Reporting. The BPA and LSRCP will coordinate and submit a yearly monitoring report to NOAA Fisheries describing these agencies' success in meeting the terms and conditions contained in this Opinion. Include the following information.

i. Project identification

(1) Project name.

(2) Type of activity.

(3) BPA contact person.

(4) Starting and ending dates for construction completed (necessary until construction of the facilities is completed.

ii. Photo documentation. Photos of habitat conditions at the project and any compensation site(s), before, during, and after Project completion.[13]

(1) Include general views and close-ups showing details of the Project and Project area, including pre- and post-construction.

(2) Label each photo with date, time, project name, photographer's name, and a comment about the subject.

iii. Other data. Additional project-specific data, as appropriate.

[13] Relevant habitat conditions may include characteristics of channels, eroding and stable streambanks in the Project area, riparian vegetation, water quality, flows at base, bankfull and over-bankfull stages, and other visually discernable environmental conditions at the Project area, and upstream and downstream from the Project.

(1) Work cessation. Dates work ceased due to high flows, if any.
(2) Fish screen. Evidence of compliance with NOAA Fisheries' fish screen criteria.
(3) Pollution control. A summary of pollution and erosion control inspections, including any erosion control failure, contaminant release, and correction effort.
(4) Site preparation.
    (a) Total cleared area – riparian and upland.
    (b) Total new impervious area.
(5) Streambank protection.
    (a) Type and amount of materials used.
    (b) Project size – one bank or two, width and linear feet.
(6) Site restoration. Photo or other documentation that site restoration performance standards were met.
(7) Long-term habitat loss. The same elements apply as for monitoring site restoration.

b. Water Quality. Conduct all water quality monitoring of hatchery effluent identified in the BA and report those findings to NOAA Fisheries. Effluent discharge will be in compliance with all applicable state water quality standards and NPDES permits.

c. Water withdrawal. Monitor effects of water withdrawal during critical periods with particular attention to providing fish passage and watering of redds. The action agency will notify NOAA Fisheries if fish passage is restricted or redds become de-watered within the reach affected by the water withdrawal in the Lostine River.

d. Lethal take. If a sick, injured, or dead specimen of a threatened or endangered species is found, the finder must notify the Vancouver Field Office of NOAA Fisheries Law Enforcement at (360) 418-4246. The finder must take care in handling sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder also has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed unnecessarily. Hatchery and research permits allow the state and Tribal biologists to rescue or salvage listed fish and collect biological samples. In these circumstances, lethal take of listed fish and collection of biological samples will be conducted, recorded and reported as required in the section 10(a)(1)(A) direct take permits for research and artificial propagation actions taken in conjunction with the operation of these facilities.

e. Report submission. Submit a copy of the report to the Oregon State Habitat Office and Salmon Recovery Division of NOAA Fisheries.

Oregon State Director Habitat Conservation Division National Marine Fisheries Service Attn: **2004/00615** 525 NE Oregon St., Suite 500 Portland, OR 97232	Assistant Regional Administrator Salmon Recovery Division National Marine Fisheries Service **Attn: 2004/00615** 525 NE Oregon St., Suite 500 Portland, OR 97232

MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires the inclusion of EFH descriptions in Federal fishery management plans. In addition, the MSA requires Federal agencies to consult with NOAA Fisheries on activities that would adversely affect EFH.

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting the definition of EFH: 'Waters' include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; 'substrate' includes sediment, hard bottom, structures underlying the waters, and associated biological communities; 'necessary' means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and 'spawning, breeding, feeding, or growth to maturity' covers a species' full life cycle (50 C.F.R. 600.110).

Section 305(b) of the MSA (16 U.S.C. 1855(b)) requires that:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH;

- NOAA Fisheries will provide conservation recommendations for any Federal or state activity that may adversely affect EFH;

- Federal agencies will, within 30 days after receiving conservation recommendations from NOAA Fisheries, provide a detailed response in writing to NOAA Fisheries regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NOAA Fisheries, the Federal agency shall explain its reason for not following the recommendations.

The MSA requires consultation for all actions that may adversely affect EFH, and does not distinguish between actions within EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and upslope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with NOAA Fisheries is required by Federal agencies undertaking, permitting or funding activities that may adversely affect EFH, regardless of its location.

Identification of EFH

The Pacific Fisheries Management Council (PFMC) has designated EFH for three species of Pacific salmon: Chinook (*Oncorhynchus tshawytscha*); coho (*O. kisutch*); and Puget Sound pink salmon (*O.gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other waterbodies currently or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream from certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (*e.g.*, natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the *Pacific Coast Salmon Plan* (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based on this information.

Proposed Action

The proposed action is detailed above in the Proposed Action section of the ESA portion of this Opinion. The action area is within the Wallowa, Imnaha, and Upper Grande Ronde Subbasins. This area has been designated as EFH for various life stages of Chinook and coho salmon.

Effects of Proposed Action

The effects on Chinook and coho salmon habitat are the same as those for SR steelhead and SR spring/summer Chinook and are described in detail in the Amount or Extent of Take section of this document. The proposed action may result in short-term adverse effects on a variety of habitat parameters. These adverse effects are:

1. Riparian disturbance from accessing construction area and construction activities performed from the bank.

2. Increased sedimentation from instream construction activities.

3. Decreased stream flow in reaches between hatchery water intakes and effluent outfalls.

4. Impairment of water quality and increased sedimentation below hatchery effluent outfalls for a distance of approximately one to two miles.

Conclusion

NOAA Fisheries believes that the proposed action may adversely affect EFH for Chinook salmon and coho salmon.

EFH Conservation Recommendations

NOAA Fisheries believes that Terms and Conditions 1 (a-k and m-o), 2 (a and b), and 3 (a) contained in ITS of this Opinion are applicable to salmon EFH. Therefore, NOAA Fisheries incorporates each of those measures here as EFH recommendations.

Statutory Response Requirement

The MSA (section 305(b)) and 50 C.F.R. 600.920(j) requires the BPA and LSRCP to provide a written response to NOAA Fisheries' EFH conservation recommendations within 30 days of its receipt of this letter. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity on EFH. If the response is inconsistent with NOAA Fisheries' conservation recommendations, the BPA and LSRCP shall explain their reasons for not following the recommendations.

Supplemental Consultation

The BPA and LSRCP must reinitiate EFH consultation with NOAA Fisheries if either the action is substantially revised or new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 C.F.R. 600.920).

DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

Section 515 of the Treasury and General Government Appropriations Act of 2001 (Public Law 106-554) ("Data Quality Act") specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the Opinion addresses these Data Quality Act (DQA) components, documents compliance with the DQA, and certifies that this Opinion has undergone pre-dissemination review.

Utility: This ESA section 7 consultation concludes that the proposed NEOH Project in the Lostine River, Imnaha River, and Lookinglass Creek will not jeopardize the affected ESUs. Therefore, the BPA can fund this project in accordance with its authority under the Pacific Northwest Electric Power Planning and Conservation Act of 1980. The WWNF will also be able to issue a special use permit for these facilities under the National Forest Management Act. The LSRCP will be able to oversee the operations and maintenance of these facilities. The intended users are the BPA, WWNF, LSRCP, and NPT. The BPA and NPT benefit from the consultation.

Individual copies were provided to the above-listed entities. This document will be posted on the NOAA Fisheries' NW Region web site (http://www.nwr.noaa.gov). The format and naming adhere to conventional standards for style.

Integrity: This consultation was completed on a computer system managed by NOAA Fisheries in accordance with relevant Information Technology security policies and standards set out in Appendix III, 'Security of Automated Information Resources,' OMB Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

Objectivity:

Information Product Category: Natural Resource Plan

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NOAA Fisheries ESA Consultation Handbook, ESA Regulations, 50 C.F.R. 402.01 *et seq*., and the MSA implementing regulations regarding EFH, 50 C.F.R. 600.920(j).

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the document's 'Literature Cited' section. The biological opinion/EFH consultation contains more background on information sources and quality.

Referencing: All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NOAA Fisheries staff with training in ESA and MSA implementation, and reviewed in accordance with Northwest Region ESA quality control and assurance processes.

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