

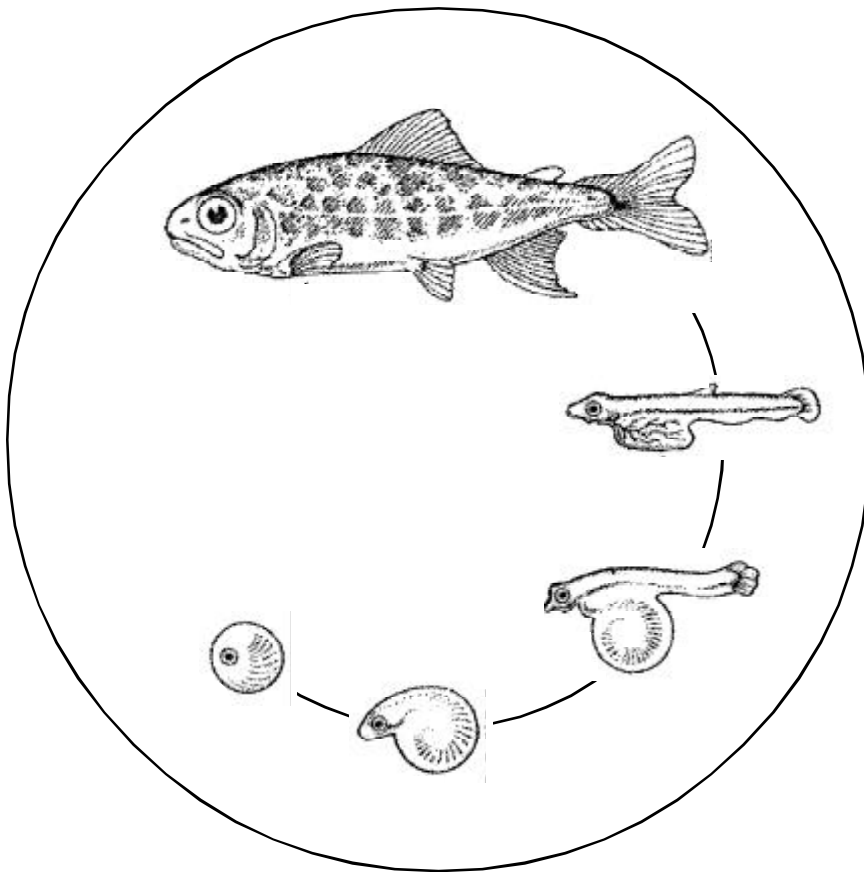
MAY 2003

# NORTHEAST OREGON HATCHERY PROGRAM

## GRANDE RONDE - IMNAHA SPRING CHINOOK HATCHERY PROJECT

Draft Environmental Impact Statement

DOE/EIS-0340



**Northeast Oregon Hatchery Program**  
**Grande Ronde – Imnaha Spring Chinook Hatchery Project**  
*Draft Environmental Impact Statement*  
(DOE/EIS-0340)

**Responsible Agency:** U.S. Department of Energy, Bonneville Power Administration (BPA)

**Cooperating Federal Agencies:** U.S. Department of Interior, Fish and Wildlife Service (USFWS); U.S. Department of Commerce, National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries); U.S. Department of Agriculture, Forest Service

**Cooperating Tribes:** Nez Perce Tribe (NPT), Confederated Tribes of the Umatilla Indian Reservation (CTUIR)

**Cooperating State Agencies:** Oregon Department of Fish and Wildlife (ODFW)

**Abstract:** To assist in the conservation and recovery of Chinook salmon native to the Grande Ronde River and Imnaha River subbasins, the Proposed Action of updating and modifying two existing hatcheries and constructing three new hatchery facilities at other sites is being studied in this Draft Environmental Impact Statement (Draft EIS). BPA proposes to fund the capital improvements and the operation and maintenance of all five facilities to aid BPA's efforts to mitigate and recover anadromous fish affected by the Federal Columbia River Power System. The Lower Snake River run of spring/summer chinook was listed as threatened under the Endangered Species Act in 1992.

The existing hatchery facilities, Lookingglass Hatchery in the Grande Ronde subbasin and Imnaha Satellite Facility in the Imnaha subbasin, have become over-extended, outdated or otherwise unsuitable for producing the numbers of hatchery fish necessary to recover the threatened Chinook stocks. The Lostine River Hatchery, Lostine Adult Collection Facility (both on the Lostine River in the Grande Ronde subbasin), and Imnaha Final Rearing Facility (in the Imnaha subbasin) would help alleviate the risk of fish production failure or disease epidemic at the existing hatcheries; and allow hatchery fish production, evaluation and monitoring programs described in the Northeast Oregon Hatchery Program Spring Chinook Master Plan (Master Plan, Ashe et al. 2000) to meet objectives of the fishery co-managers (NPT, CTUIR, ODFW, USFWS, & NOAA Fisheries).

This Draft EIS evaluates the Proposed Action and a No Action Alternative in detail. Considered, but eliminated from detailed study were nearly 40 alternative sites, which were found to be unsuitable due to insufficient water quality and/or volume at critical times of the fish production cycle, distance to native spawning grounds (important for young fish 'imprinting' to native waters), or lack of space (too little land available).

All proposed sites are privately owned except the existing Imnaha Satellite Facility, which is on Forest Service land under Special Use Permit to the USFWS. The two Imnaha facilities are within the Imnaha Wild and Scenic River corridor and the Hells Canyon National Recreation Area boundary.

Public review and comment of this Draft EIS will continue through July 7, 2003. Responses to comments will be made part of the Final EIS, which is scheduled for completion in August 2003. BPA expects to issue a Record of Decision whether to implement the project in September 2003.

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**To receive additional copies of the Draft EIS:**

Call BPA's document request line at 1-800-622-4520; record your name, address, and which document and format you would like to receive.

Executive Summary - Grande Ronde-Imnaha Hatchery Project Draft EIS (9 pages)  
Draft EIS - Grande Ronde-Imnaha Spring Chinook Hatchery Project (about 200 pages)

Formats available: Paper copy, or CD.

The documents are also available on BPA's website at: <http://www.bpa.gov> under links to environmental analysis, Active Projects.

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# Executive Summary

The Bonneville Power Administration (BPA) has a responsibility to protect, mitigate and enhance fish and wildlife affected by the Federal Columbia River Power System. (Northwest Power Act, 16 U.S.C. § 839 et seq). One species covered by that mandate is the Snake River spring/summer chinook salmon listed as threatened under the Endangered Species Act (ESA). BPA is now evaluating whether to provide funding for final design, property acquisition, construction, modification, operation and maintenance of facilities to better implement existing pre-approved programs of hatchery fish production for Snake River spring/summer chinook native to the Grande Ronde and Imnaha Rivers of Northeast Oregon. Before taking action on this matter, BPA must comply with the National Environmental Policy Act (NEPA) by preparing an Environmental Impact Statement (EIS). BPA, therefore, has prepared an EIS to consider alternatives and environmental consequences of a Proposed Action (Proposed Action) to modify and modernize existing hatchery facilities and to construct auxiliary hatchery facilities where needed to aid conservation and recovery of this species in Northeast Oregon.

The Northeast Oregon Hatchery Project Spring Chinook Master Plan (Master Plan) (Ashe et al. 2000) documented a need for updated, modified and augmented production facilities in Northeast Oregon. It found that current hatchery facilities do not provide adequate space, the best available technical and scientific advancements, or suitable rearing and migration conditions to support conservation and recovery of the Snake River spring/summer chinook. The Master Plan explains how existing hatchery facilities have become over-extended and unable to meet the Lower Snake River Compensation Plan's (LSRCP) mitigation goals or the conservation and recovery goals for ESA-listed species.

The purposes and need for taking action are fully described in Section 1.2 of the EIS. In summary, the purposes of taking action are to:

- Provide adequate, contemporary hatchery facilities in the Grande Ronde and Imnaha subbasins to help in the conservation and recovery of ESA-listed spring/summer chinook salmon native to the Grande Ronde and Imnaha Rivers, and thus further the implementation of the Lower Snake River Compensation Plan's (LSRCP) hatchery fish **production** program.
- Coordinate the operation at the existing Lookingglass Hatchery and related LSRCP hatchery facilities with the Fish and Wildlife Program of the Northwest Power and Conservation Council (NPCC or Council), thereby aiding Bonneville Power Administration's (BPA) efforts to mitigate and recover anadromous fish affected by the Federal Columbia River Power System.
- Aid in BPA's fulfillment of mitigation and recovery goals outlined in the Biological Opinion from NOAA Fisheries (formerly known as the National Marine Fisheries Service [NMFS]) on operation of the Federal Columbia River Power System (NMFS 2000a).
- Achieve economic efficiencies by integrating management of fish production programs and facilities.
- Be consistent with the requirements of pertinent federal laws, regulations and executive orders, and other relevant plans and programs.
- Support the Nez Perce Tribe's (NPT) goal to restore anadromous fish **populations** and enhance the Tribe's opportunities to exercise treaty fishing rights.

The EIS evaluates the Proposed Action and an alternative of taking no action. Several other alternatives were eliminated from detailed study because they are physically or economically infeasible or fail to meet the purposes and need for the action. Alternatives considered but eliminated are described in Section 2.3 of the EIS and include:

- Modifying the existing Lookingglass Hatchery without using, adding or modifying any other facilities;
- Using or modifying existing facilities elsewhere in the Columbia Basin to assist with Lookingglass Hatchery production; and
- Putting new facilities at other sites in Northeast Oregon to assist with Lookingglass production.

The Proposed Action consists of five sites and facilities described in Section 2.1 of the EIS. Figure ES-1 provides an overview of the Proposed Action's area and the geographic relationship of sites and facilities.

- Lookingglass Hatchery – Modifications to this existing facility are proposed to better accommodate Catherine Creek and Upper Grande Ronde components of the production program and to transfer other stock responsibilities to facilities on natal streams.
- Lostine Adult Collection Facility – A new facility is proposed for collecting adult spring/summer chinook for spawning at the Lostine River Hatchery during higher flows.
- Lostine River Hatchery – A new facility is proposed to accommodate the Lostine River component of the production program by incubating and rearing chinook near their natal waters.
- Imnaha Satellite Rearing Facility – A new facility is proposed to provide final rearing for year-old chinook in natal waters before final acclimation and release at the Imnaha Satellite Facility.
- Imnaha Satellite Facility – Modifications to the existing adult collection and acclimation facility are proposed to allow collection of broodstock over a greater range of flows and holding, spawning and incubation before transport.

The Proposed Action is designed to benefit native spring/summer chinook salmon and to avoid and minimize potential impacts. The Proposed Action includes best management practices, compliance with applicable regulatory requirements and guidance, and other activities protective of the environment. Facility design and construction would meet relevant requirements and would incorporate best management practices such as erosion control, waste management, dust control, weed management, fire prevention, work hour and noise considerations. The Proposed Action also incorporates sensitive site design measures such as retaining riparian vegetation, landscaping with native plants, erecting buildings reflective of local character, and shielding of facility lighting. Proposed facilities would be designed and constructed to meet low density rearing criteria to the extent feasible. Instream structures would meet applicable regulatory agency design requirements. Construction would be staged to accommodate existing hatchery operations and reduce impacts on fish production at each facility. Instream work would comply with applicable regulations and permits, and would occur behind temporary cofferdams or other water diversions appropriately placed to route water around work areas.

Chapter 3 of the EIS describes the environmental consequences of the Proposed Action and the No Action Alternative. It contains an analysis of potential impacts on fisheries; wildlife; plants; geology; hydrology; wild and scenic rivers; cultural resources; aesthetics; land use, recreation and transportation; socioeconomics;

air quality; noise; and, public health and safety. Table ES-1 (Summary of Environmental Consequences of Alternatives) presents the impacts of the Proposed Action and the No Action Alternative for each of these environmental resource areas.

In conformance with NEPA, BPA involved the public in meetings to identify environmental issues and concerns needing consideration during the environmental review process. Interested and affected parties included local residents, local business owners, regional special interest groups involved with fish conservation, and government agencies with regulatory responsibilities related to the environment. The public raised concerns about the biological environment, physical environment, and the social and economic environment. Specifically, the public had concerns about potential effects of the Proposed Action on ESA-listed fish species, other aquatic species, ESA-protected wildlife, big game, and plants, particularly ESA-protected plants and riparian plant communities. The public also raised issues about potential effects of the Proposed Action on water quantity and water quality. The public had a particular concern about whether proposed new facilities would unreasonably diminish values of the Imnaha and Lostine Wild and Scenic River status and the Hells Canyon National Recreation Area. Further, the public was concerned about potential noise, visual quality, and the effects of construction and operation of proposed facilities on health, safety and security of local residents and road-users. The public also asked about the costs versus the benefits of the facilities overall in the context of other means to conserve and recover spring/summer chinook in Northeast Oregon.

BPA is the lead agency for purposes of NEPA compliance, but several other agencies and tribes have worked closely with the BPA to develop the Proposed Action. The Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation, and the Oregon Department of Fish and Wildlife are co-managers of the spring/summer chinook conservation and recovery program in Northeast Oregon. Though not federal agencies, they are the primary cooperating agencies for the EIS. The USFWS, NOAA Fisheries, U.S. Forest Service (Forest Service) and other managers of habitat, fisheries and hatcheries in Northeast Oregon have been consulted during the development of this EIS. The Forest Service and the USFWS are also cooperating federal agencies. The Forest Service must decide whether to authorize/permit facilities on lands under its jurisdiction along the Imnaha River. The USFWS and NOAA Fisheries are the federal co-managers responsible for administering the LSRCP program. These agencies must concur with the design of any new LSRCP facilities, approve any modifications to Lookingglass Hatchery and the Imnaha Satellite Facility, and work with other fisheries co-managers to settle any fish production issues that may result from the addition or modification of facilities associated with the Proposed Action.

Consideration of issues concerning programmatic elements of the hatchery production program is outside the scope of the EIS. Therefore, the EIS does not consider or evaluate changes to pre-established programmatic goals, costs versus benefits of the proposed facilities compared to other recovery methods, direction, production levels, monitoring and evaluation requirements, genetics, ecological interactions, or operational means of achieving programmatic goals. While the EIS addresses cumulative effects, it does not address other issues associated with spring/summer chinook recovery programs, hatcheries in general or funding priorities for different recovery methods.

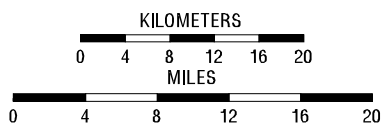
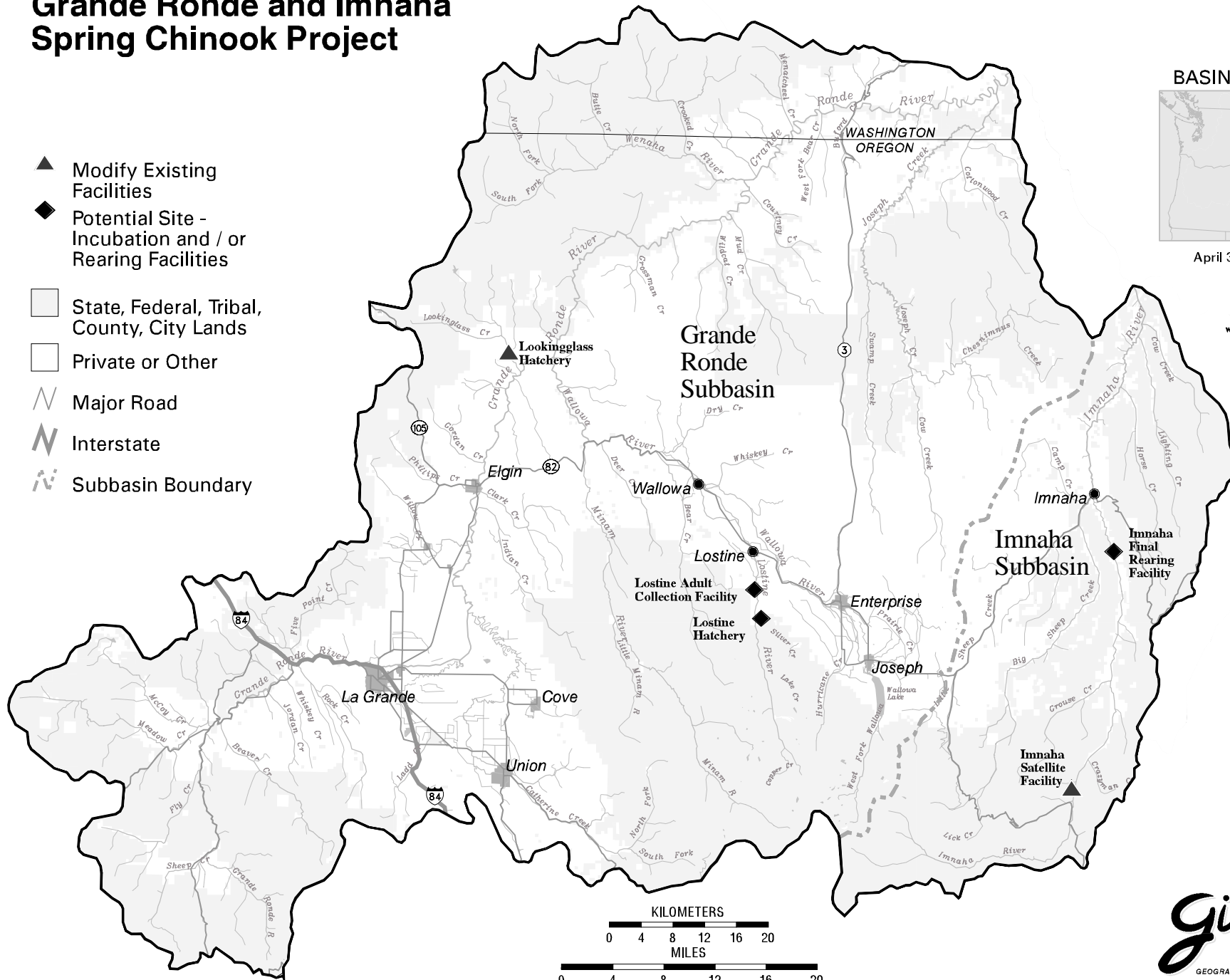
# Grande Ronde and Imnaha Spring Chinook Project

- ▲ Modify Existing Facilities
- ◆ Potential Site - Incubation and / or Rearing Facilities
- State, Federal, Tribal, County, City Lands
- Private or Other
- Major Road
- Interstate
- - - Subbasin Boundary

## BASIN LOCATION



April 30, 2003



**Table ES-1. Summary of Environmental Consequences of Alternatives.**

<b>Environmental Resource</b>	<b>Proposed Action</b>	<b>No Action Alternative</b>
<p><b>3.2 Fisheries</b></p> <ul style="list-style-type: none"> <li>Targeted spring/summer chinook</li> </ul>	<p>Site disturbances and channel alterations would create minor localized impacts that would not affect species population viability. Water withdrawals during operation of facilities would reduce habitat in the immediate reach of each diversion, but would not affect species population viability. No impacts to individuals or populations are expected from discharges at proposed facilities. Individuals and the population would benefit from improved passage as well as adult attraction and collection facilities. The population would benefit from improved broodstock collection and holding facilities. Incubation and rearing practices resulting from the proposed facilities would increase population viability and benefit the species in the long-term. Fish health maintenance activities would benefit individuals and the population by reducing disease potential.</p>	<p>Risks to hatchery fish production needed to maintain population viability would increase in the long-term because of the inadequacy of current facilities.</p>
<ul style="list-style-type: none"> <li>Non-targeted chinook</li> </ul>	<p>Site disturbances and channel alterations would create minor localized impacts that would not affect species population viability. Water withdrawals during operation of facilities would reduce habitat in the immediate reach of each diversion, but would not affect species population viability. No impacts to individuals or populations are expected from discharges at proposed facilities. Some individuals may experience short-term stress by installation of weirs, ladders and traps within the Lostine River. Improved upstream and downstream passage in both subbasins would benefit populations. Broodstock collection and maintenance are not expected to impact non-targeted chinook population viability. Incubation and rearing practices at the proposed facilities would have no impact on non-targeted chinook. Fish health maintenance activities would benefit individuals and the population by reducing disease potential.</p>	<p>No change.</p>

Environmental Resource	Proposed Action	No Action Alternative
<ul style="list-style-type: none"> <li>Other salmonids</li> </ul>	<p>Site disturbances and channel alterations would create minor localized impacts that would not affect species population viability. Water withdrawals during operation of facilities would reduce habitat in the immediate reach of each diversion, but would not affect species viability. No impacts to individuals or populations are expected from discharges at proposed facilities. Some individuals may experience short-term stress by installation of weirs, ladders and traps within the Lostine River. Improved upstream and downstream passage in both subbasins would benefit populations. Broodstock collection and maintenance are not expected to impact population viability of other salmonids. Incubation and rearing practices at the proposed facilities would have no impact on other salmonids. Fish health maintenance activities would benefit individuals and the population by reducing disease potential.</p>	<p>No change.</p>
<ul style="list-style-type: none"> <li>Non-salmonids</li> </ul>	<p>Site disturbances and channel alterations would create minor localized impacts that would not affect species viability. Water withdrawals during operation of facilities would reduce habitat in the immediate reach of each diversion, but would not affect species viability. No impacts to individuals or populations are expected from discharges at proposed facilities. Some individuals may experience short-term stress by installation of weirs, ladders and traps within the Lostine River. Improved upstream and downstream passage in both subbasins would benefit populations. Broodstock collection and maintenance are not expected to impact population viability. Incubation and rearing practices at the proposed facilities would have no impact on non-salmonids. Fish health maintenance activities would have no impact on non-salmonids.</p>	<p>No change.</p>

Environmental Resource	Proposed Action	No Action Alternative
<b>3.3 Wildlife</b> <ul style="list-style-type: none"> <li>• ESA species</li> <li>• Other species</li> </ul>	<p>No state or federally listed species are known to nest or breed at project sites. Bald eagles roosts or potential roosts have been documented at or near all sites except ISF. Tree removal at LRH, LACF, and IFRF may reduce the number of potential roost sites.</p> <p>Temporary displacement during construction activities (noise, presence of humans) would be the primary consequence to big game and other wildlife species that use project sites.</p>	<p>No change.</p> <p>No change.</p>
<b>3.4 Plants and Wetlands</b> <ul style="list-style-type: none"> <li>• ESA species</li> <li>• Other native species</li> <li>• Non-native species</li> <li>• Wetlands</li> </ul>	<p>No state or federally listed plant species are known to occur at any project sites.</p> <p>Varying amounts of native vegetation would be disturbed or displaced by facility structures. All sites would be replanted with native species. Some loss of riparian habitat is anticipated at LACF, LRH and IFRF. Improved quality of riparian habitat is expected at IFRF with exclusion of cattle from the site.</p> <p>All facilities would be maintained to discourage non-native, invasive and weed species.</p> <p>LACF and LRH – Net loss of minor amount of wetlands (less than ½ acre combined). Mitigation – Commitment to conduct formal wetland delineations and to implement compensatory wetland mitigation as warranted in consultation with regulatory authorities.</p>	<p>No change.</p> <p>No change.</p> <p>No change.</p> <p>No change.</p>
<b>3.5 Geology</b> <ul style="list-style-type: none"> <li>• Approximate acres temporarily disturbed and permanently altered</li> <li>• Slope/bank stability</li> <li>• Erosion</li> </ul>	<p>LGH – &lt; 1 acre within existing facility (total existing facility about 11 acres).</p> <p>LACF – 3 acres (total site about 3 acres).</p> <p>LRH – 5 acres temporarily, 3 acres permanently, altered (total site about 6 acres).</p> <p>IFRF – 6 acres temporarily, 3 acres permanently, altered (10 acre lease, about 6 acres “occupied”).</p> <p>ISF – &lt; 1 acre within existing facility (total existing facility about 6 acres).</p> <p>Stability unchanged.</p> <p>Short-term, localized erosion during construction.</p>	<p>LGH – No change.</p> <p>LACF – No change.</p> <p>LRH – No change.</p> <p>IFRF – No change.</p> <p>ISF – No change.</p> <p>Stability unchanged.</p> <p>Erosion potential unchanged.</p>

Environmental Resource	Proposed Action	No Action Alternative
<p><b>3.6 Hydrology</b></p> <ul style="list-style-type: none"> <li>• Water quality</li>   <li>• Water quantity</li>   <li>• Flow restrictions / floodplains</li> </ul>	<p>Localized, temporary, construction-related runoff and sedimentation within applicable standards.</p> <p>LRH – occasional short-term reduced flows along hatchery reach in extremely dry or cold periods (up to 50-60% reduction during extreme low flows; during those times, river and well water would be pumped back to the intake location).                      IFRF – similar to LRH, but shorter duration and extent; up to 50% reduction along the hatchery reach during extremely low flow periods.                      ISF – similar to LRH, but shorter duration and extent; minor flow regime alteration during extremely low flow periods.</p> <p>LACF, LRH, IFRF - localized flow restriction, concentration, and scouring where new components are installed; slight improvement with new bridge abutments at IFRF and new weir at ISF.</p>	<p>Water quality unchanged.</p> <p>Water quantity unchanged.</p> <p>Flows unchanged.</p>
<p><b>3.7 Wild and Scenic Rivers</b></p> <ul style="list-style-type: none"> <li>• Imnaha River</li>   <li>• Lostine River</li> <li>• Grande Ronde River</li> </ul>	<p>In-stream structures at ISF and IFRF would slightly constrict river flow and decrease vegetation; slight improvement with new bridge abutments at IFRF and new weir at ISF; fill at IFRF would alter and redirect surface flows during extreme storm events; likely improvement over time to fisheries Outstandingly Remarkable Values (ORVs), as well as lifestyle and recreation ORVs.</p> <p>Not likely to invade area or unreasonably diminish values of Wild and Scenic designation.</p> <p>Not likely to invade area or unreasonably diminish values of Wild and Scenic designation.</p>	<p>No change to Imnaha flow conditions; forego slightly improved replacement structures at IFRF and ISF; forego enhancement to fisheries ORV and related recreation and lifestyle ORVs.</p> <p>No change.</p> <p>No change.</p>
<p><b>3.8 Cultural Resources</b></p>	<p>No effect. If evidence of cultural materials is found later, work or activity would be halted until the site could be assessed.</p>	<p>No effect.</p>
<p><b>3.9 Aesthetics (Visual Quality)</b></p>	<p>LGH – no effect on existing visual character.                      LACF – limited effect on overall visual character.                      LRH – limited effect, visible to nearby residents.                      IFRF – limited effect, brief views from Road 551.                      ISF – limited effect on overall visual character.</p>	<p>LGH – No change.                      LACF – No change.                      LRH – No change.                      IFRF – No change.                      ISF – No change.</p>



Environmental Resource	Proposed Action	No Action Alternative
<b>3.10 Land Use, Recreation and Transportation</b> <ul style="list-style-type: none"> <li>• Land Use</li> <li>• Recreation</li> <li>• Transportation</li> </ul>	<p>Facilities consistent with local zoning as applicable, permitted outright or as conditional use; ISF on Forest Service land would require reissuing the special use permit.</p> <p>No effect on recreation, except possible long-term benefit if chinook stocks recover to enhance viewing and fishing.</p> <p>Short-term traffic increase during construction.</p> <p>LACF – improve trout farm bridge and parking.</p> <p>LRH – pave Granger Road.</p> <p>IFRF – construct turning lane on Road 551.</p>	<p>No change.</p> <p>No change.</p> <p>No change.</p>
<b>3.11 Socioeconomics</b>	<p>No change to human population; minor increase to employment, especially during construction; and some benefit to local economy if chinook recover and stimulate recreation or fishing.</p>	<p>No change; potential for some adverse effect on local economy if salmon stocks continue to decline.</p>
<b>3.12 Air Quality</b>	<p>Short-term increase in particulates during construction; no long-term effect.</p>	<p>No change.</p>
<b>3.13 Noise</b>	<p>LGH – temporary increase in area noise levels during construction; long-term potential to decrease noise at facility with new buildings and equipment.</p> <p>LACF – temporary increase in area noise levels during construction.</p> <p>LRH – temporary increase in area noise levels during construction; long-term noise associated with traffic to the facility and other activities, and an additional residence.</p> <p>IFRF – temporary increase in area noise levels during construction.</p> <p>ISF – temporary increase in area noise levels during construction; long-term potential to decrease noise in the area by replacing the existing diesel generator with powerline.</p>	<p>No change at any of the sites.</p>
<b>3.14 Public Health and Safety</b>	<p>Potential minor increased demand for public services (fire, hospital, etc.) and increased traffic during construction.</p>	<p>No change from current situation.</p>

\*Proposed Action

LGH = Lookingglass Hatchery  
 LRH = Lostine River Hatchery  
 ISF = Imnaha Satellite Facility

LACF = Lostine Adult Collection Facility  
 IFRF = Imnaha Final Rearing Facility

# Chapter 1: Purpose and Need

## 1.1 Need for Action

The Snake River spring/summer **chinook** salmon native to the Grande Ronde and Imnaha Rivers of Northeast Oregon are listed as threatened and are protected by the Endangered Species Act (**ESA**<sup>1</sup>). Adequate, contemporary hatchery facilities are needed in mitigation and recovery<sup>2</sup> of these fish **stocks**.

Currently, the Lookingglass Hatchery in the Grande Ronde subbasin and the Imnaha Satellite Facility in the Imnaha subbasin are the only two existing permanent hatchery facilities for spring chinook in Northeast Oregon. Both of these facilities were built in the early 1980's. These facilities do not provide adequate space, the best available technical and scientific advancements, or suitable rearing and migration conditions to provide for the conservation and recovery of ESA-listed **species**. The National Oceanic and Atmospheric Administration Fisheries (**NOAA Fisheries**), U.S. Fish and Wildlife Service (**USFWS**) and local fishery and hatchery managers recognize that modernization and augmentation of hatchery facilities is needed to increase the success of mitigation efforts and to halt the decline of spring/summer chinook runs.

## 1.2 Purposes of Taking Action

Agency decision-makers and local fishery and hatchery co-managers will consider the following purposes (i.e. objectives) in evaluating alternative ways to meet the conservation and recovery needs described above:

- Provide adequate, contemporary hatchery facilities in the Grande Ronde and Imnaha subbasins to help in the conservation and recovery of ESA-listed spring/summer chinook salmon native to the Grande Ronde and Imnaha Rivers, and thus further the implementation of the Lower Snake River Compensation Plan's (**LSRCP**) hatchery fish **production** program.
- Coordinate the operation at the existing Lookingglass Hatchery and related LSRCP hatchery facilities with the Fish and Wildlife Program of the Northwest Power and Conservation Council (NPCC or Council), thereby aiding Bonneville Power Administration's (**BPA**) efforts to mitigate and recover anadromous fish affected by the Federal Columbia River Power System.
- Aid in BPA's fulfillment of mitigation and recovery goals outlined in the Biological Opinion from NOAA Fisheries (formerly known as the National Marine Fisheries Service [**NMFS**]) on operation of the Federal Columbia River Power System (NMFS 2000a).
- Achieve economic efficiencies by integrating management of fish production programs and facilities.
- Be consistent with the requirements of pertinent federal laws, regulations and executive orders, and other relevant plans and programs.
- Support the Nez Perce Tribe's (**NPT**) goal to restore anadromous fish **populations** and enhance the Tribe's opportunities to exercise treaty fishing rights.

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<sup>1</sup> See Chapter 6: Glossary for list of acronyms, abbreviations, and technical terms. These terms are **bold** the first time they appear.

<sup>2</sup> Throughout this Environmental Impact Statement the phrases mitigation and recovery, and conservation and recovery will refer to the legal mandates of the Northwest Power Act (to protect, mitigate and enhance fish affected by the Federal Columbia River Power System) and the ESA (to avoid jeopardy and aid in the conservation and recovery of listed species).

## 1.3 Decisions to be Made and Responsible Officials

BPA serves as the lead federal agency in developing this EIS because it will be evaluating whether to provide the funding to enable the final design, property acquisition (or lease), construction of any new facilities, improvements to any existing facilities, and operations and maintenance of any facilities. The NPT, the Confederated Tribes of the Umatilla Indian Reservation (**CTUIR**), and the Oregon Department of Fish and Wildlife (**ODFW**) are co-managers of the spring/summer chinook conservation and recovery program in Northeast Oregon. Though not federal agencies, they are the primary cooperating agencies for this EIS.

The USFWS, NOAA Fisheries, U.S. Forest Service (**Forest Service**), and other managers of habitat, fisheries and hatcheries in Northeast Oregon have been consulted during the development of this EIS. The Forest Service and the USFWS are cooperating federal agencies. The Forest Service will decide whether to authorize/permit facilities on lands under its jurisdiction along the Imnaha River.

The USFWS and NOAA Fisheries are the federal co-managers responsible for administering the LSRCP program. Their roles include funding LSRCP production, monitoring and evaluation. The federal co-managers must concur with the design of any new LSRCP facilities, approve any modifications to Lookingglass Hatchery and the Imnaha Satellite Facility, and work with other fisheries co-managers to settle any fish production issues that may occur with the addition or modification of any facilities.

## 1.4 Background

### 1.4.1 Regional Perspective

In 1937, Congress and the Franklin D. Roosevelt administration created BPA to market bulk electricity throughout the Pacific Northwest. Today, BPA, an agency within the U.S. Department of Energy, markets about half of the electricity in the region. The electricity comes mainly from 31 federal dams located on the Columbia River and its tributaries. The U.S. Army Corps of Engineers (**USACE**) and the U.S. Bureau of Reclamation operate these federal dams. Collectively, this hydropower generation system is called the Federal Columbia River Power System. The following summarizes key developments in fish and wildlife-related legislation, environmental compliance, and funding that are relevant to the purpose and need for taking action.

- In 1976, Congress authorized the USACE to implement the LSRCP (Public Law 94-587) to mitigate for the effects of construction and operation of four federal dams on the lower Snake River on ocean-migrating fish (also called **anadromous** fish). The LSRCP specifically aims to restore the numbers of returning adult salmon and **steelhead** by raising enough juvenile fish in hatcheries to help offset mortality associated with migrating past those four dams.
- The Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act, 16 U.S.C. § 839 et seq) authorized BPA to protect, mitigate and enhance fish and wildlife affected by the Federal Columbia River Power System. The Northwest Power Act also created the Northwest Power and Conservation Council, which is responsible for establishing the fish and wildlife program under the Act and making recommendations to BPA on which projects to implement.
- Biological Opinions issued in 2000 by NOAA Fisheries and the USFWS require BPA, the USACE and the Bureau of Reclamation to manage the Federal Columbia River Power System to address the effects hydropower generation has had, and continues to have, on species specifically protected by the ESA. Primarily, the affected species include salmon, steelhead, sturgeon and bull trout. In addition

to recommending changes in FCRPS operations, the NOAA Fisheries Biological Opinion included actions to avoid jeopardy to protected species. These actions include habitat management, hatchery development and operation, and harvest levels for commerce, sport and tribal/cultural reasons.

- BPA has issued EISs with Records of Decision covering its Business Plan (1995), Wildlife Mitigation Program (1997), Watershed Management Program (1997), and Fish and Wildlife Program Implementation Plan. Each of these contains direction, standards and guidelines designed to help meet certain aspects of BPA’s fish and wildlife mitigation and recovery responsibilities. These Records of Decision and EISs authorize and guide the Proposed Action, and are incorporated by reference in this EIS.
- BPA continues to invest over 100 million dollars annually throughout the Northwest to benefit protected anadromous fish (such as salmon and steelhead), **resident** fish (such as bull trout and sturgeon), and wildlife affected by the federal hydropower dams. BPA-funded projects include habitat protection and rehabilitation, water and vegetation management, hatcheries, fish screens and ladders, predator control, monitoring and evaluation, and research, among others. BPA helps develop and fund these projects, which are proposed and sponsored by private organizations, landowners, water users groups, water improvement districts, Indian tribes, and certain state and federal agencies. These projects help meet BPA’s responsibilities under the Northwest Power Act and the Federal Columbia River Power System Biological Opinions of 2000 (NMFS 2000a; USFWS 2000).
- BPA reimburses the USACE’s capital costs for constructing the LSRCP hatcheries and related facilities. Until fiscal year 2002, BPA also reimbursed the USFWS’s costs of operating and maintaining those facilities. Now BPA directly funds the LSRCP operation and maintenance through the USFWS at approximately \$17 million annually.

#### 1.4.2 Grande Ronde-Imnaha Spring Chinook Management Perspective

Through the LSRCP in the early 1980s, the USACE funded the design, construction and operation of Lookingglass Hatchery as well as the associated fish trapping and release facilities in Northeast Oregon that served to mitigate for two stocks of Snake River chinook – one in the Grande Ronde River and one in the Imnaha River. The USFWS owns the LSRCP hatchery facilities (including Lookingglass Hatchery and the Imnaha Satellite Facility) and oversees their management and operation through cooperative agreements with the state and tribes. Figure 1-1 shows the existing and proposed hatchery facilities.

In 1988, the NPCC included the proposed Northeast Oregon Hatchery Project (NEOH) in its amended Fish and Wildlife Program to help meet its goal of doubling Columbia River anadromous fish runs. The NEOH project included plans for improving hatchery facilities in the Grande Ronde and Imnaha subbasins. The proposed project’s objective was to provide additional fish production above and beyond the LSRCP goals.

In the 1990s, under the ESA, the federal government listed several Snake River **salmonid** species as threatened or endangered, giving those stocks heightened protection under that law. The ESA listing year and status for those species are as follows:

- 1991 – sockeye salmon – endangered.
- 1992 – chinook salmon fall run – threatened.
- 1992 – chinook salmon spring/summer run – threatened.
- 1997 – steelhead – threatened.
- 1998 – bull trout – threatened.

The ESA listings caused the LSRCP managers to shift the focus of some hatchery fish production programs from mitigation for the effects of dams to a focus on the conservation and recovery of the listed fish. Compensation for dam-related impacts on salmon and steelhead remains the long-term goal of the LSRCP. Fishery co-managers (NPT, CTUIR, ODFW, NOAA Fisheries, and USFWS) have new interim goals however, and are seeking ways to increase abundance of protected fish in their native habitats and boost their populations through hatchery **supplementation** consistent with the already established LSRCP fish production goals. NOAA Fisheries authorized this reprogramming of LSRCP operations through ESA Section 10 Permits 847 and 1011, 1149 for the Lostine River, and 1128 for the Imnaha River. Those permits have recently expired, but NOAA Fisheries has new permit applications pending for both the Imnaha and Grande Ronde hatchery production programs. Since NOAA Fisheries has determined that the hatchery production programs proposed in the permit applications constitute beneficial actions for the threatened species (Ashe et al. 2000), co-managers continue to operate these programs in conformance with the permit applications.

The current hatchery production programs have eight components, and all of these components are required at the Lookingglass Hatchery. Originally, Lookingglass Hatchery was designed and built for production of two stocks of fish. The current program of hatchery production requires Lookingglass Hatchery to accommodate eight program components and five different fish stocks. The increase in program components and fish groups resulted in the need for substantial increases in space, water and equipment beyond what is currently available at the Lookingglass Hatchery. A review of Lookingglass Hatchery found it could not meet program goals even with substantial modifications (Montgomery Watson 1999a). Under the current programs, eggs are transported to Oxbow and Irrigon hatcheries, an action which has reduced fish production by 27% for the Imnaha River and 17% for the Grande Ronde (Grassel 2003). Co-managers and the NPCC recognized that without additional facilities and modifications to existing facilities to provide substantial increases in space, water and modern equipment, mitigation, conservation and recovery goals likely could not be met.

The NEOH Project Spring Chinook Master Plan (Master Plan) was prepared by the Nez Perce Tribe in 2000 to determine the programmatic and physical needs of the hatchery production program. The Master Plan depicts the program's shift in focus to conserve and recover Snake River spring/summer chinook in the Imnaha River and Grande Ronde River and their major tributaries (including the Wallowa River, the Lostine River and Catherine Creek). The Master Plan also explains how the existing hatchery facilities have become over-extended and unable to meet LSRCP mitigation goals or the conservation and recovery objectives for ESA-listed species. Further, it describes how the hatchery production program could be met if existing hatchery facilities were updated, modified, and augmented with certain new facilities.

The Master Plan hatchery program intends to:

- Prevent extinction and provide the means for recovery of protected Snake River anadromous fish, while factors limiting natural production are addressed (such as habitat restoration and improvements, etc.).
- Contribute to maintaining the naturally spawning populations of protected spring/summer chinook in currently-used habitat.
- Help reestablish populations in vacant and under-used habitat.
- Provide fish harvest opportunities when the mitigation, conservation and recovery objectives for the populations would not be jeopardized.

The Master Plan is incorporated by reference in its entirety in this EIS.

In October 2000, the NPCC accepted the Master Plan in its Fish and Wildlife Program and recommended that BPA authorize funds to proceed with implementation. BPA, pursuant to its responsibilities under the Northwest Power Act and the NOAA Fisheries 2000 Biological Opinion on the Federal Columbia River Power System, met with Northeast Oregon fishery co-managers to study the feasibility and to develop a proposed action based on the Master Plan.

The Grande Ronde - Imnaha Spring Chinook Hatchery Project (Proposed Action), the subject of this EIS, was developed from the Master Plan and proposes actions to modify and modernize existing hatchery facilities and to build auxiliary hatchery facilities in Northeast Oregon to mitigate and aid in the mitigation, conservation and recovery of threatened Snake River spring/summer chinook native to the Grande Ronde and Imnaha river basins.

## 1.5 Public Scoping and Key Issues

Public involvement is a required element of environmental analyses undertaken by the federal government pursuant to the National Environmental Policy Act (NEPA). **Scoping** refers to a process where interested and affected parties are invited to identify environmental issues or concerns they think should be considered in the analysis of a proposed action. On November 23, 2001 BPA published a Notice of Intent to prepare an EIS and a Notice of Floodplain and Wetland Involvement in the Federal Register. Those notices introduced the Proposed Action and provided contact information. The Notice of Intent announced when and where open public scoping meetings would be held for the Proposed Action.

Open scoping meetings were held in Imnaha, Oregon (January 15, 2002); Lostine, Oregon (January 16, 2002); and La Grande, Oregon (January 17, 2002). Several follow-up meetings with particular groups were also conducted upon special request. Interested and affected parties included local residents, local business owners, regional special interest groups involved with fish conservation, and government agencies with regulatory responsibilities related to the environment. The following environmental issues were raised.

### **Biological Environment:**

- Effects to ESA-protected fish species, and other aquatic species, due to facility construction, modification, or operation.
- Effects to wildlife, particularly ESA-protected species and big game (elk and deer), where cover or breeding habitat, migration routes, or traditional access to water may be affected by new facilities (Lostine River Hatchery and Imnaha Final Rearing Facility/Marks Ranch sites).
- Effects to plants, particularly ESA-protected species and riparian plant communities, due to ground disturbance, spread of weeds, landscaping, or changes to ground water or surface water availability.

### **Physical Environment:**

- Changes by season to instream water quantity and ground water table at each site due to use of new diversions of river water and wells to serve the hatchery facilities.
- Changes to water quality downstream from each site due to construction and operation of new facilities.

### Social and Economic Environment:

- Effects of the Proposed Action on the Imnaha and Lostine Wild and Scenic River status and on the Hells Canyon National Recreation Area (**HCNRA**) and, in particular, whether new facilities may unreasonably diminish remarkable values of these specially designated areas.
- Aesthetics and noise associated with proposed non-residential facilities in the Lostine/Granger Road neighborhood and at the Imnaha sites.
- Effects of construction and operation of the new facilities on health, safety and security of nearby residents and road-users.
- Costs versus benefits of the facilities overall and in the context of other means to mitigate and recover spring/summer chinook populations in Northeast Oregon and throughout their range

## 1.6 Issues Beyond the Scope of this EIS

This EIS considers alternatives for facilities to better implement existing pre-approved programs of hatchery fish production. This EIS will not consider or evaluate changes to pre-established programmatic goals, costs versus benefits of the proposed facilities compared to other mitigation and recovery actions, direction, production levels, monitoring and evaluation requirements, genetics, ecological interactions, or operational means of achieving programmatic goals. That is, consideration of issues concerning programmatic elements is outside the scope of this EIS. While this EIS addresses **cumulative effects** as required by NEPA regulations, issues associated with spring/summer chinook recovery programs, hatcheries in general, and funding priorities of different recovery methods are more appropriately addressed in other processes either 1) during reconsideration of programmatic plans such as those tied to the LSRCP, the Northwest Power and Conservation Council’s Fish and Wildlife Program, and similar broad-scale efforts, or 2) when a government agency proposes to adopt a policy or plan addressing those broader, general issues. The timing of these efforts will be covered in BPA’s Fish and Wildlife Implementation Plan.

For more detailed information on hatchery programmatic, production and genetic issues, see the Master Plan and/or the Hatchery and Genetic Management Plans (**HGMP**) for the Grande Ronde Basin Spring/Summer Chinook Program (ODFW 2002) and the Lower Snake River Compensation Plan Imnaha Spring/Summer Chinook Program. These documents are incorporated by reference into this EIS and are available upon request from BPA.

## 1.7 Relationship to Other Fish Projects and Programs in the Vicinity

Table 1-1 (adapted from the Master Plan) identifies other fish-related projects and programs in the project vicinity, and their relationship to the proposed project. Many of these other projects and programs are managed by various entities that are also partners on this project. Table 1-2 (also adapted from the Master Plan), and the Master Plan document, should be consulted for more information on programmatic and operational aspects of spring/summer chinook management in Northeast Oregon. The Master Plan is currently available on request to BPA, or at <http://www.efw.bpa.gov/cgi-bin/PSA/NEPA/Summaries/Granderonde> - then select the link to the Master Plan.

**Table 1-1. Other Projects and Programs in the Vicinity**

<b>Program/Plan and (Number)</b>	<b>Manager</b>	<b>Type</b>	<b>Relationship to Proposed Project</b>
LSRCP (Lower Snake River Compensation Plan)	ODFW  NPT  USFWS	O&M and M&E of LSRCP program at Lookingglass Hatchery; Co-operation of the Imnaha Satellite Facility and M&E of the LSRCP program	The LSRCP program funds operation and maintenance of Lookingglass Hatchery and the Imnaha River Satellite Facility. The USFWS administers and manages program funding. Fish production at Lookingglass Hatchery refocuses on conservation and recovery of fish while the original long-term goal remains to compensate for Snake River dam-related losses. The facilities proposed would alleviate the burden at Lookingglass Hatchery and make full production of the conservation programs possible. Monitoring and evaluation of the LSRCP for the Imnaha and Grande Ronde is also funded through the LSRCP.
Grande Ronde Basin Captive <b>Broodstock</b> (BPA 199801001)	ODFW	Captive Broodstock O&M and M&E at Lookingglass and Bonneville Hatcheries	BPA project 199801001 funds rearing of captive brood adults in freshwater for the Grande Ronde program. The proposed facilities would provide the additional incubation and rearing space (with sufficient segregation capability for monitoring and evaluation and fish health requirements) needed to rear progeny of the captive broodstock.
Captive Broodstock Artificial Propagation (BPA 199801006)	NPT	M&E of Captive Broodstock	BPA project 9801006 funds monitoring and evaluation activities of captive broodstock production at Bonneville Hatchery. The proposed facilities will provide incubation and rearing space needed to rear progeny of the captive broodstock.
Grande Ronde Supplementation - Lostine River (BPA 199800702)	NPT	O&M/M&E satellite facilities	BPA project 199800702 funds operation and maintenance and monitoring and evaluation of satellite facilities on the Lostine River for adult collection and juvenile <b>acclimation</b> and release of captive and conventionally produced spring chinook salmon. These facilities will act as satellites to the proposed facilities.
Grande Ronde Supplementation - Upper Grande Ronde and Catherine Creek (BPA 199800703)	CTUIR	O&M/M&E satellite facilities	BPA project 199800703 funds operation and maintenance and monitoring and evaluation of satellite facilities on the Upper Grande Ronde River and Catherine Creek for adult collection and juvenile acclimation and release of captive and conventionally produced spring chinook salmon. The proposed facilities will alleviate the burden at Lookingglass Hatchery allowing full production of these stocks.
Preserve Listed Salmonid Stock Gametes (BPA 199803800)	NPT	Cryopreservation of ESA-listed male chinook gametes	BPA project 199803800 funds the collection, cryopreservation, and storage of male chinook semen collected from Imnaha and Grande Ronde fish both on the spawning grounds and in the hatchery. Project 199803800 would continue to provide these activities for the program at the proposed facilities.
NEOH Master Plan (BPA 198805301)	NPT	Planning Capital Construction	BPA project 198805301 funds planning and activities associated with development of new hatchery facilities in the Imnaha and Grande Ronde subbasins of Northeast Oregon. Development of the master plan document occurred through this project. Project 198805301 also funds the environmental assessment and design of the proposed facilities, as well as capital construction costs.



<b>Program/Plan and (Number)</b>	<b>Manager</b>	<b>Type</b>	<b>Relationship to Proposed Project</b>
Northeast Oregon Hatcheries Planning and Implementation (BPA 198805305)	ODFW	Planning O&M/M&E Lookingglass Hatchery	BPA project 198805305 funds ODFW participation in the master planning process. Project 198805305 also funds operation of Lookingglass Hatchery for captive and conventional chinook salmon produced in the Grande Ronde program. The proposed facilities will alleviate the burden at Lookingglass Hatchery and make it possible for production goals to be met.
Manchester Captive Broodstock (BPA 199606700)	NMFS	Captive broodstock O&M at Manchester facility	BPA project 199606700 funds rearing of captive brood adults in saltwater for the Grande Ronde program. The proposed facilities will provide the additional incubation and rearing space (with sufficient segregation capability for monitoring and evaluation and fish health requirements) needed to rear progeny of the captive broodstock.
Fish Passage Center's Smolt Monitoring Project (BPA 199403300)	Fish Passage Center	Monitoring of juvenile salmon migration	Juvenile and natural salmon produced at the proposed facilities will provide information on in-river migration timing and survival (see Master Plan).
Early Life History of Spring Chinook (BPA 199202604)	ODFW	M&E of juvenile outmigration in the Grande Ronde	BPA project 199202604 is funded to establish baseline life history information on Grande Ronde River spring chinook salmon. Juvenile trapping data from project 199202604 would be used to evaluate the success of the conservation program and production from the proposed facilities.
Imnaha River Smolt Monitoring Project (BPA 198712703)	NPT	M&E of juvenile outmigration in the Imnaha	BPA project 198712703 is funded to monitor emigration survival, timing, and life history characteristics, and will intensively monitor emigration of hatchery and natural spring chinook salmon from the Imnaha River system. Project 198712703 would also be used to evaluate the success of the conservation program and production from the proposed facilities.
Genetic Monitoring and Evaluation of Snake River Salmon and Steelhead (BPA 198909600)	NMFS	Genetic M&E	BPA project 198909600 funds the collection, analysis and establishes a database of genetic data from salmon and steelhead stocks in the Snake River. Juvenile hatchery and natural salmon produced as a result of the proposed facilities would provide information for this database.
Grande Ronde Model Watershed (BPA 199402700)	Grande Ronde Model Watershed	Habitat	BPA project 199402700 is responsible for coordinating water quality monitoring and habitat enhancement projects in the Grande Ronde and Imnaha subbasins. These efforts are expected to assist recovery actions described in the master plan. In addition, juveniles produced by proposed facilities will provide information on habitat use in treatment areas.
Grande Ronde Habitat Enhancement (BPA 199608300)	CTUIR	Habitat	BPA project 199608300 is funded to improve habitat in the Grande Ronde subbasin. These efforts are focused in the upper Grande Ronde watersheds of Union County. Improvement in habitat will increase likelihood of program success.
Wallowa Basin Project Planning (BPA 9403900) and Wallowa/Nez Perce Salmon Habitat (BPA 199702500)	NPT	Habitat	BPA projects 199403900 and 199702500 are funded to improve habitat in the Imnaha and Grande Ronde subbasins. These efforts are focused in Wallowa County. Improvement in habitat will increase likelihood of program success.
Grande Ronde Habitat Enhancement (BPA 198402500)	ODFW	Habitat	BPA project 198402500 is funded to improve habitat in the Grande Ronde subbasin. These efforts are focused in Union County. Improvement in habitat will increase likelihood of program success.

Source (adapted from): Ashe et al. 2000.

**Table 1-2. Relationship to Relevant Laws, Plans, Treaties and other Guidance**

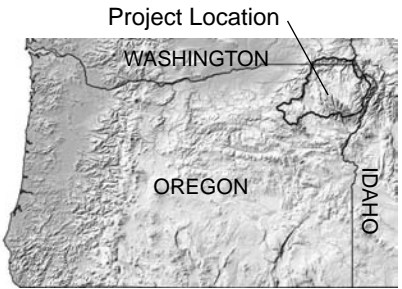
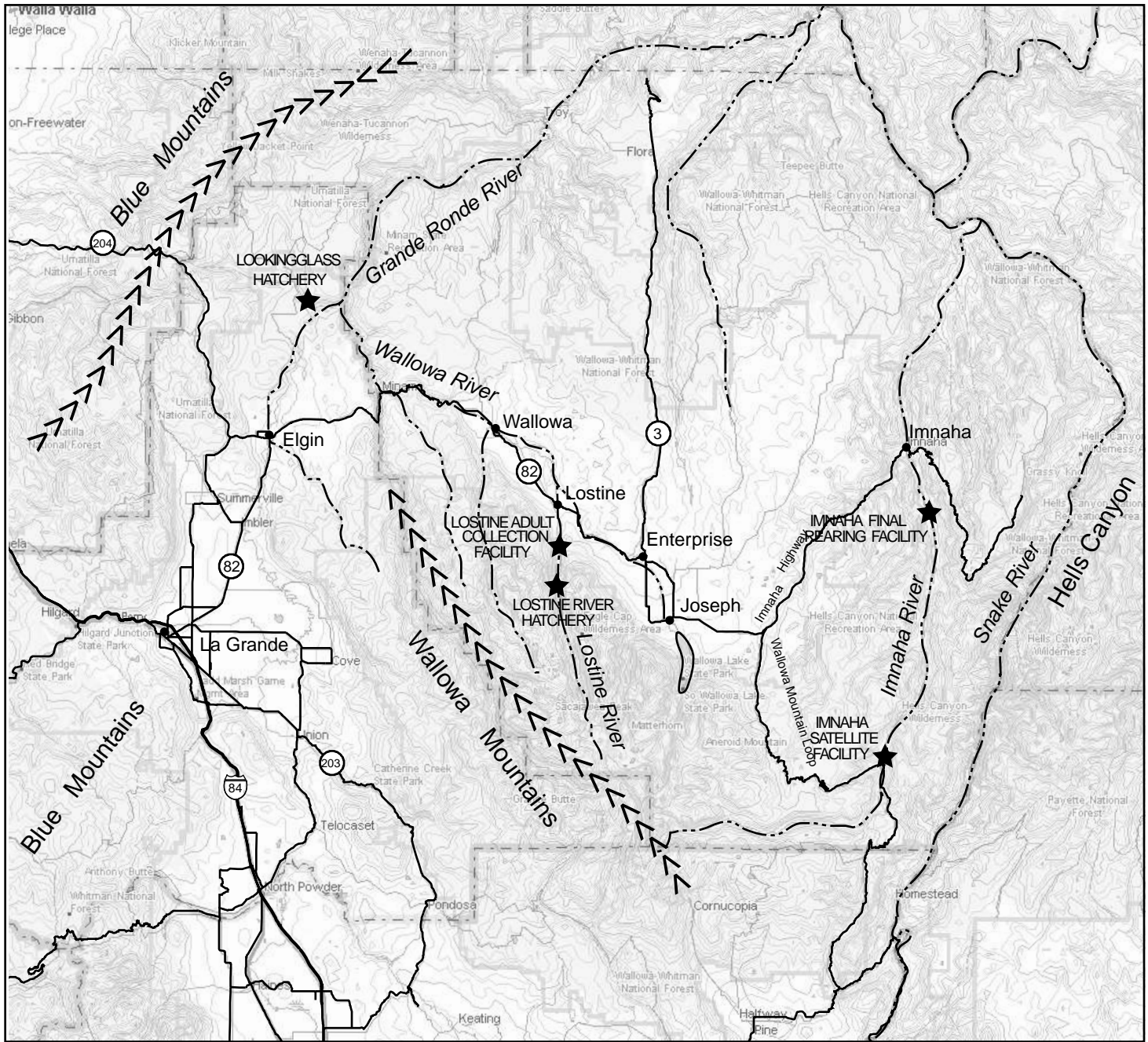
<b>Topic</b>	<b>Relevant Aspects</b>	<b>Relationship to Proposed Project</b>
Treaty of 1855	The NPT reserved “The exclusive right of taking fish in all the streams where running through or bordering said reservation ..and.. taking fish at all usual and accustomed places ...” in the Treaty of 1855.	Restoration of salmon runs resulting from fish production in the proposed facilities would assist in meeting obligations to the NPT made by the United States.
ESA (Endangered Species Act) of 1973	Snake River spring/summer and fall chinook were listed as threatened in May 1992. On August 18, 1994, they were reclassified as endangered species (Federal Register, August 1994). When the emergency rule expired in 1995, the listed status reverted to threatened. Steelhead in the Imnaha and Grande Ronde Rivers were listed as threatened under the ESA in 1996 (Federal Register, August 9, 1996). Bull trout in the Imnaha and Grande Ronde Rivers were listed as threatened under the ESA on June 10, 1998 (Federal Register volume 63 No. 111:31647-31674). <b>Taking</b> of Imnaha and Lostine (Grande Ronde) River chinook, steelhead and bull trout is regulated by the Section 7 (federal) and Section 10 (non-federal) process of the ESA (P.L. 93-205).	<p>Activities associated with the Imnaha conservation program have been authorized by ESA Section 10 Permit 847 and 1134. A description of the program is in the Section 10 Permit application, which was submitted to NMFS January 23, 1998.</p> <p>Activities associated with the Grande Ronde Endemic Spring Chinook Supplementation Program (<b>GRES</b>P) have been authorized by ESA Section 10 Permits 973, 1011, 1134 and Modification 1 to Permit 1011. Permit applications describing the Grande Ronde program were submitted by ODFW March 31, 1998 (ODFW 1998a) and the Bureau of Indian Affairs (<b>BIA</b>) April 13, 1998 (BIA 1998).</p> <p>Section 7 consultations regarding impacts to bull trout and steelhead from these programs have also been completed (NMFS 1998; NMFS 1999; USFWS 1998).</p>
Snake River Proposed Recovery Plan (NMFS 1995)	This plan was developed by NMFS in 1995 in response to the 1992 listing of Snake River spring, summer and fall chinook salmon.	Fish production in the proposed facilities is consistent with recommendations in the Proposed Recovery Plan.
Lower Snake River Fish and Wildlife Compensation Plan (USACE 1975)	Federal authorized program to mitigate for losses caused by four lower Snake River dams. Mitigation goals for spring chinook salmon are 3,210 adults to the Imnaha River and 5,820 adults to the Grande Ronde River.	Fish production in the proposed facilities would be authorized under the LSRCF program. Proposed facilities could eventually be used to achieve program goals.
<i>U.S. v. Oregon</i>	Treaty fishing rights litigation involving Columbia Basin salmon and steelhead harvest and enhancement goals.	Proposed facilities would assist the parties in meeting obligations and agreements under the lawsuit.

Topic	Relevant Aspects	Relationship to Proposed Project
NMFS Hatchery Genetic Management Plan (NMFS 2000b)	A template developed by NMFS for anadromous salmonid hatchery programs in Washington, Oregon and Idaho. The template will be used to assess artificial production impacts on listed anadromous fish and provide a source of comprehensive information for regional production and management planning.	Information required in the HGMP template is incorporated into the Master Plan. Completion of an HGMP will be used under the 4(d) rule to allow direct take of an ESA-listed species for hatchery production.
Scientific Review Team Review of Artificial Production (Brannon et al. 1999)	Independent scientific review of the Columbia Basin artificial production program, analysis of effectiveness in meeting mitigation responsibilities and enhancing salmonid production, and evaluation of supplementation of natural runs. Describes guidelines that provide the biological basis for NPPC policy on artificial production.	Proposed facilities are consistent with guidelines and recommendations developed by the SRT for artificial production facilities.
Artificial Production Review (NPPC 1999)	NPPC report to Congress on the use of artificial production in the Columbia Basin that includes recommendations for policy reform and strategies for implementing new policies.	The proposed facilities are consistent with APR recommendations and policies. See Master Plan.
Wy-kan-ush-mi wa-kish-wit: <i>Spirit of the Salmon</i> Tribal Recovery Plan (NPT et al. 1995).	Plan developed by the four Columbia River Treaty Tribes to restore fish runs using gravel-to-gravel management.	The Tribal Recovery Plan recommends production in the proposed facilities.
Wallowa County-NPT Salmon Recovery Plan (Wallowa County and NPT 1993, revised 1999)	A cooperative plan between Wallowa County and the NPT to improve watershed and habitat conditions in Wallowa County.	Habitat improvements accomplished through this plan are intended to improve productivity and survival of naturally produced salmon and fish reared in proposed facilities.
Imnaha River Subbasin Plan (NPT et al. 1990)	Plan developed by co-managers to address the NPPC goal of doubling salmon and steelhead runs. Adult return goals for spring chinook were 5,770; 3,820 for natural spawning, 1,240 for hatchery production, and 700 for harvest.	Proposed facilities could eventually be used to achieve plan goals.
Grande Ronde River Subbasin Plan (ODFW et al. 1990)	Plan developed by co-managers to address the NPPC goal of doubling salmon and steelhead runs. Spring chinook salmon adult return goals were 16,400; 10,140 for natural spawning, 2,260 for hatchery production, and 4,000 for harvest.	Proposed facilities could eventually be used to achieve plan goals.
Wild and Scenic Rivers Act	The Imnaha and portions of the Lostine and Grande Ronde Rivers are protected under the Wild and Scenic Rivers Act that requires a river to be free flowing and to possess one or more “outstandingly remarkable values.”	Populations and habitat of threatened and endangered fishes are considered an outstandingly remarkable value. Fish production in proposed facilities is consistent with protection and enhancement of these resources.

Topic	Relevant Aspects	Relationship to Proposed Project
Pacific Salmon Treaty	A treaty between the U.S. and Canada governing the joint management of Pacific salmon including harvest, rehabilitation, and enhancement.	Fish production from the proposed facilities could be harvested in marine waters.
Magnuson-Stevens Fisheries Conservation and Management Act	Congressional act that ensured that state fishing regulations off the coasts of Oregon, Washington and California conformed to the federal Fisheries Management Council regulations, which are constrained by the Pacific Salmon Treaty, ESA, and orders of federal courts, such as <i>U.S. v. OR</i> , <i>U.S. v. WA</i> and treaty Indian fishing rights. The Act also protects the ocean and fresh water habitat of commercial fisheries regulated by the act, the chinook and coho fisheries	The Act affects the potential harvest of chinook produced from the proposed facilities as bycatch in the ocean harvest. The facilities would be designed and located to not adversely affect essential fish habitat for chinook and coho.
Oregon <b>Wild Fish</b> Management Policy of 1987	Developed by ODFW in response to the creation of Oregon’s ESA in 1987, the primary focus of the WFMP is to preserve the genetic resources of managed fish populations. This policy is currently undergoing revisions and will most likely be called the Native Fish Conservation Policy.	Management of fish production from proposed facilities employs an adult sliding scale developed by NPT, CTUIR, and ODFW as a genetic risk containment tool.
Oregon Legislature House Bill 3609	Passed in 1999, HB 3609 directs the ODFW to work with the Columbia Basin Treaty Tribes to develop natural production plans for the Imnaha and Grande Ronde River subbasins.	Proposed facilities would allow implementation of plans directed by HB 3609.
Return to the River (Independent Scientific Group 1996)	Report to the NPPC in 1994 by the Independent Scientific Group to provide a conceptual and scientific foundation for public policy for decision making bodies.	This report does not recommend policies for recovery and restoration, nor does it recommend specific measures or strategies or deal with institutional structures.
Upstream Report (National Research Council 1996)	Developed by the National Research Council in 1995 to identify factors that have led to decline and extinction of salmon stocks and recommend strategies for prevention of further decline. The report emphasizes the need to protect <b>genetic diversity</b> of salmon and restore spawning and rearing habitat.	The short-term goal of fish production from the proposed facilities is protecting genetic diversity by preventing extinction. For more information on genetic risk containment see the Master Plan, Chapter 4. For more information on habitat improvements and protection see the Master Plan, Chapter 6.

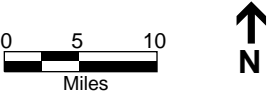
Topic	Relevant Aspects	Relationship to Proposed Project
Pacific Northwest Power Planning and Conservation Act of 1980	This Act established the Northwest Power and Conservation Council for the purpose of mitigating for the development and operation of hydroelectric projects within the basin. The Council developed and administers the Columbia River Basin Fish and Wildlife Program to protect, mitigate, and enhance fish and wildlife in the Columbia River basin.	Proposed facilities would be funded by BPA under the Fish and Wildlife Program.
Other Supplementation projects including Nez Perce Tribal Hatchery; Johnson Creek Artificial Propagation Enhancement, Yakama Fisheries Project Supplementation Program	Supplementation programs funded by BPA under the Fish and Wildlife Program.	Proposed facilities are consistent with approach taken elsewhere in the basin to use supplementation to enhance and restore declining salmon runs. Evaluation and research will be coordinated.
USACE’s Lower Snake River Feasibility Study	The Corps has prepared an EIS on options for improving juvenile salmon migration in the lower Snake River. Breaching the four lower Snake dams was one of the options studied. The EIS provides information for decision-makers who must ultimately decide on what measures are needed to recover Snake River salmon and steelhead runs. The Corps issued a decision not to breach the dams in 2002.	Fish production from the proposed facilities is intended to prevent extinction of these at-risk populations until a decision is made and limiting factors can be corrected. These facilities can also be used to restore runs once the smolt-to-adult survival rate is improved.
Interior Columbia Basin Ecosystem Management Program (ICBEMP)	ICBEMP was a massive federal land-use plan that covers 64 million acres in Oregon, Idaho, Washington, and Montana. Although not implemented, its goal was to restore this area to a condition that will better support fish and wildlife.	Fish production from the proposed facilities is intended to prevent extinction of these at-risk populations until limiting factors can be corrected. These facilities can also be used to recover runs once the smolt-to-adult survival rate is improved.
Federal Caucus Basinwide Salmon Recovery Strategy (Federal Caucus, December 1999; and December 2000)	Nine federal agencies formed a <i>Federal Caucus</i> to examine opportunities the region has in habitat, harvest, hatcheries and hydropower for recovering listed salmon, steelhead and resident fish. The All-H Paper is a conceptual recovery plan to guide future federal actions.	Fish production from the proposed facilities is intended to prevent extinction of these at-risk populations until a decision is made and limiting factors can be corrected. These facilities can also be used to recover runs once the smolt-to-adult survival rate is improved.
Biological Opinion of NOAA Fisheries, 2000.	The Biological Opinion requires BPA, the USACE and the Bureau of Reclamation to manage the Federal Columbia River Power System to address the effects hydro power has had, and continues to have, on species specifically protected by the ESA. Primarily, the affected species include salmon and steelhead.	Fish production from the proposed facilities is intended to prevent extinction of at-risk chinook populations until limiting factors can be corrected. These facilities can also be used to recover runs once the smolt-to-adult survival rate is improved.

Source (adapted from): Ashe et al. 2000.



**LEGEND**

- ★ Project Sites
- Rivers
- >>> Mountain Range
- Cities
- Roadways



SOURCE: DeLorme and Environmental Vision, 2002

BPA Northeast Oregon Hatchery Program ■

**Figure 1-1**  
Existing and Proposed Hatchery Facilities

## Chapter 2: Proposed Action and Other Alternatives

This chapter describes the Proposed Action (Section 2.1) and also describes an alternative of taking no action (Section 2.2, No Action Alternative). Several other alternatives were considered but eliminated from detailed study (Section 2.3) because they are infeasible or fail to meet the purposes and need for the action described in Chapter 1. The alternatives are compared in Section 2.4.

### 2.1 Proposed Action

The Proposed Action is to modify and modernize two existing hatchery facilities and construct three auxiliary hatchery facilities to aid native spring/summer chinook conservation and recovery in Northeast Oregon (see map, Figure 2-1).

The five sites and facilities involved are:

- Lookingglass Hatchery – modifications are proposed to better accommodate the Catherine Creek and Upper Grande Ronde (includes Lookingglass Creek) components of the hatchery fish production program and transfer other stock responsibilities to facilities on **natal** streams. Lookingglass Hatchery was designed and built for production of two stocks of fish. The current program of hatchery production requires that Lookingglass Hatchery accommodate eight program components and five different fish stocks with lower density rearing objectives.
- Lostine Adult Collection Facility – a new facility is proposed for collecting adult spring/summer chinook during higher flows for spawning at the Lostine River Hatchery. Currently, fisheries managers use a portable **picket weir** on the Lostine River near its confluence with the Wallowa River to collect adult spring/summer chinook for hatchery spawning. That existing weir cannot be operated during the higher spring flows typical during chinook migration.
- Lostine River Hatchery – a new facility is proposed to accommodate the Lostine component of the hatchery production program by incubating and rearing chinook near their natal waters. The new facility would also accommodate incubation and early to final stages of rearing of Imnaha stock.
- Imnaha Final Rearing Facility – a new facility is proposed to provide final (fall to early spring) rearing for year-old chinook in their natal waters prior to final acclimation and release at the Imnaha Satellite Facility.
- Imnaha Satellite Facility – modifications are proposed to the existing adult collection and acclimation facility to allow collection of broodstock over a greater range of spring flows and holding, spawning, and incubation prior to transport.

As recommended in the Master Plan, facilities would be designed and constructed to meet the low density rearing criteria of Natural Rearing and Enhancement System (**NATURES**) to the extent feasible (Ashe et al. 2000). Instream structures would meet applicable NOAA Fisheries and USFWS design requirements. Construction would be staged to accommodate existing project operations and reduce impacts on fish production at each facility.

Instream work would be performed in compliance with applicable regulations and permits. Any instream work would occur behind temporary **cofferdams** or other water diversions appropriately placed to route water around work areas. Portable pumps would be used to help keep work areas dry. Pump discharge would be routed through settling basins prior to discharge back into any rivers. Instream work would only occur during

ODFW's **instream work window**, normally July 1 to July 31 for the Lostine River and July 15 to August 15 for the Imnaha River, or as otherwise specified by the regulatory agency(s).

Facility design and construction would incorporate best management practices such as erosion control, waste management, dust control, weed management, fire prevention, and work hour and noise considerations; would comply with the federal Clean Water Act's (CWA) National Pollutant Discharge Elimination System (NPDES) requirements; and would incorporate sensitive site design measures such as retaining riparian vegetation, landscaping with native plants, erecting buildings reflective of local character, and shielding facility lighting. The project would incorporate other environmental requirements or mitigation measures determined to be mandatory during consultation for applicable permits. See Table 4-1 for environmental permits and approvals required at each site.

The following sections summarize the facilities proposed at each site and their functions. More details on specific facility elements are in the Montgomery Watson Harza Preliminary Design documents and Technical Memoranda, which are incorporated by reference into this EIS and available on request from BPA.

## 2.1.1 Grande Ronde Facilities

### 2.1.1.1 Lookingglass Hatchery

The proposed modifications are within the existing 11-acre hatchery compound, which is operated and maintained year round. Most of the modifications involve additions to existing facilities or internal changes to existing structures (shown in bold on Figure 2-2). See Figure 3.9-1 for site photos. Modifications to Lookingglass Hatchery would involve:

- Building a six-bay garage to securely store vehicles and other equipment out of the weather (A).
- Adding incubation trays to improve fish health, segregation, monitoring and evaluation requirements of the hatchery fish production program (B).
- Increasing the size of the rearing troughs to reduce rearing densities (B).
- Modifying **raceways** (e.g. installing bird netting) to reduce **predation** on hatchery fish (C).
- Adding three new raceways to meet NATURES rearing densities (C).
- Insulating the fish production building, removing holding tanks, replacing a gravel floor with concrete and installing roll-up doors to increase storage space for hatchery supplies and vehicles (D).
- Upgrading the electrical power supply to meet building code requirements and to provide adequate, reliable power to operate the facility year round, thus reducing operational risks associated with power outages (E).

**Water Requirements at Lookingglass Hatchery** — No additional water withdrawals are proposed beyond those already authorized.

**Construction Activities Proposed at Lookingglass Hatchery** — Minor excavation work would be necessary to place the three new raceways below grade. Excavated soil and rock would be deposited



in previously disturbed areas near the existing residences. Less than one-half acre of land would be disturbed during construction, and no in-stream work would be necessary.

### 2.1.1.2 Lostine Adult Collection Facility

Currently, fisheries managers use a portable picket weir site on the Lostine River near its confluence with the Wallowa River to collect adult spring/summer chinook for hatchery spawning. The portable weir cannot be safely or effectively operated during higher river flows (greater than 800 cubic feet per second [**cfs**]) typical during early spring to July when many adult chinook are migrating upstream, which restricts the number and genetic diversity of adults that can be collected to meet hatchery production goals.

A new adult spring/summer chinook collection facility is proposed approximately one mile upstream (south) of the town of Lostine (private land purchase or easement). This site is located downstream of current spring/summer chinook spawning areas, and the new facility (Figures 2-3 and 3.9-2) would be designed to safely and effectively allow capture of migrating adult chinook during typical higher flows (800 to 1200 cfs). The existing portable weir may continue to be used during periods of lower flows.

The new adult collection facility would be located on the west bank, across from an existing fish screen/fish ladder/irrigation diversion complex. The new facility would involve:

- Decommissioning the existing, deteriorating concrete fish ladder. The highest sill would be entirely removed; the other sills would be partially removed to the extent needed, and allowed to fill with stream gravels.
- Constructing a new concrete fish ladder and installing a modern fish-friendly weir structure (termed a **hydraulic velocity barrier**) for adult fish passage and chinook collection. The new structure would meet NOAA Fisheries criteria and greatly improve fish trapping and passage over a range of river flow conditions.
- Protecting the river's west bank from damage during high flow conditions by constructing a soil and rock levee, about three to five feet high, extending about 300 feet upstream of the exit of the fish ladder. Existing vegetation would be removed for levee construction.
- Protecting/stabilizing the river channel by placing riprap or a concrete retaining wall along both banks about 100 feet upstream of the new facility.
- Clearing, grading, and graveling an area to provide access for loading and transporting fish.
- Replacing the log bridge with a steel panel bridge and placing the bridge abutments outside the **ordinary high water** level.
- Bringing new electrical service across the bridge and installing a transformer to provide power during collection operations for the hoist and, possibly, lights.
- Constructing a temporary construction access road from the Lostine River Road to the Lostine River, just upstream of the existing irrigation diversion.

**Water Requirements at Lostine Adult Collection Facility** — This facility would not require water withdrawals from the Lostine River or from groundwater wells.

**Construction Activities Proposed at Lostine Adult Collection Facility** — Instream work would be involved with most activities, although most would be contained within about ¼ acre-sized area. About two acres would be cleared and graded adjacent to (above) the west bank for construction staging and permanent access to the facility. Temporarily disturbed construction areas would be revegetated with native species early the following growing season for the best plant growth and survival.

### 2.1.1.3 Lostine River Hatchery

Currently, Lostine River spring/summer chinook adults are spawned at Lookingglass Hatchery. Incubation occurs at two hatcheries on the Columbia River: Oxbow Hatchery (near Cascade Locks, Oregon, about 250 miles west of Lookingglass) and Irrigon Hatchery (downstream of McNary Dam, about 100 miles away). Fish are reared at Irrigon and Lookingglass hatcheries. Smolts are then trucked to a temporary facility on the Lostine River for acclimation for a couple weeks prior to release. The temporary facility consists of two aboveground troughs, a portable pump and piping. This temporary facility does not provide sufficient rearing capacity, or acceptable low-density rearing conditions.

The proposed Lostine River Hatchery would be a full-scale, multi-function facility, with permanent staff and on-site housing, designed to hold Lostine River chinook during spawning and incubation through final rearing and release into the wild. Along with the proposed adult collection facility downstream, this hatchery would have all the elements needed to successfully support the Lostine River spring/summer chinook component of the hatchery fish production program (Figures 2-4 and 3.9-3, photos 9 and 10).

The Lostine River Hatchery would also hold the entire Imnaha River spring/summer chinook program from incubation to final rearing. The first couple of years would serve as a trial period, with only one-half of the Imnaha fish reared at the Lostine River Hatchery. The remainder would be reared at Lookingglass Hatchery. Adult holding facilities would be designed to hold only the Lostine River broodstock.

The proposed Lostine River Hatchery would be located on a six-acre site (private land easement and/or purchase) about five miles upstream (south) of the proposed Lostine Adult Collection Facility and would involve:

- Installing a water supply intake (Figures 2-5 and 3.9-3, photos 11 and 12) about one-half mile upstream of the proposed hatchery, just above where the Lostine River Road (County Road 551) crosses the Lostine River. The intake would include a fish screen and trash rack meeting current NOAA Fisheries criteria for such structures, and would require: installing an **Obermeyer gate** to raise the surface water elevation to provide sufficient flow to the intake; and constructing a pool and weir fish ladder to provide upstream and downstream fish passage at the intake.
- Building a gravel access road and parking area for permanent access and temporary construction staging.
- Burying a 24-inch pipeline from the intake to the hatchery site along the Lostine River Road and Granger Road, the existing access to the hatchery site.
- Installing 12-inch pipelines from three existing groundwater supply wells to provide required **pathogen-free** water for egg incubation and **smolt** rearing. Small buildings would be placed at each well site to protect the wellhead, pumps, and other equipment. These wells would also provide drinking water to staff residences.

- Building a spawning room, including holding ponds and isolation tanks.
- Constructing a building for egg incubation and early rearing of both Lostine and Imnaha smolts and a laboratory, each complete with necessary apparatus (utilities, supplies, chillers, heaters, drains, vents etc).
- Constructing eight smolt final rearing raceways for holding Lostine and Imnaha stocks.
- Installing a water overflow system from the raceways. Flow would be directed to the hatchery outfall pipeline, **volitional** release pipeline, hatchery drain, or effluent return pump station.
- Installing a pump station and 18-inch pipeline to return hatchery water back upstream to the fish ladder at the intake. This water, primarily river water with some ground water, would restore flows in the Lostine River and help attract fish to the ladder for moving upstream and downstream.
- Constructing an operations building with office space, bunkhouse for temporary and seasonal personnel, shop, electrical room, generator room, garage and outdoor parking space for three vehicles.
- Constructing a small single family residence and remodeling an existing single family residence for permanent hatchery personnel.
- Building a basin for settling waste from water released when smolt raceways are cleaned. A sump pump would be installed in the cleaning basin to drain it so that the waste could be periodically removed and trucked to an appropriate off-site disposal facility.
- Constructing a concrete outfall downstream of the hatchery. Water from the hatchery's final rearing raceways and cleaning basin would be conveyed via a 24-inch pipe and released into the river through the partially submerged outfall. Smolts would also be released via the pipe and outfall. The outfall's small valve opening and removable bar grate would prevent adult fish from entering the pipe.
- Installing a new septic system to serve the residences, operations building and the incubation and early rearing facilities.
- Upgrading to a 3-phase electrical power supply to the hatchery, conveyed along about three miles of PacifiCorp's existing easement. A transformer would be installed at the site's main operations building. A generator would provide emergency backup power.
- Paving Granger Road from the Lostine River Road to the hatchery when hatchery construction is completed.
- Removing the existing temporary acclimation facility when the new facility is operational.

**Water Requirements at Lostine River Hatchery** — Lostine River flows vary widely, with average flows ranging from 50 cfs in the winter to 800 cfs in June during the snowmelt. With average river conditions, no more than about 25 percent of the flow would be needed to support the proposed hatchery. A maximum of about 15.3 cfs would be needed in mid-September to meet NATURES preferred criteria for all fish at the hatchery. Three new groundwater wells would provide up to 1,200 gallons per minute (**gpm**) to the facility.

**Construction Activities Proposed at Lostine River Hatchery** — The Lostine River Hatchery would require clearing about five acres of undeveloped upland currently used as horse pasture and adjacent woodlands. Trees would be protected unless they pose a safety hazard or lie along the outfall pipeline corridor. Trees that would be removed may be used as in-stream structures for fish habitat enhancement in the watershed. The site would be graded and filled with 5,000 to 10,000 cubic yards of rock from a nearby quarry to level the site and to provide some flood protection.

Site clearing, foundations and exteriors for the main buildings would be built first to allow other work to continue indoors during the winter months. Severe weather conditions may occasionally stop outdoor work activities. Construction of the raceways, incubation and spawning building, water cleaning basin, and related structures and piping would occur during the next construction season.

Because the hatchery would be located in a subdivision of rural cabins, special measures would be taken to avoid neighborhood disturbance from unreasonable noise, dust, light, traffic, and other possible construction-related annoyances. Though normal work hours would be 8 a.m. to 5 p.m. five days a week, 12-hour work days six days a week would be needed during crucial instream work windows (normally July 1 to 31) to accomplish necessary work. Two in-stream work seasons would likely be needed to complete construction of the hatchery facilities. The first instream work window would be used to construct the river water intake and fish ladder, which would include removal of a portion of the riverbank to place the intake. The second instream work window would be used to install the Obermeyer gate and pipeline at the intake and the hatchery outfall downstream. Upstream and downstream fish passage would be maintained during the instream work. Less than one-half acre of in-stream work area would be involved.

## 2.1.2 Imnaha Facilities

### 2.1.2.1 Imnaha Final Rearing Facility

Final rearing of Imnaha spring/summer chinook smolts currently occurs at Lookingglass Hatchery. No final rearing facilities exist for the Imnaha stock in their natal stream. Acclimation occurs at the Imnaha Satellite Facility. The new facility would allow rearing and prolonged acclimation of smolts to the Imnaha River.

The proposed Imnaha Final Rearing Facility would be located on about 10 acres of private land (via easement) about five miles upstream (south) of the town of Imnaha (Figures 2-6 and 3.9-4). It would involve:

- Installing a water intake structure and debris screen in the Imnaha River about 1,200 feet upstream of the proposed facility. A fish screen and fish bypass pipeline would be located upland, about 600 feet from the intake.
- Laying a 36-inch pipeline from the screened surface water supply, via the fish screen and a headbox, that routes flows to the raceways. A 30-inch overflow pipe would carry excess water back to the Imnaha River to prevent overtopping of the headbox.
- Constructing ten concrete final rearing raceways (long, rectangular outdoor ponds) served by a portable **formalin** distribution system that would treat fish during the final rearing process.

- Excavating a basin to settle the waste from water after it is removed from the raceways. Clean water would overflow near the top of the basin and be routed to the outfall.
- Constructing a concrete outfall immediately downstream of the hatchery. The outfall would return water serving the facility to the Imnaha River. The riverbank adjacent to the outfall would be covered with large rock (riprap) to prevent erosion. The outlet would have bars across it to prevent migrating and resident trout from entering the pipe.
- Erecting a building for equipment storage and maintenance, supply storage, office, lavatory, utilities, and a two-bay garage.
- Building a single-family residence for permanent on-site personnel and a bunkhouse for up to six temporary employees. These buildings would be one-story, wood-frame structures with metal roofs. Employees living in these facilities would work on-site and at the Imnaha Satellite Facility. The residence, bunkhouse and maintenance building would be supplied with drinking water from existing wells.
- Installing a new septic system.
- Laying pipes to route groundwater from the existing “orchard” and “house pasture” wells to the intake and fish screen, as needed, to prevent icing during extended cold periods.
- Moving the existing bridge across the Imnaha River upstream about 200 feet and placing it on concrete abutments for permanent access to the facility (Figure 2-7). The bridge would also be lengthened to improve river flow past the bridge. A turning lane on the Upper Imnaha River Road (County Road 727) would give fish hauling trucks and other traffic safer passage near the bridge. Paving the access road to the facility would protect the river and facility from road-based sedimentation.
- Bringing a powerline down the slope and across the bridge from PacifiCorp’s existing line that runs just below the ridge on the opposite side of the Imnaha River Road. Approximately 300 feet of new powerline and associated poles would be installed.
- Fencing the perimeter of the site for security and to deter livestock and fish predators.

**Water Requirements at Imnaha Final Rearing Facility** — The project would divert up to 32.6 cfs from the Imnaha River, of which 22 cfs would be screened and routed to the final rearing facility, with the remaining flow used to return fish (that entered the intake) back to the river. Existing groundwater wells (known as the “house pasture well” and the “orchard well”) would provide water for residential use and for de-icing the intake and fish screen as needed. Water from the house pasture well would be conveyed north along the Upper Imnaha River Road and across the bridge to the headbox. Water from the orchard well would also be routed to the headbox.

**Construction Activities Proposed at Imnaha Final Rearing Facility** — The Imnaha Final Rearing Facility would require clearing about six acres of undeveloped land currently used as pasture for livestock. Lower portions of the site would be raised with rock fill to protect it from flooding. Five different places of in-stream work (intake, outfall, bridge removal, bridge replacement, and fish bypass) would involve a total of about one-half acre of in-stream work area. Existing native trees and large shrubs along the river would be retained to screen the facility from the Upper Imnaha River Road. Construction activities at the site would occur throughout the calendar year because of the milder winter conditions found in the Imnaha River canyon.

### 2.1.2.2 Imnaha Satellite Facility

The existing Imnaha Satellite Facility is located about 29 miles upstream (south) of the town of Imnaha on about six acres of land administered by the Forest Service. The facility, a satellite of Lookingglass Hatchery, is operated seasonally under a special use permit from the Forest Service. The USFWS owns the facility and holds the special use permit. The facility, operated by ODFW, is an adult chinook holding and smolt release facility. The facility has deficiencies that limit its effectiveness to safely and efficiently collect and hold adult fish by contemporary standards.

The proposed facility improvements are located within the existing hatchery compound (Figures 2-8 and 3.9-5). These improvements, along with the Imnaha Final Rearing Facility and the Lostine River Hatchery, would greatly reduce the demands of the Imnaha spring/summer chinook program on Lookingglass Hatchery. The Imnaha and Lostine facilities would be used to collect, hold, and **spawn** adult broodstock and to provide incubation and acclimation before release. Lookingglass Hatchery would also hold some Imnaha adults as a precaution to spread the risk of failure if the new Imnaha or Lostine facilities should have difficulties.

The current facility is deficient in adult collection and holding, and does not allow incubation or acclimation within NATURES operational criteria. Improving the facilities would involve:

- Installing a new **Chiwawa weir** across the river that operates safely and effectively at higher river flows, replacing the existing picket weir.
- Building a more effective fish ladder (designed to NOAA Fisheries criteria), alongside the existing ladder, which would be used as an auxiliary water supply to attract fish to the fish ladder entrance.
- Enlarging the trapping and holding area.
- Installing an additional water intake structure in the river, alongside the existing intake, to provide higher flows for acclimation and to improve adult attraction to the fish ladder. In addition to the second intake and new 24-inch conveyance pipeline, related improvements would include a better debris and fish screen on the existing intake and a sediment basin where sand and silt would settle out before the water flows into the acclimation ponds.
- Developing an on-site well capable of supplying disease-free water for incubation.
- Enlarging the existing juvenile chinook acclimation pond to provide more space for acclimating fish at preferred densities.
- Adding an egg incubation room to the existing spawning shed.
- Bringing a powerline about six miles from PacifiCorp's substation to the north. The powerline would be buried under the Upper Imnaha River Road (Forest Service Road 3955).

**Water Requirements at Imnaha Satellite Facility** — An additional 13 cfs would be diverted from the Imnaha River for acclimation of smolts. Depending on the season, the total requirement for facility operations would be about 26 cfs. Up to 100 gpm of ground water would be pumped from a new well for incubation and adult spawning.

**Construction Activities Proposed at Imnaha Satellite Facility** — Proposed improvements, including instream work to replace the weir and modify the intake, would involve less than one-half acre, much of which has been altered previously by development. About 650 feet of new pipeline would be buried next to the existing pipeline under the gravel road.

Due to the remote location and harsh winter conditions, construction would likely occur only between April and early November. Construction would be scheduled to avoid disruption of existing hatchery operations when possible. However, during installation of the new Chiwawa weir and modifications to the fish ladder migrating fish would be temporarily collected below the site for spawning or passage/release above the site.

## 2.2 No Action Alternative

NEPA requires consideration of a No Action Alternative to provide an environmental baseline against which consequences of the Proposed Action (and any alternatives) can be compared. “No Action” in this EIS means the current activities would continue with no changes to the function, type, or number of available facilities. However, the existing facilities would deteriorate over time due to age and use.

Existing facilities would continue to be relied upon to support the conservation and recovery program for the spring/summer chinook in Northeast Oregon. Current disease risks and other problems, insufficiencies and limitations associated with the existing situation would likely stay the same or possibly improve slightly with changes in practices and minor upgrades over time. Lostine and Imnaha chinook stocks would continue to be incubated and reared away from their natal waters, and acclimated at the facility on the Lostine River and the Imnaha Satellite Facility.

The No Action Alternative means production of spring/summer chinook at Lookingglass Hatchery would continue below levels desired for conservation and recovery goals, and at elevated risk of a complete loss of a year’s production of one or more stocks of fish in the event of a system failure or operational accident.

## 2.3 Alternatives Eliminated from Detailed Study

The following alternatives were considered in the planning process for the proposed action, but have been eliminated from detailed study in this EIS because they are either physically or economically infeasible, or did not meet the purposes or need for taking action presented in Chapter 1 of this EIS. See Chapter 3 of the Master Plan (incorporated by reference in this EIS, available upon request from BPA) for a complete description of the following alternatives and the screening process used to eliminate them from further study.

### 2.3.1 Modify Lookingglass Hatchery and Use, Add or Modify No Other Facilities

This alternative sought to modify Lookingglass Hatchery to the extent necessary to meet full production goals for all fish stocks managed for mitigation, conservation, and recovery goals in Northeast Oregon. However, this alternative would not provide sufficient space or water supply to substantially improve the fish production program. Chapter 3.3.1 of the Master Plan contains more detailed information about this alternative.

### **2.3.2 Use or Modify Existing Facilities Elsewhere in the Columbia Basin to Assist with Lookingglass Hatchery Production**

Co-managers considered using other existing facilities throughout the Columbia Basin to assist Lookingglass Hatchery in meeting the fish production program goals. Though the preferred production strategy requires rearing fish in their natal watershed, all anadromous fish hatcheries in the Columbia Basin and one on the Oregon coast were evaluated. Tables 3-3 and 3-4 of the Master Plan describe the 12 facilities reviewed.

The facilities were also reviewed in the NEOH Final Siting Report (Montgomery Watson 1995a). The evaluation resulted in the elimination of each of these facilities for one or more of the following reasons: restricted expansion potential and/or existing facilities near capacity; inadequate water supply to accommodate expansion; poor water quality or undesirable temperature regimes; excessive distance to and from the Grande Ronde and Imnaha subbasins for safely transporting eggs and smolts; and/or did not meet goal of maximizing production within natal waters. Chapter 3.3.2 of the Master Plan contains more detailed information about this alternative.

### **2.3.3 Put New Facilities at Other Sites in Northeast Oregon to Assist Lookingglass Hatchery Production**

Co-managers studied many sites in the Imnaha and Grande Ronde subbasins for potential new facilities (Table 2-1). Chapter 3.3.3 of the Master Plan describes the sites, screening criteria and the evaluation process used to eliminate them from detailed study in this EIS. Sites were evaluated on their potential to accommodate a main hatchery facility or several smaller, integrated facilities to serve one or both basins.

This investigation found that only the Imnaha Final Rearing Facility site (Wayne Marks Ranch, site 10) and the Lostine River Hatchery Site (adjacent to the ODFW Bighorn sheep range, site 21), both of which are included in the Proposed Action, (EIS Section 2.1) had adequate water flow, supply and temperature; space; and power supply near historic spawning areas to efficiently accommodate certain critical facilities. All other sites have therefore been eliminated from further consideration.

## **2.4 Comparison of Alternatives**

Table 2-2 compares the Proposed Action and the No Action Alternative to the stated purposes for taking action.

Table 2-3 compares the facilities associated with the Proposed Action and the No Action Alternative.

Table 2-4 summarizes the anticipated environmental consequences of the Proposed Action and the No Action Alternative.



**Table 2-1. Sites Investigated.**

Imnaha Subbasin Sites	Grande Ronde Subbasin Sites	
1. Indian Crossing 2. Gumboot Creek (existing facility) 3. Grouse Creek-Imnaha confluence 4. Big Sheep-Lick Creek confluence 5. Big Sheep Creek 6. Big Sheep-Little Sheep confluence 7. Little Sheep Creek 8. Gene Marr Ranch 9. Horse Creek 10. Wayne Marks Ranch	1. Catherine Creek N&S Fork confluence 2. Catherine-Milk Creek confluence 3. Catherine Creek at Union 4. Vey Meadows 5. Sheep Creek 6. Beaver Creek 7. Sanderson Springs-Mill Creek 8. Lower Willow Creek near Elgin 9. Indian Creek near Elgin 10. Grande Ronde near Elgin 11. Lookingglass Hatchery 12. Wildcat Creek Area 13. Fish Ladder 14. Flora Grade	15. Cottonwood Creek 16. Wallowa Lake 17. Hayes Fork-Prairie Creek 18. Wallowa Hatchery 19. Big Canyon Creek 20. Minam River – Wallowa River confluence 21. ODFW Bighorn sheep range 22. Strathearn Ranch 23. Lostine Dam 24. Clearwater Ditch Diversion – Lostine River 25. Davis Dam-Catherine Creek 26. Minam above Wallowa River 27. Wallowa River below Minam confluence 28. Wenaha River above Troy
Source: Montgomery Watson 1995a.		

**Table 2-2. Comparison of Proposed Action and No Action Alternative to the Stated Purposes of Taking Action.**

Purposes of Taking Action	Proposed Action	No Action Alternative
<p>Provide adequate, contemporary hatchery facilities in the Grande Ronde and Imnaha subbasins to help in the conservation and recovery of ESA-listed native chinook and further the implementation of the LSRCP hatchery fish production program.</p>	<p>Would meet this purpose to the greatest extent. Implementation of the full program would provide facilities adequate to support conservation and recovery of Grande Ronde and Imnaha spring/summer chinook.</p>	<p>Would only provide facilities to implement partial program elements. Existing facilities are currently undersized and inadequate for the current programs.</p>
<p>Coordinate the operation of Lookingglass Hatchery and related LSRCP hatchery facilities with the Fish and Wildlife Program of the NPCC, thereby aiding BPA’s efforts to mitigate and recover fish affected by FCRPS.</p>	<p>Would meet this purpose to the greatest extent. Modifications proposed to Lookingglass Hatchery would better accommodate the Catherine Creek and Upper Grande Ronde (includes Lookingglass Creek) components of the hatchery fish production program and transfer other stock responsibilities to additional facilities on natal streams for full implementation of the LSRCP.</p>	<p>Would not meet this purpose. Lookingglass Hatchery would continue to be relied upon, despite a review that found it could not meet program goals even with substantial modifications. The No Action Alternative could also result in a system failure at Lookingglass Hatchery and complete loss of a year’s production of one or more of the stocks currently reared there.</p>
<p>Aid in BPA’s fulfillment of mitigation and recovery goals outlined in the Biological Opinion of NOAA Fisheries on operation of the FCRPS.</p>	<p>Would meet this purpose to the greatest extent. The modernization and improvement of existing facilities, and construction of certain new facilities, provide the potential for restoration and prevention of extinction of spring/summer chinook. The proposed action would support the recovery goals for operation of the FCRPS.</p>	<p>Would not meet this purpose. Existing facilities would continue to be relied upon to support the conservation and recovery program for the chinook in Northeast Oregon. Current disease risks and other problems, insufficiencies, and limitations associated with the existing situation would continue. Lostine and Imnaha chinook stocks would continue to be incubated and reared away from their natal waters, except for the temporary rearing facility on the Lostine River.</p>
<p>Achieve economic efficiencies by integrating management of fish production programs and facilities.</p>	<p>Would meet this purpose. Implementation of this project supports integration and coordination of LSRCP, BPA, NPCC, NPT, CTUIR, and ODFW hatchery management interests and expenditures.</p>	<p>Coordination and economic efficiency are constrained by the limitations of the existing hatchery facilities to meet LSRCP mitigation goals or the conservation and recovery objectives for ESA-listed species shared by the fishery managers.</p>
<p>Be consistent with pertinent laws, relevant plans and programs and tribal objectives for fishery management and harvest.</p>	<p>Would meet this purpose to the greatest extent, particularly related to mitigation and recovery of ESA-listed species.</p>	<p>Would not be inconsistent with any laws, or relevant plans and programs or tribal objectives, but would not further any objectives contained therein.</p>

**Table 2-3. Comparison of Facilities Associated with Proposed Action and No Action Alternative.**

Facilities	Proposed Action	No Action Alternative
Number of Sites Involved	<u>5 Sites</u> Lookingglass Hatchery Lostine Adult Collection Facility, including the Lostine Adult Collection Weir Lostine River Hatchery Imnaha Final Rearing Facility Imnaha Satellite Facility	<u>4 Sites</u> Lookingglass Hatchery Lostine Adult Collection Weir, included as part of the Lostine Adult Collection Facility site Lostine Acclimation & Rearing Imnaha Satellite Facility
Approximate Acres Occupied	Lookingglass Hatchery (11) Lostine Adult Collection Weir Lostine Adult Collection Facility, including the Lostine Adult Collection Weir (3) Lostine River Hatchery (6) Imnaha Final Rearing Facility (10) Imnaha Satellite Facility (6)	Lookingglass Hatchery (11) Lostine Adult Collection Weir, included as part of the Lostine Adult Collection Facility site (1) Lostine Acclimation & Rearing (1) Imnaha Satellite Facility (6)
Number of Sites Improved	<u>2 Sites</u> Lookingglass Hatchery Imnaha Satellite Facility	None
Number of New Sites	<u>3 Sites</u> Lostine Adult Collection Facility Lostine River Hatchery Imnaha Final Rearing Facility	None
Number of Sites Incorporated into Others	<u>1 Site</u> Lostine Acclimation & Rearing, functions moved to Lostine River Hatchery	None
Number of Sites Unchanged	<u>1 Site</u> Lostine Adult Collection Weir, included as part of the Lostine Adult Collection Facility site	<u>All 4 Sites</u> (minor modifications and improvements likely over time)

**Table 2-4. Summary of Environmental Consequences of Alternatives.**

Environmental Resource	Proposed Action	No Action Alternative
<p><b>3.2 Fisheries</b></p> <ul style="list-style-type: none"> <li>Targeted spring/summer chinook</li> </ul>	<p>Site disturbances and channel alterations would create minor localized impacts that would not affect species population viability. Water withdrawals during operation of facilities would reduce habitat in the immediate reach of each diversion, but would not affect species population viability. No impacts to individuals or populations are expected from discharges at proposed facilities. Individuals and the population would benefit from improved passage as well as adult attraction and collection facilities. The population would benefit from improved broodstock collection and holding facilities. Incubation and rearing practices resulting from the proposed facilities would increase population viability and benefit the species in the long-term. Fish health maintenance activities would benefit individuals and the population by reducing disease potential.</p>	<p>Risks to hatchery fish production needed to maintain population viability would increase in the long-term because of the inadequacy of current facilities.</p>
<ul style="list-style-type: none"> <li>Non-targeted chinook</li> </ul>	<p>Site disturbances and channel alterations would create minor localized impacts that would not affect species population viability. Water withdrawals during operation of facilities would reduce habitat in the immediate reach of each diversion, but would not affect species population viability. No impacts to individuals or populations are expected from discharges at proposed facilities. Some individuals may experience short-term stress by installation of weirs, ladders and traps within the Lostine River. Improved upstream and downstream passage in both subbasins would benefit populations. Broodstock collection and maintenance are not expected to impact non-targeted chinook population viability. Incubation and rearing practices at the proposed facilities would have no impact on non-targeted chinook. Fish health maintenance activities would benefit individuals and the population by reducing disease potential.</p>	<p>No change.</p>

Environmental Resource	Proposed Action	No Action Alternative
<ul style="list-style-type: none"> <li>Other salmonids</li> </ul>	<p>Site disturbances and channel alterations would create minor localized impacts that would not affect species population viability. Water withdrawals during operation of facilities would reduce habitat in the immediate reach of each diversion, but would not affect species viability. No impacts to individuals or populations are expected from discharges at proposed facilities. Some individuals may experience short-term stress by installation of weirs, ladders and traps within the Lostine River. Improved upstream and downstream passage in both subbasins would benefit populations. Broodstock collection and maintenance are not expected to impact population viability of other salmonids. Incubation and rearing practices at the proposed facilities would have no impact on other salmonids. Fish health maintenance activities would benefit individuals and the population by reducing disease potential.</p>	<p>No change.</p>
<ul style="list-style-type: none"> <li>Non-salmonids</li> </ul>	<p>Site disturbances and channel alterations would create minor localized impacts that would not affect species viability. Water withdrawals during operation of facilities would reduce habitat in the immediate reach of each diversion, but would not affect species viability. No impacts to individuals or populations are expected from discharges at proposed facilities. Some individuals may experience short-term stress by installation of weirs, ladders and traps within the Lostine River. Improved upstream and downstream passage in both subbasins would benefit populations. Broodstock collection and maintenance are not expected to impact population viability. Incubation and rearing practices at the proposed facilities would have no impact on non-salmonids. Fish health maintenance activities would have no impact on non-salmonids.</p>	<p>No change.</p>

Environmental Resource	Proposed Action	No Action Alternative
<p><b>3.3 Wildlife</b></p> <ul style="list-style-type: none"> <li>• ESA species</li>   <li>• Other species</li> </ul>	<p>No state or federally listed species are known to nest or breed at project sites. Bald eagles roosts or potential roosts have been documented at or near all sites except ISF. Tree removal at LRH, LACF, and IFRF may reduce the number of potential roost sites.</p> <p>Temporary displacement during construction activities (noise, presence of humans) would be the primary consequence to big game and other wildlife species that use project sites.</p>	<p>No change.</p> <p>No change.</p>
<p><b>3.4 Plants and Wetlands</b></p> <ul style="list-style-type: none"> <li>• ESA species</li>   <li>• Other native species</li>   <li>• Non-native species</li>   <li>• Wetlands</li> </ul>	<p>No state or federally listed plant species are known to occur at any project sites.</p> <p>Varying amounts of native vegetation would be disturbed or displaced by facility structures. All sites would be replanted with native species. Some loss of riparian habitat is anticipated at LACF, LRH and IFRF. Improved quality of riparian habitat is expected at IFRF with exclusion of cattle from the site.</p> <p>All facilities would be maintained to discourage non-native, invasive and weed species.</p> <p>LACF and LRH – Net loss of minor amount of wetlands (less than ½ acre combined). Mitigation – Commitment to conduct formal wetland delineations and to implement compensatory wetland mitigation as warranted in consultation with regulatory authorities.</p>	<p>No change.</p> <p>No change.</p> <p>No change.</p> <p>No change.</p>
<p><b>3.5 Geology</b></p> <ul style="list-style-type: none"> <li>• Approximate acres temporarily disturbed and permanently altered</li>   <li>• Slope/bank stability</li> <li>• Erosion</li> </ul>	<p>LGH – &lt; 1 acre within existing facility (total existing facility about 11 acres).</p> <p>LACF – 3 acres (total site about 3 acres).</p> <p>LRH – 5 acres temporarily, 3 acres permanently, altered (total site about 6 acres).</p> <p>IFRF – 6 acres temporarily, 3 acres permanently, altered (10 acre lease, about 6 acres “occupied”).</p> <p>ISF – &lt; 1 acre within existing facility (total existing facility about 6 acres).</p> <p>Stability unchanged.</p> <p>Short-term, localized erosion during construction.</p>	<p>LGH – No change.</p> <p>LACF – No change.</p> <p>LRH – No change.</p> <p>IFRF – No change.</p> <p>ISF – No change.</p> <p>Stability unchanged.</p> <p>Erosion potential unchanged.</p>

Environmental Resource	Proposed Action	No Action Alternative
<p><b>3.6 Hydrology</b></p> <ul style="list-style-type: none"> <li>• Water quality</li>   <li>• Water quantity</li>   <li>• Flow restrictions / floodplains</li> </ul>	<p>Localized, temporary, construction-related runoff and sedimentation within applicable standards.</p> <p>LRH – occasional short-term reduced flows along hatchery reach in extremely dry or cold periods (up to 50-60% reduction during extreme low flows; during those times, river and well water would be pumped back to the intake location).                      IFRF – similar to LRH, but shorter duration and extent; up to 50% reduction along the hatchery reach during extremely low flow periods.                      ISF – similar to LRH, but shorter duration and extent; minor flow regime alteration during extremely low flow periods.</p> <p>LACF, LRH, IFRF - localized flow restriction, concentration, and scouring where new components are installed; slight improvement with new bridge abutments at IFRF and new weir at ISF.</p>	<p>Water quality unchanged.</p> <p>Water quantity unchanged.</p> <p>Flows unchanged.</p>
<p><b>3.7 Wild and Scenic Rivers</b></p> <ul style="list-style-type: none"> <li>• Imnaha River</li>   <li>• Lostine River</li> <li>• Grande Ronde River</li> </ul>	<p>In-stream structures at ISF and IFRF would slightly constrict river flow and decrease vegetation; slight improvement with new bridge abutments at IFRF and new weir at ISF; fill at IFRF would alter and redirect surface flows during extreme storm events; likely improvement over time to fisheries Outstandingly Remarkable Values (ORVs), as well as lifestyle and recreation ORVs.</p> <p>Not likely to invade area or unreasonably diminish values of Wild and Scenic designation.</p> <p>Not likely to invade area or unreasonably diminish values of Wild and Scenic designation.</p>	<p>No change to Imnaha flow conditions; forego slightly improved replacement structures at IFRF and ISF; forego enhancement to fisheries ORV and related recreation and lifestyle ORVs.</p> <p>No change.</p> <p>No change.</p>
<p><b>3.8 Cultural Resources</b></p>	<p>No effect. If evidence of cultural materials is found later, work or activity would be halted until the site could be assessed.</p>	<p>No effect.</p>
<p><b>3.9 Aesthetics (Visual Quality)</b></p>	<p>LGH – no effect on existing visual character.                      LACF – limited effect on overall visual character.                      LRH – limited effect, visible to nearby residents.                      IFRF – limited effect, brief views from Road 551.                      ISF – limited effect on overall visual character.</p>	<p>LGH – No change.                      LACF – No change.                      LRH – No change.                      IFRF – No change.                      ISF – No change.</p>

Environmental Resource	Proposed Action	No Action Alternative
<p><b>3.10 Land Use, Recreation and Transportation</b></p> <ul style="list-style-type: none"> <li>• Land Use</li> <li>• Recreation</li> <li>• Transportation</li> </ul>	<p>Facilities consistent with local zoning as applicable, permitted outright or as conditional use; ISF on Forest Service land would require reissuing the special use permit.</p> <p>No effect on recreation, except possible long-term benefit if chinook stocks recover to enhance viewing and fishing.</p> <p>Short-term traffic increase during construction.</p> <p>LACF – improve trout farm bridge and parking.</p> <p>LRH – pave Granger Road.</p> <p>IFRF – construct turning lane on Road 551.</p>	<p>No change.</p> <p>No change.</p> <p>No change.</p>
<p><b>3.11 Socioeconomics</b></p>	<p>No change to human population; minor increase to employment, especially during construction; and some benefit to local economy if chinook recover and stimulate recreation or fishing.</p>	<p>No change; potential for some adverse effect on local economy if salmon stocks continue to decline.</p>
<p><b>3.12 Air Quality</b></p>	<p>Short-term increase in particulates during construction; no long-term effect.</p>	<p>No change.</p>
<p><b>3.13 Noise</b></p>	<p>LGH – temporary increase in area noise levels during construction; long-term potential to decrease noise at facility with new buildings and equipment.</p> <p>LACF – temporary increase in area noise levels during construction.</p> <p>LRH – temporary increase in area noise levels during construction; long-term noise associated with traffic to the facility and other activities, and an additional residence.</p> <p>IFRF – temporary increase in area noise levels during construction.</p> <p>ISF – temporary increase in area noise levels during construction; long-term potential to decrease noise in the area by replacing the existing diesel generator with powerline.</p>	<p>No change at any of the sites.</p>
<p><b>3.14 Public Health and Safety</b></p>	<p>Potential minor increased demand for public services (fire, hospital, etc.) and increased traffic during construction.</p>	<p>No change from current situation.</p>

\*Proposed Action  
 LGH = Lookingglass Hatchery  
 LRH = Lostine River Hatchery  
 ISF = Imnaha Satellite Facility

LACF = Lostine Adult Collection Facility  
 IFRF = Imnaha Final Rearing Facility



# Grande Ronde and Imnaha Spring Chinook Project

- ▲ Modify Existing Facilities
- ◆ Potential Site - Incubation and / or Rearing Facilities

■ State, Federal, Tribal, County, City Lands

□ Private or Other

— Major Road

— Interstate

— Subbasin Boundary

## BASIN LOCATION



January 30, 2003

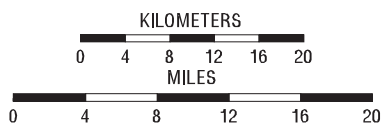
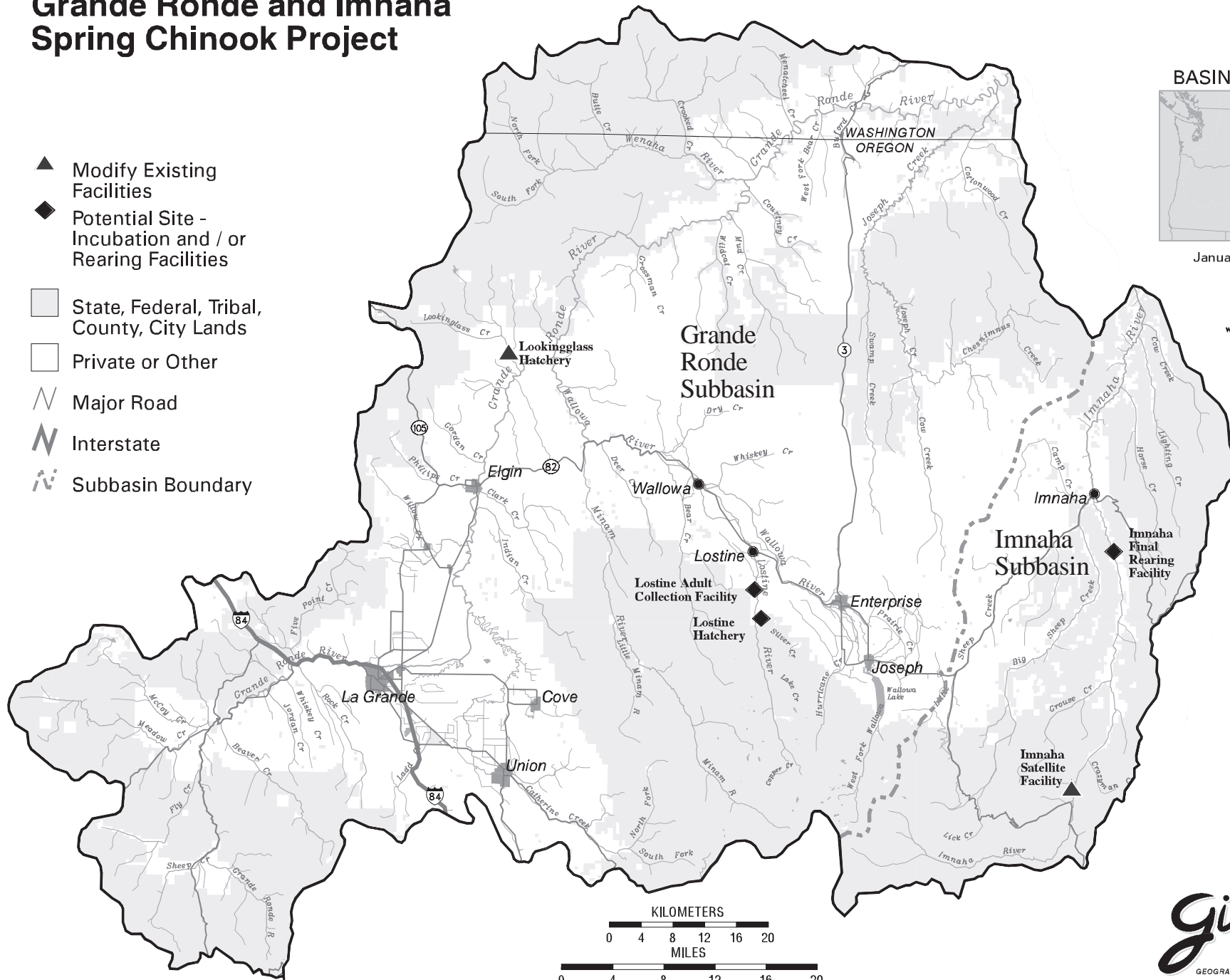
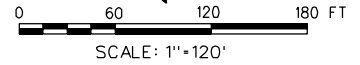


Figure 2-1



EASEMENT LINE  
HATCHERY OUTFALL  
RIPRAP PROTECTION

EASEMENT LINE  
GRAVEL ROAD



EFFLUENT PUMP STATION

CLEANING WASTE BASIN

RESIDENCE

PROPOSED GROUNDWATER PIPELINE

PROPOSED WATER SUPPLY PIPELINE

SPAWNING FACILITY

FUTURE DISINFECTION

SURFACE WATER STRAINERS

VALVE VAULTS

HEADBOX

FLOW METER VAULT

ADULT HOLDING

FINAL REARING RACEWAYS

RIPRAP PROTECTION (TYPICAL)

ASPEN GROVE TO BE PROTECTED

EASEMENT LINE

PAVED

NEW POWER LINE AND TRANSFORMER

FIR STREET

OPERATIONS BUILDING

GARAGE/SHOP AND GENERATOR BUILDING

EXISTING HOUSE TO BE EXPANDED AND REMODELED

INCUBATION / EARLY REARING BUILDING

18" HDPE FM FROM EFFLUENT PUMP STATION TO INTAKE

24" HDPE SUPPLY FROM INTAKE

LOSTINE RIVER (APPROX. LOCATION)

LOSTINE RIVER ACR

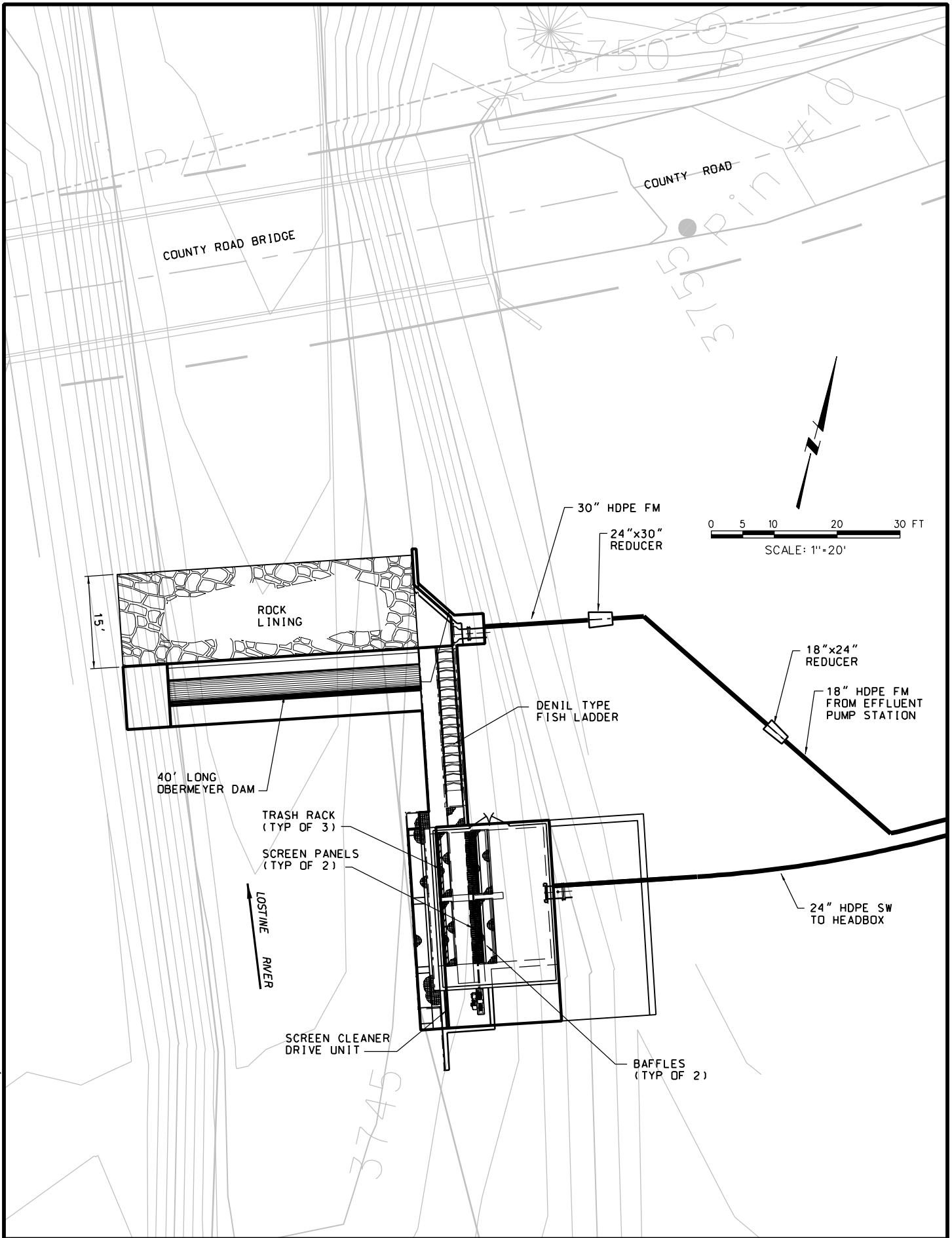
PLATTED LOT LINE, THIS LOT LINE COULD BE



NORTHEAST OREGON HATCHERY PROGRAM  
GRANDE RONDE IMNAHA SPRING CHINOOK PROJECT

LOSTINE RIVER HATCHERY SITE PLAN

FIGURE 2-4



NORTHEAST OREGON  
HATCHERY PROGRAM  
GRANDE RONDE IMNAHA  
SPRING CHINOOK  
PROJECT

LOSTINE RIVER HATCHERY  
INTAKE SITE PLAN

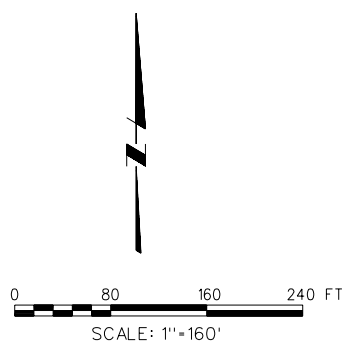
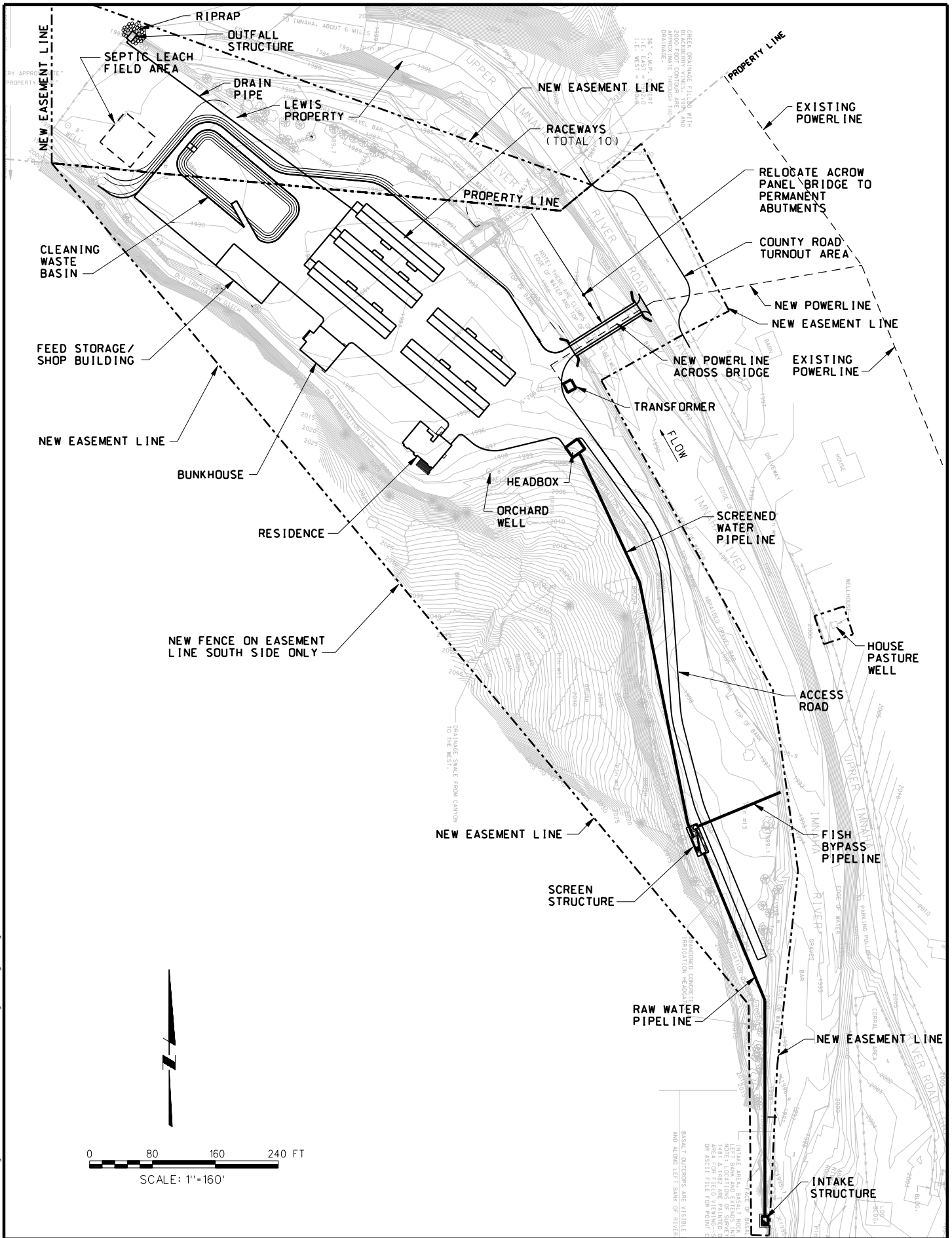
FIGURE  
2-5

Plot Date: 04/22/2003

User: mm.wain

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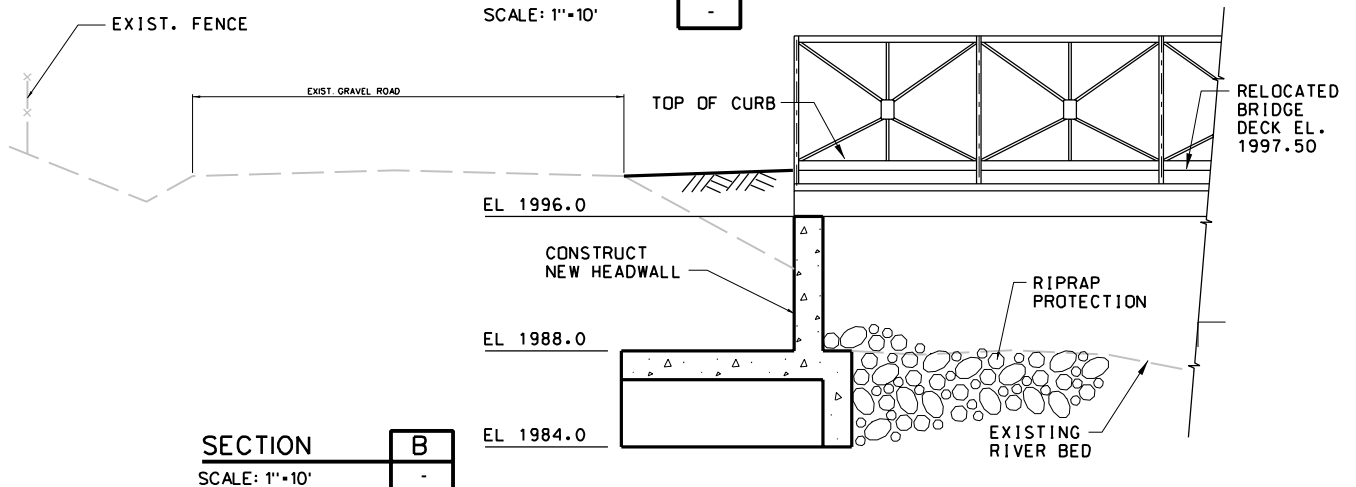
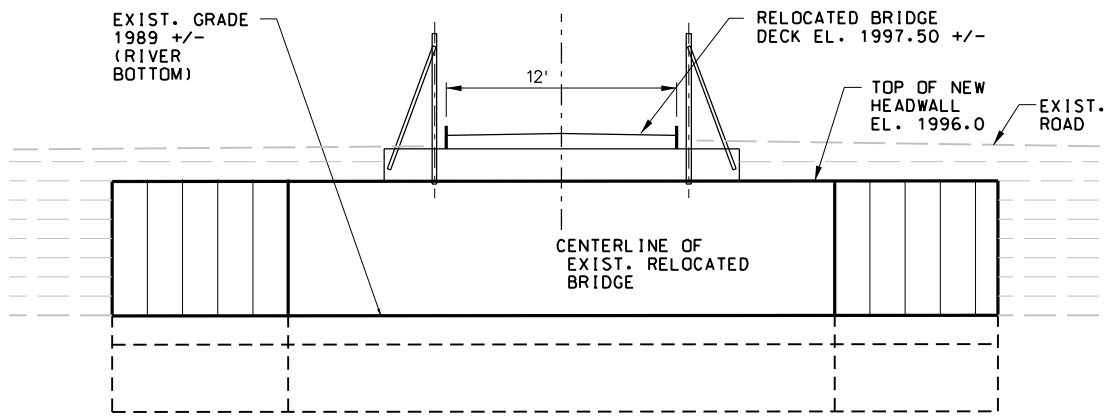
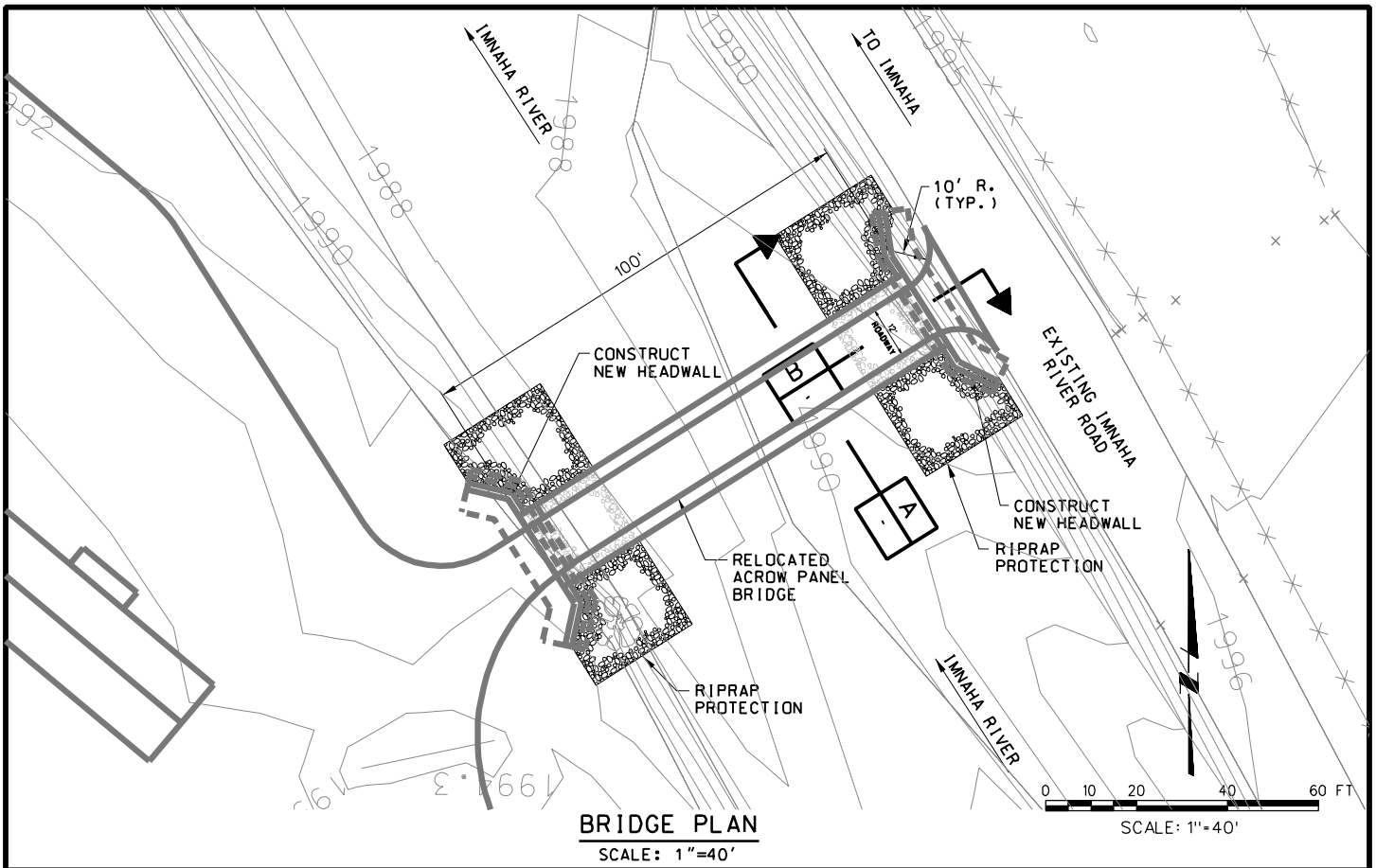
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NORTHEAST OREGON  
HATCHERY PROGRAM  
GRANDE RONDE IMNAHA  
SPRING CHINOOK  
PROJECT

IMNAHA FINAL REARING FACILITY  
SITE PLAN

FIGURE  
2-6





# Chapter 3: Affected Environment and Environmental Consequences

## 3.1 Introduction

This chapter is organized into the following sections describing specific resource areas or environmental elements:

- Fish
- Wildlife
- Plants and Wetlands
- Geology, Geology Hazards and Soils
- Hydrology, Floodplains and Water Quality
- Wild and Scenic Rivers
- Cultural Resources
- Aesthetics (Visual Quality)
- Land Use, Recreation and Transportation
- Socioeconomics
- Air Quality
- Noise
- Public Health and Safety

Each of the above sections first describes the affected environment and then analyzes the environmental consequences of alternatives, including the Proposed Action and No Action Alternative.

For this EIS, the affected environment includes the Grande Ronde and Imnaha subbasins of the larger Snake River drainage basin. Within the Grande Ronde subbasin, the affected environment includes Lookingglass Creek and the Lostine River. Within the Imnaha subbasin, the affected environment description focuses on the Imnaha River. The Proposed Action sites, along with landscape features such as main roads, rivers, and mountain ranges, are depicted in Figure 1-1.

For each resource or environmental element in this chapter, the analysis of environmental consequences considers the direct, indirect and cumulative effects of alternatives. For purposes of determining effects, each section contains evaluation criteria and assesses potential impacts based on their context and intensity. The term “context” refers to the general affected environment in which the Proposed Action would take place. The term “intensity” refers to the severity or degree of impact that the Proposed Action would have on the affected environment. Features of project design, and any reasonable mitigation measures, which help avoid, minimize or compensate for potential adverse effects are identified. Cumulative effects analysis considered the activities shown in Table 1-1 as well as other reasonably foreseeable actions relevant to each environmental element below. As a baseline condition for cumulative effects, larger-scale land management activities on nearby National Forest (consisting primarily of recreation, grazing and some logging use) and private lands (primarily agriculture, grazing and residential use) are expected to remain constant. No substantial changes in these activities in the subbasins is anticipated.

This chapter concludes with sections that address short-term uses of the environment; maintenance and enhancement of long-term productivity; irreversible and irretrievable resource commitments; and adverse effects that cannot be avoided.



## 3.2 Fish

### 3.2.1 Affected Environment

The geographic locations of the affected environment for fish are confined to the Grande Ronde and Imnaha subbasins. Within the Grande Ronde subbasin, the water bodies of interest are Lookingglass Creek and the Lostine River. Within the Imnaha subbasin, the water body of interest is the Imnaha River.

Both the Grande Ronde and Imnaha subbasins continue to support fisheries that were an important part of the regional economy and regional tribal cultures (James 1984; Wallowa County and NPT 1999; Ashe et al. 2000). The Draft Biological Assessment (in process) presents more detailed information on fish species in the subbasins, including historic and present distribution and abundance. The sections that follow present an overview of existing conditions in the subbasins and analyze potential project impacts.

#### 3.2.1.1 Grande Ronde Subbasin

Historically, an estimated 43 fish species, including 24 native and 19 introduced species, are known to have occurred in the Grande Ronde subbasin (Ashe et al. 2000). Thompson and Haas (1960) report that coho salmon historically were abundant in the subbasin, but were **extirpated** from the subbasin in the 1980s. Historic abundance of sockeye salmon in the Wallowa River system (including the tributary Lostine River) is unknown, but it is assumed to have been high given the presence of sockeye canneries at Wallowa Lake in the 1890s (ODFW et al. 1990). Although anadromous sockeye salmon were extirpated from the area by 1905, their genetic component may still be present in wild kokanee in Wallowa Lake (Nowak and Eddy 2001). Table 3.2-1 lists both native and introduced species currently present in the Grande Ronde subbasin.

**Table 3.2-1. Fish Species Currently Occurring within Grande Ronde Subbasin.**

Common name	Scientific name	Native
Spring/summer chinook salmon	<i>Oncorhynchus tshawytscha</i>	X
Fall chinook salmon	<i>Oncorhynchus tshawytscha</i>	X
Summer steelhead	<i>Oncorhynchus mykiss</i>	X
Sockeye salmon/kokanee	<i>Oncorhynchus nerka</i>	X
Rainbow trout	<i>Oncorhynchus mykiss</i>	X
Redband trout	<i>Oncorhynchus mykiss</i>	X
Cutthroat trout	<i>Oncorhynchus clarki</i>	X
Bull trout	<i>Salvelinus confluentus</i>	X
Mountain whitefish	<i>Prosopium williamsoni</i>	X
Pacific lamprey	<i>Lampetra tridentata</i>	X
White sturgeon	<i>Acispenser transmontanus</i>	X
Mountain sucker	<i>Catostomus platyrhynchus</i>	X
Largescale sucker	<i>Catostomus macrocheilus</i>	X
Bridgelip sucker	<i>Catostomus columbianus</i>	X
Chiselmouth	<i>Acrocheilus alutaceus</i>	X
Longnose dace	<i>Rhinichthys cataractae</i>	X
Torrent sculpin	<i>Cottus rhotheus</i>	X
Leopard dace	<i>Rhinichthys falcatus</i>	X
Mottled sculpin	<i>Cottus bairdi</i>	X
Northern pikeminnow	<i>Ptychocheilus oregonensis</i>	X
Peamouth	<i>Mylocheilus caurinus</i>	X

Redside shiner	<i>Richardsonius balteatus</i>	X
Paiute sculpin	<i>Cottus bidingi</i>	X
Shorthead sculpin	<i>Cottus confusus</i>	X
Lampreys	<i>Lampetra spp.</i>	X
Speckled dace	<i>Rhinichthys osculus</i>	X
Largemouth bass	<i>Micropterus salmoides</i>	
Yellow perch	<i>Perca flavescens</i>	
Sunfish	<i>Lepomis spp</i>	
Brown bullhead	<i>Ictalurus nebulosus</i>	
Common carp	<i>Cyprinus carpio</i>	
Channel catfish	<i>Ictalurus punctatus</i>	
Smallmouth bass	<i>Micropterus dolomieu</i>	
White crappie	<i>Pomoxis annularis</i>	
Brook trout	<i>Salvelinus fontinalis</i>	
Black bullhead	<i>Ameiurus melas</i>	
Black crappie	<i>Pomoxis nigromaculatus</i>	
Bluegill	<i>Lepomis macrochirus</i>	
Flathead catfish	<i>Pylodictis olivaris</i>	
Golden trout	<i>Oncorhynchus aguabonita</i>	
Lake trout	<i>Salvelinus namaycush</i>	
Pumpkinseed	<i>Lepomis gibbosus</i>	
American shad	<i>Alosa sapidissima</i>	
Tadpole madtom	<i>Noturus gyrinus</i>	
Yellow bullhead	<i>Ameiurus natalis</i>	

Source: Adapted from Coby Menton, NRCS, as referenced in the Master Plan (Ashe et al. 2000).

Currently, spring/summer and fall chinook, steelhead, and bull trout returning to the Grande Ronde River and its tributaries are listed as threatened under the ESA. Discussion of each species (and stocks) follows.

**Chinook Salmon** — Chinook salmon are an anadromous fish species. Anadromous fish migrate up rivers from the sea to breed in freshwater. Due to the chinook salmon's relatively large size, they usually spawn in streams that are larger and deeper than those used by other salmon. Chinook salmon fry and smolts usually stay in fresh water from 1 to 18 months before travelling downstream to estuaries, where they remain up to 200 days. Chinook salmon spend one to six years at sea before returning to their natal streams to spawn (Sankovich 2002, personal communication). Spawning occurs from summer to late fall, depending on the stock, *i.e.* fall or spring/summer chinook (ODFW 2001).

In-subbasin and out-of-subbasin habitat changes and out-of-subbasin salmon harvest have reduced all salmon populations and extirpated or nearly eliminated certain segments of chinook salmon populations (Mobrand and Lestelle 1997). Declining adult returns from the early 1980s and early 1990s resulted in the 1992 federal ESA listing of the Snake River **evolutionarily significant unit (ESU)** as threatened. The Grande Ronde River stock is a part of that ESU. Recent redd counts, however, show a significant increase in adult **escapement** (Table 3.2-2). Chinook salmon that once may have spawned from late-September through October probably have been extirpated, and chinook populations that spawn in November have been reduced to a remnant population.

*Spring/Summer Chinook*

Escapement levels and trends in the early to mid 1990s indicate that Grande Ronde spring/summer chinook salmon were in immediate danger of extirpation (Sims 1994). **Smolt-to-adult return ratios (SARs)** were below 1.0 for the eight brood years in the 1990s (Carmichael et al. 1998a). Recent (2000 – 2002) **redd** counts, however, indicate an increase in spawners within the Grande Ronde basin, as shown in Table 3.2-2.

**Table 3.2-2. Number of Spring Chinook Salmon Redds Observed in the Grande Ronde River and Tributaries, 1998-2002.**

	Year														
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Redds Observed	969	227	296	198	558	688	149	80	306	298	253	180	502	868	884

Sources: Nowak and Eddy (2001); Kinery 2003, personal communication.

Grande Ronde spring/summer chinook enter the Columbia River in March through June (Neeley et al. 1994) and they pass through the lower Snake River primarily during April through mid-July (Thompson et al. 1960; Bjornn et al. 1992). High water temperatures greatly restrict summer use of the Grande Ronde subbasin. In most recent years, high mainstem temperatures blocked upstream migration of adult fish during much of the summer, and probably prevented juveniles from rearing from mid-July through August. Spawning usually occurs in August and September with fry emergence between March and May. Juveniles that remain in the subbasin for one year generally begin their outmigration in June through October. **Smoltification** occurs the following spring. Adults usually remain at sea for one to four years and return to spawn between ages three and six (ODFW 2001).

Within Lookingglass Creek, spring/summer chinook enter the creek in the later part of May and generally spawn from mid-August to September. Fry emerge from March to May and juveniles tend to remain for rearing in areas relatively close to where they hatched. Catherine Creek, from which Lookingglass Hatchery collects a portion of its broodstock, differs slightly in spawn timing as some individuals have been observed spawning in late July (Zollman 2002a, personal communication).

Lostine River spring/summer chinook returning adults generally enter the river beginning in the first week of June and generally spawn in mid-August to late September. Earlier spawning may occur as spawned-out carcasses have been observed as early as mid-July (Zollman 2002b, personal communication). Fry emerge from March to May, depending on water temperature. Variability of river water temperature occurs in association with springs creating thermal infusion areas. Generally, fry tend to remain near emergence sites, but may move downriver in June or July depending upon river conditions.

*Fall Chinook*

Although fall chinook salmon are indigenous to the Grande Ronde subbasin, including all of the lower portion of the river system, only remnant populations occur in the lower Grande Ronde River from the mouth to just above the Wenaha River, primarily in Washington. These populations occur downstream of the proposed project sites. Grande Ronde fall chinook salmon are part of the Snake River ESU and were federally listed as threatened under the ESA in 1992.

Although life history information for Grande Ronde River fall chinook is extremely limited, life histories for Snake River fall chinook may be comparable. Generally, fish from the Snake River populations spawn in

mid-November. Fry emerge in early to late May and leave the Snake River in late June to early July (ODFW 2001).

Currently, there is no "direct" artificial production of fall chinook within the Grande Ronde subbasin. However, wild fall chinook may be impacted by the adult returns to the mainstem Snake River programs where smolts are acclimated at locations like Captain Johns Rapids and Pittsburg Landing. The adults that return from those programs find locations and spawn naturally, occasionally within the Grande Ronde River.

**Steelhead** — From 1988 to 2000 steelhead redd counts showed a steady decline in summer steelhead spawning in all reaches of the Grande Ronde River. Due to this decline, the Grande Ronde River stock of summer steelhead, included in the Snake River ESU, was federally listed as threatened under the ESA in 1997.

Presently, summer steelhead are distributed throughout the accessible portions of the Grande Ronde subbasin. Summer steelhead are known to occupy 238 streams in the subbasin. They use about 33 percent of the total stream length available for spawning and rearing. On average, summer steelhead grow for two years in the Grande Ronde River system before migrating to the ocean. Most smolt migration occurs from April through June (Smith 1975). A smaller smolt migration occurs in the fall, when juveniles are thought to migrate to lower stream reaches to avoid freezing conditions in the upper tributaries. Upstream areas may be repopulated the following spring. Juveniles may also move upstream to find cool water sanctuaries during the summer (ODFW 1993).

Within Lookingglass Creek, steelhead adults migrate upstream during late winter/early spring when flows increase due to spring runoff. Juveniles are supported throughout the river, as evidenced by ODFW trap data, and emigrate in spring (Sankovich 2002, personal communication).

Lostine River steelhead spawners begin to ascend upstream in early spring (March – April). In late April or early May, adults begin to move up tributaries to spawn (Zollman 2002b, personal communication). Rearing juveniles may move upstream and downstream within tributaries for up to 2 years. Smolt emigration occurs after 2 years of rearing throughout the Lostine, usually in late March through May, once again coinciding with increased flow due to spring runoff (Sankovich 2002, personal communication).

In the Grande Ronde subbasin, summer steelhead artificial production takes place at the Wallowa Hatchery, Irrigon Hatchery and the Big Canyon **acclimation site** in Oregon, and at the Lyons Ferry Hatchery and Cottonwood acclimation facility in Washington. The Wenaha and Minam Rivers and Joseph Creek are wild fish management areas for summer steelhead in the subbasin and, thus, receive no hatchery supplementation (Nowak and Eddy 2001). Grande Ronde steelhead broodstock was founded from fish collected at one of the Snake River dams and probably included fish from throughout the Snake River basin (ODFW 1995).

**Bull Trout** — Although there is limited historical distribution information, bull trout presently occur throughout the Grande Ronde subbasin in areas where water quality and habitat are suitable to the species. Populations within the Wenaha River are considered healthy, however, most Grande Ronde bull trout populations are considered at “moderate risk of extinction” (Buchanan et al. 1997). Populations within Wallowa Lake and Wenatchee Creek, a tributary to the lower Grande Ronde, have been extirpated (ODFW 2001). Due to population declines, Grande Ronde bull trout were listed as threatened under the ESA in 1998, as part of the larger Columbia River Basin Distinct Population Segment (DPS).

The status of Lookingglass Creek bull trout populations was considered “of special concern” by some researchers (Ratliff and Howell 1992), but has been downgraded to a “moderate risk of extinction” (Buchanan et al. 1997). Although no population estimates have been made in the Lookingglass Creek drainage, presence/absence surveys and spawning ground surveys indicate that bull trout abundance is low (Buchanan

et al. 1997). High water temperatures occur at the Lookingglass Hatchery location during low flow periods within the diversion reach; these may limit bull trout usage during those periods (Lund 2002, personal communication). Although bull trout have been caught throughout the year, there are definite peaks in catch rates in the spring and fall with a low in July (ODFW 1995). Bull trout that occur in the portions of Lookingglass Creek near the hatchery may experience temporary delays in migration due to instream barriers (Sankovich 2002, personal communication). However, total dewatering does not take place and when necessary, during the late summer, flow into the hatchery is reduced to provide sufficient flow in the river to provide for bull trout passage, while still providing a healthy environment for fish in the hatchery (Zakel 2003, personal communication).

Lostine River bull trout are mostly fluvial (migrating between tributaries and larger river systems) and may overwinter throughout the Lostine, although studies have suggested severe mortality of those fish that overwinter there (Sankovich 2002, personal communication). Spawning survey information is limited, but current populations are thought to be healthy (Zollman 2002a, personal communication; Sausen 2002, personal communication). Stream surveys conducted in 1992 indicated a low abundance of adult bull trout in the Lostine (ODFW 1995). They migrate up the river from June through August, and are in upstream tributaries in late August when temperatures exceed their tolerable limit. Generally, bull trout are upstream of river mile (RM) 10 during the warm months of the summer. Subadults will be higher upstream, seeking cooler temperatures in the summer (Sankovich 2002, personal communication). Adults may migrate downstream in late fall or early winter, before icing occurs in the upper portion of the river (Zollman 2002b, personal communication).

**Lamprey** — Pacific lamprey historically inhabited a large portion of the Grande Ronde River subbasin. Remnant populations may persist in the subbasin but their distribution and abundance are unknown (ODFW 1996). According to Jackson et al. (1996), the Pacific lamprey population in the Grande Ronde subbasin and tributaries are likely near extinction and no individuals have been captured in Lookingglass Creek during trapping operations. However, reintroduction efforts are currently proposed by several entities including BPA and the CTUIR.

Western brook lamprey are also native to the subbasin. A dead individual of this species was observed in the Wenaha River in the early 1990s (ODFW 2001). This observation suggests at least a few individuals may persist in the subbasin, although their distribution and abundance are unknown.

**Redband Trout** — Isolated populations of rainbow trout in the Grande Ronde subbasin have been identified as inland “redband” type trout. Within the Grande Ronde, Behnke (1979) suggests that redband trout represent the wild component of resident steelhead, while rainbow trout represent a hatchery lineage. As of April 20, 2000, redband trout were listed as a **sensitive species** in Oregon and managed similarly to steelhead when occurring in waters frequented by anadromous fish. Wild trout distribution surveys conducted in the Grande Ronde drainages in 1991 indicated that redband trout were widespread and abundant in all streams surveyed. According to ODFW (1995), there are six known populations of resident redband trout located in the upper East and West Forks of the Wallowa River, Hurricane Creek, Little Creek, Jarboe Creek and in Limberjim Creek.

**Rainbow Trout** — Since 1925, hatchery rainbow trout have been used to enhance fishery opportunities and harvest in the Grande Ronde River subbasin. This stocking effort supported popular trout fisheries on many subbasin streams, especially Catherine Creek and the Grande Ronde, Lostine and Wallowa Rivers. Historically, releases have consisted of fry, fingerling, and legal-size (six- to ten-inch) fish. Some streams were stocked only once and many others were stocked annually until the mid-1950s. Stocking of catchable rainbow trout has been discontinued in the Wallowa and Lostine Rivers (Buchanan et al. 1997).

In 1992, when spring/summer chinook salmon were listed as threatened under the ESA, ODFW restricted the location of rainbow trout stocking, and reduced the number of fish stocked, to avoid primary chinook salmon spawning and rearing areas. In 1997, when steelhead were listed as threatened, ODFW ceased stocking rainbow trout in all anadromous streams in the Grande Ronde subbasin (ODFW 2001).

**Kokanee** — Kokanee do not currently occur in the Grande Ronde River or its tributaries. Within the Grande Ronde subbasin, Wallowa Lake historically supported a large anadromous sockeye salmon population and continues to provide habitat for a naturally reproducing population of resident kokanee. From about 1955 to 1970, kokanee from Montana, Washington and British Columbia were planted in Wallowa Lake to supplement the existing population (ODFW 2001).

**Brook Trout** — High lakes of the Wallowa Mountains were historically stocked with brook trout. Stocked brook trout from the Eagle Cap Lake population have trickled down into some of the Grande Ronde subbasin systems, including the Lostine. Introduced brook trout pose a serious threat to bull trout populations due to resource competition and the potential for hybridization that results in sterile offspring (Leary et al. 1991). A number of stream systems within the Grande Ronde subbasin contain established populations of brook trout that have successfully hybridized with bull trout. Although competition and hybridization occur, it appears that bull trout in the Lostine are currently maintaining themselves as a genetically distinct population (Smith 2002, personal communication). There is no evidence of brook trout presence in Lookingglass Creek (ODFW 2001).

### 3.2.1.2 Grande Ronde Subbasin Project Sites

**Lookingglass Hatchery** — Lookingglass Hatchery was opened in 1982 as part of the LSRCP program to produce spring/summer chinook salmon juveniles for release in the Imnaha and Grande Ronde Rivers. Currently, the hatchery rears stock from Grande Ronde River, Catherine Creek, the Lostine River and the Imnaha River.

Upstream passage of steelhead, bull trout and spring/summer chinook is impeded by water withdrawal and instream structures at Lookingglass Hatchery. The existing intake passage system does not allow for adequate passage of adult bull trout and steelhead. The existing fish ladder system does not provide effective guidance during low flow conditions as some fish are stranded at these times. These instream passage issues are currently being discussed by LSRCP and ODFW personnel for correction as an action separate from this Proposed Action.

**Lostine Adult Collection Facility and Lostine River Hatchery** — The majority of spring/summer chinook spawning in the Lostine River occurs between RM 10 and RM 13, which is in the general vicinity of the proposed Lostine River Hatchery (near RM 12). Chinook salmon have also been observed holding and spawning in the lower reaches of the Lostine River (below RM 1.5) where spawning habitat is available (Harbeck 1998). There is spawning habitat upstream of the proposed intake structure, however, there is reduced spawner use of habitat upstream of the proposed facility location due to the presence of cobble and steep gradient (Zollman 2002b, personal communication). Late-run spring/summer chinook historically have spawned in this area (Thompson and Haas, 1960).

Natural escapement declines of the Lostine River spawning aggregate of spring/summer chinook have paralleled those of other Grande Ronde River tributaries. Redd count totals for the Lostine River have dropped substantially since the mid-1950s as shown in Table 3.2-3. However, recent (2001-2002) redd counts have shown an increase in spawners. This increase may be attributed to a variety of factors including ocean rearing conditions, juvenile outmigration freshwater conditions, harvest management, and supplementation associated with existing programs.

**Table 3.2-3. Lostine Spring/Summer Chinook Redd Counts from Various Survey Years.**

	Year									
	1957	1994	1995	1996	1997	1998	1999	2000	2001	2002
Redds Observed	893	16	11	27	49	35	57	64	131	209

Sources: ODFW (2001); Keniry (2003, personal communication).

From the data of the 1990s, co-managers determined that the Lostine River spawning aggregate of Grande Ronde River spring/summer chinook was at short-term risk of extirpation, and sought to implement the conservation and recovery program.

### 3.2.1.3 Imnaha Subbasin Overview

There are 20 native and 9 introduced fish species in the Imnaha River (Table 3.2-4; Ashe et al. 2000). Introduced species are found predominantly in the lower reaches of the Imnaha River. Currently, spring/summer and fall chinook, steelhead, and bull trout returning to the Imnaha River are listed as threatened under the ESA.

**Chinook Salmon** — In-subbasin and out-of-subbasin habitat changes and out-of-subbasin salmon harvest have reduced all Imnaha River salmon populations and extirpated or nearly eliminated certain segments of chinook salmon populations. However, as shown in Table 3.2-5, returns have significantly increased in recent years. Chinook that may have once spawned from late-September through October have probably been extirpated, and chinook populations that spawn in November have been reduced to a remnant population. Many genetic and heritable traits have likely been lost as a result. A highly variable environment challenges remaining traits, as do genetic consequences associated with small breeding populations (Bryson et al. 2001).

#### *Spring/Summer Chinook*

The Imnaha River subbasin once supported healthy runs of spring/summer chinook salmon as an estimated 6,700 adults returned to the subbasin annually (USACE 1975). Returns to the Imnaha River subbasin have declined dramatically during the past three decades. Peak escapement of spring chinook salmon to the Imnaha River was estimated at 3,459 adults in 1957; returns of natural origin fish have declined to levels below 150 individuals (ODFW 1998b). ODFW performed population modeling on the stock, based on return data from the early 1990s, and determined that without a supplementation program the natural population would continue to decline and would become extinct between 2030 and 2050 (ODFW 1998b). Recent redd counts have shown a significant increase in spawners, although the percentages of these that are wild spawners was not reported in the data (Table 3.2-5).

Members of the Grande Ronde Model Watershed Program (1994) conducted surveys along the mainstem Imnaha River to determine the cause and type of fish habitat problems within the Imnaha. The group determined that the natural dynamics of the river may preclude substantial use of the area by spring/summer chinook. A general lack of woody debris and related pool habitat partially may be due to the high hydraulic forces along the river. These conditions persist and continue to limit the amount of habitat available for spring chinook in the basin (Zollman 2002b, personal communication). Additionally, high summer water

temperatures below Freezeout Creek may restrict the upstream migration period and prevent extended summer use of the lower 30 miles of the river by juvenile chinook (Schwartzberg et al. 2001).

**Table 3.2-4. Fish Species Currently Occurring in the Imnaha River Subbasin.**

<b>Common name</b>	<b>Scientific name</b>	<b>Native</b>
Spring/summer chinook salmon	<i>Oncorhynchus tshawytscha</i>	X
Fall chinook salmon	<i>Oncorhynchus tshawytscha</i>	X
Summer steelhead	<i>Oncorhynchus mykiss</i>	X
Bridgelip sucker	<i>Catostomus columbianus</i>	X
Chiselmouth	<i>Acrocheilus alutaceus</i>	X
Longnose dace	<i>Rhinichthys cataractae</i>	X
White sturgeon	<i>Acispenser transmontanus</i>	X
Torrent sculpin	<i>Cottus rhotheus</i>	X
Leopard dace	<i>Rhinichthys falcatus</i>	X
Mottled sculpin	<i>Cottus bairdi</i>	X
Mountain whitefish	<i>Prosopium williamsoni</i>	X
Northern pikeminnow	<i>Ptychocheilus oregonensis</i>	X
Pacific lamprey	<i>Lampetra tridentata</i>	X
Rainbow trout	<i>Oncorhynchus mykiss</i>	X
Redband trout	<i>Oncorhynchus mykiss</i>	X
Peamouth	<i>Mylocheilus caurinus</i>	X
Redside shiner	<i>Richardsonius balteatus</i>	X
Paiute sculpin	<i>Cottus bidingi</i>	X
Shorthead sculpin	<i>Cottus confusus</i>	X
Bull trout	<i>Salvelinus confluentus</i>	X
Lampreys	<i>Lampetra spp.</i>	X
Largescale sucker	<i>Catostomus macrocheilus</i>	X
Speckled dace	<i>Rhinichthys osculus</i>	X
Smallmouth bass	<i>Micropterus dolomieu</i>	
Largemouth bass	<i>Micropterus salmoides</i>	
Yellow perch	<i>Perca flavescens</i>	
Sunfish	<i>Lepomis spp</i>	
Brown bullhead	<i>Ictalurus nebulosus</i>	
Common carp	<i>Cyprinus carpio</i>	
Channel catfish	<i>Ictalurus punctatus</i>	
White crappie	<i>Pomoxis annularis</i>	
American shad	<i>Alosa sapidissima</i>	

Source: Adapted from Mundy and Witty 1998.



**Table 3.2-5. Estimate of Total Spring Chinook Salmon Redds in the Imnaha River Subbasin, 1964 -1995<sup>1</sup>; 1996-2002<sup>2</sup>.**

Year	Redd Count	Year	Redd Count	Year	Redd Count
1964	496	1977	241	1990	54
1965	391	1978	715	1991	99
1966	561	1979	85	1992	118
1967	447	1980	66	1993	384
1968	507	1981	162	1994	36
1969	556	1982	225	1995	32
1970	474	1983	178	1996	125
1971	738	1984	506	1997	216
1972	626	1985	245	1998	146
1973	909	1986	207	1999	119
1974	464	1987	156	2000	261
1975	281	1988	208	2001	635
1976	280	1989	74	2002	1111

<sup>1</sup>Source: Williams et al. 1998.

<sup>2</sup>Source: Keniry (2003, personal communication)

#### *Fall Chinook*

Although fall chinook salmon are present in the Imnaha subbasin, their abundance is much less than historic levels. Anecdotal accounts suggest that fall chinook may have used the lower 19.5 miles of the Imnaha mainstem for spawning, and generally did not occur above the town of Imnaha (Chapman 1940 as referenced in Bryson et al. 2001). Others contend that fall chinook spawning occurred as far upstream as the confluence of Freezeout Creek (Mundy and Witty 1998 as referenced in Bryson et al. 2001).

Documented occurrence of fall chinook spawners within the lower Imnaha have been shown through redd surveys since 1964. No occurrence of fall chinook spawning above Fence Creek has been observed in recent decades (Bryson et al. 2001). Due to the low escapement, the contribution of natural spawning to annual recruitment has not been demonstrated (Chapman and Witty 1993).

There is no fall chinook artificial production in the Imnaha River basin.

**Steelhead** — Steelhead population distribution in the Imnaha subbasin is generally similar to historic conditions. Although actual historic escapement data does not exist, it is estimated that prior to the construction of the four lower Snake River dams, up to 4,000 summer steelhead returned to the Imnaha subbasin annually (USACE 1975). In the absence of historic distribution data, it is difficult to determine which streams were inhabited by summer steelhead. However, the lack of residual rainbow trout above Imnaha Falls (RM 73) suggests that steelhead were likely restricted to all accessible areas downstream from this probable migration barrier (Mundy and Witty 1998, as referenced in Bryson et al. 2001).

Annual steelhead spawning surveys in the Imnaha are limited (U.S. Forest Service 1998a; 1998b). Current escapement estimates are based on data collected in Camp Creek, a tributary to Big Sheep Creek. Annual escapement of wild/naturally spawning fish has declined over the past three decades with recent estimates ranging from 300 to 1,000 adults (Bryson et al. 2001).

Currently, Imnaha steelhead maintain widespread distribution throughout most of the subbasin, and generally occur in all tributaries that do not have vertical falls near their mouths (Mundy and Witty 1998 as referenced in Bryson et al. 2001). About 397 river miles of summer steelhead spawning and rearing habitat have been identified in the Imnaha subbasin (U.S. Forest Service 1998a; 1998b).

Imnaha steelhead overwinter in the Snake River and move up the Imnaha during spring runoff conditions (March – April), when flows are at their peak. Juvenile out migrations are also driven by increased flows in spring, but juveniles may move up and down tributaries of the Imnaha at any time of the year, with pulses occurring in late summer. There is not a significant number of steelhead that overwinter in the Imnaha (Sankovich 2002, personal communication).

**Bull Trout** — In 1998, the USFWS listed the Klamath and Columbia River DPS of bull trout as threatened. Bull trout are currently listed as a species of critical concern in Oregon. Historical information regarding Imnaha River bull trout populations is limited. Unlike other salmonids, it is doubtful that bull trout occupied all accessible streams at any one time (U.S. Forest Service 2000), due to their current patchy distribution in even pristine, “stronghold” habitat types (Rieman and McIntyre 1995).

Both resident and fluvial forms of bull trout occur in the Imnaha subbasin. As with Grande Ronde bull trout, waterfall barriers usually isolate resident forms. Generally, most individuals that occur above Imnaha Falls are considered residents, while those occurring below the falls are considered fluvial (U.S. Forest Service 2000).

In the Imnaha River, bull trout populations are considered at “low risk” (Buchanan et al. 1997). Fluvial bull trout migrate upstream in June through August to escape summer warm waters and head to cooler spawning grounds. By September, most bull trout are upstream of the Imnaha Satellite Facility at unknown spawning sites where they often hold at the mouth of tributaries and wait for temperatures to drop to 7-9°C (Hanson 2002, personal communication). They out-migrate from their spawning areas in late September through November and head downstream, most likely overwintering in portions of the Imnaha, Grande Ronde and Snake rivers. Subadults, about two-three years of age, move out of the areas where they were spawned and move to overwintering sites, possibly within the Snake River (Sankovich 2002, personal communication).

**Lamprey** — Although lamprey abundance has dramatically declined in recent decades, not all Lampetra species have been extirpated from the subbasin. A population of non-anadromous brook lamprey occurs in portions of the Imnaha subbasin (Sankovich 2002, personal communication).

Numerous ODFW biologists have stated that, prior to the 1970s, Pacific lampreys existed in large numbers within the Imnaha subbasin (Jackson et al. 1996). Pacific lamprey populations went through a rapid decline after 1970, primarily due to human induced habitat degradation, over-fishing and the installation and operation of the hydroelectric dams that may have impacted adult migration and juvenile outmigration. Currently, Pacific lamprey is federally listed as a species of concern, but is considered extinct in the Imnaha subbasin (NPT 2001).

**Redband and Rainbow Trout** — It is likely that endemic populations have been steadily declining for decades due to habitat degradation from improper livestock grazing practices, stream channel manipulation and timber harvest (all of which tend to increase erosion, sedimentation and stream temperature as well as decrease the amount of large woody debris, stream bottom complexity and riparian vegetation). Additionally, **introgression** with hatchery rainbow trout and competition from introduced fish threaten the continued viability of redband trout in the Imnaha (Behnke 1992). As in the Grande Ronde subbasin, rainbow trout stocking in the Imnaha region has been reduced over the years due to concerns for competition with spring/summer chinook and concerns over potential redband introgression and subsequent genetic loss.

**Mountain Whitefish** — Information regarding mountain whitefish within the Imnaha subbasin is limited, but populations are likely doing well (Bryson et al. 2001). Mountain whitefish are members of the Salmonidae family and are closely related to salmon and trout. Indigenous to eastern Oregon, Mountain Whitefish are still found in their original distribution pattern, except where areas were chemically treated (ODFW 1996).

These fish have been an important food fish for humans and provide a variety of angling opportunities (ODFW 1996).

**White Sturgeon** — White sturgeon, a federally listed species of concern (Columbia Basin Fish and Wildlife Authority [CBFWA] 1999), occasionally use lower portions of the mainstem Imnaha (Wallowa County and NPT 1993) but do not likely inhabit the river for extended periods (Bryson et al. 2001).

**Smallmouth Bass** — The introduction of smallmouth bass into the Hells Canyon Hydroelectric Complex was accompanied by a subsequent expansion of the fishery into free flowing reaches of the Snake and Imnaha Rivers (U. S. Forest Service 1999). The development of the smallmouth population in free flowing environments warrants concern due to the fish eating and competitive behavior smallmouth exhibit toward salmonid species, particularly bull trout (Bryson et al. 2001).

### 3.2.1.4 Imnaha Subbasin Project Sites

**Imnaha Final Rearing Facility and Imnaha Satellite Facility** — Currently, most spring/summer chinook within the Imnaha subbasin spawn in the mainstem Imnaha from the Blue Hole to Crazyman Creek. These sites are upstream and downstream, respectively, of the existing Imnaha Satellite Facility. Some individuals have been observed spawning as far upstream as the lower reaches of the South Fork and as far downstream as Freezeout Creek (Witty 1964-1990).

A few spring/summer chinook salmon are known to spawn in Big Sheep and Lick Creeks. Most spawning in Big Sheep Creek occurs from RM 29.4 to RM 33.4. The majority of spawning in Lick Creek occurs in the lower 2.3 miles (Bryson et al. 2001; Smith 2003, personal communication).

## 3.2.2 Impacts Evaluation Summary

Impacts caused by specific activities are summarized and defined as either short-term or long term. Criteria used to define these impacts are:

- Short term impacts – those activities/operations that will disturb habitat, individuals and populations over a short temporal scale.
- Long-term impacts – those activities/operations that are anticipated to have effects to habitat, individuals and populations over a long-term temporal scale, potentially extending through the length of the project.

Where appropriate, impacts are evaluated over a spatial scale.

Since the spring/summer chinook life cycle spans across different ecosystems and subsequently, different locations over time, impacts were evaluated within different geographical and temporal scales. Some impacts, such as those related to construction of the facilities, are limited to the facility sites. Other impacts would be distributed over larger geographic areas. The impacts were evaluated for the following fish categories:

- Targeted chinook – those hatchery chinook produced by the NEOH program and the wild populations from which they are drawn or introduced.
- Non-targeted chinook – non-NEOH chinook originating within and outside the Grande Ronde and Imnaha subbasins encountered during out migration, in the ocean, or on the return to freshwater.

- Other salmonids and trout – steelhead, bull trout, cutthroat trout, and brook trout in the river systems occupied by the NEOH spring/summer chinook.
- Non-salmonids – all other fish species in the river systems occupied by the NEOH spring/summer chinook.

### 3.2.3 Consequences of the Proposed Action

#### 3.2.3.1 Grande Ronde Subbasin

Table 3.2-6 summarizes the impacts on targeted chinook, non-targeted chinook, other salmonids and non-salmonids for construction, operations and ecological interactions as a result of implementing proposed projects in the Grande Ronde subbasin.

**Table 3.2-6. Summary Results of Impacts for NEOH Program Proposed Action Components within the Grande Ronde Subbasin, including Lookingglass Hatchery, the Lostine Adult Collection Facility, and the Lostine River Hatchery.**

Construction/ Operational Component	Fish Category			
	Targeted spring/ summer chinook	Non-Targeted chinook	Other salmonids	Non-salmonids
<b>Siting and Construction of Facilities</b>				
Site Disturbances	<p>Impacts due to upland and in-water site disturbances from construction would have similar impacts to all fish species that may be present. Construction site disturbances are not anticipated to negatively affect population viability on a watershed scale. However, impacts to individuals may occur as a result of construction activities.</p> <ul style="list-style-type: none"> <li>• Sedimentation due to construction may impact water quality. Impacts would be temporary and short-term.</li> <li>• Increased impervious surface area may result in increased runoff. Impacts would be long-term but limited in spatial scale to the immediate receiving waters.</li> <li>• Construction noise may disturb individuals, causing them to disperse from the site. Impacts would be temporary and short-term.</li> <li>• Removal of <b>riparian habitat</b> may result in decreased shading habitat, which may displace individuals. Impacts would be long-term but limited in spatial extent.</li> </ul>			
Channel Alterations	<p>Impacts due to instream construction activities would have similar impacts to all fish species that may be present. Placement of permanent instream structures would result in a permanent loss of small amounts of instream and riparian habitat.</p> <ul style="list-style-type: none"> <li>• Cofferdams would alter stream flow upstream and downstream of the structure. Alterations may affect utilization of the immediate area by fish species, including migrating salmonids. Cofferdam placement would directly reduce instream habitat available in the immediate vicinity of the construction site. Impacts would be short-term and limited in spatial scale to the site and construction impact area.</li> <li>• Increased human presence and activity may disturb fish species and cause them to disperse from the immediate construction area. Impacts would be short-term and limited in spatial scale to the site and construction area.</li> <li>• Placement of intake, outfall, weirs, ladders and riprap structures would alter or remove instream habitat, causing individuals to seek other available rearing, holding, or migratory habitat. Impacts would be long-term, but limited in spatial scale and are not anticipated to affect population viability.</li> </ul>			

Construction/ Operational Component	Fish Category			
	Targeted spring/ summer chinook	Non-Targeted chinook	Other salmonids	Non-salmonids
<b>Siting and Construction of Facilities</b>				
Water Gains and Losses	<ul style="list-style-type: none"> <li>Although water diversions would be non-consumptive, all species may be affected by withdrawals. Withdrawals would reduce instream habitat availability and may result in decreased utilization within the diversion reach during peak diversions and instream low-flow conditions. To protect in-stream habitat, minimum or acceptable flow, or pump-return, strategies have been developed for the facilities.</li> <li>These impacts would be long-term but limited to the immediate diversion reaches. Withdrawals may affect individuals but are not anticipated to affect the population viability on a watershed scale.</li> </ul>			
Water Quality	<ul style="list-style-type: none"> <li>Discharged organic waste materials or chemical therapeutants would meet applicable state or federal standards. The potential for long-term impacts due to these discharges is therefore low.</li> <li>Water temperature of discharge water would be at ambient temperature. No impact to individuals or populations is anticipated to occur.</li> </ul>			
Fish Traps, Ladders, and Weirs	<p>Individuals and the populations would benefit in the long-term from improved passage and collection facilities. Individuals may be delayed in upstream and downstream migration by the new ladder at the Lostine Hatchery intake site. Individuals and populations are anticipated to benefit from improved passage to the Adult Collection site versus the no action – existing condition alternative. Effects would be long-term.</p>	<ul style="list-style-type: none"> <li>Individuals would be impacted by installation of weirs, ladders and traps within the Lostine River. Although species would likely pass upstream or downstream through the ladders with little difficulty, some delay is anticipated, and handling, when it occurs, may stress individuals.</li> <li>Improved upstream passage is anticipated to occur at the Adult Collection site. Downstream passage would improve as compared to existing conditions during extreme low flow conditions as water would be consolidated and routed through the ladder maintaining deeper flowing water.</li> <li>Effects at the Adult Collection site would be long-term over a limited spatial scale of the Lostine River. Individuals and populations are anticipated to benefit from the proposed action over the no action – existing condition alternative.</li> </ul>		
Broodstock Collection and Maintenance	<p>Spring chinook would benefit in the long-term from improved broodstock collection and holding facilities, resulting in less stress and pre-spawning mortality than obtainable with existing facilities.</p>	<ul style="list-style-type: none"> <li>Non-target individuals may be affected over the long-term by additional handling associated with broodstock collection handling and sorting.</li> <li>Negative impacts to population viability over the long-term are not anticipated.</li> </ul>		

Construction/ Operational Component	Fish Category			
	Targeted spring/ summer chinook	Non-Targeted chinook	Other salmonids	Non-salmonids
Siting and Construction of Facilities				
Incubation and Rearing Practices	Decreased rearing densities and reduced hauling trips/time would be beneficial for NEOH spring chinook over the long-term. It is anticipated that increases in survival and improved <b>homing</b> to natal streams would occur. Population viability is anticipated to increase in the long-term.	No impact	No impact	No impact
Fish Health Maintenance	<ul style="list-style-type: none"> <li>Intensive fish health monitoring strategies would benefit all salmonids over the long-term and result in less potential for the spread of disease.</li> <li>Decreased rearing densities would benefit individuals over the long-term by reducing the potential for the spread of disease within the hatchery population and, in turn, wild salmonid populations.</li> </ul>			No impact

**Lookingglass Hatchery** — Currently, Lookingglass Hatchery (shown in Figures 2-2 and 3.9-1) rears stock from the Grande Ronde River, Catherine Creek, the Lostine River and the Imnaha River. Under the proposed program, production would remain the same for Catherine Creek and Grande Ronde stocks, but the Lostine stock would no longer be transferred to Lookingglass for spawning. Some portion of the Imnaha stock may continue to be reared at Lookingglass under the “spread the risk” approach to offset a facility-wide disease or system failure, should it occur, but the majority would be reared elsewhere.

With the implementation of the Proposed Action, the number of smolts reared at Lookingglass Hatchery would decrease, providing more rearing space and better rearing densities, and ability to meet NATURES criteria. Overall impacts of the proposed improvements at Lookingglass Hatchery are beneficial to spring/summer chinook with no impact to low impact to water quality, quantity and other species.

#### *Site Disturbances*

Modifications to existing facilities at Lookingglass Hatchery (building improvements and construction, upgrades to power supply, and new raceways) would involve upland work that would take place where ground has previously been disturbed within the existing site boundary. Construction of three raceways against the toe of a banked hill east of the existing raceways would entail excavation, which would result in the removal of some herbaceous vegetation. The removed soil would be used elsewhere on-site.

These modifications would disturb the ground and increase the amount of impervious surface area at the site. Silt erosion control devices would be used during construction of the bay pole building. Construction

activities would occur away from the creek bank and any increase in sediment due to upland site disturbance would be minimal and temporary and is not expected to exceed the creek's sediment load capacity.

An additional power line would be installed on existing poles along the access road adjacent to the creek, and may result in temporary disturbance to the normal activity of salmonid and resident fish individuals within the creek, both adjacent to and downstream from the site. This activity is not likely to impact population viability.

Upland construction at the facility would be scheduled around facility operations to minimize hatchery fish disturbance.

#### *Channel Alterations*

No instream construction is proposed.

#### *Hatchery Operations and Management*

Water Gains and Losses: Lookingglass Hatchery has an existing water right for diversion of up to 42 cfs from the creek. Currently, peak use does not exceed 35 cfs (Lund 2003, personal communication). Water management practices and fish production changes with the proposed program could potentially reduce the surface water demand from Lookingglass Creek. Therefore, there would be no additional impact to the existing water balance at Lookingglass Hatchery.

Water Quality: Modifications to Lookingglass Hatchery would not alter existing water quality conditions. The amount of effluent could potentially decrease if fewer fish are reared at the facility, resulting in less discharge of wastewater from the facility. Facility discharges would continue to satisfy existing NPDES permit requirements.

Fish Traps, Ladders and Weirs: No modifications to existing fish ladders or weirs are proposed. Existing passage issues for salmonid species would be addressed under a separate project. Trapping, handling and tagging fish may result in mortalities, but these are not expected to exceed current mortality rates at the hatchery.

Broodstock Collection and Maintenance, Adult Holding and Spawning, Incubation and Rearing, Fish Health Management and Methods and Magnitude of Release: The Lookingglass Hatchery is an existing facility that has been in operation since 1982. Methods of broodstock collection, adult holding and spawning, incubation and rearing practices, and release methods are described in the HGMP for Grande Ronde Basin Spring/summer Chinook Program (ODFW 2002). Modifications to the existing facility would not result in additional impacts to spring/summer chinook populations. The modifications would generally benefit the target species by allowing the implementation of practices that are reflective of NATURES criteria.

To more accurately describe the NATURES criteria incorporation, items proposed for implementation include:

- Provide for low-density rearing.
- Design lighting system to mimic photoperiods in the early rearing building. This would be accomplished by using a combination of special lighting and windows.
- Use a dark color for the early rearing troughs.
- Provide automatic feeders.
- Limit human contact.

- Incorporate natural diet training such as live food introduction to the rearing vessel.
- Provide structure in the raceways to support introduction of natural cover such as Christmas trees or tree branches.
- Provide baffling to create varying flow patterns and backwater conditions.
- Incorporate system to allow varying degree of sunlight penetration to the water surface.
- Provide coloring of the final rearing raceways concrete to mimic the natural riverbed colors to the degree feasible.
- Provide volitional release from each final rearing raceway.

As the design process proceeds, the hatchery managers (tribal and agency project sponsors) would continue to monitor other facilities, which have implemented NATURES criteria and take advantage of the experience and findings at these proposed facilities.

**Lostine Adult Collection Facility** — Modifications to existing facilities and construction of new structures at the Lostine Adult Collection Facility (Figures 2-3 and 3.9-2) would involve mostly instream and riverbank work that would have physical impacts related to channel alterations to improve the fish ladder passage system.

#### *Site Disturbances*

Site disturbances would result in the removal or disturbance of about 300 feet of riparian vegetation on the west bank of the Lostine Adult Collection Facility site and placement of fill and riprap to construct a levee. Existing side channels that occur west of the proposed levee site would be routed under the levee (with french drains) for continued discharge into the Lostine River. A temporary access road to the levee site may also be required.

Best management practices to reduce sedimentation from construction activities are incorporated into the Proposed Action. However, construction activities may still result in a temporary increase in sediment and runoff to the Lostine River. According to Waters (1995), most such construction projects, done essentially at a point on a stream, will have temporary effects. If subsequent flows within these river systems are high enough to scour away light deposits, as is the case in the Lostine, invertebrates and fish will generally repopulate quickly (Waters 1995). The anticipated amount of sedimentation would not alter the channel configuration or exceed the river's ability to carry sediment. A river's ability to carry sediment depends on two things: competence and capacity. Competence is the ability of a stream to move large particles and depends on velocity. Capacity is how much load a stream can carry and depends on discharge of stream.

In each case of facility construction, the subject rivers are likely capable of carrying the estimated sedimentation from construction activities downstream through flow predicted during the proposed construction windows (this prediction is simply based on recorded Mean Monthly Flows). If sedimentation exceeds the stream's ability to carry and disperse it downstream, it will settle out and may cause increased impacts until the next high flow event. Excess sediments will be washed downstream following the first storm event.

#### *Channel Alterations*

Instream work to remove portions of an existing fish ladder; install a hydraulic velocity barrier and fish ladder, trap and hopper; place large rocks for channel protection; and replace the existing bridge and abutments would result in alterations to the existing channel. All instream work would take place in one construction season during ODFW's instream work window of July 1 – July 31.



Installation of the new fish ladder and trap would require the placement of a cofferdam, and associated dewatering structures to isolate the construction area. Portable pumps would maintain a dry work area and pump discharge would be routed through an upland sediment-settling basin prior to discharge into the Lostine, downstream of the construction site. Installation of the new ladder would occur on the west bank of the Lostine, behind an existing riprap bank. Excavation of a portion of the west riverbank would be necessary to install the new fish ladder.

Removal of both the most upstream and downstream existing concrete sills would be accomplished with a backhoe mounted jackhammer, followed by removal with an excavator. Jackhammer use would produce noise and inwater vibration that may disrupt fish behavior or displace species both upstream and downstream of the area. The remaining sills would be kept in place and allowed to fill naturally with river bedload gravel over time would create a more natural **substrate** for fish species.

During construction of the velocity barrier, most of the river water would be routed through the new fish ladder (during operation, the ladder would pass most water during low flow periods in August and September; water would flow instream during higher flows). Installation of the flow velocity barrier would require the construction of concrete walls and removal of about 20 feet of the bank, including a small amount of existing riparian vegetation. The impact of riparian vegetation removal on shading habitat is expected to be minimal because the majority of canopy trees would remain in place and much of the area to be disturbed has been previously riprapped. Installation of the velocity barrier and levee would have minimal impact on river hydraulics, both upstream and downstream from the site. The proposed levee and velocity barrier would not affect the overall river hydrograph.

The proposed levee, composed of fill and riprap, would be constructed on the west bank of the river to protect the bank and site from damage during high flows and to minimize erosion. Construction of the levee would isolate small side channels returning to the Lostine in this area. French drains would convey river and on-site spring water to the Lostine River, but habitat for juvenile chinook (and potentially bull trout) would be lost. The amount of habitat loss would not impact the populations of listed species within the watershed.

Cofferdam placement and use of the new fish ladder for passage would result in a temporary reduction in available habitat for fish that reside within the river or that are migrating upstream or downstream during the construction period. Diverted flow is not expected to affect water temperatures. Adult steelhead overwinter in the Snake and lower Grande Ronde and migrate up the Lostine in March and April, while juveniles emigrate in late spring (Sankovich 2002, personal communication). While most adult steelhead would therefore not be impacted, potential **kelt** downstream migrants may be affected by construction activities. Rearing juvenile steelhead move up and down the Lostine at all times of the year, with pulses occurring in spring, outside of the construction window. Both adult and juvenile chinook use the Lostine during summer months when instream work would occur. Adult bull trout are known to migrate up the Lostine in June through August, during the proposed instream work window. Smolt emigration occurs in late fall, and would not be impacted by instream construction. Delays to chinook and bull trout passage may occur both upstream and downstream of the site due to the presence of the cofferdam and rerouting of river flow. Daily monitoring during construction activities would determine if salmonid passage, both upstream and downstream of the cofferdam, is impacted by activities. If adverse impacts to passage are observed, fish biologists would consult with federal and state fisheries managers to determine an appropriate action to assist in the passage of individuals. This may include manual transfer of fish to areas upstream or downstream of the construction area. Impacts would be temporary and would be limited to one instream work window.

#### *Hatchery Operations and Management*

Water Gains and Losses: During operation of the collection facility, no Lostine River water would be permanently diverted. Water losses and gains would remain the same as existing conditions after installation of the new fish ladder, levee and flow velocity barrier. However, during periods of low flow (September,

near the end of operation), most river water would be diverted through the fish ladder. This could potentially impact species use at the reach as usable habitat would be altered for a short river segment, extending approximately 150 feet from the centerline of the entrance to the centerline of the release channel. The release channel is extended upstream of the velocity barrier crest to ensure that the release point is far enough upstream to prevent fallback over the barrier.

Water Quality: Because the proposed adult collection facility's function is to collect fish and not to hold and rear, no discharges of organic or chemical pollutants are anticipated. Sediment from the fish ladders would be removed and disposed of at appropriate upland locations.

Fish Traps, Ladders and Weirs: The fish ladder, trap and hopper would be equipped so that managers may collect returning hatchery adults on an as-needed basis. The take rate within the Lostine River is on a sliding scale, based on the number of returning adults in that season. The Lostine Collection Facility would be in operation from early April through September and the trap would be checked daily. The exit from the ladder would be far enough upstream to prevent the majority of adults from dropping back over the velocity barrier, requiring them to pass through the collection system/ladder again. Non-targeted salmonids such as steelhead and native trout would be released from the traps and allowed to continue upstream within 24 hours of trapping. Trapping, holding, weighing, measuring and tagging trapped fish could result in some mortality, but occurrences are isolated and not expected to impact spring/summer chinook populations within the river. At the end of adult collection, the trapping equipment would be removed and the structure would function only as a ladder for fish passage.

During periods of critical low flow, all Lostine River water would be diverted through the ladder, which may impact fish use and behavior. Juveniles may be present for rearing upstream or downstream of the facility and may be impacted during low flow periods. During periods of critical low flow most river water would be diverted through the collection ladder. This could alter the way in which fish use this section of the river. Behavior may be altered as some fish may be delayed in seeking the ladder entrance, however, attraction flow should minimize disruption of upstream movement by allowing fish sufficient flow and depth for migration. Passage of adults would be improved using the new ladder system as opposed to the existing system that operates ineffectively in periods of low flow. Juveniles, if they are present at this time, would seek the main flow of the river and would pass downstream through the ladder. Some temporary delay may occur as fish encounter the ladder structure but it is anticipated that flows would sweep them through the ladder for continued migration.

A potential risk of the velocity barrier is to change the habitat use of spawning salmonids. The velocity barrier and trap facilities have the potential to impede or delay spawning migrations of bull trout and chinook and potentially cause fish to spawn below weir sites. There is limited available spawning habitat downstream of the weir site, with most of the prime spawning habitat located upstream. However, the velocity barrier is anticipated to enhance fish passage for all species over a wider range of river flow conditions. To minimize outmigrant effects, the flow velocity barrier would maintain a pool depth of about three feet and river flow would pass through the ladder. To ensure protection of fish species, the Proposed Action includes daily monitoring of the barrier, when in operation. Additionally, cleaning of weirs and checking downstream areas for remnant spawners is included in the Proposed Action. Close monitoring of spawning distribution above and below the weirs would be part of the NPT's on-going annual spawning surveys. Adjustments to adult collection strategies would occur if adult distribution becomes a problem (BIA 1998). Strategies to improve distribution of spawners may include decreasing the number of spawners collected, which would in turn affect that season's production.

Broodstock Collection: Fish that are trapped for broodstock would be hauled by a tanker truck upstream to the proposed Lostine River Hatchery for spawning. Since this facility would function only as a collection

site, no other production operations apply. Collected spawners would be transferred about four miles upstream to the proposed Lostine River Hatchery.

**Lostine River Hatchery** — The proposed Lostine River Hatchery (Figures 2-4 and 3.9-3) would fully support the Lostine River spring/summer chinook program by holding 250,000 Lostine River smolts from spawning through final rearing and release. Additionally, the hatchery would be designed to hold 100 percent of the Imnaha River spring/summer chinook program (490,000) from incubation to early stages of final rearing in September. For the initial years of the program, a portion of the Imnaha stock may be reared at Lookingglass. The facility would be designed so that the Imnaha stock would be reared at the Lostine River Hatchery once the facility has been successfully operational. See Table 3.2-7 for timing details for the proposed program. One benefit of the use of a hatchery on the Lostine is decreased hauling time for fish transported from Lookingglass. Under the current program, fish are transported four times with an estimated transport time of 14 hours. The fish are moved at critical life stages such as adults and as unfertilized eggs where higher rates of mortality have been observed. With the proposed program and the new facilities, the fish would be transported three times with an estimated transport time of five hours. The adults would be trapped, held, and spawned at the Imnaha Satellite Facility. Incubation to **eyed egg** stage prior to transport to the Lostine Hatchery would also occur. The length of transport time is significantly reduced since the fish are not moved outside Wallowa County.

**Table 3.2-7. Lostine River Hatchery Conventional Broodstock Program for Lostine and Imnaha River Stocks (Operated Year-Round).**

<b>Lostine Stock</b>		<b>Imnaha Stock</b>	
<b>Life Stage</b>	<b>Time Period</b>	<b>Life Stage</b>	<b>Time Period</b>
Fish collected at Lostine Adult Collection Facility	High flow collection from May – August 1 Low flow collection 15 July – October 1	Fish collected, held and spawned at Imnaha Satellite Facility	June - September
Lostine adults transferred, held and spawned at Lostine River Hatchery	May – October 1	Transport of Imnaha Satellite eyed eggs to Lostine River Hatchery	October - November
Incubation of Lostine stock eggs	August - February	Incubation and early rearing at Lostine River Hatchery	November - April
Final rearing of Lostine stock	April (year 1) – April (year 2)	Intermediate rearing	April – September (year 2)
Acclimation and release of Lostine stock	April (year 2)	Transfer of smolts to Imnaha Final Rearing Facility for final rearing prior to release from Imnaha Satellite	September (year 2)

*Site Disturbances*

Construction of the Lostine River Hatchery would have physical impacts that relate to site disturbances, channel alterations, and the placement of water intake, conveyance and discharge structures on previously undeveloped land. Construction activities would disturb the ground and add about three acres of impervious surfaces to the site, which may lead to increased or rerouted runoff and sediment carried into the river.

Increased runoff is expected to be short-lived and is not anticipated to exceed the river's ability to carry sediment or to change the river's substrate. Erosion at the hatchery site is expected to be minimal due to the relatively flat topography. Most upland construction activity would occur away from the river channel and would be managed by the use of erosion control devices, removal of the least amount of vegetation possible and revegetation of the site immediately following construction. Site disturbances may temporarily affect fish behavior and individual distribution during the construction phase. These affects are anticipated to be minimal and short-lived.

#### *Channel Alterations/Water Intake and Discharge Structures*

The Lostine River channel would be affected by the installation and placement of a surface water supply intake weir diversion structure and a fish ladder and outfall structure and riprap as described in Section 2.1.1. Construction and installation of in-water structures would take place over two seasons during ODFW's instream work window of July 1 – July 31. During the first season, the intake structure, fish ladder and associated pipeline would be installed. In the second instream work season, the weir would be constructed.

Installation of the intake would require construction of a cofferdam and the use of a dewatering system. The river would be diverted to allow for fish passage. About 100 feet of the riverbank would be removed for the placement of the intake, screens, fish ladder and pipeline. Riprap would be placed instream to stabilize the river channel around the intake and to minimize sedimentation. Upon completion of the intake and ladder, the cofferdam would be removed. Limited removal of overhead shading vegetation would occur during this process.

The weir would be installed during the project's second year instream work window. This structure would operate to pool water upstream of the intake to provide adequate water depth for the intake screens. To install the weir, a temporary cofferdam would be placed in the river to direct water into the previously constructed fish ladder. Large riprap and bolted anchors would be placed on the river bottom to help stabilize the substrate and the weir.

Construction of the outfall structure would require the excavation of about 150 cubic yards of bank material. About 35 cubic yards of basin cobbles would be placed around the outfall to stabilize the structure and prevent erosion and sedimentation. Operational scouring is not expected to be significant since the maximum outfall would not exceed 15 cfs, which is well within the channel's capacity (McMillen 2002, personal communication). River rocks occur under a thin layer of sediment and would provide a naturally occurring non-erosive substrate at the outfall. The outfall would be equipped with one-inch bar racks to prevent returning adults, which may cue into the hatchery discharge, from entering the outfall pipe. The velocity of the discharge would be too high for juveniles to enter the outfall pipe (McMillen 2002, personal communication).

Fill and riprap would be placed upstream and downstream within an existing meander side channel to protect the hatchery from flooding events that may cause bank erosion. The riprap would be placed stream-side of existing vegetation. In-channel habitat would be slightly altered, but original meanders would be maintained and riprap placement is not expected to affect instream flow or habitat use.

About 100 to 150 feet upstream and downstream of the river bank adjacent to the most northern well would be riprapped for flood protection and erosion control. This portion of the bank is prone to erosion and riprap would stabilize the channel at that section. Riprap would be placed on top of weedy herbaceous vegetation that does not currently function as shading habitat.

During construction, fish that inhabit the immediate area, including juvenile salmonids, may be displaced, and some mortality may occur, but it is unlikely. Juvenile bull trout would likely be farther upstream in July to avoid warm river temperatures, although both adult and juvenile bull trout are known to use this stretch of the

Lostine in the summer. As discussed in the Lostine Adult Collection Facility construction section, passage of migrating bull trout and chinook may be impacted temporarily during the July instream work window. Locally spawning chinook generally do not enter the area until later in the summer, but juvenile chinook are known to use this stretch of the Lostine in the summer. Summer steelhead complete spawning by July, and downstream moving kelts may be impacted.

Alterations to the river's hydrology due to placement of instream structures may occur, but would affect minimal amounts of habitat and are not anticipated to affect flow within the river. Rerouted water flow during construction is not anticipated to affect ambient water temperatures. Long-term impacts may include behavioral modifications and changes in the distribution of individual fish due to changes in upstream and downstream hydrology.

The amount of riparian vegetation to be removed at the intake, outfall and side-channel is not significant in relation to the amount of riparian habitat available upstream and downstream of the proposed facility site. Riparian vegetation at the side channel improvement location is limited to low-growing shrubs and herbaceous vegetation, which do not provide significant shading benefits. A limited number of trees may be removed from the outfall location. Fish would likely relocate to areas adjacent to the project site that have suitable riparian vegetation cover.

#### *Hatchery Operations and Management*

**Water Gains and Losses:** The Lostine River Hatchery would be in operation year-round. Surface water requirements for the facility are shown in Table 3.2-8. Diversion of surface water from the intake to the outfall structure would take place over a linear distance of 2,800 feet. For an average year, there appears to be adequate flow in the Lostine to accommodate hatchery demands, while leaving no less than 75 percent of the flow in the river. However, during dry and/or cold years, water demand of the hatchery may be 50 to 60 percent of the total flow in the river. Instream Flow Incremental Methodology (**IFIM**) studies have indicated that at low flow, summer conditions (September), the minimum hatchery flow requirement is 11.5 cfs, which represents about 22 percent of the average flow in September and 50 percent of the September low flow (Mongomery Watson Harza 2001a). This amount of diversion is necessary to support the hatchery during low flow periods and could potentially result in a decrease in the amount of instream habitat available.

Rearing juvenile anadromous salmonids, particularly steelhead and chinook, and resident species may use the reach during low flow periods and may therefore be affected by withdrawals. It is not likely that anadromous adults would be migrating upstream or downstream during September (Sankovich 2002, personal communication). Although prime chinook spawning habitat occurs just downstream of the proposed hatchery, where intake water would be returned to the river, local spawning habitat extends into the diversion reach (Zollman 2002b, personal communication; McMillen 2002, personal communication). Therefore, spawning chinook and their redds could potentially be affected by low flow. Juvenile bull trout and rapid turnaround spawners may out-migrate in September, but would likely remain higher upstream until Lostine River temperatures drop. Adult steelhead would be in the Snake River or arriving in the lower Grande Ronde during September (for overwintering) and would not likely be in the Lostine during that low flow period.

Low flows in the winter months are also a concern, since freezing temperatures and a lack of runoff can drop the river stage to 25 cfs or less. During these periods, water consumption at the hatchery can be reduced because fish activity and growth is near zero due to the cold water temperatures. To meet instream flow requirements for the bypass reach, the minimum water budget shown in Table 3.2-8 would be implemented in low flow years and/or hatchery effluent would be pumped back to the hatchery intake to supplement instream flows in the Lostine River. Freezing at this section of the Lostine River is an existing limiting factor for salmonid use during winter months.

**Table 3.2-8. Surface Water Minimum Flow Strategy, Acceptable and Preferred Flow Index, and Mean Monthly Streamflow (cfs) for the Lostine River Hatchery.**

	Jan	Feb	Mar	Apr	May	Jun	Mid Jul	Jul	Aug	Mid Sep	Sep	Oct	Nov	Dec
Minimum <sup>1</sup> flow strategy	2.5	2.7	2.7	3.1	0.9	2.4	3.7	7.0	11.2	11.5	3.9	2.6	2.2	2.0
Acceptable <sup>2</sup> flow index	6.2	6.7	6.7	8.2	0.9	4.6	7.0	14.4	14.3	15.3	7.5	6.2	6.2	6.2
Preferred <sup>3</sup> flow index	10.7	10.7	10.7	13.6	2.2	8.2	10.5	15.2	14.4	15.5	10.1	9.4	9.4	9.4
Mean Monthly Streamflows <sup>4</sup>	49.7	47.6	55.4	162	514	787	NA	384	86.4	NA	50.3	56.6	64.4	58.9

<sup>1</sup>Minimum flow strategy: minimum water required to maintain fish during low river stages.

<sup>2</sup>Acceptable Flow Index: provides an adequate rearing/holding environment based on NATURES technical memorandum

<sup>3</sup>Preferred Flow Index: provides an improved rearing/holding environment through higher turnover rates.

<sup>4</sup> Source: USGS 2003. USGS Gauge No. 13330000 on the Lostine River near Lostine, Oregon, water years 1912 - 2001.

In order to minimize instream impacts during low flow conditions within the bypassed river reach, a pump station would be installed to pump the hatchery effluent back, along with supplemental well water, to the intake. The pumped flow would be introduced at the bottom of the fish ladder to return river water near the point of diversion. The pump station has been sized so that, when low flow management strategies are implemented, it could transport the entire diverted flow back to the intake location. Therefore, flow alterations would not likely affect the viability of any fish population currently present, near or downstream of the Lostine River Hatchery at any time.

If the upstream intake structure cannot supply enough water for hatchery operations due to low flow or icing conditions, an emergency intake pump would be used near the north well location. The Lostine River does not regularly freeze in the vicinity of the north well (Zollman 2002b, personal communication) and surface water could be available for diversion year-round.

Operation of the prime production well may impact a nearby pond, a discharge stream channel and a side channel during low flows, but this channel is not used as spawning habitat. A seven-day test of the prime production well has shown no drawdown from the Lostine River (McMillen 2002, personal communication).

**Water Quality:** Discharges would meet applicable federal and state standards, and would satisfy NPDES permit requirements for aquaculture facilities though they would constitute a new source of water quality impact. Important physical properties and chemical constituents in hatchery effluent would be routinely monitored to assure compliance with water quality standards. Chemicals used to prevent or treat fish diseases would be handled, applied, and disposed of in accordance with applicable state and federal regulations.

Effluent pumped back to the base of the fish ladder via a return pipeline would have levels of solids below current NPDES permit requirements, due to low density rearing. Effluent during cleaning operations would be routed to a cleaning waste basin, where solids would settle and be collected and then disposed of in a local landfill or other permitted disposal site.

Water discharged from the Lostine River Hatchery could be cooler than the receiving river water if chillers are used to maintain incubation and early rearing temperatures in the hatchery below-ambient temperatures. Water released would mix rapidly with the river water downstream of the facility. Temperature changes would therefore be minor and are not expected to impact fish species.

Effluent discharge from the Lostine River Hatchery may disrupt the behavior and distribution of individual fish immediately adjacent to and downstream of the site, but the overall impact is not anticipated to affect populations on a watershed scale.

Fish Traps, Ladders and Weirs: Upstream and downstream passage at the intake would be accommodated by a fish ladder. This type of ladder provides for good attraction flow. Juveniles and adults would move through the ladder in periods of low flow, as most flow would be directed through the ladder during those periods. The return effluent pipe (used to return intake water to the bottom of the fish ladder during periods of low river flow) would be fitted with a diffuser screen that would reduce the discharge velocity to less than one foot per second, to prevent fish from being falsely attracted to the discharge (Bell 1991).

During spring runoff, the weir would be submerged or level with the water surface, allowing fish to pass directly upstream or downstream over the weir. During periods of extreme low flow, the weir may block or delay passage of migrating fish. As previously discussed, summer low flow occurs in September, when most migrating salmonids have passed the Lostine River Hatchery site. Winter low flow periods, occurring primarily in February, may delay adult steelhead migration if low flow continues into March and April. However, steelhead begin to move upstream in response to higher flows, and would not likely be impacted by winter low flows. Downstream migrants, such as steelhead kelts, rapid-turnaround bull trout spawners and bull trout sub-adults, may collect at the weir as they search for passage. Spring/summer chinook yearlings generally move downstream in early summer, and passage is not likely to be affected. Monitoring of the weir would be conducted in low flow periods to observe passage conditions. Corrective measures to encourage the survival of naturally reproducing adults would be applied should passage problems occur with the weir. Corrective measures could include reducing the amount of water diverted into the intake (*i.e.* minimum, acceptable strategies as opposed to the preferred strategy), which is part of the Proposed Action. Other measures, not specifically identified as part of the proposed action may include physical movement of migrants passed the weir.

Although lamprey are considered to be extirpated from the Lostine, reintroduction efforts may eventually be successful in returning them to the system. The pool and weir fish ladder would be designed to accommodate lamprey passage. Such designs could incorporate rounded corners within the structure to allow for safe passage of the species.

Broodstock Collection and Maintenance: Adult spring/summer chinook salmon to be reared at the Lostine River Hatchery would be trapped at the Lostine Adult Collection Facility, approximately four miles downstream, and at the existing seasonal picket weir in the lower Lostine. Care would be taken to collect individuals from throughout the spawning run to represent a full genetic complement of individuals within the run. This would preclude a potentially large contribution to subsequent generations from a small segment of the parent population.

Risks associated with salmon supplementation through the use of hatchery-produced juveniles have been identified by Cuenco et al. (1993) and Waples et al. (1991), among others. Potential negative effects to wild populations from hatchery-reared individuals may occur if interbreeding between hatchery and wild fish occurs. Negative effects may include outbreeding depression, which may result in reduced fitness of offspring and therefore reduced reproductive potential. To minimize these risks, local broodstock, which are adapted to local environmental conditions and may contain gene complexes reflecting such adaptation, would be used annually. A distinct “hatchery” population would not be created. Genetic divergence between the hatchery and wild run components is not intended.

Genetic risks resulting from potential interbreeding of hatchery and wild fish have been identified and taken into account in program planning and are far outweighed by the demographic risk of extirpation associated with the current low abundance in the wild spawner populations of recent brood years in the 1990s to present.

Adult Holding and Spawning: Spawning fish in a hatchery entails risks that may affect natural populations. Typical pre-spawning mortality under the current program is almost 20 percent (Ashe et al. 2000). Under the current program, adults collected at the Lostine River are transported to the Lookingglass Hatchery, which is more than five times the distance of the proposed Lostine River Hatchery. Holding and spawning of collected adults at the Lostine River Hatchery would likely result in less stress on transported fish. Therefore, the proposed Lostine River Hatchery would likely benefit fish that are currently trapped at the Lostine River. Although individual mortalities may occur, overall abundance of spring/summer chinook is expected to increase by the supplementation program.

Incubation and Rearing Practices: Rearing conditions can strongly influence the physiological, **morphological** and behavioral characteristics of hatchery fish, which, in turn affect the magnitude and types of interactions between hatchery and wild fish. **Pathogen** free, silt free well water would be used for incubation to ensure maximum survival and minimize potential loss from disease and early rearing. To mimic the various characteristics of their wild counterparts during incubation, darkness (simulates shading) and substrate are planned for use as outlined in the NATURES criteria. Improvements in post-release survival of hatchery-reared chinook (results are limited to the conditions and populations at specific research sites) have been documented using NATURES techniques, such as colored substrate and shading (Maynard et al. 1996, Maynard and Flagg 2001; Maynard et al. 2001; Berejikian et al. 2000).

Fish Health Management: Co-managers have developed fish health monitoring protocols for the Grande Ronde and Imnaha broodstock program (ODFW 1996). The goals of the activities occurring under this program are to: 1) provide healthy and robust hatchery smolts whose survival will not be impaired by health constraints; and 2) conduct the fish health program such that it integrates concerns for both natural and hatchery populations to minimize infectious disease interactions between both populations.

Fish health monitoring objectives for the NEOH project, as presented in Ashe et al. (2000), include the following practices:

- Monitor adult mortalities and spawned adults for presence of viral, bacterial, fungal, and parasitic agents.
- Conduct monthly monitoring of hatchery-reared juveniles to assess presence of viral, bacterial, fungal and parasitic agents.
- Monitor preliberation of hatchery-reared smolts annually.
- Conduct examinations at all life stages when unusual loss or anomalies occur to determine cause of loss and recommend preventative and therapeutic treatment.

Fish health procedures used for disease prevention and treatment can be found in the Master Plan (Ashe et al. 2000).

Fish rearing practices, waste removal and treatment of disease outbreaks within the hatchery would help maintain acceptable fish health and reduce risk of pathogen amplification.

Methods and Magnitude of Release: The magnitude and methods of release of hatchery fish affect the frequency and kinds of interactions between hatchery and wild fish. The timing of hatchery releases would



consider the availability of local resources so as to avoid overwhelming the available rearing habitat and resources. Spring/summer chinook fry releases would be scheduled for times when food and temperature conditions favor rapid growth and emigration. Spring/summer chinook psmolts would also be released near the end of the growing season to minimize competition with wild fish.

The Lostine River Hatchery would use the volitional release strategy where fish would be released directly from their rearing containers into the Lostine River. The use of the volitional release strategy assumes that fish would exit the rearing units over an extended period of time, thus spreading their impact on natural biota over time. To minimize competition between wild and hatchery stocks, smolts from the Lostine River Hatchery may also be transported upstream of the facility and scatter-point released directly into the river. This method would minimize competition within the immediate area of the hatchery by reducing the density and loading of the system in the immediate vicinity of the hatchery. Less fish means less competition for resources, including space, food and cover. Also, release of smolting fish reduces in-river residency time, as these fish are cued into actively migrating.

The impact on the spring/summer chinook populations is likely to be beneficial as this recovery project intends to increase the population status and trends over time. Impacts to other species of fish, including other salmonids, may occur through natural competition if the supplementation program returns enough spring/summer chinook to allow them to once again become the most prevalent inhabitant of the river system.

**3.2.3.2 Imnaha Subbasin**

Table 3.2-9 summarizes impacts to fish species in the Imnaha River subbasin.

**Table 3.2-9. Summary Results of Impacts for NEOH Program Proposed Action Components within the Imnaha Subbasin, including the Imnaha Final Rearing Facility and the Imnaha Satellite Facility.**

Construction/ Operational Component	Fish Category			
	Targeted spring/ summer chinook	Non-Targeted chinook	Other salmonids	Non-salmonids
<b>Siting and Construction of Facilities</b>				
Site Disturbances	Impacts due to upland and in-water site disturbances from construction would have similar impacts to all fish species that may be present. Construction site disturbances are not anticipated to negatively affect population viability on a watershed scale. However, impacts to individuals may occur as a result of construction activities. <ul style="list-style-type: none"> <li>• Sedimentation due to construction may impact water quality. Impacts would be temporary and short-term.</li> <li>• Increased impervious surface area may result in increased runoff. Impacts would be long-term but limited in spatial scale to the immediate receiving waters.</li> <li>• Construction noise may disturb individuals, causing them to disperse from the site. Impacts would be temporary and short-term.</li> <li>• Removal of riparian habitat may result in decreased shading habitat, which may displace individuals. Impacts would be long-term but limited in spatial scale.</li> </ul>			

<p><b>Channel Alterations</b></p>	<p>Impacts due to instream construction activities would have similar impacts to all fish species that may be present. Placement of permanent instream structures would result in a permanent loss of small amounts of instream and riparian habitat.</p> <ul style="list-style-type: none"> <li>• Cofferdams would alter stream flow upstream and downstream of the structure. Alterations may affect utilization of the area by fish species, including migrating salmonids. Cofferdam placement would directly reduce instream habitat available in the immediate vicinity of the construction site. Impacts would be short-term and limited in spatial scale to the site and construction areas.</li> <li>• Increased human presence and activity may disturb fish species and cause them to disperse from the immediate construction area. Impacts would be short-term and limited in spatial scale to the site and construction areas.</li> <li>• Placement of intake, outfall, weirs, ladders and riprap structures would alter or remove instream habitat, causing individuals to seek other available rearing, holding or migratory habitat. Impacts would be long-term, but limited in spatial scale and are not anticipated to affect population viability.</li> </ul>			
<p><b>Facility Operations and Management</b></p>				
<p><b>Construction/Operational Component</b></p>	<p><b>Targeted spring/summer chinook</b></p>	<p><b>Non-Targeted chinook</b></p>	<p><b>Other salmonids</b></p>	<p><b>Non-salmonids</b></p>
<p>Water Gains and Losses</p>	<ul style="list-style-type: none"> <li>• Although water diversions would be non-consumptive, all species may be affected by withdrawals. Withdrawals would reduce instream habitat availability and may result in decreased utilization within the diversion reach during peak diversions and instream low-flow conditions. To protect in-stream habitat, minimum or acceptable flow strategies have been developed for the facilities.</li> <li>• These impacts would be long-term but limited to the immediate diversion reaches. Withdrawals may affect individuals but are not anticipated to affect the population viability on a watershed scale.</li> </ul>			
<p>Water Quality</p>	<ul style="list-style-type: none"> <li>• All discharged organic waste materials or chemical therapeutants would meet applicable state and federal standards. The potential for impacts due to these discharges is therefore low.</li> <li>• Water temperature of discharge water would be at ambient temperature. No impact to individuals or populations is anticipated to occur.</li> </ul>			
<p>Fish Traps, Ladders, and Weirs</p>	<p>Individuals and the population would benefit from improved adult attraction and collection facilities at the Imnaha Satellite Facility. Reduction in delay time to enter the fish ladder is anticipated. Fall back and forced spawning below the weir are expected to be reduced. Effects would be long-term.</p>	<ul style="list-style-type: none"> <li>• Installation of the new Chiwawa weir is expected to benefit non-target species compared with existing conditions (No Action alternative).</li> <li>• Improved upstream and downstream passage during weir operation is anticipated.</li> <li>• Effects would be long-term and limited spatially to the upper Imnaha River.</li> </ul>		

<p>Broodstock Collection and Maintenance</p>	<p>Spring chinook individuals and the population would benefit from improved broodstock collection and holding facilities. A reduction in stress and pre-spawning mortality from that obtainable with the existing operational program and facilities is anticipated. Effects would be long-term.</p>	<ul style="list-style-type: none"> <li>• Non-target individuals may be affected by broodstock collection via handling, which may cause stress to individuals. This is an existing condition that would be improved with the implementation of the Proposed Action.</li> <li>• Negative impacts to population viability over the long-term are not anticipated.</li> </ul>		
<p>Incubation and Rearing Practices</p>	<p>Incubation facilities at the Imnaha Satellite Facility are anticipated to improve egg survival. Decreased rearing densities and reduced hauling trips/time would be beneficial for NEOH spring chinook over the long-term. Increases to survival and homing to natal streams is expected.</p>	<p>No impact</p>	<p>No impact</p>	<p>No impact</p>
<p>Fish Health Maintenance</p>	<ul style="list-style-type: none"> <li>• Intensive fish health monitoring strategies would benefit all salmonids and result in less potential for the spread of disease.</li> <li>• Decreased rearing densities would benefit individuals by reducing the potential for the spread of disease within the hatchery population and, in turn, wild salmonid populations.</li> </ul>	<p>No impact</p>		

**Imnaha Final Rearing Facility** — The proposed Imnaha Final Rearing Facility (Figures 2-6 and 3.9-4) would be constructed to provide early final rearing of 490,000 spring/summer chinook smolts incubated at the Imnaha Satellite Facility and intermediately reared at Lostine River Hatchery or Lookingglass Hatchery. The facility would operate from September through March for final rearing of smolts. See Table 3.2-10 for the proposed program summary. Ground water limitations may preclude incubation and early rearing at the Imnaha Final Rearing Facility. The proposed facility, in combination with the proposed Lostine River Hatchery, would reduce the need for extensive hauling of produced smolts and allow rearing in NATURES densities and natal waters.

**Table 3.2-10. Proposed Imnaha Final Rearing Facility Broodstock Program (Operated September - March).**

Life Stage	Time Period
Final rearing of Imnaha Satellite smolts	September – March
Transfer back to Imnaha Satellite for acclimation and release near spawning habitat	March

Siting and construction of the Imnaha Final Rearing Facility would necessarily be near the Imnaha River. Construction would have physical impacts that relate to site disturbances, channel alterations, and the placement of water intake, conveyance and discharge structures.

#### *Site Disturbances*

The upland infrastructure required to develop the site into a final rearing facility includes a headbox, raceways, water supply well, shop, residence, and ancillary support facilities. Construction of the proposed facilities would occur on undeveloped pastureland that is currently grazed by cattle. Construction would add about three acres of impervious surfaces to the site, which may lead to increased or rerouted runoff and sediment carried into the river. Increased runoff is expected to be temporary and is not anticipated to exceed a stream's ability to carry sediment away from the site. Associated best management practices to reduce sedimentation are part of the Proposed Action.

To protect the site from flooding, approximately three feet of fill would be placed on the upland side of riparian vegetation. Erosion control devices would be used during site raising to minimize sedimentation. The sites would be revegetated with native species, where appropriate, upon completion of construction.

Site disturbances may temporarily alter fish behavior and individual distribution during the construction phase. These effects are anticipated to be minimal and short-lived, and are not anticipated to affect listed populations on a watershed scale.

#### *Channel Alterations/Water Intake and Discharge Structures*

Instream work within the Imnaha River channel includes installation of a river intake structure with screens, outfall structure, by-pass pipeline and access bridge improvements. Installation of instream structures would take place within ODFW's instream work window of July 15 – August 15.

The intake structure would be located on the west bank of the river, about 1,200 feet upstream of the proposed outfall site. Installation of the structure would require the excavation of an existing rock abutment and the use of a fill cofferdam and two dewatering pumps. The pumps would discharge water through a sediment pond located within the upland meadow prior to being discharged back to the Imnaha River downstream of the construction area. The cofferdam is proposed for installation from the end of the existing irrigation channel and access road to about 50 feet upstream of the intake location. The river would be diverted to the east bank. Construction equipment would be driven across the pasture from the existing bridge to the cofferdam area via a temporary access road.

The first section (about 50 feet) of the surface water diversion pipeline would be imbedded below the water surface into the west bank via trenching, then mortared with rocks to mimic natural substrate. The remaining sections of the pipeline would be installed within an existing irrigation ditch, requiring the removal of some non-riparian vegetation. Installation of this pipeline could result in temporary increases in sediment, but erosion control devices would be in place to minimize sedimentation and contain it within the cofferdam area.

The intake fish screen would be placed on the upland portion of the site, about 600 feet downstream from the intake. Fish that entered the intake would be returned to the river via a fish bypass pipeline that originates at the screen site. A majority of the fish bypass pipeline construction would take place on the upland portion of the site. The outfall for the bypass line would be located on the west bank as close to the river surface as possible. To aid in returning fish to the river at the bypass outfall, a pool would be excavated at the base of the outfall. Fish may collect within this pool for short periods of time, but would eventually continue their migration.

The cast-in-place concrete outfall structure would be constructed concurrently with the intake. A small cofferdam and dewatering system would be used to install the outfall. The structure would require 200 cubic yards of riprap flood protection on the upstream and downstream sides of the bank.

The existing bridge, which is located about three feet lower than the **100-year flood** elevation, would be relocated upstream to an area above the 100-year floodplain. Concrete abutments would be placed bankside of the normal flow levels to minimize the need for dewatering. Abutments would likely impact a small amount of riparian vegetation and shading. Disturbed areas of the temporary bridge location would be revegetated. The outfall location has good shading habitat and the majority of shading vegetation would remain.

Impacts due to installation of the intake, outfall, by-pass pipeline and bridge abutments include short-term fish displacement and behavioral modifications. Immediate effects of construction may result in the displacement of some resident fish during placement and removal of the cofferdam and dewatering. Fish passage, specifically adult spring/summer chinook migrants, at the construction site would be impacted temporarily and delays may occur due to the presence of the cofferdams. Adult steelhead would not likely be present in the construction area during the instream work and are not likely to be affected by in-water activities. Late season bull trout migrants, both upstream and downstream, could be affected during the instream work window, depending on water temperatures during the construction year. Juvenile salmonids may potentially occur within the Imnaha during construction, although they are more likely to be higher upstream due to high water temperatures in August. Interruption of spring/summer chinook spawning and delays to bull trout may occur due to construction. Vigilant monitoring of the construction area would occur to observe passage conditions. If adverse passage conditions were observed, steps to minimize these impacts would occur. Project staff would consult with state and federal fisheries agencies to determine how to protect fish passage.

The west bank of the Imnaha would be altered by excavation and installation of instream structures. These alterations are minimal and are not expected to affect the flow of the river or instream habitat elements. Sedimentation may occur during construction, but the effects would be short-term and limited. Removal of riparian habitat is expected to be limited to the area of the intake pipeline, outfall and bridge abutments. The amount of riparian habitat affected by this removal is about 1600 square feet, which is negligible and would not affect the total shading habitat available. Riparian zones would be replanted with native vegetation. The land use change from a cattle pasture would encourage the reestablishment of more diverse native riparian vegetation along the riverbank and decrease some sedimentation.

Driving construction equipment on the rocky riverbed is not expected to result in change to the substrate. All construction equipment would be free of petroleum or hydraulic fluid leaks, and would be serviced outside of the riparian zone.

#### *Hatchery Operations and Management*

Water Gains and Losses: The Imnaha Final Rearing Facility would operate from September to March.

Surface water requirements for the facility are shown in Table 3.2-11. Also shown in Table 3.2-11 are the mean monthly flows at the closest U.S. Geological Survey (USGS) gauge, located downstream of the facility

(USGS gauge 13292000). This gauge measures total flow from the Imnaha River, Big Sheep Creek and Little Sheep Creek. According to Ashe et al. (2000), Big Sheep Creek is the largest tributary to the Imnaha River and drains an area of 342 square miles. Based on the drainage area of the Imnaha, Oregon gauge (622 square miles, including the 342 square miles from Big Sheep Creek), flows from Big Sheep and Little Sheep Creeks are about 55 percent of the flow at the gauge, while flows from the Imnaha River are about 45 percent of the total flow. Therefore, the adjusted mean monthly flows shown in Table 3.2-11 represent about 45 percent of the total flow at the downstream gauge, the portion attributable to the Imnaha River alone. Adjusted flows for September and October reflect more than 45 percent of the gauge flow as they are corrected for irrigation withdrawals of 120 cfs water right, which is likely fully used in the summer (R. Zollman, personal communication), for Big Sheep and Little Sheep Creeks. Irrigation withdrawals within the Imnaha River are insignificant (Ashe et al. 2000).

The water budget has been designed to adjust the facilities water requirements based on instream flow from year to year, as shown in Table 3.2-11. The “preferred NATURES” criteria provides an improved rearing/holding environment through the use of higher pond turnover (complete exchange of pond water) rates. The “acceptable NATURES” water strategy, provides an adequate rearing environment, but reduces the amount of water withdrawal and thus reduces turnover rates.

The maximum flow required for rearing at the Imnaha Final Rearing Facility is about 23 cfs, based on the “preferred” NATURES criteria flow scenario. This flow would be required for a short period of time (late February through March) during the transition period of rearing when smolts are on hand. Water use would be non-consumptive; all water withdrawn would be returned to the Imnaha River.

In addition to the water required for rearing, about 10 cfs would be diverted through the intake to operate the fish screening and bypass pipeline. This diversion would take place over the first 600 feet of the total 1,200 feet of diversion from the intake to the outfall. The total diversion at peak usage, therefore, would be about 33 cfs (March) for about 600 feet, and about 23 cfs for the remaining 600 feet to the outfall. During critical low flow years, this water diversion scenario could negatively impact habitat use when the maximum diversion is desired at the facility. Implementation of the “acceptable” rearing criteria surface water withdrawals would then occur.

**Table 3.2-11. Surface Water Acceptable and Preferred Rearing Scenario Requirements, Imnaha River Gauge Flows and Adjusted Imnaha River Mean Monthly Streamflow at the Imnaha Final Rearing Facility (cfs).**

	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Acceptable <sup>1</sup> NATURES criteria requirements	9.8	10.5	11.4	11.4	11.4	12.3	14.5
Preferred <sup>2</sup> NATURES criteria rearing requirements <sup>3</sup>	14.3	16.3	16.3	18.3	18.3	18.3	22.6
Flows at gauge 13292000 <sup>4</sup>	145	158	185	214	212	243	414
Adjusted Mean monthly streamflows	119 <sup>5</sup>	125 <sup>5</sup>	83	96	95	109	186

<sup>1</sup>Acceptable criteria: provides an adequate rearing/holding environment based on NATURES technical memorandum

<sup>2</sup>Preferred criteria: provides an improved rearing/holding environment through higher turnover rates.

<sup>3</sup>Does not include the 10 cfs required for operation of the fish bypass line. For each month, an additional 10 cfs would be diverted approximately 600' from the intake to the fish bypass return line. The remaining facility water would then be routed to the facility and then to the outfall. The distance from the bypass to the outfall is an additional 600'. See site plan.

<sup>4</sup>Source: USGS 2003. USGS Gauge No. 13292000 near Imnaha, Oregon, water years 1928 - 2001.

<sup>5</sup>Assuming 100% utilization of the 120 cfs water right on Big Sheep and Little Sheep Creeks in September and October.

Peak water diversion in February and March, and withdrawals during low-flow periods (September – October) may adversely affect fish passage through the diversion reach at the Imnaha Final Rearing Facility. The majority of migrating bull trout would be in cooler, upstream waters in September and would move downstream in the late fall when low flow would not impact outmigration. Rapid turn-around bull trout spawners may encounter low flow conditions, depending on water temperatures during each season. Steelhead do not occupy the mid-Imnaha in the fall and winter, but begin upstream migration in early spring (March – April). Early steelhead migrants may be present during the final stages of operation at the Imnaha Final Rearing Facility, when the maximum amount of surface water is diverted (about 33 cfs from intake to fish bypass; then about 23 cfs from bypass to outfall). Therefore, delays to migrating steelhead may occur if flows are low during this period. Monitoring would be performed to determine the affect on passage of migrating salmonids. If passage problems are observed, program changes would occur. These may include reducing the required amount of water at facilities to allow for more instream flow, or physical passage of species upstream.

The Imnaha Final Rearing Facility would begin operation during spring/summer chinook spawning in September when water levels are low; however, most spawning occurs upstream of the facility. If spawning habitat is negatively impacted due to diversion during periods of low flow, modifications to the water management strategy would be implemented. The “acceptable” water strategy, which reduces the amount of water withdrawal could be used if impacts to spawners, caused by low flows, are observed.

Rearing juvenile chinook and resident fish may be affected by water diversion, but impacts would occur over a brief period of time and are not expected to affect long term population trends or individual distribution.

Icing conditions at this facility are not expected to be an issue. Sheet ice often forms during winter months, but water can still be diverted from beneath the ice. Well water may also be used to aid in de-icing if there is a loss of available surface water during winter months.

Water Quality: Discharges of chemical and organic pollutants would meet applicable federal and state standards, and would satisfy NPDES permit requirements for aquaculture facilities. Important physical properties and chemical constituents in hatchery effluent would be routinely monitored to assure compliance with water quality standards. Chemicals used to prevent or treat fish diseases would be handled, applied, and disposed of in accordance with state and federal regulations. An on-site cleaning waste basin would be used for cleaning wastes from the raceways. Water would flow constantly through the pipelines and the facility, and so would not be subject to heating. The minimal water quality changes resulting from the proposed Imnaha Final Rearing Facility are not anticipated to disrupt the behavior or distribution of individual fish adjacent to and immediately downstream of the site.

Fish Traps, Ladders and Weirs: There would be no fish traps, ladders or weirs associated with the Imnaha Final Rearing Facility. The fish bypass pipeline would serve as the only fish diversion structure. The bypass pipeline would return fish to the river via a plastic (PVC) pipe. This pipe would be maneuverable to accommodate seasonal (erosive) changes in the riverbank.

Broodstock Collection and Maintenance: No broodstock collection activities would occur at Imnaha Final Rearing Facility.

Adult Holding and Spawning: There would be no adult holding and spawning facilities at the Imnaha Final Rearing Facility.

**Incubation and Rearing Practices:** Incubation would not occur at this facility. Final rearing practices would be similar to those presented for the proposed Lostine River Hatchery.

**Fish Health Management:** A comprehensive fish health monitoring and disease control program has been ongoing for the Imnaha River chinook salmon since 1982. This program is described in Groberg et al. (1999) and would be implemented at the proposed Imnaha Final Rearing Facility. The goals and objectives of this plan are similar to those presented for the Lostine River Hatchery. In addition to the plan, the Imnaha Final Rearing Facility is not expected to have a high disease risk for the following reasons:

- The proposed site is about 25 miles downstream from where most spawning occurs resulting in a greater spatial segregation between spawning area and the hatchery intake than occurs on Lookingglass Creek.
- Problems with carcasses stacking up on the hatchery intake at this site are not expected.
- The quantity of flow in the Imnaha River is much greater than Lookingglass Creek, therefore the dilution factor is greater.
- During the initial site screening process, the disease potential for sites in the vicinity of the Imnaha Final Rearing Facility were evaluated as “low w/temperature and flow control” (Montgomery Watson 1995b; Ashe et al. 2000).
- The available area at the proposed site would allow for spatial segregation and very low rearing densities that would improve the ability to manage fish health.

**Methods and Magnitude of Release:** Fish reared at the Imnaha Final Rearing Facility would be transferred to the Imnaha Satellite Facility for release. Release strategies are discussed in the Imnaha Satellite Facility section.

**Imnaha Satellite Facility** — Currently, the Imnaha Satellite Facility (Figures 2-8 and 3.9-5) provides spring/summer chinook adult collection and holding. Table 3.2-12 presents a summary of existing and proposed programs.

Some smolts may continue to be reared at Lookingglass Hatchery according to the Current Production Program (CPP). However, the majority of Imnaha stock would be incubated at the Satellite Facility. Eyed-eggs would be transferred to the proposed Lostine River Hatchery for further incubation, early and intermediate rearing. Final rearing would occur at the proposed Imnaha Final Rearing Facility, and upon completion, smolts would be transferred back to the Satellite Facility for acclimation and volitional release.

The proposed modifications to the Imnaha Satellite Facility would result in impacts to the aquatic environment due to site disturbances and channel alterations for modifications or additions of instream structures including a new Chiwawa weir, a new fish ladder and ladder entrance, and an expanded screened intake. The existing intake structure’s screen is currently out of compliance with the 1996 NMFS juvenile screening criteria and would be brought into compliance through this project.



**Table 3.2-12. Innaha Satellite Facility, Existing and Proposed Programs for Conventional Broodstock (Operated March – November).**

Existing		Proposed	
Life Stage	Time Period	Life Stage	Time Period
Fish collected at Innaha Satellite	June – September	Adult fish collected at Innaha Satellite	May – October 1
Adults transported to Lookingglass Hatchery; and then held, spawned, incubated and reared	September – April (year 2)	Adults remain at Satellite for holding and spawning	May – October 1
Returned to Innaha Satellite for acclimation and release	April (year 2)	Incubation to eyed stage	August - November
		Transfer eyed eggs to Lostine River Hatchery	October - November
		Incubation and early to intermediate rearing at Lostine River Hatchery	November – September (year 2)
		Transport and final rearing at Innaha Final Rearing Facility	September – March (year 2)
		Return to Innaha Satellite for acclimation and release	March – mid April (year 2)

*Site Disturbances*

Upland construction includes expansion of the adult fish trap and holding areas; addition of a new water supply line, pre-settling basin, incubation room, and formalin treatment system; and extension of a new power supply line six miles to the site.

The construction of the new facility structures would take place within the existing site boundary. Construction would remove about seven trees that have been planted on the existing lawn. The 650-foot surface water supply pipeline would be installed under a gravel road that currently covers the existing intake pipeline. The additional power supply would initiate from the Pallete Ranch, located about six miles downstream from the site. The power supply line is proposed to be buried under and along the existing access road Forest Service Road number 3955. These activities would disturb ground and add about one quarter of an acre of impervious surface to the site, which may lead to increased or rerouted erosion and sediment carried into the river. Increased runoff during construction is expected to be short-lived. Also, the Proposed Action includes erosion control devices such as silt fences, hay bales and other typical best management practices for erosion control.

Installation of the power supply line and the additional surface water pipeline would not disturb riparian vegetation. Most construction activities would occur away from the river, and where appropriate, areas would be revegetated upon completion. The removal of about seven ornamental trees would not impact riparian

shading or fish habitat because the trees are not immediately adjacent to the river and do not currently provide shading habitat. Runoff from construction activities would be contained away from the river, and sedimentation would be minor.

Site disturbances may alter the behavior and individual distribution of fish within the area, but these impacts are short-lived and are not expected to affect long-term use, passage, abundance and distribution of fish that occur in the Imnaha. Because riparian vegetation would not be disturbed, no change in the amount or quality of fish habitat would occur.

#### *Channel Alterations/Water Intake and Discharge Structures*

Instream disturbances would include the expansion of the existing water intake structure and upgrade to its screens (to meet NOAA Fisheries criteria); installation of a hydraulically operated fish barrier; and construction of a new fish ladder along side the existing ladder. All instream work would be conducted during ODFW's instream work window of July 15 – August 15.

Expansion of the intake structure and upgrades to the existing screen would require the use of a cofferdam and dewatering pumps. Installation would require disturbance of about 900 square feet of bed and bank upstream of the existing intake. The submersible dewatering pumps would route water through the existing intake pipeline to the existing raceway (that would be used as an on-site sediment basin) and through the outfall pipe that discharges water at the current fish ladder entrance. The construction area would be limited to the riprap portion of the banks and would not disturb riparian vegetation.

About 100 cubic yards of riprap would be placed at and upstream of the intake to stabilize it. Riprap would be placed stream-side of existing vegetation so as not to impact riparian vegetation or shading. This riprap may slightly alter the hydrology of the river in the area, potentially causing very minor, localized modifications to habitat use. Preservation of natural meanders would occur, where possible. Disturbed soils may create minor short-term sedimentation in the river during cofferdam removal.

Construction of instream structures would temporarily delay migrant fish passage. Adult chinook begin entering the Satellite Facility on or around May 23 (Lund 2003, personal communication) and generally spawn immediately adjacent to the construction area beginning in mid-August. Construction activities would, therefore, interrupt migration and spawning of those adult spring/summer chinook that are not needed for broodstock and are passed upstream for natural spawning. Juveniles that may rear in the area could be impacted. Spring/summer chinook are not generally known to spawn in this reach before mid-August (Zollman 2002a, personal communication; Smith, 2002, personal communication), but potential early spawners, however unlikely, could be impacted during construction.

Migrating adult bull trout move up the Imnaha in June through September, with most individuals upstream of the Imnaha Satellite Facility by late August. Bull trout are routinely captured at the Imnaha Satellite Facility between June and September (Buchanan 1997). Therefore, delays to migrating bull trout may occur during the early stages of in-water construction activities if migrants are late to move upstream. Delays to subadult bull trout emigration are not expected because the majority of individuals move downstream during late fall, outside of the instream work window.

Adult steelhead in the Imnaha are early spring spawners and would not be impacted by construction. Kelts emigrate to the ocean soon after spawning and would not be affected. Steelhead juvenile emigrants move out of the Imnaha in spring and are not likely to be affected by instream work. However, younger juveniles may move upstream and downstream within the Imnaha and its tributaries during summer and fall and could use the construction area for rearing.

An electric weir was originally used for adult collection, but caused fish injury and did not effectively direct fish to the existing ladder. Currently, a portable picket-style weir is used to direct fish to the existing ladder, but it also does not direct fish effectively to the ladder. The ladder entrance is too far downstream and fish cannot locate the entrance easily, causing fish to drop back downstream, where they often spawn. Weir installation during high flows is difficult and a portion of the run can be missed when the weir cannot be installed. This can result in broodstock that do not represent the complete run and in less smolt production at the facility than desired.

The proposed action would replace the existing weirs with a Chiwawa weir on the existing concrete sill. Installation would require the addition of concrete abutment walls on both riverbanks. Construction would take place within the area already impacted by the existing weir and concrete sill. Because spring/summer chinook spawners could be present at the time of instream work, a portable picket weir would be installed slightly downstream to direct adults into the fish ladder for collection or upstream passage. Sandbags would be used to dewater the weir construction area, one side of the river at a time. The placement of sandbags and the temporary picket weir has the potential to create minor sedimentation and affect fish habitat if river hydraulics are influenced.

A new fish ladder would be installed alongside the existing ladder coinciding with the weir installation. Riprap would stabilize the ladder at the river entrance, and a minor amount of riparian vegetation would be impacted. The existing ladder would remain to increase water flow and fish attraction to the new ladder.

Construction of the weir and ladder during the current ODFW instream work window may impact the passage of adult spring/summer chinook, potentially stressing individuals. Monitoring by fisheries biologists during construction would take place to observe passage conditions and determine if additional physical passage upstream or downstream of the construction area is necessary. Also, during their monitoring fisheries biologists would consider the need to use any alternate instream work windows to lessen impacts to spring/summer chinook.

#### *Hatchery Operations and Management*

Water Gains and Losses: Due to icing on the Imnaha during the winter and worker access difficulties, the Satellite Facility would only operate from March through November. Table 3.2-13 shows the maximum surface water withdrawals for the facility in comparison to the instream flows. Combining existing and proposed surface water withdrawals, a no more than about 21 cfs would be diverted from the river for juvenile acclimation and release (March – April) and adult collection, holding and spawning (May 15 – September 30).

An additional six cfs would be required during adult collection to operate the adult recovery by-pass pipeline system. During adult collection, a second separate intake is operated at a location about 800 feet downstream from the existing surface water intake (about 130 feet upstream from the existing picket fish barrier). This intake feeds a fish return channel with a maximum water right of six cfs and is operated only when adults are migrating. The intake diverts water into a channel with a 21-inch flow return pipe extending from the fish recovery area to a discharge location just upstream from the fish barrier. When adult sorting occurs at the adult trapping and holding facility, those adults and native fish not selected for broodstock are placed in a 12-inch PVC return tube and routed to the fish recovery area. From this area, the fish would hold until recovered, then swim volitionally back to the Imnaha River and on upstream.

During early fall low flow periods, these diversions could potentially impact aquatic resources within the diverted river reaches.

**Table 3.2-13. Maximum Surface Water Requirements and Mean Monthly Stream Gauge Flow for the Imnaha Satellite Facility (cfs).**

	Mar	Apr 15	May 15	Jun	July	Aug	Sept
<b>Rearing and adult holding requirements</b>	20.3	20.3	26.3	26.3	26.3	26.3	26.3
<b>Mean monthly streamflows</b>	92.0	341	804	859	453	150	87.1

<sup>1</sup> Source: USGS 2003. USGS gauge located above Gumboot Creek, upstream of facility, water years 1944 - 1953.

Bull trout adults move upstream past the Satellite Facility in June through August. They out-migrate with subadults in the fall when water temperatures in the lower Imnaha drop. The amount of water diverted from the intake to the outfall is not expected to affect bull trout usage because low flows occur later in September when bull trout are upstream of the Satellite Facility. Also, water would be diverted over approximately 1,000 linear feet and is not expected to impact hydrographs at that time of the year.

Adult steelhead migrate up the Imnaha in March through April, and juveniles out-migrate later in the spring. Although the facility would be in operation during steelhead spawning, the acceptable NATURES criteria, instead of preferred criteria, for surface water requirements may be implemented if flows are critically low. Additionally, steelhead spawners would likely hold downstream to migrate upstream until spring river flows increase. Spring chinook that are not collected at the facility may be impacted by low flows since spawning occurs within the diversion reach during late summer months. Water management strategies that divert the least amount of water possible to maintain facility production would be implemented to ensure safe spawning and passage of spring/summer chinook. Water usage at the facility in late August and September can be modified to meet the requirements of the broodfish be held at that time. The amount of attraction water required would also be reduced as the hydrograph begins to decline in these months.

About 100 gallons per minute (gpm) of pathogen-free well water would be required for incubation. An existing on-site well has been shown to produce about 300 gpm during low flow periods with no river draw-down (McMillen 2002, personal communication). Therefore, there would be no impact on river water quantity due to incubation activities at the Imnaha Satellite Facility.

**Water Quality:** Discharges of chemical and organic pollutants would meet applicable federal and state standards, and would satisfy NPDES permit requirements for aquaculture facilities. Important physical properties and chemical constituents in hatchery effluent would be routinely monitored to assure compliance with water quality standards. Chemicals used to prevent or treat fish diseases would be handled, applied, and disposed of in accordance with state and federal regulations.

Juveniles would be held and acclimated in the ponds for about 30 to 45 days prior to release. No cleaning of the raceways would occur during this period. Under planned operating procedures, following release of fish, the ponds would be cleaned by hand and disinfected prior to use for adults. Therefore, no settled waste material would be released to the Imnaha River.

Cleaning of the proposed pre-settling basin, to be used for sediment removal of intake water, would be accomplished with shovels and a bobcat and disposed of at appropriate upland locations.

Water quality at the Imnaha Satellite Facility is appropriate for fish culture use, however, a chiller may be necessary for incubation due to high river temperatures during July - September. Chilled water would likely be cooler than the receiving river water, but released water would mix rapidly with the river water

downstream of the facility. Temperature changes would be temporary, localize and minor, and are not expected to impact fish species.

Fish Traps, Ladders and Weirs: Operation of the new fish ladder would likely benefit targeted and non-targeted spring/summer chinook through improved attraction to the ladder and less migratory delay. The current ladder entrance does not allow for efficient collection or passage, often resulting in downstream spawning of chinook that would normally spawn further upstream. The new ladder would be equipped with about a 12-inch wide opening to allow for increased attraction flow near the Chiwawa weir. No additional impacts to species that currently use the ladder are anticipated.

When in operation, the Chiwawa weir would provide the flexibility to lower individual panels to allow downstream steelhead kelts and bull trout passage. The existing picket weir does not have these capabilities. When not in operation, the new Chiwawa weir would be designed to lie flat under the water to allow downstream passage. A section on the west abutment would also be placed at a slightly lower elevation to support both upstream and downstream fish passage by providing a deep channel for migration. This type of barrier also operates effectively during high flow events, thus allowing better fish collection and passage than the current weir systems in place at the Satellite Facility.

For targeted spring/summer chinook, the weir would be designed to route fish to the base of the fish ladder, facilitating safer and more efficient adult collection. Vigilant monitoring of fish collection and instream structures would take place, especially during periods of low flow, to ensure that listed species are not negatively impacted by the upgraded structures.

Broodstock Collection and Maintenance: The Imnaha Satellite is an existing facility that has been in operation since 1984. Methods of broodstock collection, adult holding and spawning, incubation and rearing practices, and release methods are described in the HGMP for LSRCP Imnaha Spring/summer Chinook Program (ODFW 2002). The genetic risks associated with use and maintenance of broodstock have been previously discussed in the Lostine River Hatchery section.

Co-managers need to collect about 320 adults to reach the program production goal of 490,000 smolts (Ashe et al. 2000). Fish would be selected for broodstock or released above the weir to spawn naturally according to a sliding scale or other management tools as agreed to by co-managers. Fish not needed for broodstock or to meet natural spawner goals above the weir may be **outplanted** into other tributaries in the subbasin. The sliding scale tool currently used for broodstock management (Table 3.2-14) is discussed in detail in the Section 10 Permit Application to NMFS (ODFW 1998b). The scale has an underlying premise, that at low population levels the greatest risk to persistence is demographic risk of extinction. In the sliding scale, fewer constraints are placed on the number of hatchery fish spawning naturally and the number of naturally-produced fish spawned in the hatchery when population levels are low. As population levels increase, demographic risks are of less concern and greater constraints are placed on the hatchery program to control the genetic risks associated with hatchery rearing (**domestication selection**).

**Table 3.2-14. Sliding Scale Developed for Allocation of Imnaha River Spring/Summer Chinook Salmon Collected at the Imnaha Satellite Facility to Natural Spawning or Hatchery Production.**

Estimated total adult escapement to the Imnaha River mouth	Ratio of hatchery to natural adults at the mouth	Maximum % natural adults to retain for broodstock	Maximum % hatchery adults to retain for broodstock	Maximum % adults of hatchery - released fish above the weir	Minimum % of broodstock of natural origin
<50	Any	0	0	a*	Not applicable
51-700	Any	50	≤50	a	a
701-1000	Any	40	a	70	20
1001-1400	Any	40	a	60	25
>1400	Any	30	a	50	30

\*a – Percentages determined as a result of implementing other criteria, therefore not a decision factor  
Source: ODFW, 1998 (Section 10 permit)

**Adult Holding and Spawning:** As discussed within the proposed Lostine River Hatchery section, holding and spawning of fish may result in pre-spawning stress and potential mortalities of chinook or other species that enter the facility. Currently, fish collected at the Satellite Facility are transported to Lookingglass for spawning. This transfer causes mortalities and additional stress on fish that are already stressed due to being held. The amount of stress that collected fish encounter would be reduced if fish were held and spawned at the Satellite Facility, as proposed. Although individuals may die, the mortality rate under the proposed program is anticipated to be less than that of the existing holding and transport program, and be within an acceptable level as determined through program permitting.

**Incubation and Rearing Practices:** Incubation would occur at the Imnaha Satellite Facility, or at another appropriate facility, until eggs are eyed. Spring/summer chinook eyed eggs would then be transferred from incubation units to appropriate rearing facilities. Final rearing would occur at the proposed Imnaha Final Rearing Facility. Because of the use of techniques to maintain wild-type characteristics among hatchery fish, the impact on spring/summer chinook and other fish populations is expected to be minimal.

**Fish Health Management:** Fish health management issues for the Imnaha Satellite Facility would be similar to those presented for the proposed Lostine River Hatchery.

**Methods and Magnitude of Release:** As discussed in the Lostine River Hatchery section, the magnitude and methods of release are vital factors that would have the most influence on the status and trend of chinook populations. Volitional release from the Satellite Facility (transferred back to the site after rearing) would begin in late March, after acclimation in an on-site pond. The timing of hatchery releases would consider the availability of local resources to avoid overwhelming the available rearing habitat and resources. Spring/summer chinook releases would be scheduled for times when conditions favor migration. Yearling smolts would probably not interact to any great extent with their wild counterparts because it is anticipated that the hatchery smolts would begin their downstream migration shortly after release.

A portion of the production may be direct stream released in small groups farther upstream of the acclimation facility, or the acclimation facility may acclimate different release groups sequentially. This release method

would take place over a period of several weeks to allow the biological impact of the smolts entering the Imnaha to be spread over time.

The long-term impact on spring/summer chinook populations is likely to be beneficial as this activity is intended to cause an increase in population over time. Impacts to other species of fish, including salmonids, through interaction and competition may occur if the supplementation program returns enough spring/summer chinook to allow them to once again become the most abundant inhabitant of the river system. The abundance of unused habitat and species preference for specific habitat types would limit this impact.

### **3.2.4 Cumulative Impacts**

#### **3.2.4.1 La Grande/Union County**

According to the City of La Grande/Union County Building Inspection Department (Botts 2003), six building permits have been requested for projects that are currently underway in the County. They include four building permits for additions to private residences, one for the construction of a private residence and one permit for alteration of a commercial property. However, none of the projects are in the immediate vicinity of the proposed facility upgrades described in this EIS. These actions in conjunction with the Proposed Action cumulatively would not likely affect any fish species in the area.

Several on-going salmon/habitat recovery projects are listed within the Grande Ronde watershed in Union County. These include fish presence surveys, riparian habitat restoration and water quality monitoring studies (Grande Ronde Basin Model Watershed Program 2003). These actions, combined with the on-going projects listed in Table 1-1 and considered cumulatively with the Proposed Action project, would not result in increased negative impacts to the action area, and would ultimately be expected to result in benefits to listed species and their habitats.

#### **3.2.4.2 Wallowa County**

According to the Wallowa County Planning Department (Jones 2003), three permits have been requested in the past year for projects located in the same township and range as the proposed Lostine River adult collection facility. These projects are all modifications to existing single-family residences and include two house remodels and one porch addition. One permit was issued for the addition of a pole building in the same section as the proposed Lostine River Hatchery. Because these activities most often would involve re-models of existing facilities, changes in water diversion or effluent discharge are not expected. Therefore, these activities in conjunction with the Proposed Action cumulatively would not likely affect any fish species in the area.

#### **3.2.4.3 Harvest and Poaching**

Harvest is authorized and regulated by ODFW with a Section 10(a) consultation. Presently, there is no harvest of spring chinook or bull trout in all tributaries, although catch and release fishing is allowed for bull trout within the Imnaha River. Only adipose fin-clipped steelhead may be taken in the Northeast zone (ODFW 2002). Within both Lookingglass Creek and the Lostine River, angling is restricted to artificial lures and flies for all species. Additionally, all angling opportunities are closed 200 feet downstream from a hatchery water intake. In all tributaries of the Northeast zone, all trout, salmon and steelhead that are released must be unharmed and must not be removed from the water. Also protected within this zone are margined sculpin. These activities in conjunction with the Proposed Action cumulatively would not likely affect these fish species in the region.

In 1998, the NPT and ODFW cooperatively developed a management agreement for Imnaha River broodstock allocation and harvest of adults by setting adult escapement goals (Ashe et al. 2000). This agreement is outlined in Table 3.2-15. During 1992 and 1993, in Lookingglass Creek tribal members harvested 173 and 110 Rapid River (non-native) stock chinook returning to Lookingglass Hatchery. There is little information to describe current tribal harvest in the Lostine River.

**Table 3.2-15. NPT and ODFW Harvest Management Guidelines.**

Escapement Level	Harvest for Tribal Ceremonial Use	Harvest for Tribal Subsistence	Recreational Harvest
<300 for 2 consecutive years	*	*	No
51-700	Yes	*	No
>700	Yes	Yes	*

\* Decision made on case-by-case basis

#### 3.2.4.4 State and Federal Actions

Within Wallowa County, state and federal actions include the proposed Wallowa Lake Dam project. This project proposes to rehabilitate the poorly functioning dam at Wallowa Lake and to exchange irrigation diversions to release lake water seasonally to irrigate lower valley farms. This exchange would result in increased flows, thereby increasing salmonid habitat, in both the Lostine River and Bear Creek. This project, in conjunction with the Proposed Action, would result in cumulatively beneficial effects to listed species.

The Wallowa County/Nez Perce Tribe Salmon Habitat Recovery and Multi-Species Strategy is currently ongoing within unincorporated Wallowa County. The goal of this strategy is to assist in salmon recovery, particularly chinook recovery, by increasing spawning, rearing, and migration habitat within the County to ultimately aid in the recovery of all Snake River salmonids. This strategy has resulted in the development of Coordinated Resource Management Plans (CRMPs) and/or Watershed Action Plans for Bear Creek, Lostine River, Big Sheep Creek, Little Sheep Creek, and Upper Joseph Creek. Participation in WC/NPS&MS implementation includes private landowners, NPT, Forest Service, Soil & Water Conservation District, NRCS, ODFW, Grande Ronde Model Watershed Program, Oregon Department of Forestry, and Oregon State University. On-going research studies related to the Wallowa County/Nez Perce Tribe Salmon Habitat Recovery and Multi-Species Strategy are anticipated to have beneficial impacts for listed species and critical habitats. These activities when considered together with the Proposed Action would have beneficial cumulative impacts for fish species in the region.

#### 3.2.5 Consequences of Taking No Action

Taking no action would continue current rearing practices that do not allow for rearing of juveniles within their natal water source. Rearing in natal streams is believed to increase a juvenile's homing success and may therefore increase adult returns to the area and decrease the potential for straying. Straying could result in less escapement to collection sites and to the appropriate natal streams. Additionally, if a catastrophic event occurred at Lookingglass Hatchery, including a disease outbreak, the No Action Alternative may result in loss of entire stocks of fish. With no action, the "spread the risk" approach could not be satisfied as the majority of the Lostine and Imnaha juveniles are initially reared in one facility, Lookingglass Hatchery.

The proposed changes would allow for collection of a more complete complement of the run across the hydrograph than that which currently occurs at collection sites. Collecting more individuals from throughout the run increases genetic diversity. Proposed collection sites and structures would also allow for more



efficient collection, promoting less stress on spawners as well as less stress on non-target species passing through the ladders and weirs. Safer collection, for both those fish collected and those humans operating the trapping structures, would be accomplished under the proposed alternative. Additionally, the use of NATURES rearing techniques, specifically low density rearing, would not occur under the No Action Alternative. The use of low density rearing is thought to contribute to increased post-release survival of spring chinook (Maynard et al. 1996; 2001).

The following describes the consequences of taking no action at each of the Proposed Action sites.

### **3.2.5.1 Lookingglass Hatchery**

Under the No Action Alternative, no modifications would occur at the Lookingglass Hatchery. Therefore, no change in impacts to aquatic resources would occur. Spring/summer chinook salmon recovery efforts would continue, but recovery of populations within the Grande Ronde subbasin may not occur as quickly. When constructed in 1982, the Lookingglass Hatchery was designed to accommodate two stocks of spring/summer chinook. The CPP, in response to the ESA listings in the late 1990s, expanded the responsibilities of the hatchery beyond its physical capacity to handle more stocks at the desired low densities. Under current conditions, smolt production is below that which was permitted due to sub-optimal rearing densities and an overload of facility resources. If no action were to occur, early and final rearing facilities, as well as incubation, holding and spawning facilities would not be modernized at the hatchery. Chinook salmon would not be reared in facilities that implement acceptable NATURES criteria.

### **3.2.5.2 Lostine Adult Collection Facility**

If no action were taken to modify existing structures, construction impacts would not occur to the aquatic environment. However, if the existing structures were not replaced and the velocity barrier not installed, safe adult collection and trapping at high river stages would continue to be problematic. Fish passage problems at the existing fish ladder during periods of low flow would not be resolved and impacts to listed species would occur from migration delays and/or restricted passage.

### **3.2.5.3 Lostine River Hatchery**

If the proposed Lostine River Hatchery were not constructed, no impacts to the aquatic environment would occur as a result of construction or operation. However, spring/summer chinook production at the existing facilities, including Lookingglass and the Imnaha Satellite Facility, would likely continue to be below levels suggested in the program. Hauling of fish collected at the existing portable weir to Lookingglass would continue, causing stress on fish collected from the Lostine. Additionally, with no action, the Lostine River component would not be reared in natal waters, as desired under NATURES and APRE fish culture designs.

### **3.2.5.4 Imnaha Final Rearing Facility**

Under the no action alternative, the Imnaha Final Rearing Facility would not be constructed and therefore, construction and operation of instream features would not impact existing fish resources. Final rearing of Imnaha stock smolts would not take place in natal waters at the Imnaha Final Rearing Facility and long-distance hauling stress on juveniles would continue. It is expected that Imnaha chinook runs, currently reared at Lookingglass and released at the Imnaha Satellite Facility, would increase, but at a slower rate than if the Imnaha Final Rearing Facility were not used for final rearing, due to the limited space and water available at Lookingglass Hatchery.

### 3.2.5.5 Imnaha Satellite Facility

Under the No Action Alternative, instream structures that currently cause adverse impacts to migrating and spawning salmonids at the Imnaha Satellite facility would not be improved. Better collection of spawners and an anticipated increase in downstream passage ability past the structures would not be attained. An increased fish ladder attraction, and collection of adults across a larger hydrograph would not take place. The inefficient collection, migrational delay, and forced downstream spawning would continue to occur. Additionally, if no action were taken, the existing intake screen would remain out of compliance with NMFS (1996) juvenile fish screening criteria.

## 3.3 Wildlife

### 3.3.1 Affected Environment

#### 3.3.1.1 Grande Ronde Subbasin

**General Wildlife Overview** — Numerous wildlife species reside or are seasonally present in the Grande Ronde subbasin. These species are found in association with the area’s primary habitat types, including riparian areas; wetlands, seeps and springs; shrub and early seral habitats; shrub/deciduous forest types; and conifer forests. Project sites within the subbasins include all of these habitat types, and therefore, wildlife species that occur throughout the subbasin could occur at any of the project sites. The riparian habitats found at each of the proposed project sites most likely provide travel, dispersal, cover, resting and foraging corridors for many of these species.

Twenty-one species of ducks, four species of geese, and two species of swans occur in the Grande Ronde subbasin during migration and nesting seasons (Nowak and Eddy 2001). In addition, a number of wading and shorebirds, including sandhill cranes, are found in the subbasin. Upland birds found in the basin include chukar and Hungarian partridge; blue, ruffed, sage and Columbian sharp-tailed grouse; mountain and California valley quail; wild turkey, and ring-necked pheasant. Chukar, Hungarian partridge, ring-necked pheasant, and wild turkey are not native to the Grande Ronde subbasin (Nowak and Eddy 2001), but are introductions. Many raptor species reside in the subbasin including golden eagle, American kestrel, peregrine falcon and northern goshawk. Bald eagle and Swainson’s hawk are seasonal migrants to the subbasin (Nowak and Eddy 2001). The subbasin is also home to many migratory and resident species of songbird, woodpecker, and other non-game bird species.

Game species common in the subbasin include Rocky Mountain bighorn sheep, mountain goats, Rocky Mountain elk, Rocky Mountain mule deer, white-tailed deer, black bear and cougar. Rocky Mountain bighorn sheep disappeared from Oregon in the mid-1940s, but have been reintroduced since 1971. Within the Grande Ronde subbasin, bighorns have been released in the Lostine, Minam and Wenaha drainages (Nowak and Eddy 2001). Mountain goats, once indigenous to northeast Oregon, disappeared before or at the time of European settlement (Nowak and Eddy 2001). Present populations resulted from reintroductions and occur in the Wallow Mountains, Hells Canyon and Elkhorn Mountains. A band of 20 to 25 mountain goats is known to occur in the Lostine subbasin (U.S. Forest Service 2002b), although their presence in the immediate project vicinity is not anticipated.

Furbearing species common in and near the mainstem rivers, tributaries and wetlands of the Grande Ronde River subbasin include beaver, river otter, mink, muskrat, and raccoon. American martens are known to occur in the subbasin, but between 1991 and 1994, surveys conducted by the Forest Service in the Lostine River area detected no martens (U.S. Forest Service 2002b). Surveys conducted by the Forest Service

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Twenty-one species of ducks, four species of geese, and two species of swans occur in the Grande Ronde subbasin during migration and nesting seasons (Nowak and Eddy 2001). In addition, a number of wading and shorebirds, including sandhill cranes, are found in the subbasin. Upland birds found in the basin include chukar and Hungarian partridge; blue, ruffed, sage and Columbian sharp-tailed grouse; mountain and California valley quail; wild turkey, and ring-necked pheasant. Chukar, Hungarian partridge, ring-necked pheasant, and wild turkey are not native to the Grande Ronde subbasin (Nowak and Eddy 2001), but are introductions. Many raptor species reside in the subbasin including golden eagle, American kestrel, peregrine falcon and northern goshawk. Bald eagle and Swainson’s hawk are seasonal migrants to the subbasin (Nowak and Eddy 2001). The subbasin is also home to many migratory and resident species of songbird, woodpecker, and other non-game bird species.

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between 1992 and 1995 indicate that several species of bats occur within the Grande Ronde subbasin (U.S. Forest Service 2002b), including: Townsend’s big-eared bat, silver haired bat, small-footed myotis, long-eared myotis, long-legged myotis, fringed myotis, Yuma myotis, big brown bat, hoary bat, California bat, little brown bat and Western pipistrelle.

**Threatened and Endangered Wildlife Species** — Numerous species having federal or state protection are found in the Grande Ronde subbasin. Table 3.3-1 identifies listed wildlife species known or expected to occur in the subbasin. Like other wildlife expected to occur in the subbasin, these species may use project sites even though their presence at sites has not been documented.

State and federal regulatory and management agencies classify species differently as shown on Table 3.3-1. Under its endangered and sensitive species rules, the State of Oregon (ODFW) ranks species as threatened, endangered or sensitive. Within the sensitive ranking, the state classifies species as critical, vulnerable, peripheral or naturally rare, or undetermined. Federal agencies (NOAA Fisheries and USFWS) characterize species as threatened, endangered, species of concern or candidate. For lands under its management control, the Forest Service classifies species occurring on its lands as sensitive and as management indicator species (MIS). General definitions for these terms are as follows:

- Critical – species for which listing as threatened or endangered is pending.
- Vulnerable – species for which listing as threatened or endangered is not believed to be imminent.
- Peripheral – species whose Oregon populations are on the edge of their range.
- Undetermined – species for which status is unclear.
- Endangered – a species in danger of extinction throughout all or a significant portion of its range.
- Threatened – a species likely to become endangered within the foreseeable future.
- Species of concern – an informal term for a species that a USFWS region or the NOAA Fisheries considers in decline or in need of concentrated conservation actions to prevent decline.
- Candidate – a species for which USFWS or NOAA Fisheries has enough information to warrant proposing them for listing as endangered or threatened, but these species have not yet been proposed for listing.
- Sensitive – species identified by a Regional Forester for which **population viability** is a concern.
- MIS – designation for species or habitat components selected to monitor the effects of planned Forest Service management activities.

**Table 3.3-1. Federally or State Listed Species Known or Suspected of Occurring in the Grande Ronde Subbasin<sup>1/</sup>.**

Common Name	Scientific Name	State Status <sup>2/</sup>	Forest Service Status <sup>2/</sup>	Federal Status <sup>2/</sup>
<b>Mammals</b>				
Pygmy rabbit	<i>Brachylagus idahoensis</i>	SV	--	SOC
Gray wolf <sup>3/</sup>	<i>Canis lupus</i>	E	S	T
Pale western big-eared bat	<i>Corynorhinus townsendii pallescens</i>	SC	S	SOC
Spotted bat	<i>Euderma maculatum</i>	--	S	SOC
California wolverine <sup>3/</sup>	<i>Gulo gulo luteus</i>	T	S	SOC
Silver-haired bat	<i>Lasionycteris noctivagans</i>	SU	--	SOC
Canada lynx	<i>Lynx canadensis</i>	--	S	T
Pacific fisher <sup>3/</sup>	<i>Martes pennanti pacifica</i>	SC	S	SOC
Western small-footed myotis	<i>Myotis ciliolabrum</i>	SU	--	SOC
Long-eared myotis	<i>Myotis evotis</i>	SU	S	SOC
Fringed myotis	<i>Myotis thysanodes</i>	SV	--	SOC
Long-legged myotis	<i>Myotis volans</i>	SU	--	SOC
Yuma myotis	<i>Myotis yumanensis</i>	--	--	SOC
Preble's shrew	<i>Sorex preblei</i>	--	--	SOC
<b>Birds</b>				
Northern goshawk	<i>Accipiter gentilis</i>	SC	MIS	SOC
Western burrowing owl	<i>Athene cunicularia</i>	SC	--	SOC
Upland sandpiper	<i>Bartramia longicauda</i>	SC	S	SOC
Ferruginous hawk	<i>Buteo regalis</i>	SC	--	SOC
Western greater sage-grouse	<i>Centrocercus urophasianus</i>	SC	--	SOC
Black tern	<i>Chlidonias niger</i>	--	--	SOC
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	SC	--	C
Olive-sided flycatcher	<i>Contopus cooperi</i>	SV	--	SOC
Eastern Or. Willow flycatcher	<i>Empidonax trailii adastus</i>	SU	--	SOC
Peregrine falcon	<i>Falco peregrinus</i>	E	S	--
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	S	T
Harlequin duck	<i>Histrionicus histrionicus</i>	SU	--	SOC
Yellow-breasted chat	<i>Icteria virens</i>	SC	--	SOC
Lewis's woodpecker	<i>Melanerpes lewis</i>	SC	MIS	SOC
Mountain quail	<i>Oreortyx pictus</i>	SU	--	SOC
White-headed woodpecker	<i>Picoides albolarvatus</i>	SC	MIS	SOC
Columbian sharp-tail grouse	<i>Tympanuchus phasianellus</i>	--	S	SOC
<b>Reptiles &amp; Amphibians</b>				
Northern sagebrush lizard	<i>Sceloporus graciosus</i>	SV	--	SOC
Columbia spotted frog	<i>Rana luteiventris</i>	SU	S	C
Tailed frog	<i>Ascaphus truei</i>	SV	--	SOC

1/ Sources USFWS (2002); (Nowak and Eddy 2001); ONHP (2002, 2001); U.S. Forest Service (2002a and 2002b).

2/ E = Endangered, T = Threatened, C = Candidate, SOC = Species of Concern, SC = State Sensitive (critical), SU = State Sensitive (unknown), SV = State Sensitive (vulnerable), S = USFS Sensitive, MIS = USFS Management Indicator Species.

3/ Denotes species extirpated from the area or whose population status is unknown.

No state or federally listed species are known to occur at the project sites in the Grande Ronde subbasin. Bald eagle nests have been documented in Union and Wallow Counties (Nowak and Eddy 2001), but Oregon Natural Heritage Program (**ONHP**) surveys show none at project sites (ONHP 2002). No regularly occupied breeding locations have been documented for the yellow-billed cuckoo within Oregon (Csuti, et al. 2001), although project sites have riparian vegetation (black cottonwood and willows) where these birds have been documented along the rivers of eastern Oregon (Csuti et al. 2001). The ONHP reports a single, historic lynx trapping within one mile of the proposed Lostine River Hatchery, although surveys for lynx conducted in the subbasin in 1999 and 2000 failed to detect lynx in this area (Nowak and Eddy 2001). Forest Service surveys in the Lostine watershed also failed to document lynx use in the watershed (U.S. Forest Service 2002b). Extensive surveys conducted throughout eastern Oregon since 1996 have documented a number of Columbia spotted frog sites, including about 12 low-elevation locations in Wallowa County, but none on project sites (USFWS 2001; U.S. Forest Service 2002b). Project sites do provide some of the wetland plant communities (dominated by sedges, rushes and grasses) where these frogs are generally found (Leonard et al. 1993). Another listed species that is known to occur along the Lostine River is the northern goshawk. The ONHP (2002) reports a 1976 observation of a northern goshawk nest within one mile of the proposed Lostine River Hatchery intake. More current surveys show six or more nesting records and ten different goshawk territories overlapping within the Lostine River area (U.S. Forest Service 2002b). Gray wolves are thought to be extirpated from Oregon. California wolverine are typically distributed at elevations around 5000 feet (Marshall 1989). Wolverine sightings are occasionally reported in the Wallowa Mountains, but their abundance and distribution is unknown (Nowak and Eddy 2001). Peregrine falcons occupy cliff faces or inaccessible ledges for nesting. They are often found in open habitat near water sources as their preferred prey are other bird species. The peregrine falcon is reported to nest on cliffs within the Grande Ronde River valley (ODOT 2002).

**Lookingglass Hatchery** — The Lookingglass Hatchery is situated on a small terrace within a relatively steep valley at approximately 2,565 feet in elevation (Figures 2-2 and 3.9-1). Surrounding, steeply sloping hills are locally dominated by grassy vegetation with scattered shrub thickets and intermittent tree cover. Remaining areas are forested with mixed conifer stands of Douglas-fir and ponderosa pine. Small areas of cliffs and talus slopes are present in the vicinity. Elk, deer, cougar, bear, eagles, osprey, bats and frogs have all been noted in the immediate project vicinity (Lund 2002, personal communication). No bald eagle nest sites are known to occur in the vicinity of this site or any of the proposed project sites in the Lostine subbasin (ONHP 2002; Weatherford, 2002, personal communication). This site is well below the elevation generally thought of as providing suitable lynx and wolverine habitat. Gray wolves are not expected to occur at the project site. Suitable habitat for peregrine falcons may occur in the vicinity of the hatchery. Peregrine falcons may fly over the project site though no sightings have been reported.

**Lostine River Adult Collection Facility** — The proposed Lostine River Adult Collection Facility is located about one mile south of the town of Lostine, on private property currently operated as a trout farm (Figures 2-3 and 3.9-2). Elevation at the site is about 3,470 feet. This section of the Lostine River is relatively narrow and constricted. The riparian zone in this river reach is primarily characterized by deciduous species, although conifers are dominant in localized areas. The riparian plant communities at this site have been previously impacted through past and current site use and contain a mix of unvegetated river rock or riprap and native vegetation. Numerous small channels, seeps, springs and ponds occur on the subject property.

No bald eagle nest sites are known to occur in the vicinity of any of the proposed project sites in the Lostine subbasin (ONHP 2002; Weatherford 2002, personal communication). However, bald eagles are likely to forage or roost along the entire Lostine River corridor, and may use the small trout holding ponds at the site as a foraging area. Canada Lynx habitat, characterized as large tracts of densely stocked, mixed conifer forest with large numbers of downed logs for den sites, is not present at this site. This site is also well below the elevation for lynx and wolverine. The small side channels, springs, wetlands and ponds that are found on-site likely provide suitable habitat for the Columbia spotted frog, although no frogs have been documented at the

site. Gray wolves are not expected to occur at the project site. Suitable habitat for peregrine falcons may occur in the vicinity. Sightings have been reported on the Wallowa River, and as peregrines are known to travel at least 10 miles to hunt they fly over but are not known to occur in the immediate vicinity.

**Lostine River Hatchery** — The Lostine River Hatchery is proposed on an approximately five-acre site in the low density Lostine River Acres residential community (Figures 2-4 and 3.9-3). The site is situated in the Lostine subbasin at about 3,700 feet in elevation with the Lostine River forming the western boundary of the property. The braided channels present in this river reach provide conditions conducive to wide bands of riparian vegetation dispersed throughout the exposed cobble areas of the riverbed and banks. Woody debris from high flow events is scattered throughout the riverbed and side banks.

The ONHP notes the presence of a bald eagle winter roost on the Lostine River, within one mile of the proposed Lostine River Hatchery (ONHP 2002). Up to nine eagles were observed at this site in 1990. No bald eagle nest sites are known to occur in the vicinity of the site (ONHP 2002), although nests have been documented in both Union and Wallowa Counties (Nowak and Eddy 2001).

Reports of Canada lynx trapping have been noted within about one mile of the proposed Lostine River Hatchery intake site in 1970 and 1971 (ONHP 2002), but surveys conducted between 1991 and 2001 failed to document the presence of lynx in the Grande Ronde subbasin (Nowak and Eddy 2001; U.S. Forest Service 2001 and 2002b). The Lostine River Hatchery site may provide lynx habitat components, as this site is nearer to the 4,500 foot minimum elevation and is within close proximity to core lynx habitat identified within the Eagle Cap Wilderness Area. However, lynx are unlikely to use the project site for denning based on the existing level of disturbance resulting from roads, surrounding residential development, and agricultural uses in the vicinity. Gray wolves are not expected to occur at the project site. The site is below the 5,000 foot elevation, and does not contain the preferred sub-alpine forest habitat for wolverine. Suitable habitat for peregrine falcons may occur in the vicinity. Sightings have been reported on the Wallowa River, and as peregrines are known to travel at least 10 miles to hunt they fly over but are not known to occur in the immediate vicinity.

### 3.3.1.2 Imnaha Subbasin

**General Wildlife Overview** — A list of wildlife species present in the Imnaha River subbasin developed by the Forest Service and others indicates that the Imnaha subbasin is inhabited by about 12 amphibian species, 19 reptile species, 239 bird species, and 69 mammal species (Bryson et al. 2001; U.S. Forest Service 1998c). Some of these species, including many of the birds, only reside in the area for short periods of the year during their migration. Although there are exceptions, most of the wildlife species of the Imnaha subbasin are thought to have healthy and stable populations (Bryson et al. 2001). The overall rugged nature of the watershed results in fairly limited and defined travel corridors for many wildlife species (U.S. Forest Service 1998c). Benches, plateaus and major drainages provide the primary travel corridors. Project sites within the subbasin provide potential habitat for most any of the species found in the subbasin, although the Imnaha Satellite Facility provides the best habitat in terms of the least amount of development and human disturbance.

Game animals in the Imnaha subbasin include mule and white-tailed deer, Rocky Mountain elk, black bear, cougar, turkey, pheasant, California quail, chukar partridge, Hungarian partridge, forest grouse, snipe and mourning dove (Bryson et al. 2001). Furbearers include beaver, coyote, mink, muskrat, otter, skunk, raccoon and weasel. Raptors include bald and golden eagles, prairie and peregrine falcons, American kestrel, merlin and a variety of hawks.

The Yuma myotis, long-eared myotis, fringed myotis, long-legged myotis, Townsend’s big-eared bat, western small-footed myotis, spotted bat and pallid bat occur in the forest, sagebrush and montane shrub habitats of the Imnaha basin (Bryson et al. 2001). Townsend’s big-eared bats are year-round residents (U.S. Forest Service 1998c), although populations are thought to be decreasing across the western United States.

**Threatened and Endangered Wildlife Species** —Table 3.3-2 lists species having federal or state status that can be found in the Imnaha subbasin. Threatened or endangered species may occur on or use the Imnaha project sites, though not formally documented. Habitat for bald eagle, yellow-billed cuckoo and Columbia spotted frog exist at or near project sites. On the fringe of Canada lynx range, only two occurrences of lynx have been reported to the ONHP in the Imnaha subbasin (Bryson et al. 2001), although no lynx reports have been confirmed for many years and winter track counts and surveys conducted by the Forest Service found no evidence of lynx in the subbasin (U.S. Forest Service 1998c). There are no known bald eagle nest sites within the Imnaha subbasin (U.S. Forest Service 1998c). There are, however, documented bald eagle winter roosts or nest sites along the Snake River (U.S. Forest Service 2002c). Surveys completed on the Wallowa-Whitman National Forest since 1979 have shown an increasing trend for wintering bald eagles in the area (U.S. Forest Service 1998c), primarily from November through March. No regularly occupied breeding locations have been documented for the yellow-billed cuckoo in the Imnaha subbasin (Csuti et al. 2001). However, because parts of the Imnaha subbasin contain relatively undisturbed riparian areas, the subbasin does have potentially suitable breeding habitat. Columbia spotted frogs are generally found in or near permanent bodies of water, including lakes, ponds, slow streams and marshes. The species is most often associated with non-woody wetland plant communities. Recent surveys found 12 spotted frog locations within the Wallowa County, all of which are at lower elevations than project sites (U.S. Forest Service 2002b). California wolverines are typically found at elevations around 5000 feet (Marshall 1989) in association with sub-alpine forests. Peregrine falcon captive breed birds have been re-introduced into the Seven Devils area of the Hells Canyon, and the Wallowa-Whitman National Forest reports at least one active nest in 2001. Preferred habitat is open areas near a water source with available cliff faces and inaccessible ledges for nesting (Csuti et al. 1997).

**Table 3.3-2. Federally or State Listed Species Known or Suspected of Occurring in the Imnaha Subbasin<sup>1/</sup>.**

Common Name	Scientific Name	State Status <sup>2/</sup>	Forest Service Status <sup>2/</sup>	Federal Status <sup>2/</sup>
<b>Mammals</b>				
Pallid bat	<i>Antrozous pallidus</i>	SV		--
Pale western big-eared bat	<i>Corynorhinus townsendii pallescens</i>	SC	S	SOC
Spotted bat	<i>Euderma maculatum</i>	--	S	SOC
California wolverine <sup>3/</sup>	<i>Gulo gulo luteus</i>	T	S	SOC
Silver-haired bat	<i>Lasionycteris noctivagans</i>	SU	--	SOC
White-tailed jackrabbit	<i>Lepus townsendii</i>	SU	--	--
Canada lynx	<i>Lynx canadensis</i>	--	S	T
American marten	<i>Martes americana</i>	SV	MIS	--
Pacific fisher <sup>3/</sup>	<i>Martes pennanti pacifica</i>	SV	S	SOC
Western small-footed myotis	<i>Myotis ciliolabrum</i>	SU	--	SOC
Long-eared myotis	<i>Myotis evotis</i>	SU	S	SOC
Fringed myotis	<i>Myotis thysanodes</i>	SV	--	SOC
Long-legged myotis	<i>Myotis volans</i>	SU	--	SOC
Yuma myotis	<i>Myotis yumanensis</i>	--	--	SOC
Preble’s shrew	<i>Sorex preblei</i>	--	--	SOC



<b>Birds</b>				
Northern goshawk	<i>Accipiter gentilis</i>	SC	MIS	SOC
Boreal owl	<i>Aegolius funereus</i>	SU	--	--
Western burrowing owl	<i>Athene cunicularia</i>	SC	--	SOC
Upland sandpiper	<i>Bartramia longicauda</i>	SC	S	SOC
Bufflehead	<i>Bucephala albeola</i>	SU	S	--
Barrow's goldeneye	<i>Bucephala islandica</i>	SU	--	--
Ferruginous hawk	<i>Buteo regalis</i>	SC	--	SOC
Swainson's hawk	<i>Buteo swainsonii</i>	SV	--	--
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	SC	--	C
Olive-sided flycatcher	<i>Contopus cooperi</i>	SV	--	SOC
Spruce grouse	<i>Dendragapus canadensis</i>	SU	--	--
Bobolink	<i>Dolichonyx oryzivorus</i>	SV	S	--
Pileated woodpecker	<i>Dryocopus pileatus</i>	SV	MIS	--
Eastern Or. Willow flycatcher	<i>Empidonax trailii adastus</i>	SU	--	SOC
Peregrine falcon	<i>Falco peregrinus</i>	E	S	--
Northern pygmy owl	<i>Glaucidium gnoma</i>	SC	--	--
Greater sandhill crane	<i>Grus canadensis tabida</i>	SV	--	--
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	S	T
Harlequin duck	<i>Histrionicus histrionicus</i>	SU	--	SOC
Yellow-breasted chat	<i>Icteria virens</i>	SC	--	SOC
Lewis's woodpecker	<i>Melanerpes lewis</i>	SC	MIS	SOC
Mountain quail	<i>Oreortyx pictus</i>	SU	--	SOC
Flammulated owl	<i>Otus flammeolus</i>	SC	--	--
American white pelican	<i>Pelecanus erythrorhynchos</i>	SV	--	--
White-headed woodpecker	<i>Picoides albolarvatus</i>	SC	MIS	SOC
Black-backed woodpecker	<i>Picoides arcticus</i>	SC	MIS	--
Three-toed woodpecker	<i>Picoides tridactylus</i>	SC	MIS	--
Red-necked grebe	<i>Podiceps grisegena</i>	SC	--	--
Bank swallow	<i>Riparia riparia</i>	SU	--	--
Pygmy nuthatch	<i>Sitta pygmaea</i>	SC/SV	MIS	--
Williamson's sapsucker	<i>Sphyrapicus thyroideus</i>	SU	MIS	--
Great gray owl	<i>Strix nebulosa</i>	SV	--	--
Columbian sharp-tail grouse	<i>Tympanuchus phasianellus</i>	--	S	SOC
<b>Reptiles &amp; Amphibians</b>				
Tailed frog	<i>Ascaphus truei</i>	SV	--	SOC
Western toad	<i>Bufo boreas</i>	SC	--	--
Painted turtle	<i>Chrysemys picta</i>	SU	S	--
Columbia spotted frog	<i>Rana luteiventris</i>	SV	S	C

1/ Sources USFWS (2002); ONHP (2002, 2001); U.S. Forest Service (2002a); (Bryson et al. 2001)

2/ E = Endangered, T = Threatened, C = Candidate, SOC = Species of Concern, SC = State Sensitive (critical), SU = State Sensitive (unknown), SV = State Sensitive (vulnerable), S = USFS Sensitive, MIS = USFS Management Indicator Species.

3/ Denotes species extirpated from the area or whose population status is unknown.

**Innaha Final Rearing Facility** — The proposed Innaha Final Rearing Facility is located within the lower Innaha subbasin, at an elevation of about 1,995 feet (Figures 2-6 and 3.9-4). Site topography is relatively flat and the river channel at this location is well defined. Currently the site is used for cattle grazing, and the central portion of the site is devoid of woody vegetation and is dominated by introduced pasture grasses and weedy forbs. A narrow fringe of riparian vegetation, dominated by water birch, black cottonwood, willows, hawthorn and mountain alder remains along the river corridor. Ponderosa pine and black cottonwood are the

primary overstory species found on the Imnaha River Road (east) side of the river. No significant springs, seeps or wetland areas were noted in the project area, except for a very narrow fringe along the river channel.

Upland game birds are expected to occasionally use the riparian habitat at the site. Riparian vegetation provides nesting cover and winter food sources for many game birds. Bats, which use a variety of habitat for day roosts, are also expected to occur in the project area, as appropriate habitat features exist throughout the vicinity. Elk and deer are expected to use habitat in the vicinity of the site during the late fall and winter. Elk herds travel along primary migration corridors, including Summit, Puderbaugh and Neiman ridges, in late October or November as they return to wintering grounds in Hells Canyon (U.S. Forest Service 1998c). Mule deer migrate to the lower elevation areas of the subbasin in winter, to escape deep snow levels. Lynx habitat, characterized as large tracts of densely stocked, mixed conifer forest with large numbers of downed logs for den sites, is absent from the site. There are no known bald eagle nest sites or communal winter roost sites within the Imnaha subbasin (ONHP 2002; Weatherford 2002, personal communication; U.S. Forest Service 1998c). Some habitat may be favorable for Columbia spotted frog and yellow-billed cuckoo, although neither species has been documented at the site. The site is well below 5,000 foot elevation and does not contain the preferred sub-alpine forest habitat for California wolverine. Suitable habitat for peregrine falcons may occur in the surrounding vicinity. Re-introduced populations occur within the Seven Devils mountains, and as peregrines are known to travel at least 10 miles to hunt they may fly over the project site but are not known to occur in the immediate vicinity.

**Imnaha Satellite Facility** — The Imnaha Satellite Facility occupies about six acres of Forest Service land in the upper Imnaha subbasin at an elevation of about 3,760 feet (Figures 2-8 and 3.9-5). The entire site is located on Forest Service land, within a Forest Service-designated Riparian Habitat Conservation Area (RHCA). All areas within 300 feet of the river are included in the RHCA. The site contains the existing hatchery facility, maintained lawns, and small areas of native, riparian vegetation in a mixed conifer forest. The only area on-site having wetland characteristics is the narrow fringe at the river's edge. No significant springs, seeps or other wetland types were noted within the project boundaries.

No bald eagle winter roosting sites or nesting territories have been documented in the vicinity of the Imnaha Satellite Facility (ONHP 2002). Any use of the area by bald eagles would most likely consist of transient foraging individuals during the wintering period and is expected to be infrequent. Of the project locations within the Imnaha subbasin, the Imnaha Satellite facility is the most likely to provide lynx habitat components due to its elevation and proximity to relatively undisturbed, large forested stands. The Imnaha Satellite Facility is near an identified lynx travel corridor, and mapped lynx core habitat is located within approximately two air miles of the site. However, denning is not likely to occur in the immediate vicinity of the facility due to the developed nature of the site and lack of suitable habitat. The Imnaha Satellite Facility is located in a portion of the subbasin in which riparian communities are dominated by mixed coniferous forest typical in mid- to low elevations of the basin, rather than the deciduous forested riparian communities preferred by the cuckoo. As such, this site is unlikely to provide suitable yellow-billed cuckoo habitat. The lack of wetland habitat at the site also limits the probability of Columbia spotted frog occurrence.

The site is well below the 5,000 foot elevation, and does not contain the preferred sub-alpine forest habitat for California wolverine. And, the established presence of human activity at this site is likely to preclude use of the site by wolverines. Suitable habitat for peregrine falcons may occur in the vicinity of the hatchery. Re-introduced populations occur within the Seven Devils Mountains, and as peregrines are known to travel at least 10 miles to hunt they may fly but are not known to occur in the immediate vicinity.

The Imnaha Satellite Facility is the only project site that is located on lands managed by the Forest Service. Species known or likely to occur on the site of particular interest to the Forest Service include Forest Service listed sensitive and management indicator species. Such species documented in the subbasin include American marten, northern goshawk, pileated woodpecker, and a variety of cavity-nesting birds.

### 3.3.2 Evaluation Criteria

The following criteria were used to evaluate potential impacts to wildlife, at the proposed sites:

- Substantial changes to state or federally listed species, big game or their habitats.
- Elimination, disturbance or enhancement of designated critical habitat or primary travel routes.

### 3.3.3 Consequences of the Proposed Action

Each of the proposed project sites occupies a somewhat similar ecological setting. Each of the sites occurs within the context of rural or forestland development, and is characterized by impacts resulting from agriculture and aquaculture, low-density rural residential developments, and timber harvest and livestock grazing activities. Although they do not occur in pristine habitat, they are all located in generally lightly developed portions of the respective subbasins within riparian corridors. The riparian habitats at the sites provide wildlife travel and dispersal corridors, and cover, resting, and foraging habitats. In addition, each of the sites is within proximity to large blocks of available habitat of varying types. Open rangeland, private and federal forest lands, and protected wilderness areas and wildlife preserves occur near the project sites.

Because of their similar settings, wildlife expected to occur at the sites are likely to be the same. Species commonly found throughout the Grande Ronde and Imnaha subbasins, including ducks and geese, raptors, upland game birds, song birds, mule and white-tailed deer and elk, black bear, cougar, coyote, raccoon, mink, river otter, skunk and weasel, and bats, would be expected to occur at all of the sites at least seasonally. Species more typically associated with higher elevations or old growth habitat, such as lynx, wolverine and martens, would not be likely to occur within the project vicinities. However, their potential use of the sites for periodic foraging, migration, or dispersal habitat cannot be precluded.

Expected wildlife impacts include temporary, small-scale habitat damage or loss and temporary, although relatively constant, disturbance during construction; and some long-term, although small-scale, habitat loss and periodic disturbance during facility operation and maintenance. Direct loss of habitat resulting from clearing, grading and filling in upland habitats and the small portion of related riparian habitats would potentially result in the most impact to wildlife. Current densities of snags, downed logs and other habitat attributes would be affected in localized areas only.

Beneficial effects for species relying on salmon for forage may be realized over the long-term if program goals for salmon supplementation are successful.

#### 3.3.3.1 Lookingglass Hatchery

Proposed modifications to the existing hatchery would occur within the existing, developed area. Construction would result in minor new ground disturbance and would increase the amount of impervious surface area currently present at the site (less than ¼ acre). Temporary erosion and sedimentation impacts to riparian habitat would be minimal based on the limited amount of new construction, distance of excavation from Lookingglass Creek, amount and location of existing pavement and associated slopes, and implementation of best management construction practices.

The overall quality of habitat at this site would remain essentially unchanged from existing conditions. Construction activities, which would last about eight months (April to November), could result in disturbance to normal activity patterns of wildlife present in the vicinity and potential displacement of some individuals. However, disturbances would be temporary and limited in spatial extent, and are not anticipated to negatively impact individuals or populations over time. Construction would occur outside of the bald eagle wintering

period, so disturbance impacts to any wintering eagles would be avoided. No bald eagle nesting territories have been documented in the vicinity of the site (ONHP 2002).

### **3.3.3.2 Lostine Adult Collection Facility**

Installation of the flow velocity barrier would require construction of concrete abutment walls and the removal of up to 20 feet of the riverbank, including associated riparian vegetation. Placement of fill and riprap for construction of the flood-proofing levee would displace existing riparian habitat along another 300 feet of the river channel. Construction of the proposed levee would also isolate small side channels and associated wetlands that occur on the west bank of the river. Although Columbia spotted frogs have not been documented at the site, impacts to potential habitat would occur as a result of site clearing, grading and filling and from potential changes to the existing hydrologic regime subsequent to construction of the west bank levee. Use of the riparian zone at the site for travel, dispersal, cover, foraging, resting and nesting by all local species would be temporarily impaired during construction.

Jackhammer use and other construction noise would produce noise levels that are likely to temporarily disturb wildlife occurring within a mile of the site. Temporary displacement of some individuals may occur. The high noise level activities would occur in July, during the instream work window. Noise impacts to wintering bald eagles that may use the area would be avoided by this construction timing. Removal of several large, dominant trees (black cottonwood and ponderosa pine) may limit long-term opportunities for bald eagle roosting in the immediate vicinity. Removal of potential perch trees would occur on both sides of the river; including from about 300 feet of the west bank and from about 20 to 50 feet of the east bank. However, the majority of canopy trees would remain in place on the east bank.

The site is currently used as a private trout farm and is adjacent to the Lostine River Road. The long-term level of human disturbance (human presence, vehicles, noise, light glare, etc.) resulting from the Proposed Action would not be greatly increased over existing levels.

### **3.3.3.3 Lostine River Hatchery**

Construction of the proposed facilities would result in about three acres of new impervious surface at the site. Numerous large trees, primarily grand fir, Englemann spruce, and black cottonwood, would be removed, as would a small number of diseased trees, snags and downed wood. Two small aspen stands occur at this site, and although impacts to these stands would be avoided to the extent possible and new aspen would be planted, some trees would be removed. Installation of the intake, screens, fish ladder and conveyance pipeline would result in the removal of about 100 feet of the riverbank and associated riparian habitat. Localized impacts would result from construction and stabilization of the outfall structure, which would require excavation of about 150 cubic yards of riverbank material and placement of about 35 cubic yards of cobbles for stabilization of the structure.

Temporary displacement of wildlife is expected during construction. Equipment noise is likely to disturb bald eagles wintering in this section of the river. Although construction of buildings would occur within the bald eagle wintering period, foundation and exterior work would occur early on, and quieter, interior work would be completed later in the wintering period to minimize disturbance. Removal of trees at this site is not anticipated to adversely affect bald eagle roosting, as the majority of tree removal would be conducted away from the mainstem river channel where perching is most likely to occur. Construction activities may also temporarily disrupt movement of big game, especially elk, mule deer and white-tailed deer, from upland areas to the river corridor. These effects would be minimal and short-lived as animals within the project vicinity are somewhat accustomed to human presence and disturbances.

Some temporary impacts to wildlife use of and movement through the site may be unavoidable. Over the long-term, a well-vegetated area would be maintained between the proposed hatchery facility and the main river channel. Adequate cover to provide for travel, dispersal, cover, resting, and foraging corridors is expected to remain at this site. The hatchery site would not be fenced so that big game may continue to access the river after construction.

Long-term wildlife habitat loss would result from project construction and activity at specific site locations. Aspen stands are reportedly used by 188 vertebrate species for reproduction and feeding in the Blue Mountains (Thomas et al. 1979) and some indirect impact to wildlife through removal of this habitat would result from site activities. Some of the forested riparian community in the project area, including the outfall access road corridor that provides potentially suitable breeding and feeding habitat for the yellow-billed cuckoo, would be removed. However, no regularly occupied breeding locations have been documented within Oregon (Csuti, et al. 2001), and other suitable habitat is available in the vicinity. Suitable habitat for Columbia spotted frog may be present in portions of the meander side channel within the project area, including in proximity to the proposed outfall location would also be removed (although no spotted frogs have been documented at the project site). However, adequate suitable habitat is available in the vicinity and any individuals present are likely to disperse to adjacent habitat.

#### **3.3.3.4 Imnaha Final Rearing Facility**

The proposed Imnaha Final Rearing Facility would be staffed year-round, and operated from September through March. Proposed facilities include a residence, shop and bunkhouse; raceways, intake and outfall structures; well, pipelines and septic system; access road and power; and relocation of an existing bridge. Prior to construction, up to three feet of rock fill would be placed on the lower end of the site. The vegetated riparian zone would be largely avoided. Construction of facilities would result in about three and one-half acres of new impervious surface at the six-acre facility.

The existing bridge would be relocated about 200 feet upstream of its current location, to a stable rock bar. A small number of trees and at least one snag would be removed due to placement of the bridge abutments. Additional snags occur in close proximity to the proposed bridge location, however, and it is possible that one or more additional snags would be affected either directly by placement of the structure, or indirectly if adjacent snags (overhanging canopy) interfere with equipment operation for safe placement of the panel bridge. Removal of large, dominant trees (black cottonwood and ponderosa pine) may limit opportunities for bald eagle roosting in the immediate vicinity. However, removal of snags and potential perch trees would be restricted to this location, and many others are available off-site.

Rock fracturing, drilling and excavation for installation of the intake structure and concrete cutting to dismantle the old bridge abutments would produce high, periodic noise levels that are likely to disturb wildlife within a mile or more of the site and alter normal behavior patterns. Temporary displacement of some individuals may occur. The highest noise level activities would primarily occur between July 15 and August 15, during the instream work window. Noise impacts to wintering bald eagles that may use the area would be avoided by this timing. No nesting territories are documented near the site (ONHP 2002). Disturbance levels resulting from remaining construction activities would likely be reduced, due to the lower noise levels generated, but may also cause temporary displacement of local wildlife.

The ability of many Imnaha subbasin riparian zones to support wildlife and provide aquatic habitat has been reduced by roads and livestock grazing. Exclusion of cattle from the riparian zone and supplemental planting of native species at the proposed Imnaha Final Rearing Facility would, in the long-term, improve the functioning condition of the riparian habitat along this stream segment. Some long-term adverse wildlife impact is expected at this site from the loss of a small amount of riparian habitat where structures would be

placed, increased human access and human-related disturbances, and disturbance to potential bald eagle roosting habitat outside of the critical wintering period.

### **3.3.3.5 Imnaha Satellite Facility**

The improved Imnaha Satellite Facility would operate from March through November with one full-time operator on-site during that period. Construction of all new structures would be within the area of existing development. The construction work window would extend from late April to early November due to the remote location and high snowfall at the site. The new acclimation pond, settling basin, modifications to the adult holding, and other miscellaneous site improvements would be constructed from June through November. All instream work would occur from July 15 to August 15.

Proposed site improvements would disturb ground and add a small amount (one-quarter acre) of new impervious surface to the site. Construction noise and activity disturbances may alter the behavior and individual distribution of certain wildlife within the area, but these impacts are short-lived and are not expected to affect long-term use, abundance and distribution of wildlife in the area. Construction would not occur in the bald eagle wintering period and no nesting territories have been documented in the vicinity.

The site is currently developed as a hatchery and proposed improvements would not expand the developed area or greatly increase the long-term level of human disturbance or activity over existing conditions. No snags or mature trees would be removed and the overall quality of wildlife habitat at this location would remain essentially unchanged from existing conditions.

### **3.3.4 Cumulative Impacts**

As described in EIS Section 3.2.4 and Table 1-1, other projects in the vicinity of the Proposed Action sites include renovation of existing and construction of new private residences, rehabilitation of Wallowa Lake Dam, numerous habitat restoration projects, salmon recovery projects, watershed management activities, and the Nez Perce Tribal Hatchery Program. During construction, some of these projects may have temporary minor impacts to wildlife (e.g. noise, displacement). However, several habitat and salmon recovery projects on federal, state and private lands would likely result in long-term beneficial effects to wildlife. Considering all ongoing and future activities together with the Proposed Action, adverse long-term cumulative impacts to wildlife populations are not expected.

### **3.3.5 Consequences of Taking No Action**

Current land use and land management would remain the same at all sites under the No Action Alternative. There would be no additional construction of fish trapping and hatchery facilities within the subbasins. Supplementation and recovery activities for salmon stocks would continue as they are currently programmed. Wildlife resources and population trends within the basin would remain relatively unchanged. However, riparian-associated and scavenger species could be potentially impacted by a continued reduction in the salmon population (i.e. reduced food source and nutrient loading as salmonid stocks decline).

## **3.4 Plants and Wetlands**

### **3.4.1 Affected Environment**

#### **3.4.1.1 Grande Ronde Subbasin**

At one time native grasslands occupied an extensive area in eastern Oregon, but over time, many native grass communities in the Grande Ronde subbasin have been lost due to burning, over-grazing, mowing, plowing

and irrigation (Nowak and Eddy 2001). As elevation increases in the subbasin, grasslands intermingle with shrub/scrub plants, eventually grading into coniferous forests in the Blue and Wallowa Mountains (Nowak and Eddy 2001). Forest associations also change with increasing elevation, with low elevation ponderosa pine associations grading into Douglas-fir, grand fir, subalpine fir and mountain hemlock associations where conditions are appropriate (Nowak and Eddy 2001).

The ONHP has identified numerous state or federally listed plant species and species of concern in the Oregon portion of the subbasin (shown in Table 3.4-1). No known occurrences of listed or candidate plant species, or those identified as species of concern by the USFWS or by the ONHP (2002), were identified within the immediate vicinity of project sites in the Grande Ronde subbasin.

**Table 3.4-1. Federally Listed Plant Species and Species of Concern in the Grande Ronde and Imnaha Subbasins, Wallowa and Union Counties, Oregon<sup>1/</sup>.**

Common Name	Scientific Name	County	Federal Status <sup>2/</sup>
Wallowa ricegrass	<i>Acnatherum wallowaensis</i>	Wallowa	SOC
Hells Canyon rock cress	<i>Arabis hastatula</i>	Wallowa	SOC
Upward-lobed moonwort	<i>Botrychium ascendens</i>	Wallowa	SOC
Crenulate moonwort	<i>Botrychium crenulatum</i>	Union, Wallowa	SOC
Skinny moonwort	<i>Botrychium lineare</i>	Wallowa	C
Twin-spike moonwort	<i>Botrychium paradoxum</i>	Union, Wallowa	SOC
Stalked moonwort	<i>Botrychium pedunculosum</i>	Union, Wallowa	SOC
Fraternal paintbrush	<i>Castilleja fraterna</i>	Union, Wallowa	SOC
Purple alpine paintbrush	<i>Castilleja rubida</i>	Wallowa	SOC
Hazel's prickly-phlox	<i>Leptodactylon pungens</i>	Wallowa	SOC
Greenman's lomatium	<i>Lomatium greenmanii</i>	Wallowa	SOC
Membrane-leaved monkeyflower	<i>Mimulus hymenophyllus</i>	Wallowa	SOC
Macfarlane's four-o'clock	<i>Mirabilis macfarlanei</i>	Wallowa	T
Howell's spectacular thelypody	<i>Thelypodium howellii</i> ssp. <i>spectabilis</i>	Union	T
Douglas clover	<i>Trifolium douglasii</i>	Union	SOC
Spalding's campion (catchfly)	<i>Silene spaldingii</i>	Wallowa	T

1/ Sources USFWS (2002); Nowak and Eddy (2001); ONHP (2002, 2001)

2/ E = Endangered, T = Threatened, P = Proposed, C = Candidate, SOC = Species of Concern

Several weed species were documented on and near project sites. In Oregon, noxious weeds pose a serious economic and environmental threat (Nowak and Eddy 2001). Forty-two noxious weeds have been listed by the weed boards of Union and Wallowa counties (Nowak and Eddy 2001). These invasive, mostly non-native, plants choke out crops, destroy range and pasture lands, clog waterways, affect human and animal health and threaten native plant communities (Nowak and Eddy 2001). The spread of noxious weeds reduces forage production for wildlife and replaces wildlife forage on range and pasture, thereby reducing habitat suitability (Bryson et al. 2001).

**Lookingglass Hatchery** — Lookingglass Hatchery sits on a small terrace within a relatively steep valley. Surrounding slopes are locally dominated by grasses, scattered shrub thickets and intermittent tree cover

(Figures 2-2 and 3.9-1). Remaining areas are forested with mixed conifer stands of Douglas-fir and ponderosa pine. Cliffs and talus slopes are present in the vicinity, creating a mosaic of subbasin habitat types.

Wetlands at the site are limited to a narrow fringe at the ordinary high water mark of Lookingglass Creek. This riparian wetland fringe is dominated by willows, red-osier dogwood, reed canarygrass, horsetail, small-fruited bulrush and spikerush. Further upslope the riparian zone is characterized by a somewhat drier vegetation community, dominated by mock orange, Rocky Mountain maple, mountain alder, oceanspray and mallow ninebark.

Other prevalent plant species found on-site are ponderosa pine, Douglas-fir, grand fir and western larch in the overstory. Blue elderberry, serviceberry, snowberry, black hawthorn and thimbleberry are common in the shrub understory, while buckwheat, bracken fern, yarrow and various native and introduced grasses and forbs characterize the herbaceous layer.

Weedy, non-native species noted at the Lookingglass Hatchery site include diffuse knapweed, common mullein, sulfur cinquefoil, prickly lettuce, St. John's-wort and Canada thistle, among others. The hatchery maintains a contract for noxious weed control services, including the use of a broad-spectrum herbicide for spot applications (Lund 2002, personal communication).

**Lostine Adult Collection Facility** — The proposed Lostine Adult Collection Facility is located in the lower Lostine River subbasin where the river occupies a relatively level valley bottom (Figures 2-3 and 3.9-2). The riparian zone in this river reach is primarily characterized by deciduous species with conifers dominant in some areas. The riparian plant communities throughout this area have been affected by agriculture, irrigation withdrawals, livestock grazing, residential development, road construction and bank stabilization. The riverbanks and immediate upland areas contain a mix of open river rock and native vegetation. Dominant trees along the river margin include ponderosa pine, black cottonwood and quaking aspen.

Numerous small channels, seeps, springs and ponds occur at the site. Some of the ponds are used as holding ponds for the private trout farm that is operated on-site. Although a formal wetland delineation has not been conducted, observations of plant community dominants and standing and flowing water indicate the presence of a wetland area on the west side of the river at this location (Figure 3.4-1). The wetland area contains willows and a diverse herbaceous understory. Dominant plant species within the wetland area include small-fruited bulrush, several sedges including sawbeak sedge, rushes including dagger-leaf rush, forget-me-not, monkey-flower, western jacob's-ladder and grasses such as meadow foxtail and manna-grass.

Additional plants species dominant in the drier portions of the site, or along the river banks, include mountain alder, chokecherry, water birch, red-osier dogwood, virgin's-bower, wild rose, snowberry, blue elderberry and spreading dogbane. Common herbaceous species include star-flowered false solomon's seal, stinging nettle, orchard grass, reed canarygrass, timothy, fescue and numerous other native and introduced grasses and forbs.

The Nez Perce Biocontrol Center conducted a survey for invasive and non-native plant species at the Lostine River sites. Weedy, non-native species noted on the proposed adult collection facility site include Canada thistle, white campion, teasel, cheatgrass, hairy vetch and western salsify. Diffuse knapweed was noted adjacent to the site in low densities and common mullein was found throughout the area (Nez Perce Biocontrol Center 2001).

**Lostine River Hatchery** — The Lostine River Hatchery site is on about six acres of undeveloped land adjacent to the Lostine River (Figures 2-4 and 3.9-3). Plant communities differ slightly at the proposed intake site, primary hatchery facility location, outfall access road and structure, and production wells.



The intake site is a mixed conifer community that includes ponderosa pine, Douglas-fir, and grand fir. The understory is fairly open and is vegetated by oceanspray, Rocky Mountain maple, western juniper, creeping Oregon grape, serviceberry, mock orange and huckleberry. Characteristic forbs and grasses include nodding onion, meadowrue, star-flowered false solomon's seal, heartleaf arnica, yarrow, pine grass and orchard grass. Weedy, invasive species include salsify, dandelion, diffuse knapweed, prickly lettuce and cheatgrass.

The primary components of the proposed hatchery would be built within an area that has been intensively grazed by horses, however, scattered groups of trees still exist including grand fir, Englemann spruce, black cottonwood, and quaking aspen. Other species commonly occurring in this area include snowberry, mock orange, yarrow, common mullein, salsify, prickly lettuce, dandelion, white campion, phacelia, timothy, bromes and other introduced grasses. Additional weed species noted at the proposed Lostine River Hatchery site include diffuse knapweed, cheatgrass, teasel and Canada thistle (Nez Perce Biocontrol Center 2001).

The outfall structure and associated access road are proposed in the least disturbed plant community found at this project location. This area is dominated by Englemann spruce, grand fir and black cottonwood in the overstory with mountain alder, Rocky Mountain maple, snowberry, gooseberry and currant, red-osier dogwood, blue elderberry, wild rose, blackcap, cow parsnip, stinging nettle, large-leaved avens, bedstraw and lady fern in the understory.

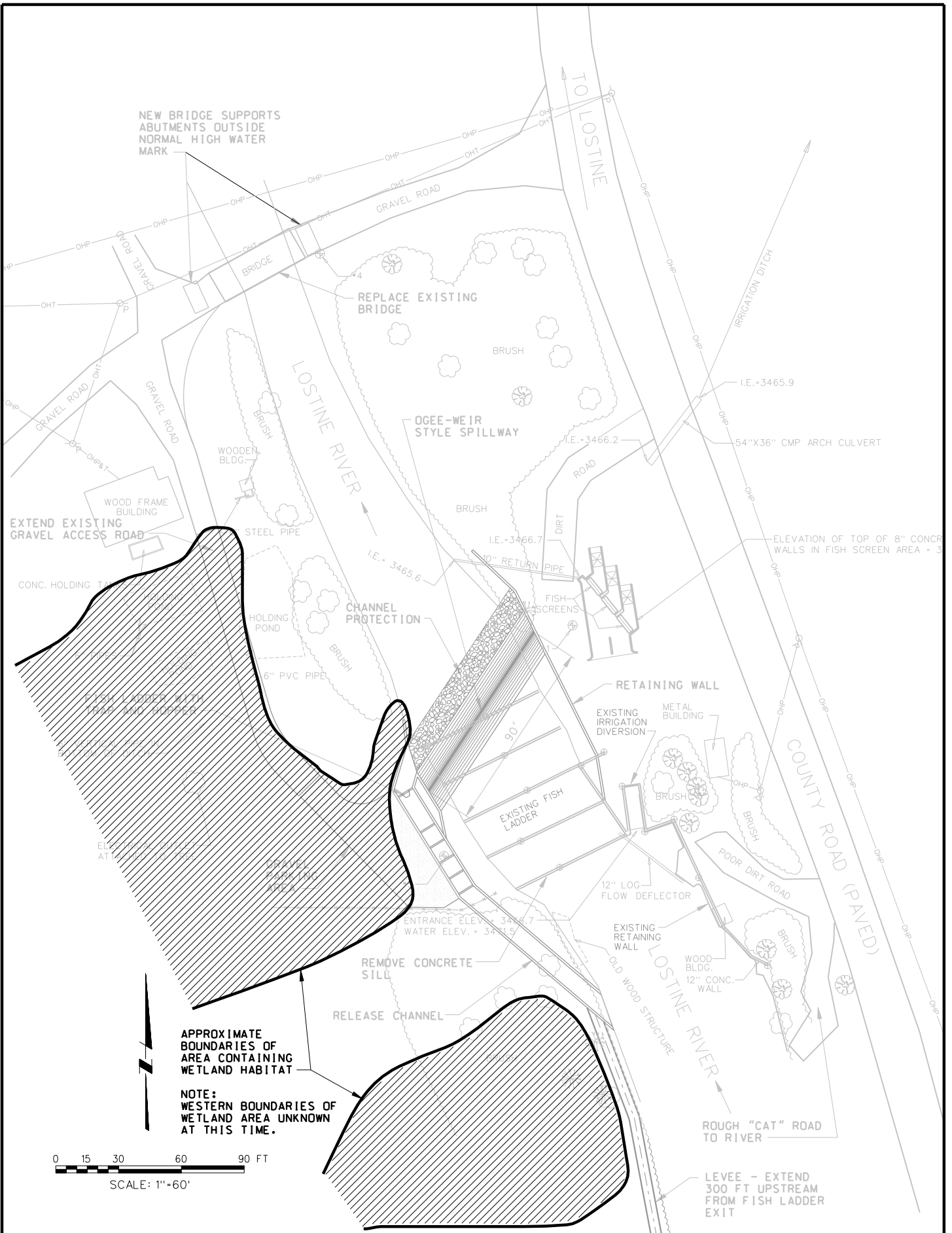
Wetland habitat at this site occurs in association with meanders and side channels of the Lostine River, and small ephemeral and perennial streams feeding the mainstem river. A wet plant community dominates at the proposed outfall side channel location (Figure 3.4-2). Dominant species are mountain alder, water birch, and red-osier dogwoods in the overstory, and manna-grass, sawbeak sedge, monkey flower, lady fern, horsetail, forget-me-not, and white bog orchid in the understory.

The production wells also occur in generally wet plant communities due to their close proximity to the river. A small feeder stream occurs at the primary production well location. The plant community here is by grand fir, Englemann spruce, mountain alder, hawthorn and water birch in the overstory, with lady fern, horsetail, and cow parsnip in the understory. The plant communities at the other two well sites have a larger weedy component, especially the north well location where some bank stabilization activities are apparent.

### **3.4.1.2 Imnaha Subbasin**

Forested communities cover about 42 percent of the subbasin (Bryson et al. 2001). At high elevations, subalpine fir, lodgepole pine, and Engelmann spruce dominate forested stands (Bryson et al. 2001; U.S. Forest Service 1998c). These high elevation forest communities are found in the headwater areas at the southern end of the subbasin and along parts of the eastern boundary of the subbasin. Grand fir, Douglas-fir, and ponderosa pine dominate low elevation forest communities such as that found at the Imnaha Satellite Facility (U.S. Forest Service 1998c). Ponderosa pine communities in the subbasin are most common on warm, low elevation sites where they often grade into grassland communities such as that found at the Imnaha Final Rearing Facility (Bryson et al. 2001).

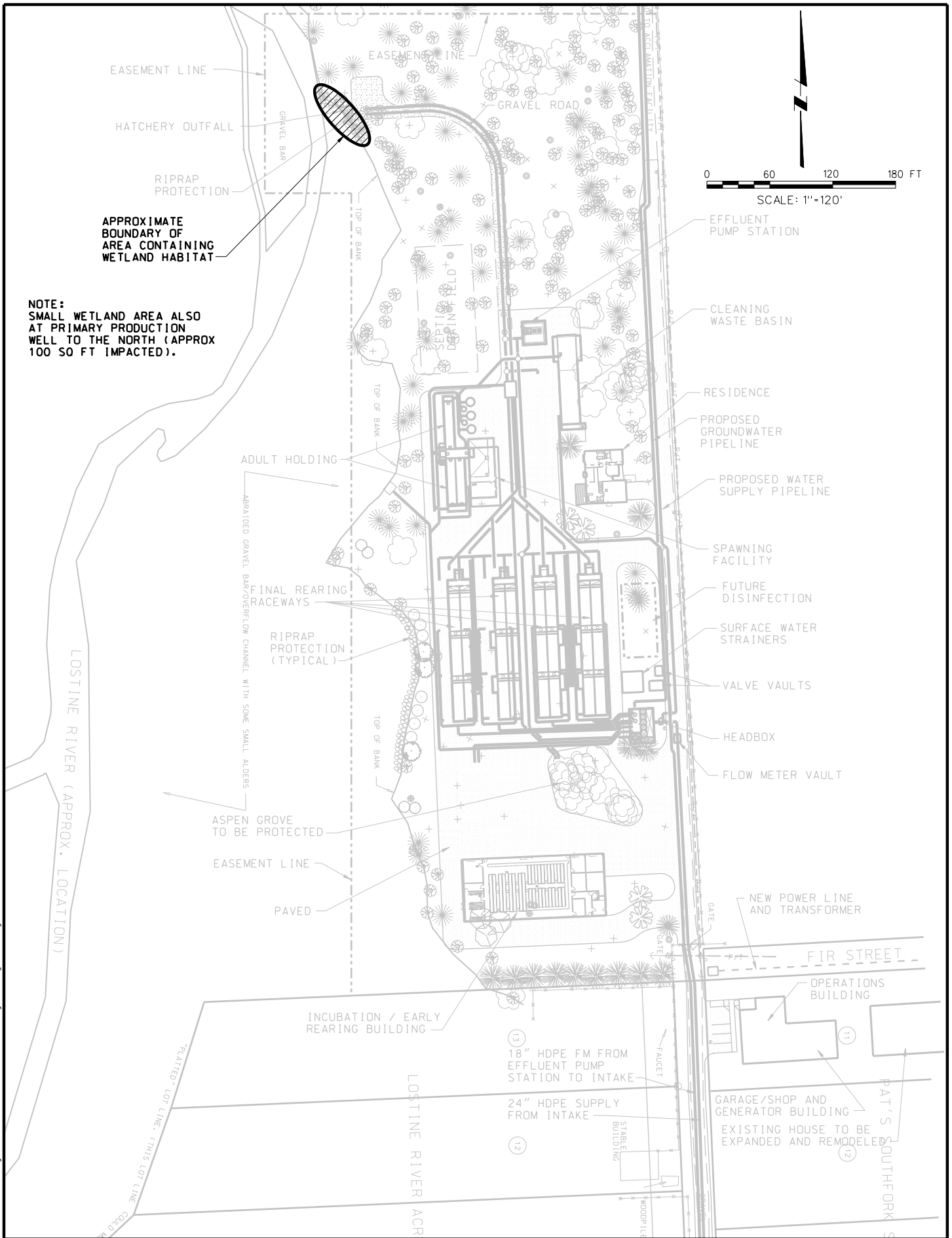
Grasslands cover about 43 percent of the subbasin (Bryson et al. 2001). Most high elevation grasslands in the subbasin belong to the green fescue-Hood's sedge association. These grassland communities occur in the headwaters region of the subbasin (Bryson et al. 2001). Grasslands at lower elevations belong to a variety of bunchgrass associations with dominants including bluebunch wheatgrass, Idaho fescue, Sandberg's bluegrass, and Kentucky bluegrass (Bryson et al. 2001). These grasslands belong to the northeastern Oregon canyon grasslands vegetation type. They are found along the steep canyons of the subbasin and generally throughout the northern and western sections of the subbasin (Bryson et al. 2001).



NORTHEAST OREGON  
HATCHERY PROGRAM  
GRANDE RONDE IMNAHA  
SPRING CHINOOK  
PROJECT

LOSTINE RIVER ADULT COLLECTION FACILITY  
WETLAND AREA (APPROX)

FIGURE  
3.4-1



**NOTE:**  
 SMALL WETLAND AREA ALSO  
 AT PRIMARY PRODUCTION  
 WELL TO THE NORTH (APPROX  
 100 SO FT IMPACTED).



NORTHEAST OREGON  
 HATCHERY PROGRAM  
 GRANDE RONDE IMNAHA  
 SPRING CHINOOK  
 PROJECT

LOSTINE RIVER HATCHERY  
 WETLAND AREA (APPROX)

FIGURE  
**3.4-2**

Table 3.4-1 identifies listed plant species that are present in Wallowa and Union Counties. Two federally listed threatened species, Macfarlane’s four o’clock and Spalding’s catchfly, have been documented in the Imnaha subbasin (Bryson et al. 2001). Over 50 other rare or sensitive plant species have also been documented on the Wallowa-Whitman National Forest (Bryson et al. 2001). However, no known occurrences of listed or candidate plants species, or those identified as species of concern by the USFWS, were identified by the ONHP (2002) within the project areas.

Thirty-two introduced plant species are recognized as noxious weeds in Wallowa County. Many of these species exist in the Imnaha subbasin (Bryson et al. 2001) and many have been found at project sites (Nez Perce Biocontrol Center 2001). Some of the successful invaders of riparian communities are diffuse knapweed, yellow star thistle, and leafy spurge. Cheatgrass, leafy spurge, and knapweeds are problematic invaders of grasslands throughout the subbasin (Bryson et al. 2001). Disturbed areas and roadways in the subbasin host a variety of the introduced species listed above and additional species such as Canada thistle.

**Imnaha Final Rearing Facility** — The Imnaha Final Rearing Facility is proposed on about ten acres of private land within the lower Imnaha subbasin, where ponderosa pine communities grade into grassland communities (Figures 2-6 and 3.9-4). The site and surrounding areas are characterized by open, dry grassland communities, while riparian areas are dominated by shrub and forest communities. The site has long been used for grazing livestock. Evidence of an old homestead is apparent at the southeast end of the cleared pasture, where remnants of an orchard are found. The central portion of the site has no woody vegetation and is dominated by introduced pasture grasses and weedy forbs. Species include tall fescue, cheatgrass, orchard grass, timothy, meadow foxtail, ryegrass, clover, dandelion, English plantain, prickly lettuce, and yarrow. The Nez Perce Biocontrol Center survey identified the following invasive non-natives: common bugloss, Canada thistle, cheatgrass, bull thistle, common mullein, white horehound, and white campion (Nez Perce Biocontrol Center 2001). Species that were noted, but less common, include teasel and black medic.

A narrow fringe of wetland and riparian vegetation exists along the river corridor at the site. Common species include water birch, black cottonwood, willows, hawthorn, mountain alder, wild rose, snowberry, common mullein, horsetail and white campion. Ponderosa pine and black cottonwood are the primary overstory species found. Vegetation along the abandoned irrigation ditch (proposed pipeline location) is similar in nature to the riparian vegetation common throughout the area – dominant woody species include water birch, hawthorn, red-osier dogwood, mock orange, mallow ninebark, rose, chokecherry and plum.

Where the steep, rocky canyon walls and the river meet at the southern (upstream) portion of the site (proposed intake location), riparian vegetation is less disturbed and has greater diversity. Species found in this area include Rocky Mountain maple, chokecherry, blue elderberry, mock orange, currant, poison ivy, blackcap, mountain sweet-cicely, stinging nettle, buttercup and horsemint.

**Imnaha Satellite Facility** — The existing Imnaha Satellite Facility is located in the upper subbasin, and is characterized by mixed conifer forest (Figures 2-8 and 3.9-5). Dominant overstory species in undisturbed portions of the site include grand fir and Douglas-fir, which commonly dominate low elevation forest communities in the subbasin. The entire site is located within a Forest Service-designated Riparian Habitat Conservation Area. The site contains the existing hatchery facilities, maintained lawns, ornamental plantings and small areas of native, riparian vegetation. The area north of the fish ladder is a community of Douglas-fir, grand fir, mountain maple, snowberry, thimbleberry, serviceberry, blackcap, currant, horsetail, trillium, star-flowered false solomon’s seal, twisted stalk, queen’s cup, mountain sweet-cicely, heartleaf arnica and violet. The only wetland is the narrow fringe at the river’s edge. No significant springs, seeps or other wetland types were noted within the site.

The area to the south of the existing intake structure is a mixed conifer forest and riparian zone. Dominant species include grand fir, black hawthorn, mountain alder, red-osier dogwood, snowberry, serviceberry,

creeping Oregon grape, horsetail, redstem ceanothus, pine grass and pinedrops. Vegetation surrounding the existing intake is non-native weedy species, including black medic, prickly lettuce, common bugloss, and clovers.

Non-native weeds growing at the Imnaha Satellite Facility include sulfur cinquefoil, common bugloss, prickly lettuce, common mullein and white campion (Nez Perce Biocontrol Center 2001). St. John's-wort and bull thistle are also found in areas adjacent to the facility. Weed control methods being implemented at the hatchery include hand-pulling and mowing to keep weed seed production to a minimum (Nez Perce Biocontrol Center 2001).

### **3.4.2 Evaluation Criteria**

The following criteria were used to evaluate the potential impacts to plant life and wetland areas at the proposed sites:

- A change in the number or amount of threatened, endangered or rare native species.
- A change in the number or amount of non-native or weed species.
- A change to wetland characteristics.

### **3.4.3 Consequences of the Proposed Action**

Construction activities would result in both short-term and long-term impacts on plant communities and species at all sites. Short-term adverse impacts would include disturbance (removal, sedimentation, etc.) of species that would regenerate in one season (damage to vegetation that could be overcome). Long-term adverse impacts would include permanent loss of native species or reduction in diversity of species through soil removal, soil erosion, soil compaction, burial, or displacement by noxious weeds or other invasive species. Long-term beneficial impacts would include control of noxious weed, preservation of and use of native vegetation in landscaping and elimination of livestock grazing at sites.

#### **3.4.3.1 Lookingglass Hatchery**

The site is an existing fish production facility. All proposed improvements would occur within the existing, developed area. The raceways and storage building are proposed where native vegetation has been largely replaced with ornamental or invasive plant species. No direct impacts to the riparian zone, or other native habitats, are expected. Few, if any, trees would be removed.

No changes to native plant communities at this location are expected as a result of proposed activities and on-site programs for control of weed species would continue.

#### **3.4.3.2 Lostine Adult Collection Facility**

Construction of a flood-proofing levee would result in the removal of about 300 feet of riparian vegetation on the west bank of the Lostine River. Adjacent plant communities would be disturbed by equipment staging, the temporary access road and operation of equipment during construction of the levee. Construction of a concrete wall and the removal of about 20 to 50 feet of the riverbank (to install the flow velocity barrier) would result in the removal of associated riparian vegetation.

Direct and indirect wetland impacts would occur as a result of proposed clearing, grading and filling for construction of the fish ladder, access and loading driveway. A net loss of about 12,000 to 15,000 square feet of wetland area would result from installation of proposed project components, primarily in the vicinity of the parking area and the levee. Long-term, indirect impacts may also occur as a result of potential changes to the

hydrologic regime of the site due to levee construction and proposed french drains. These impacts are not quantifiable at this time, but could involve changes to site plant composition (resulting from changes to the wetland water situation) and associated impacts to site wildlife (particularly amphibians). The Proposed Action includes a commitment to conduct a formal wetland delineation and to implement any compensatory wetland mitigation based on the outcome of the delineation and applicable regulations.

Long-term preservation of site plant diversity and health would be accomplished through revegetation of disturbed areas with native species and active control of noxious weeds.

### **3.4.3.3 Lostine River Hatchery**

Numerous mature trees, primarily grand fir, Englemann spruce and black cottonwood, would be removed from the central portion of the site during construction of hatchery facilities. Localized impacts to forested riparian communities are anticipated at the intake, outfall structure, and production wells. A portion of relatively diverse riparian forest with dense understory vegetation would be removed in the outfall access road corridor.

Two small aspen stands at the proposed Lostine River hatchery site would be avoided if possible. However, some trees may be removed and indirect impacts may occur over time as a result of construction disturbance and on-going operation and management activities at the hatchery facility. Aspen planting is proposed as a part of project improvements.

An adverse impact to vegetation is likely from proposed activities at this site due to the loss of some aspen trees and the disturbance of a relatively unaltered forested riparian community near the outfall. About 3,000 to 5,000 square feet of wetland area would be lost at the outfall and primary production well locations. The Proposed Action includes a commitment to conduct a formal wetland delineation and to implement any compensatory mitigation based on the outcome of the delineation and applicable regulations.

### **3.4.3.4 Imnaha Final Rearing Facility**

Most of the project activity is proposed in the center of the site, which currently lacks woody vegetation and is dominated by introduced pasture shrubs, grasses and weedy forbs. Removal of native vegetation is primarily limited to the intake structure and intake pipeline corridor (about 1000 feet, most of which is along an existing road), outfall structure (less than 20 feet) new bridge abutments (about 40 feet on each side of the river) and in the corridor for a new power line (about 300 feet). However, a small number of mature trees and at least one snag would be removed from the proposed bridge relocation site. Additional snags occur in close proximity to the proposed bridge location, however, and it is possible that more than one snag would be removed for the structure or to allow for safe equipment operation during structure placement. Where possible, the riparian zone would be replanted with native vegetation.

Exclusion of cattle from the riparian area and planting disturbed areas with native species would encourage more diverse riparian vegetation along the riverbank. Weed control at the project site would also encourage reestablishment of native vegetation.

### **3.4.3.5 Imnaha Satellite Facility**

Most construction activities at this existing facility would occur in areas devoid of native vegetation or in areas that are maintained as lawn and landscaping. For example, no vegetation would be removed to install a new power line in the existing roadbed. About seven young trees planted as ornamental landscaping would be removed. The new intake structure may result in minor incidental impacts to riparian vegetation as a result of brush clearing, excavation, and placement of structures and associated riprap. A minor amount of woody

riparian vegetation may be removed or disturbed where the new fish ladder would be installed adjacent to the existing ladder. Riprap would be used at this location to stabilize the ladder at the river entrance.

Only very minor impacts to native vegetation is expected at this location as the site is already operated and maintained as a hatchery facility, and proposed improvements would be confined to the existing facility area. Native plants would be encouraged through revegetation and continuing weed control efforts.

### 3.4.4 Cumulative Impacts

As described in EIS Section 3.2.4 and Table 1-1, other projects in the vicinity of the Proposed Action sites include renovation of existing and construction of new private residences, rehabilitation of Wallowa Lake Dam, numerous habitat restoration projects, salmon recovery projects, watershed management activities and the Nez Perce Tribal Hatchery Program. During construction, some of these projects may have temporary minor adverse effects to plants and wetlands until sites are revegetated or other standard best management practices and mitigation measures are applied. However, several habitat improvement and salmon recovery projects would result in long-term beneficial effects to plants and wetlands, as would ongoing weed control, erosion control, fire management, and other activities. These projects, when considered together with the Proposed Action are not expected to result in broadscale depletion or other adverse long-term cumulative impacts to plants or wetlands in general.

### 3.4.5 Consequences of Taking No Action

No direct changes to plant communities are expected as a result of the No Action Alternative. Native and non-native species would probably not be removed or disturbed at any of the project sites and existing land uses, such as grazing, would continue.

## 3.5 Geology, Geologic Hazards and Soils

### 3.5.1 Affected Environment

#### 3.5.1.1 Grande Ronde Subbasin

Located within the Grande Ronde subbasin, the Lostine River watershed is part of the Wallowa Mountain Terrane, which includes remnants of ancient volcanic islands including granite rock intrusions (called the Wallowa Batholith); fine-grained sedimentary rocks of Jurassic-age (about 150-million years old); and younger Grande Ronde Basalt and Columbia River Basalt (Walker 1991). The basalt underlying this area formed from lava that began to flow over eastern Oregon about 17 million years ago and continued for about 5 million years. In the upper and middle portions of the Lostine River watershed, a series of ancient glaciers and faulting (11,000 to 500,000 years ago) created U-shaped and hanging valleys and other glacial features such as cirques (steep, semi-circular peaks formed by glaciers) and cirque lakes (found at the base of many cirques), moraines (ridges of unsorted material deposited by glaciers) and other glacial deposits, and very steep valley walls. The lower portion of the Lostine River watershed is characterized by sediment deposited by glacial melt waters and an ancient glacial lake. Geology in the Grande Ronde River valley near Lookingglass Creek consists of thick sections of Grande Ronde Basalt incised by the river to form narrow river canyons flanked by steep walls.

Common soils within the Lostine River basin resulted from residual volcanic ash and glacial and **alluvial** deposits. Alluvial deposits are those laid down by water and can include a mix of clay, silt, sand and gravel. Historically, streams deposited material where the gradient flattened and formed a floodplain. Lacustrine

riparian vegetation may be removed or disturbed where the new fish ladder would be installed adjacent to the existing ladder. Riprap would be used at this location to stabilize the ladder at the river entrance.

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(lake bottom) soils formed when water was impounded behind a moraine or other barrier. These soils are easily reworked during flood events and generate additional sediment. In areas underlain by basalt, such as Lookingglass Creek, the soils were formed primarily from mechanical and chemical weathering of basalt.

Erosion potential is moderate to high in most of the Lostine River basin due to steep slopes and the lack of soil cohesiveness or ability to bind together (U.S. Forest Service 1997). Erosion processes include debris flows and torrents, snow avalanches and slides, instream channel erosion, and sheet, rill (very small channel or rivulet) and gully erosion. When debris flows wash out fills, road surfaces, and culverts, they deliver significant amounts of fine-grained sediment and gravel to the Lostine River. Sheet and rill erosion are more likely to occur on steep slopes with little vegetation, especially on slopes degraded by livestock over-grazing. Erosion is less likely in the areas underlain by hard basalt bedrock such as that found in Lookingglass Creek.

Northeast Oregon and the Grande Ronde subbasin are not considered seismically active, and few seismic events are felt by humans. Ground failures, such as liquefaction, are highly unlikely because only earthquakes capable of generating significant ground shaking would trigger such failures.

**Lookingglass Hatchery** — Lookingglass Creek flows through a narrow channel with steep sides of exposed Grande Ronde Basalt bedrock, typical of that part of the Grande Ronde valley (Figures 2-2 and 3.9-1). The Lookingglass Hatchery lies next to Lookingglass Creek, between Lookingglass Falls and the mouth of Jarboe Creek. The hatchery occupies a relatively flat site between a ridge to the east and Lookingglass Creek. The flat topography is partially due to rock quarrying activities that took place before the hatchery was built. A relatively steep rock slope along the east side of the site, reflects this previous activity. Erosion potential on the site is low because of the prevalence of bedrock and the rocky nature of the soil.

**Lostine Adult Collection Facility** — The site of the proposed Lostine Adult Collection Facility is on the Lostine River within the broad, alluvial Lostine River valley of the river's lower sub-watershed (Figures 2-3 and 3.9-2). Alluvial deposits consisting of sand, silt, gravel and clay underlie the site. Meadows on the west side of the river indicate high seasonal groundwater conditions with fine-grained soils. Such soils can exhibit expansive characteristics, be compressible under loads and have lower permeability. The Lostine River gradient is steeper and, therefore, the river meanders less here than it does upstream. Soil erosion potential is low to moderate at this location.

**Lostine River Hatchery** — The site of the proposed Lostine River Hatchery (Figures 2-4 and 3.9-3) is located upstream of the Lostine Adult Collection Facility in the broad, alluvial valley of the Lostine River's lower sub-watershed. The Lostine River valley becomes narrower upstream of the hatchery. The site is on a relatively flat floodplain on the east bank of the river where the river gradient decreases and the Lostine River flows through braided stream channels. This flow regime causes deposition of coarse alluvium such as rounded sand, gravel, cobbles and some boulders. Overall, alluvial deposition is more common than erosion at this site. The intake site is located about 2,000 feet upstream of the proposed Lostine River Hatchery site, in similar alluvial soils, where the Lostine River Road crosses the river (Figure 2-5). Riverbank erosion and retreat are visible upstream and downstream of the bridge.

### 3.5.1.2 Imnaha Subbasin

Mountain building and erosional downcutting have shaped the Imnaha River watershed. Mountain uplift and glacial scour are the dominant geologic processes evident in the headwaters of the upper Imnaha River. Downcutting by the Imnaha River and widening of the canyon by erosion predominate downstream of Coverdale Campground and downstream (north) of Grouse Creek. Floodplain development is less pronounced here than to than to the south where the river's mainstem flows through an alluvial valley with short sections of bedrock gorges.

Massive volcanic rocks and the Martin Bridge Formation limestone dominate the geology of the Imnaha River headwaters. Glaciers formed a U-shaped valley and deposited sand and gravel in the valley and glacial till (material deposited by glaciers, including clay, silt, sand, gravel, and boulders) along the east flank of the mountains below. Near the Coverdale Campground, the bedrock is predominately the resistant Columbia River Basalt. Downcutting by the Imnaha River has exposed older basalt flows (Imnaha River Basalt) along the steep canyon walls. The softer, less-resistant Imnaha River Basalt also is exposed below Summit Creek and further south in Horse, Lightning, and Cow Creeks. Below Cow Creek, the Imnaha River drops steeply to the Snake River where sheer canyon walls expose massive igneous rock (formed from solidified magma).

Common soil types within the Imnaha River basin resulted from a mix of residual volcanic ash and glacial and alluvial deposits. The dominant erosion processes are sheet erosion, rill erosion, debris flows, snow avalanches and slides, and in-stream channel erosion. Sheet erosion occurs throughout the watershed but primarily on south and west slopes with less vegetation. Debris flows are common in tributaries of the Imnaha River after high intensity thunderstorms. These debris flows form debris fans (deposits of soil, rock, trees and other vegetation) at the mouths of the tributaries. Landslides and mass soil movement, while less frequent, have occurred in the subbasin.

Northeast Oregon and the Imnaha River subbasin are not considered seismically active, and very few seismic events are felt by humans. Ground failures, such as liquefaction, are highly unlikely because only earthquakes capable of generating significant ground shaking would trigger such failures.

**Imnaha Final Rearing Facility** — The proposed Imnaha Final Rearing Facility site (Figures 2-6 and 3.9-4) is located in a pasture about 1,200 feet downstream of an outcrop of Imnaha River Basalt. The Imnaha River bends at this location to flow around the bedrock outcrop. Such basalt outcrops and steep cliffs characterize this segment of the river. The alluvial soils are a mixture of angular gravel, cobbles and boulders in a silty and sandy matrix. The site is well drained, and groundwater is not evident at or near the surface. Talus (rock fragments that collect at the base of cliffs) is evident in the fan that forms the bench upstream of the pasture area that characterizes the bulk of the site. The erosion potential at the site is moderate.

**Imnaha Satellite Facility** — The Imnaha Satellite Facility (Figures 2-8 and 3.9-5) site is located on the Imnaha River floodplain approximately one mile downstream of the mouth of Gumboot Creek. Similar to the Imnaha Final Rearing Facility site, the Imnaha Satellite Facility site has terrain characterized by river canyons cut into bedrock of Imnaha River Basalt. Alluvial soils here include clay, sand, silt, gravel and boulders. The erosion potential at the site is moderate.

### 3.5.2 Evaluation Criteria

Impacts assessed include slope stability, soil condition and erosion potential. Seismic (earthquake) hazard and associated ground failures (such as liquefaction) were not analyzed because Northeast Oregon is not considered seismically active. The following were used to evaluate potential impacts to geologic resources:

- Change in slope stability and frequency/severity of related debris flows, slope failure or landslides.
- Changes in soil/topsoil erosion or topsoil compaction.

### 3.5.3 Consequences of the Proposed Action

#### 3.5.3.1 Lookingglass Hatchery

Soil and rock would be excavated from the base of the rock slope in order to construct the new raceways at Lookingglass Hatchery. Surface weathering of the bedrock and joint fractures could weaken the rock and

cause the slope to fail. Such failures would most likely occur if excavation encroached into the toe (base) of the slope, reducing slope equilibrium leading to localized failures and rockfalls. Slope failures caused by excavation and grading would tend to be relatively small and unlikely to cause extensive damage or injury. Slope instability would be addressed through a geologic assessment as part of project design and by establishing and maintaining adequate setbacks from unstable slopes. Slopes would also be revegetated and/or seeded with erosion control mix as feasible. With these design provisions and construction measures, there would be no impact to slope stability.

Soil erosion would be a concern during construction, especially during initial site grading, when bare soil would be exposed. Precipitation, stormwater runoff and wind on exposed soils would cause erosion during construction; however, the erosion potential would be low due to the rocky nature of the site. In addition, the Proposed Action's best management practices (such as minimizing the extent of exposed or disturbed soil, installing sediment traps such as silt fences or hay bales, monitoring construction activities, and revegetating disturbed areas with native species) would largely control erosion during and following construction. Erosion would be of limited duration and extent and would not be a concern after construction. The total area temporarily disturbed would be less than 1/4 acre and those areas would be within areas previously disturbed during initial hatchery construction and/or rock quarry activities.

### **3.5.3.2 Lostine Adult Collection Facility**

Construction of the proposed Lostine Adult Collection Facility would involve demolition of the existing fish ladder and construction of several new in-water structures. All of these activities have the potential to reduce slope stability and cause minor erosion of the riverbank. The risk of instability is greatest during construction and would not be a longer-term concern with proper design and monitoring. Proper facility design, construction methods (such as adequately compacting fill, and appropriately placing and sloping the levee and riprap) and construction monitoring would prevent accelerated riverbank loss. Any disturbed, unarmored part of the riverbank would be revegetated with native species. With these methods, there would be no decrease in riverbank stability or increase in risk to people or property.

Soil erosion would be a concern during construction, especially during initial site grading, when bare soil would be exposed. Precipitation, stormwater runoff and wind on exposed soils would likely erode loose, fine-grained material. The Proposed Action's best management practices (such as minimizing the extent of exposed or disturbed soil, installing sediment traps such as silt fences or hay bales, monitoring construction activities, and revegetating disturbed areas with native species) would largely control erosion during and after construction. The planned dewatering of instream work areas would reduce the amount of erosion within the river, but would not eliminate it entirely. Erosion would be of limited duration and extent and would not be a concern after construction. About three acres would be temporarily disturbed and about two acres would be permanently altered.

### **3.5.3.3 Lostine River Hatchery**

Construction of the proposed Lostine River Hatchery would involve construction of a fish ladder and other in-water structures. All of these activities have the potential to reduce slope stability and cause minor failure of the riverbank. The risk of instability is greatest during construction and would not be a longer-term concern with proper design and monitoring. Proper facility design, construction methods (such as adequately compacting fill, and appropriately placing the structures and riprap) and construction monitoring would prevent bank failure. Any disturbed, unarmored part of the riverbank would be revegetated with native species. With these methods, there would be no decrease in riverbank stability or increase in risk to people or property.

Hatchery construction would require clearing about five acres of upland pasture and adjacent woodlands. The site would be graded and filled with about 5,000 to 10,000 cubic yards of rock from a nearby quarry to level the site and to provide some flood protection. Soil erosion would be a concern during construction, especially during initial site grading, when bare soil would be exposed. Precipitation, stormwater runoff and wind on exposed soils would erode loose, fine-grained material. Soils would also be compacted through concentrated vehicle traffic and building activities. Soil compaction would decrease the natural permeability of soil and also contribute to accelerated runoff and erosion. The Proposed Action's Best Management Practices (such as minimizing the extent of exposed or disturbed soil, installing sediment traps such as silt fences or hay bales, monitoring construction activities, and revegetating disturbed areas with native species) would largely control erosion during and after construction. The planned dewatering of instream work areas would reduce the amount of erosion within the river, but would not eliminate it entirely. Riverbanks at the Lostine River Hatchery site are low and over-bank flood channels exist on both banks at the proposed intake structure. Site soils here are pervious, which could complicate channel dewatering and require extra effort and attention to keep the channel work areas dry. With these measures, erosion would be of limited duration and extent and would not be a concern after construction. About five acres of the six-acre site would be temporarily disturbed and about three acres would be permanently altered.

#### **3.5.3.4 Innaha Final Rearing Facility**

Construction of the proposed Innaha Final Rearing Facility would involve relocating the bridge and bridge abutments and constructing an intake and two outfall structures. All of these activities have the potential to reduce slope stability and cause minor failure of the riverbank. While the slope is steep in the area of the intake structure, most of the bank in that location is rock outcrop and less likely to fail. The risk of instability is greatest during construction and would not be a longer-term concern with proper design and monitoring. Proper facility design, construction methods (such as adequately compacting fill, and appropriately placing the structures and riprap) and construction monitoring would prevent bank failure. Any disturbed, unarmored part of the riverbank would be revegetated with native species. With these methods, there would be no decrease in riverbank stability or increase in risk to people or property.

Construction of the Innaha Final Rearing Facility would require clearing about six acres of upland pasture and raising the lower portions of the site with up to three feet of rock fill to protect it some from flooding. Soil erosion would be a concern during construction, especially during initial site grading, when bare soil would be exposed. Precipitation, stormwater runoff and wind on exposed soils would erode loose, fine-grained material. Soils would also be compacted through concentrated vehicle traffic and building activities. Soil compaction would decrease the natural permeability of soil and also contribute to accelerated runoff and erosion. The Proposed Action's Best Management Practices (such as minimizing the extent of exposed or disturbed soil, installing sediment traps such as silt fences or hay bales, monitoring construction activities, and revegetating disturbed areas with native species) would largely control erosion during and after construction. The planned dewatering of instream work areas would reduce the amount of erosion within the river, but would not eliminate it entirely. With these measures, erosion would be of limited duration and extent and would not be a concern after construction. Most of the six acres occupied by the facility would be temporarily disturbed and about three acres would be permanently altered.

#### **3.5.3.5 Innaha Satellite Facility**

Modifications to the Innaha Satellite Facility would involve constructing a new intake, fish ladder and weir. All of these activities have the potential to reduce slope stability and cause minor failure of the riverbank. The risk of instability is greatest during construction and would not be a longer-term concern with proper design and monitoring. Proper facility design, construction methods (such as adequately compacting fill, and appropriately placing the structures and riprap) and construction monitoring would prevent bank failure. Any

disturbed, unarmored part of the riverbank would be revegetated with native species. With these methods, there would be no decrease in riverbank stability or increase in risk to people or property.

Modifications to the Imnaha Satellite Facility would involve disturbance of less than one acre of land, much of which was previously altered during earlier construction. Soil erosion would be a concern during construction, especially during initial site grading, when bare soil would be exposed. Precipitation, stormwater runoff and wind on exposed soils would erode loose, fine-grained material. The Proposed Action's Best Management Practices (such as minimizing the extent of exposed or disturbed soil, installing sediment traps such as silt fences or hay bales, monitoring construction activities, and revegetating disturbed areas with native species) would largely control erosion during and following construction. The planned dewatering of instream work areas would reduce the amount of erosion within the river, but would not eliminate it entirely. With these measures, erosion would be of limited duration and extent and would not be a concern beyond construction. Less than one acre would be temporarily disturbed and permanently altered by the facility modifications.

### **3.5.4 Cumulative Impacts**

As described in EIS Section 3.2.4, other projects in the vicinity of Proposed Action sites include renovation of existing and construction of new private residences, rehabilitation of Wallowa Lake Dam, numerous habitat restoration projects, salmon recovery projects, watershed management activities, and the Nez Perce Tribal Hatchery Program. For all of these projects, adverse impacts to soils, geology and geologic hazards would be minor, temporary and localized. These projects, when considered together with the Proposed Action in the context of the large geographic area in which they are proposed, would have no to very low cumulative impacts on soils and geologic stability.

### **3.5.5 Consequences of Taking No Action**

The No Action Alternative would not change the rates of soil erosion or soil loss or change the risk of slope instability hazard from existing conditions.

## **3.6 Hydrology, Floodplains and Water Quality**

### **3.6.1 Affected Environment**

The affected environment includes the Grande Ronde and Imnaha subbasins of the lower Snake River drainage basin. Within the Grande Ronde subbasin, the stream courses of interest include Lookingglass Creek and the Lostine River. Within the Imnaha subbasin, the Imnaha River is involved.

Hydrology refers to hydrologic processes such as flooding, erosion, deposition of material, channel migration, and flow alterations (*e.g.* facilities, structures, or debris in the river channel). Floodplain values include the natural effects of flooding such as periodic deposition of sediment and nutrients. Water quality involves the suitability of surface water for human use, recreation and wildlife habitat.

#### **3.6.1.1 Grande Ronde Subbasin**

**Lookingglass Creek** — The Lookingglass Creek watershed includes Summer Creek, Eagle Creek, and the main stem and tributaries (Buzzard and Moffett Creeks) of Little Lookingglass Creek. Lookingglass Creek receives flow from Jarboe Creek and then empties into the Grande Ronde River. The drainage area of

Lookingglass Creek is about 78 square miles. Most of the Lookingglass Creek watershed is underlain by basalt that is incised by streams to form deep canyons with steep walls. Rates of erosion and down cutting depend on the age and composition of the particular basalt formation a channel bisects.

The Lookingglass Creek watershed receives most of its flow from precipitation and snowmelt. The USGS gauging station (#13324300) has recorded Lookingglass Creek flows since August 1982 (USGS 2003). Peak flows occur in the late winter and early spring and can range between 500 and 1,500 cfs. The highest recorded stream flow of 2,120 cfs occurred on February 9, 1996.

Throughout most of the Lookingglass Creek watershed, especially the lower portions, development of broad floodplains and overflow areas are limited due to the presence of deeply incised canyons. This **geomorphology** lends itself to formation of boulder-strewn streambeds with minor accumulations of fine-grained sediments.

Lookingglass Creek is listed by the Oregon Department of Environmental Quality (**Oregon DEQ**) on the 1998 Water Quality Limited Streams **303(d) List** for temperature, sedimentation, and modifications to natural stream habitats (Oregon DEQ 2003). Sedimentation and habitat modification parameters are listed for the reach of stream from the mouth to the headwaters, and the temperature parameter is considered between the mouth and Luger Springs. The Oregon DEQ's Total Maximum Daily Load (**TMDL**) document for the Upper Grande Ronde River subbasin, of which Lookingglass Creek is part, have been approved by the U.S. Environmental Protection Agency (**EPA**). The document establishes limits of daily loads of pollutants and other measures to improve the water quality of listed water bodies and fulfill Section 303(d) requirements. TMDLs to address elevated temperatures include attaining appropriate shade levels, according to the vegetation type and elevation of the area in which the temperature-impacted stream or tributary is located. In cases where active channel restoration is occurring (and only in such cases), TMDLs also call for reducing channel widths if needed to meet width requirements that have been established for various reaches, including Lookingglass Creek. TMDL parameters are frequently related, and often, measures to address temperature (such as planting vegetation to increase effective shade), help address habitat modification and sedimentation parameters.

**Lookingglass Hatchery** — The existing hatchery lies along Lookingglass Creek between Lookingglass Falls and the mouth of Jarboe Creek (Figures 2-2 and 3.9-1). The hatchery facilities are sited on a relatively flat area once used as a rock quarry. Lookingglass Creek flows through a narrow channel with steep sides that expose Grande Ronde Basalt bedrock. The resistant bedrock and the river gradient at this location restrict flow to the active channel, while less frequent high flood flows are typically confined within the steep bedrock banks. Extremely high flood events periodically exceed the capacity of the channel causing water to overtop the banks and flow in sheets down the facility's access road. The Lookingglass Hatchery receives water for incubation and rearing from a groundwater well one-quarter mile upstream of the facility. A surface water intake is located at Lookingglass Falls at the upper end of the site.

**Lostine River** — Most of the information and data contained in this section comes from the Lostine Watershed Analysis conducted by the Forest Service (U.S. Forest Service 1997).

#### *Watershed Divisions*

The Lostine River system drains about 92 square miles and is divided into upper, middle, and lower sub-watersheds. The upper sub-watershed lies almost exclusively within the Eagle Cap Wilderness and is characterized by a classic U-shaped, glacial valley that includes the Lostine and the East Lostine Rivers. The middle sub-watershed begins at the confluence of the Lostine River with the East Lostine River and lies in a steep, deeply incised canyon. The lower sub-watershed begins at the Wallowa-Whitman National Forest boundary, flows through the wide, low relief Lostine River valley, and ends at river's mouth near the town of Lostine. This meandering section of river also contains braided side channels, wetlands and riparian

corridors. The floodplain in this lower sub-watershed is also broader than upstream areas. The Lostine Adult Collection Facility and the Lostine River Hatchery are proposed along the Lostine River in this relatively flat lower section of the Lostine River valley.

#### *River Flows*

The Lostine River receives most of its flow from snowmelt, peaking in May and June. Runoff reaches the river through major tributaries that include Silver Creek, Copper Creek and the East Lostine River. Annual precipitation ranges from 17 inches on the Lostine valley floor to 36 inches of snow fall in the upper elevations. In addition, thunderstorms cause flash floods that primarily affect the hydrology of small, intermittent and perennial streams rather than the main stem of the Lostine River due to the river's ability to handle tributary flows.

The USGS gauging station (#13330000) has recorded Lostine River flows for most of the last century. Average monthly flows are 162 cfs in April, 514 cfs in May, 787 cfs in June and 384 cfs in July (USGS 2003). Sixty-six percent of the maximum flow occurs in June. Flows that maintain channel morphology (about 1,380 cfs) occur at intervals of 1.5 to 2.3 years. The maximum flow for the period of record, 2,550 cfs on June 16, 1974, is considered a 50-year **flood event**. Observations of flood levels indicate that 100-year or greater storm events have inundated some recreation sites along the Lostine River.

#### *Floodplains*

The geomorphology of the upper and middle sub-watersheds of the Lostine River does not lend itself to development of broad floodplains. Steep canyons, formed by water cutting down into the underlying bedrock, characterize these sub-watersheds. The Lostine River then transports the eroded material, and deposits it as the gradient and flow velocity decrease to form the broad Lostine valley floodplain. In this lower river reach, alluvial deposition is more common than erosion. During periods of high flow, the river overflows its banks depositing silt, sand and gravel. Flood events rework this material to form a series of gravel bars and braided channels.

#### *Hydrologic Features*

Small wetlands, seeps, and springs occur throughout the basin and are found frequently in the upper and middle sub-watersheds along mountain slopes within exposed bedrock formations or along boundaries of layers of less permeable rock. Wetlands and springs also occur in the low-relief floodplain of the Lostine River valley. Often, springs emerge and flow only a few yards before percolating back into the soil. Springs and seeps found along stream channels in higher elevations frequently mark the upper extent of perennial flow while wetlands are common in meadows adjacent to the lower gradient portions of the upper Lostine and East Lostine River. Small wetland areas form in depressions on ridge tops where snowmelt accumulates above soil or bedrock layers with little or no permeability. The lower Lostine River valley is representative of remnants of glacially dammed lakes and glacial out-wash plains, which are broad gently sloping areas composed of material deposited by streams of glacial meltwater that flowed beyond the glacier.

#### *Water Quality*

Water quality in the upper Lostine River is considered good to excellent based on a survey completed in 1991 by the Forest Service (U.S. Forest Service 1997). During that survey, the Forest Service monitored water temperature and suspended sediments. Water quality monitoring of the Lostine River watershed consisted of spot water temperature measurements that indicated water temperatures below 15.5° C. Because management activities have not altered streamside vegetation or channel morphology, these waters have not deviated from their natural temperature range.

Suspended sediments derived from riverbank scour and erosion in the upper river segments and soil erosion from development, grazing, and agricultural activities in the lower sub-watershed have the potential to periodically degrade water quality. Except for temperature and suspended sediments, no other state water

quality standards have been monitored on Forest Service lands (U.S. Forest Service 1997). The Lostine River is listed by the Oregon DEQ on its 1998 Water Quality Limited Streams 303(d) List for sedimentation (Oregon DEQ 2003). TMDLs have not been approved for the Willowa subbasin in which the Lostine River is located. Oregon DEQ's target date for completion of TMDLs for the Willowa subbasin is 2000-2006.

**Lostine Adult Collection Facility** — The Lostine Adult Collection Facility (Figures 2-3 and 3.9-2) is proposed within a section of the Lostine River valley where the gradient is steeper than it is upstream. As a result, the river meanders less and riparian and floodplain areas are less extensive. The meadow along the west side of the river contains small ponds that are slightly above the river. Seasonal ponds, small springs and seeps also occur in this area because of the shallow groundwater. Under unimpeded, natural equilibrium conditions, groundwater seeps and springs in adjacent meadows and wetlands contribute to the recharge of the Lostine River. This occurs primarily in the spring when runoff is high and the Lostine River is a “gaining” stream, but this has also been observed at certain locations during the summer months. In high flood stage, the river overtops its banks and flows into over-bank channels and through the lower meadow areas. More severe storms or snowmelt events and floodwaters cover the roadway east of the proposed facility and the downstream (trout farm) bridge. An irrigation diversion structure, just above the existing fish ladder, directs some of the river flow into a north-flowing water supply ditch.

**Lostine River Hatchery** — The Lostine River Hatchery site (Figures 2-4, 2-5, and 3.9-3) is proposed upstream of the Adult Collection Facility at the head of the Lostine River valley. Here, the gradient decreases and the river is not confined to a single, defined channel. The Lostine River meanders through a low-relief valley floor characterized by a broader, flatter floodplain with braided stream channels, overflow channels and over-bank deposits.

The Lostine River Road crosses the river between the proposed hatchery intake and main hatchery facility. The bridge abutments constrict river flow at flood stage. Riverbank erosion and retreat are visible upstream and downstream of the bridge abutments. Residents along the east bank, upstream of the bridge, have constructed small flood protection levees.

Groundwater exploration wells were drilled at the site between December 1998 and January 1999. Production potential from one groundwater well was estimated between 1200 gpm. Production can apparently be sustained for long-term pumping without affecting nearby domestic wells. Another groundwater production well at the site, which has not yet been developed for testing, may produce up to 100 gpm (Montgomery Watson 1999b).

### 3.6.1.2 Imnaha Subbasin

**Imnaha River** — The Imnaha watershed ranges from 8,717 feet above sea level in the high glacial valleys of its headwaters to about 958 feet at its confluence with the Snake River 48 miles north. Annual precipitation exceeding 47 inches is typical at higher elevations while 12 inches is typical at lower elevations. At high elevations, winters are severe and summers are mild; at low elevations, winters are mild and summers are extremely hot. Most of the information and data contained in this section comes from the Imnaha Watershed Analysis conducted by the Forest Service (U.S. Forest Service 1998c).

#### *Watershed Divisions*

The Imnaha River watershed contains 28 sub-watersheds that comprise the main stem and its tributaries. The sub-watersheds differ widely in their geographic characteristics, vegetation and land use. For assessment of erosional characteristics, the Forest Service refers to the upper portions of the watershed within the Eagle Cap Wilderness as Montane and the lower watershed as Plateau and Canyon. Both Imnaha sites are within the lower watershed Plateau and Canyon. A stream channel classification system developed by the Forest Service divides the Imnaha River watershed into four geographic areas: The Eagle Cap Wilderness, the



segment from Coverdale Campground to Freezeout Creek (includes Imnaha Satellite Facility), Freezeout Creek to Fence Creek (includes Imnaha Final Rearing Facility), and Fence Creek to the Snake River.

#### *River Flows*

The Imnaha River watershed is fed primarily by snowmelt. Warm weather systems from the west can cause rapid melting and flooding. These storms contribute more runoff to small, intermittent and perennial tributaries than to the main stem because their effects are localized. Furthermore, the main stem of the Imnaha River has more capacity to handle flows than do the smaller tributaries.

The USGS monitors the Imnaha River at a gauge near the town of Imnaha (#13292000). The maximum recorded discharge occurred on January 1, 1997 and was estimated at 20,200 cfs, while the lowest flow rate recorded was 16 cfs in November 1931. The average river discharge through 2000 was about 600 cfs. Annual low-flow occurs during the fall months after dry summers or during winter freeze-up periods. High river flows are common during the spring melt runoff. Flash flood events can also follow severe summer thunderstorms. In less frequent cases, as in January 1997, warm winter storms provide unusually high amounts of rain and melt the existing snow pack. Such events can cause extremely high flood flows.

#### *Floodplains*

Steep canyons formed by water cutting down into the underlying bedrock characterize most of the Imnaha River watershed as in the river segment from Grouse Creek to the town of Imnaha. However, the stream segment between Coverdale Campground and Grouse Creek, exhibits a broader, developed floodplain with established riparian areas. The Imnaha Satellite Facility is located within this segment.

#### *Hydrologic Features*

Small wetlands, seeps and springs are located throughout the Imnaha River watershed, occurring along mountain slopes with exposed bedrock or along boundaries of layers of less permeable rock. Riparian floodplain areas characterize the stream segments between Coverdale Campground and Grouse Creek. These floodplains support wetlands and groundwater seeps and springs. They also contain braided stream channels and overflow channels.

#### *Water Quality*

The Oregon DEQ 303(d) List of Water Quality Limited Streams includes the Imnaha River and several tributaries (Gumboot, Grouse, etc.) because of high summer stream temperatures (typical in late July through early August). Sediment has not been identified as a concern in the perennial tributaries except in the upper headwaters where timber activities, grazing and road building have occurred. Erosion also increases in the steep, landslide-prone, granitic bedrock of the headwater reaches. No channels administered by the Forest Service in the Imnaha River watershed are listed on the 303(d) listing of streams affected by chemical contamination. TMDLs have not been approved for the Imnaha subbasin in which the Imnaha River and its tributaries are located. Oregon DEQ's target date for completion of TMDLs for the Imnaha subbasin is 2001-2015 (Oregon DEQ 2003).

**Imnaha Final Rearing Facility** — The proposed Imnaha Final Rearing Facility site (Figures 2-6, 2-7 and 3.9-4) is located on a flat, bedrock outcrop at a bend on the west side of the Imnaha River approximately six miles upstream of the town of Imnaha. Plateau and canyon terrain with incised basalt bedrock and steep cliffs characterize this segment of river. The gradient and the presence of bedrock limit the formation of broad floodplains. Although high flood-stage flows are typically contained within the river channel, floodwater can overtop the banks causing minor flooding. The 500-year storm event in 1996-97 caused flooding of less than one foot on the south quarter of the site (Montgomery Watson Harza 2001a). At the northern portion of the site, the turn in the Upper Imnaha River Road has been reconstructed with engineered fill slopes to support the roadway. The toe of the slope reaches the river's edge and is protected with riprap. Currently, the small-vehicle bridge to the site has abutments that constrict river flow at flood stage.

Water quality within this segment is expected to be generally good, but considering the level of development and agricultural uses near the town of Imnaha, the river is susceptible to contaminants including sediments, nutrients and adverse effects related to livestock presence. Test wells were drilled on both sides of the river to assess production and water quality in the area. Information from these test wells adds to the understanding of groundwater in the area. For example, a test well on the east side of the river across from the proposed intake has a production potential of 350 gpm. Of the two wells drilled on the west side of the river, one produced very little groundwater and the other was projected to have production potential of 225 gpm for short periods of time (100-125 gpm recommended for extended pumping). Water quality was good and the temperature range was 11-12 degrees C (BPA 2001).

**Imnaha Satellite Facility** — The existing Imnaha Satellite Facility (Figures 2-8 and 3.9-5) is located on the Imnaha River floodplain approximately one mile downstream of the mouth of Gumboot Creek in plateau and canyon terrain characterized by river canyons cut into basalt bedrock. The floodplain is approximately 1,000 feet wide, contains side channels with overbank deposits, and supports riparian areas and wetlands. Water quality in this stretch of river is considered generally good but can be affected by increased sediment loads due to bank instability.

### 3.6.2 Evaluation Criteria

Impacts to hydrology, floodplain values or water quality are characterized by activities that would:

- Change river channels
- Change flooding
- Change flows
- Cause violations of water quality or waste discharge requirements by introducing sediment, chemicals or nutrients to the river system

### 3.6.3 Consequences of the Proposed Action

#### 3.6.3.1 Lookingglass Hatchery

Proposed modifications to Lookingglass Hatchery do not include in-stream facilities or construction. Project grading, excavation and construction would be located away from the river and outside the floodplain. Excavated soil and rock would be removed and placed in previously disturbed areas at a sufficient distance from the river to avoid substantial sedimentation or water quality degradation. During construction of facility improvements, best management practices would be employed to reduce erosion and site run off as discussed in Section 3.5 of this EIS. With these best management practices in place, construction-related sedimentation would be of limited extent and duration and within applicable state and federal regulations.

#### 3.6.3.2 Lostine Adult Collection Facility

Levee construction and riprap placement would have an adverse effect on the floodplain and on water quality by increasing flow velocities and changing the flow regime through this river segment, but only during floods. Such changes would cause limited increased erosion and sediment load during flood events. During high flows, the levee and bank could fail causing scour and additional sedimentation. In such cases, downstream deposition of eroded, fine-grained sediments would degrade water quality by increasing turbidity and altering water chemistry (*i.e.*, temperature, Biological Oxygen Demand and pH). Lateral bank protection would reduce the amount of water and sediment deposited on the adjacent floodplain, decreasing soil-forming sediments and nutrients.

Partial demolition of the existing fish ladder and construction of the new fish ladder would employ best management practices including operating within the state’s instream work window, dewatering the area under construction and implementing erosion control measures as described in Sections 2.2.1 and 3.5 of this EIS. Even with such practices, a short-term decrease in water quality through inadvertent releases of sediment to the river is likely. Rain events would increase the risk of water quality degradation due to erosion of soils and stormwater runoff containing gasoline and oil from construction equipment. Construction activities would have an adverse, though short-term, impact on water quality and are not expected to result in any violations of water quality standards, or cause a water quality temperature change.

### 3.6.3.3 Lostine River Hatchery

The proposed Lostine River Hatchery and its access would be constructed adjacent to the Lostine River within its active 50- to 100-year floodplain. Peak flows generated during spring runoff or a major 100-year+ storm event may be diverted or impacted by the presence of hatchery development which could change the flood dynamics at or below the site. The Lostine River reached its fifth highest flow on record in 1999 and resulted in massive flooding in the watershed (BPA 2001). The hatchery site reportedly did not flood during the 1999 event. Still, proposed placement of fill and construction of the hatchery could alter flood flows and impede the natural movement of floodwaters during flood events larger than the one in 1999. Given past trends, excessive flooding of the site would likely be infrequent, but if it occurred, excessive flooding could damage equipment and structures, cause localized erosion and sedimentation, alter large flood flows and change local **morphology**. Locating the facilities within the active floodplain would have an adverse impact, but past flood events at the proposed site indicate that the likelihood of increased flooding is low.

Instream structures such as the hatchery intake would reduce natural channel area, impede flow, and disrupt the natural flow regime at the site. Changes to the natural flow could cause localized, continued bank erosion and occasional flooding. Installing the Obermeyer gate and intake structure would exacerbate the existing river constriction caused by the bridge abutments and further reduce the natural channel area. This would lead to increased flooding risks (*i.e.*, flood height and frequency) just upstream from the intake structure. It would also result in more rapid bank erosion rates both upstream and downstream of the bridge. The proposed outfall structure would be installed downstream of the hatchery facility within a small side channel, so it would not likely impede or alter river flow.

Construction activities such as site grading and excavation, and road paving would potentially deliver above-normal concentrations of fine-grained sediment and other contaminants to the Lostine River. However, as described in Section 3.5 of this EIS, best management practices included in the Proposed Action would control erosion and prevent contamination from chemicals or construction debris. Similarly, the proposed septic system would be designed to meet required standards that would prevent fecal coliform, or other contaminants from leaching into the Lostine River. No violations of water quality or waste discharge standards are expected to result from construction activities associated with the proposed Lostine River Hatchery.

Installation of the instream structures upstream of the main hatchery facilities would potentially contribute short-term “excess” sediment in the immediate vicinity of the installation work. However, the Proposed Action includes best management practices, and work would be conducted during summer low flow months and over two instream work seasons, spanning a maximum of two months each year. During the first season, a portion of the riverbank would be removed and the river water intake and fish ladder would be constructed. During the second season, the Obermeyer gate and intake pipeline would be installed. These short-term activities include dewatering and are not expected to result in violations of applicable standards.

Hatchery water would come from the Lostine River and groundwater wells. Water use would be non-consumptive, meaning that all water used would be treated and returned to the Lostine River. Diversion of surface water from the intake to the outfall structure would take place over a linear distance of about 2,800 feet or about a half-mile reach of the river upstream from the outfall at the hatchery site. Average monthly flows on record (from 1912 to 1999) range from about 48 to 64 cfs between September and March and for April through August flows range from 90 to 800 cfs. For an average year, there appears to be adequate flow in the Lostine to accommodate hatchery demands, while leaving no less than 75 percent of the flow in the river. However, during dry and/or cold years, water demand of the hatchery may be 50 or 60 percent of the total flow in the river. IFIM studies have indicated that at low flow, summer conditions (September), the minimum hatchery flow requirement is 11.5 cfs, which represents about 22 percent of the average flow in September and 50 percent of the September low flow (Montgomery Watson Harza 2001a). This amount of diversion is necessary to support the hatchery during low flow periods. (Montgomery Watson Harza 2001b).

In order to minimize instream impacts during low flow conditions within the bypassed river reach, a pump station would be installed to pump the hatchery effluent back, along with supplemental well water, to the intake. The pumped flow would be introduced at the bottom of the fish ladder to return river water near the point of diversion. The pump station would be sized so that when low flow management strategies are implemented, the pump could transport the entire diverted flow back to the intake location. Because of the pumped return strategy, even during extreme conditions, impacts to flows would be short-term and limited to the one half mile reach of the river immediately upstream from the hatchery (Montgomery Watson Harza 2001b). Water temperature change is not anticipated under the Proposed Action.

#### **3.6.3.4 Imnaha Final Rearing Facility**

The proposed Imnaha Final Rearing Facility and bridge would be constructed adjacent to the Imnaha River within the 100- to 500-year floodplain. The site is a low-lying, flat basalt bedrock shelf covered by alluvial sediments. The site is only partially flooded during extreme runoff events such as a 100- to 500-year flood.

Data from the USGS Imnaha gauge five miles downstream of the site indicate that river stage can increase substantially and sometimes double during a 100- to 500-year event as it did on January 1, 1997 (USGS 2003). While estimating infrequent flood events involves considerable uncertainty, and the available data are not directly transferable, the data suggest that a similar increase could occur at the Imnaha Final Rearing Facility site. However, during large storm events such as the one on January 1, 1997, the site does not typically flood. When it does flood, waters are typically less than one foot deep and confined to the lowest portion of the site (Montgomery Watson Harza 2001a).

The proposed project design would place two to three feet of fill over the low side of the site to raise it above the current projected 100-year floodplain. This would reduce flood potential by keeping most major flood events from overtopping the west bank and inundating the proposed facility. A 500-year flood event could potentially inundate the site, disrupt facility operations, overwhelm onsite drainage systems and damage vulnerable equipment (i.e. electric pumps, controllers, raceways, etc). Overall however, flood impacts at the site would be reduced by the Proposed Action. For the river channel itself, fill placement on the site would restrict flows during temporary high water events, confining them to the active channel. This would result in higher water levels in the active channel and an increased potential for downstream flooding, scour, and erosion during more extreme events such as 100- to 500-year floods.

The effects of the proposed intake and outfall structures on river flow, while adverse, would be very localized. The proposed intake structure, while it may affect localized flow patterns, would not represent a substantial flow impediment, would not change the overall flow regime or cause flooding. The proposed fish bypass outfall would have riprap flood protection on its upstream and downstream sides. The bypass outfall would be placed outside the main channel and would not impede or alter the typical flow regime. The main hatchery

outfall would be armored with riprap and would only disrupt flow in its immediate vicinity. While the new bridge abutments would slightly disrupt flow, they would be an improvement over the current situation.

Instream construction, excavation and grading, bridge construction and placement of fill could introduce sediment or other construction-related contaminants to the Imnaha River over short periods of time resulting in localized temporary water quality effects. However, the Proposed Action includes best management practices, as described in Chapter 2 and Section 3.5 of this EIS. For example, instream construction of the intake structure, raw water pipeline, fish bypass, outfall structure, and bridge would employ temporary cofferdams or other water diversions appropriately placed to route water around instream work areas. Flow would remain in the channel, but be directed away from work areas. This would reduce potential sedimentation and portable pumps would be used to help keep work areas dry. Pump discharge would be routed through a sediment basin prior to discharge back into the Imnaha River. With use of these best management practices, the Proposed Action is not expected to result in violations of water quality standards during or after construction, or cause any change to water temperatures.

The proposed septic system would be designed and built according to applicable standards to prevent leaching of fecal coliform and other contaminants into the Imnaha River. The construction and operation of the proposed septic system would not result in water quality impacts that would exceed regulatory thresholds.

Water supply for this facility would be provided from the Imnaha River. Water use would be non-consumptive, meaning that all water withdrawn would be treated and returned to the river downstream of the facility. As described in Section 3.2.1 of this EIS, the maximum flow required for rearing at the Imnaha Final Rearing Facility is about 23 cfs, based on the preferred NATURES criteria flow scenario. This flow would be required for a short period of time between late-February through March yearly. In addition to the water required for rearing, about 10 cfs would be diverted through the intake to operate the fish screening and bypass pipeline. This diversion would take place over about the first 600 feet of the about 1,900 feet of diversion from the intake to the outfall.

Based on river flow measurements obtained from the USGS gauge near the town of Imnaha, the required withdrawal would account for less than 25 percent of the total river flow for periods of average low flow. During below-normal years, drought years or extremely cold years, when the flow is considerably below normal, the hatchery may demand up to 50 percent of the flow. However, based on historic Imnaha River gauge data, years with extremely low flows are infrequent. The flow reductions would be localized to the reach of the river between the intake and the outfall and would be temporary due the water treatment and return strategy planned for the facility.

Cold water fish are identified as a beneficial use under Section 303d of the Clean Water Act. Hatchery water would flow constantly through the facility from September through March during final rearing of smolts, and so would not be subject to excessive heating or exacerbate the July to August normal heating which caused the Imnaha River to be listed as water quality limited by OR DEQ. Water temperature changes at the facility, if any, would be temporary, localized and minor. Any such changes are not anticipated to disrupt the behavior or distribution of individual fish adjacent to or downstream of the site.

### **3.6.3.5 Imnaha Satellite Facility**

The proposed new fish barrier would benefit river flow by removing the existing barrier that currently restricts flows. This structure would provide improved flexibility for operation and maintenance and would also reduce the need for instream maintenance work. The new barrier combined with the more effective fish ladder (along side the existing ladder) would improve river flow and fish passage through the facility.

The existing intake structure would be enlarged to accommodate desired higher flow rates for the facility. The intake structure modification would add capacity to the current intake structure to provide the about 20 cfs needed for fish acclimation as described in Section 3.2.3.2 of this EIS. An additional 6 cfs diversion would be required during adult collection to operate the adult recovery by-pass pipeline system. This would be accomplished through use of a second separate intake operated about 800 feet downstream from the existing intake structure. During extremely low flow periods of early fall, these diversions could alter the river's natural flow regime in the immediate vicinity of the intake. However, since these diversions would be temporary and localized they are not expected to affect the overall flow of the river in the area.

Instream work and upland construction, excavation and grading could introduce sediment and other minor contaminants to the Imnaha River. Best management practices, as described in Chapter 2 and Section 3.5 of this EIS, are part of the Proposed Action and would be implemented to minimize erosion and river sedimentation. The impact of construction on water quality would be localized, of short duration and would not likely cause violations of water quality standards.

Water temperature changes are not anticipated as a result of the Proposed Action. Cold water fish are identified as a beneficial use under Section 303d of the Clean Water Act. Water quality at the facility is appropriate for fish culture use, although a chiller may be necessary for incubation due to high river temperatures during July to late August. Chilled water would likely be cooler than the receiving river water, but would mix rapidly after release downstream of the facility. Temperature changes would be minor and localized, and not expected to impact water quality or fish.

### **3.6.4 Cumulative Impacts**

As described in Section 3.2.4 of this EIS, other projects in the vicinity of the Proposed Action sites include renovation of existing and construction of new private residences, rehabilitation of Wallowa Lake Dam, numerous habitat restoration projects, salmon recovery projects, watershed management activities, and the Nez Perce Tribal Hatchery Program. For all of these projects, adverse impacts to hydrology, floodplains and water quality would be minor, temporary and localized. They are not expected to impair the current beneficial use of any water body. These projects, when considered together with the Proposed Action are not expected to have substantial adverse cumulative impacts to hydrology of the Lostine and Imnaha subbasins.

### **3.6.5 Consequences of Taking No Action**

The No Action Alternative does not change the potential for flooding, existing river flow regimes, or existing water quality. The No Action Alternative would allow the current situation and trends to continue and would not impact existing floodplains.

## **3.7 Wild and Scenic Rivers**

### **3.7.1 Affected Environment**

Congress established the Wild and Scenic Rivers Act (Public Law 90-542, 16 USC 1271-1278, as amended) in October 1968 to protect rivers having distinctively unique or outstandingly remarkable values (ORVs) that set it apart from other rivers. The goal of designating a river as Wild and Scenic is to protect its free-flowing character and resources worthy of special protection.

The passage of the Oregon Omnibus Wild and Scenic Rivers Act of 1988 placed the Grande Ronde, Lostine and Imnaha Rivers into the Wild and Scenic Rivers System. The Wallowa River was added to the Wild and Scenic River System in 1996. The Wild and Scenic Rivers Act stipulates that each agency charged with administration of a segment of the Wild and Scenic Rivers System must establish boundaries (an average of not more than 320 acres per mile on both sides of the river) and prepare a comprehensive management plan to provide for the protection of river values. The plan must address resource protection, development of lands and facilities, user capacities, and other management practices necessary to achieve the purposes of the Act.

As the designated land manager, the Forest Service released the Imnaha River Wild and Scenic River Management Plan in January 1993 and the Lostine River Wild and Scenic River Management Plan in June 1993 (U.S. Forest Service 1993a and 1993b). Similarly, the Bureau of Land Management and the Forest Service, together, released the Wallowa<sup>1</sup> and Grande Ronde Rivers Management Plan in 1993 (Bureau of Land Management et al. 1993). These management plans identify the boundaries, classifications, and ORVs of each wild and scenic river. These management plans also provide standards and guidelines for managing federal lands, standards and guidelines for managing private lands, and desired strategies for implementing these standards and guidelines.

Section 2 of the Wild and Scenic Rivers Act requires that the river be classified and administered as Wild, Scenic, or Recreational river segments, based on the condition of the river corridor at the time of designation. The classification of a river segment indicates the level of development on the shorelines and in the watershed, and the accessibility by road or trail. Classifications are defined in the Act as follows:

- Wild river areas – Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shoreline essentially primitive and waters unpolluted.
- Scenic river areas – Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
- Recreational river areas – Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

The Imnaha Final Rearing Facility site and the Imnaha Satellite Facility are both located on the Imnaha Wild and Scenic River segment classified as Recreational.

The portion of the Grande Ronde River that has been designated as Wild and Scenic is several miles downstream of the Lookingglass Hatchery, which is well outside the boundaries of the Wild and Scenic River. The distance and the nature of modifications proposed at the Lookingglass Hatchery site are considered not likely to invade the Wild and Scenic River area or unreasonably diminish the values for which the Grande Ronde River was designated as Wild and Scenic. Therefore, this EIS does not include Wild and Scenic River analysis of the Grande Ronde River.

The portion of the Lostine River that has been designated as Wild and Scenic is about 5 miles upstream from the proposed Lostine Adult Collection Facility and about 1 mile upstream from the Lostine River Hatchery. The distance from the Wild and Scenic River corridor and the nature of the proposed activities at these sites are considered not likely to invade the Wild and Scenic River area or unreasonably diminish the values for which the Lostine River was designated as Wild and Scenic. Therefore, this EIS does not include Wild and Scenic River analysis of the Lostine River.

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<sup>1</sup> In 1993, at the time of the plan, the Forest Service was studying the the Wallowa River for National designation.

### 3.7.1.1 Section 7 Determination

While the Wild and Scenic Rivers Act does not prohibit development along a river corridor, it provides guidance in Sections 7a and 7b for determining appropriate actions that may be allowed within the bed and banks of a Wild and Scenic River. As the administrator for the Imnaha Wild and Scenic River, the Forest Service must determine if proposed water resources projects<sup>2</sup> will directly and adversely affect the values for which the river was designated.<sup>3</sup> The Forest Service's Section 7 determination is provided to the USACE for their consideration in deciding whether to issue a permit authorizing instream work under Section 404 of the Clean Water Act.

### 3.7.1.2 Imnaha Wild and Scenic River Management Plan

As discussed above, the Imnaha River Wild and Scenic River Management Plan classifies the segment of segment of the river along which the Imnaha Final Rearing Facility and Imnaha Satellite Facility are located as Recreational. The Management Plan also calls for five management actions: 1) District / HCNRA responsibilities; 2) motorized restriction on the scenic segment of the river; 3) education and monitoring program on scenic segment of the river; 4) fisheries projects; and 5) historic/prehistoric. The management action addressing fisheries projects is the only one that applies to the proposed project sites. This management action states:

The Imnaha Stream Survey Report (February 1992) identified the Imnaha River to be in good to excellent condition. Because of this, the interdisciplinary team determined that the best action is to let the natural processes work. However, the report listed several management recommendations. These recommendations would improve fish habitat at specific location[s]. Any of the recommendations that are consistent with the river management plan may be implemented after further analysis.

## 3.7.2 Evaluation Criteria

The following are used to evaluate potential impacts to wild and scenic river values.

- Degree of change to the free flow of a wild and scenic river (seasonally and quantitatively by percentage flow in affected reach).
- Degree of change in the water quality of a wild and scenic river (temporally and as related to state and federal regulations).
- Degree of change to a designated ORV associated with the wild and scenic river expressed in terms of the general descriptions in the Imnaha Wild and Scenic River Management Plan (described temporally, qualitatively, and quantitatively relative to the corridor segment).

<sup>2</sup> A water resources project is any dam, water conduit, reservoir, powerhouse, transmission line, or other works project under the Federal Power Act, or other developments that will affect the free-flowing characteristics of a wild and scenic or congressionally authorized study river. In addition to projects licensed by the Federal Energy Regulatory Commission, water resources projects may also include: dams, water diversions, fisheries habitat and watershed restoration, bridges and other roadway construction/reconstruction projects, bank stabilization projects, channelization projects, levee construction, boat ramps, fishing piers, and activities that require a Section 404 permit from the U.S. Army Corps of Engineers (Interagency Wild and Scenic Rivers Coordinating Council 1997).

<sup>3</sup> This description of the Wild and Scenic Rivers Act Section 7 determination process is adapted from a technical report by the Interagency Wild and Scenic Rivers Coordinating Council (1997).



### 3.7.3 Consequences of the Proposed Action

One of the purposes of the Proposed Action is to aid in the conservation and recovery of ESA-protected spring/summer chinook salmon native to the Grande Ronde and Imnaha subbasins, an important element of the fisheries ORV of the Grande Ronde, Lostine and Imnaha Wild and Scenic Rivers. Improving the fisheries ORVs would lead, over time, to enhancements of the recreation ORVs of these three wild and scenic rivers and the tradition-and-lifestyle ORV unique to the Imnaha River. Other changes to ORVs on the Grande Ronde and Lostine Wild and Scenic Rivers attributable to the Proposed Action are not anticipated and cumulative impacts to other ORVs are not expected. The cumulative effects to fisheries on these three wild and scenic rivers would continue on a trend toward improvement as native protected species recover.

Table 3.7-1 provides an overview of the effects of the Proposed Action on the ORVs of the Imnaha Wild and Scenic River. In addition to the beneficial impacts to ORVs related to fisheries, two adverse impacts would occur with the Imnaha Final Rearing Facility: 1) the loss of riparian vegetation at the intake structure and bridge would adversely effect the vegetation / botanical ORV and 2) the loss of ten acres of cattle grazing land would adversely effect the tradition-and-lifestyle ORV.

**Table 3.7-1. Effects of the Proposed Action on ORVs of the Imnaha Wild and Scenic River.**

<b>Outstandingly Remarkable Value</b>	<b>Effects of the Proposed Action</b>
<p><i>Scenic</i> – There is great contrast and variety of landforms, vegetation, and color throughout the Imnaha subbasin. The pastoral setting of the predominately ranch-oriented middle section of the river evokes images of a classic western landscape. The middle section of the river, where the hatchery facilities are proposed, is classified as Recreational (U.S. Forest Service 1993a); river segment classifications of Wild, Scenic or Recreational are described in FSM 2354.41 Exhibit 01 and FSM 2354.42). A large, high voltage power line; the steep, dramatic bunch grass covered basalt layered canyon walls; the string of ranches, residences, pastures, and developed campgrounds; and the Imnaha River itself dominate the seen landscape and capture the typical visitor’s attention.</p>	<p>Passing motorists on the Upper Imnaha River Road could catch a glimpse of the bridge, buildings, access road, and other structures at the Imnaha Final Rearing Facility. These features would not seem out of place in a setting where a mix of ranch houses, residences, barns, corrals, sheds, garages, and associated rural scene appurtenances are commonplace. The Imnaha Satellite Facility would not be seen any differently than it is now except to the astute observer who could detect the proposed structural changes within the existing compound or occasional evidence of the buried power line in the road corridor. Neither site would be such a drastic contrast in architectural style, size or nature of development that it would dominate or greatly detract from the scenery in general. Both sites would be recognizable as administrative facilities for natural resource (fisheries) management.</p> <p>The Imnaha Final Rearing Facility would be on the other side of the river from the Upper Imnaha River Road in what is now a small, privately owned livestock pasture. The proposed buildings would be wood-sided, bland colored, simple in architectural style, set back as far from the river as possible, and mostly screened from view by existing native riparian vegetation (including large trees) on both sides of the river and new supplemental native landscaping plantings around the site. The road and fish raceways would be mostly screened as well. The water intake and outlet structures would be obscured from view either by vegetation, water, riverbank angle, or strategic placement near boulders or other visual obstructions. The pipelines to the hatchery and outlets would be buried, and disturbed soil revegetated. Where that is not possible, the intake pipeline would be covered with mortar and cobbles so it would blend in with the background. Thus, no change to the scenic ORV would occur as a result of the Proposed Action except right at the project site. The viewer’s reaction to the change may be positive or negative depending on personal preference and beliefs and the intensity of reaction (positive or negative) likely would diminish over time as the viewer became more accustomed to the site.</p> <p>See also EIS Section 3.9 for more information on visual resource impacts of the Proposed Action.</p>

<b>Outstandingly Remarkable Value</b>	<b>Effects of the Proposed Action</b>
<p><i>Recreation</i> – Located within the HCNRA, popular pursuits include hunting, fishing, sightseeing, horseback riding, hiking, snowmobiling, and camping.</p> <p>Dispersed camping and developed camping are the dominant use along the river within the Forest boundary. Other activities include picnicking, mushroom picking, photography, and cross-country skiing.</p> <p>Much of the river (&gt;45%) is on private property including the bed and banks. In most cases, the recreational opportunities on private land are limited to sightseeing and photography from the Imnaha River Road. The Wild and Scenic Rivers Act does not change private land rights, so the recreational value should be tempered on private lands.</p> <p>Some recreational activities, although they may exist in the river corridor, were not determined to be part of the ORV. These include boating, rafting, recreational gold dredging, and recreational experiences associated with modern camping facilities.</p>	<p>Proposed modifications to the existing Imnaha Satellite Facility would not change any recreational opportunities around the site. However, if the existing diesel generator is replaced by the proposed underground power line (buried in the road right-of-way), the noise levels from the Satellite Facility would decrease, which would provide a better experience for nearby forest visitors. Also, the proposed new communication line to the facility could aid in emergency situations and overall area management.</p> <p>The proposed Imnaha Final Rearing Facility is on private land far from any dispersed or developed recreation site managed for the public. Public recreation is limited to sightseeing and photography from the Upper Imnaha River Road. The site of the Imnaha Final Rearing Facility is not known as a particularly unique sightseeing opportunity or popular photo point. The proposed facility’s effect on sightseeing is discussed above under Scenic ORV.</p> <p>Other recreational activities that were not determined to be part of the ORV do not occur at or near the proposed project sites. Thus, no degradation of the recreation ORV would occur as a result of the Proposed Action.</p> <p>See also Section 3.10 of this EIS for more information on recreational impacts of the Proposed Action.</p>
<p><i>Fisheries</i> – This emphasizes the populations of the threatened spring/summer and fall Snake River chinook salmon, steelhead and bull trout, and their habitat. The river was historically an important producer of spring/summer chinook, however today’s runs are probably a small fraction of historic runs.</p>	<p>One of the purposes of the Proposed Action is to provide adequate hatchery facilities to help in the conservation and recovery of ESA-listed anadromous spring/summer chinook salmon native to the Imnaha subbasin while not being detrimental to other species. Therefore, the Proposed Action should ultimately enhance the fisheries ORV, and other benefits associated with fisheries (recreation, quality of life, economics, etc.). In this situation, locating acclimation and rearing facilities where natal waters can be used is vitally important for returning chinook to those waters to spawn naturally as adults. In addition, the proposed facilities allow future implementation of intense monitoring, evaluation and research of all aspects of the local fisheries and affected species, water conditions, and certain habitat requirements.</p> <p>See also Section 3.2 of this EIS for more information on fisheries impacts of the Proposed Action.</p>

<b>Outstandingly Remarkable Value</b>	<b>Effects of the Proposed Action</b>
<p><i>Wildlife</i> – This value pertains to wildlife populations and habitat in the Imnaha River corridor. It includes Rocky Mountain big horn sheep and a variety of other species including mule deer, elk, and black bear.</p> <p>ESA-protected and U.S. Forest Service sensitive species within the corridor are an important part of the ORV.</p> <p>The ability to view a variety of wildlife in the corridor is also important.</p>	<p>Site surveys indicate that the Proposed Action would not adversely affect any ESA-protected or U.S. Forest Service sensitive species of wildlife. Although some temporary disturbance of wildlife could occur during construction, neither project site involves actions that would affect critical habitat or large enough amounts of common habitat to change the quantity, variety, use, or visibility of any wildlife in the river corridor.</p> <p>Scavengers of post-spawning chinook salmon (e.g., eagles, mammals, etc.) could be more seasonally prevalent in the area if the spring/summer chinook salmon runs improve.</p> <p>See also Section 3.3 of this EIS for more information on wildlife impacts of the Proposed Action.</p>
<p><i>Historic/Prehistoric</i> – Nez Perce historic and prehistoric sites, as well as Euro-American historic sites, are included in this value.</p>	<p>No historic or prehistoric sites were detected during surveys of the proposed facility sites. Any sites uncovered later would be protected until they could be assessed for appropriate remediation. So, no effect on historic/prehistoric values is anticipated.</p> <p>See also Section 3.8 of this EIS for more information on impacts of the Proposed Action on historic and prehistoric sites.</p>
<p><i>Vegetation/Botanical</i> – Emphasis is on the ESA-protected or U.S. Forest Service sensitive species of plants.</p> <p>Also included is the plant and ecosystem diversity that can be found in the Imnaha River corridor. The river corridor starts at 8,000 feet and descends to 950 feet. Most ecosystems found on the Wallowa-Whitman National Forest can be identified in the river corridor.</p>	<p>Site surveys indicate that the Proposed Action would not adversely affect any ESA-protected or U.S. Forest Service sensitive species of plants. The Proposed Action would not alter the general vegetative and ecological diversity in the Imnaha River corridor, though minor amounts of native and non-native vegetation would be removed where new facilities and utilities would be located. Replanting of native species and control of weeds at disturbed sites, and use of native shrubs and trees as visual screening of facilities would mostly offset the amount of native and non-native vegetation affected. Less than one acre of riparian vegetation and about one acre of upland native vegetation would be permanently lost as a result of the Proposed Action.</p> <p>See also Section 3.3 of this EIS for more information on vegetation impacts of the Proposed Action.</p>

<b>Outstandingly Remarkable Value</b>	<b>Effects of the Proposed Action</b>
<p><i>Traditional Value/Lifestyle Adaptation</i> – This relates to the lifestyle that has evolved and is representative of the early Euro-American settlers within the Imnaha River corridor.</p> <p>This lifestyle is dominated by a ranching/farming tradition that has evolved over time. This lifestyle, as it relates to the river, is an extension of how the river corridor has been used for years, including the use by the NPT.</p>	<p>At the site proposed for the Imnaha Final Rearing Facility, cattle grazing would be discontinued on less than ten riverside acres. In a landscape where livestock ranching covers wide expanses of public and private land, the grazing could be easily moved to another, less sensitive site. The Proposed Action would be inconsequential to the continuation of the western ranching traditional value/lifestyle in the area.</p> <p>Because the Imnaha Satellite Facility already exists, no change in traditional values or lifestyles would be expected due to the minor modifications proposed there.</p> <p>With integration of the Imnaha facilities with the other hatchery facilities in the Proposed Action, chinook salmon runs in the Imnaha River would likely improve over the current situation, thereby enhancing the traditional values and lifestyle pursuits related to their presence and abundance. This would be particularly important to the NPT and CTUIR.</p> <p>See also Section 3.8 of this EIS for more information on impacts of the Proposed Action to traditional values and lifestyle.</p>

### 3.7.3.1 Imnaha Final Rearing Facility

Because components of the proposed Imnaha Final Rearing Facility would be constructed and installed within the bed and banks of the Imnaha River and may affect the free flow of the Imnaha River (see Figures 2-6, 2-7 and 3.9-4), whether the free flow of the Imnaha Wild and Scenic River is substantially altered is an issue. The Proposed Action would remove the existing bridge abutments at the Imnaha Final Rearing Facility, which would eliminate a constriction to river flow. However, the installation of a replacement bridge upstream of the existing bridge would result in placing abutments that would also constrict the natural river flow. This constriction of the natural river flow would be slightly less than under current conditions (see Section 3.6 of this EIS for more information on water flow impacts of the Proposed Action). The final design of the replacement bridge would result in the bridge abutments being placed in locations that minimize effects on the free flow of the Imnaha River. Thus, no adverse change to the free flowing condition of the Imnaha River is expected as a result of the bridge replacement, and flow conditions may actually be improved because of the bridge replacement.

In addition, the intake and outfall structures for this facility would be placed within the bed and banks of the Imnaha River. The intake structure, although small, could slightly impede or alter natural river flows and thus is considered to be a minor adverse effect to free flow of the river. In addition, when water is taken through the facilities for hatchery operations, the flow in the river channel would be reduced between the intake and outfall (also see EIS Sections 3.2 and 3.6), but the river would maintain its free flow appearance overall. During periods when flows are below normal, up to 50 percent of the flow of the Imnaha River would be used by the Imnaha Final Rearing Facility. This would affect the flow of the river between the intake and the outfall structures, which is a distance of about 1900 feet, until the flows increased again. Above the intake and below the outfall, flow quantities would be unaffected since hatchery water use is non-consumptive.

Thus, the overall effect of this facility on river flows would be isolated to the hatchery reach, and during times of lowest flows.

The Imnaha Final Rearing Facility is within the 100-year floodplain of the Imnaha River. During 100-year+ flood events, the new facilities and the fill (to raise the surface elevation of the site) would alter and redirect flows over the site. These redirected flows could cause downstream riverbank scour, flooding, and/or localized flooding to be increased during a 100-year+ flood. The more frequent, typical seasonal flood events would not be affected by the Imnaha Final Rearing Facility since it would be equipped with a storm drainage system with sufficient capacity to effectively manage and divert both typical stormwater runoff and flood flows.

During construction of the Imnaha Final Rearing Facility, best management practices would be implemented to suppress the effects of erosion and sedimentation. With these best management practices, construction activities would introduce only limited amounts of sediment for a short time into the river. Although adverse, the impact of construction on water quality would be localized, of short duration, and within state and federal regulatory standards or CWA Section 404 permit parameters.

### **3.7.3.2 Imnaha Satellite Facility**

Improvement to the existing intake structure and weir, and construction of a new fish ladder beside the existing fish ladder, are the three components of the proposed Imnaha Satellite Facility that would take place within the bed and banks of the Imnaha River (Figures 2-8 and 3.9-5). The intake structure improvements, though small, would slightly impede or alter natural river flows and is considered to be an adverse impact to the free flow of the river at that spot. Also, the additional water taken by the intake structure for hatchery operations would decrease the flow in the river channel between the intake and outfall for a distance of about 900 feet (see Sections 3.2 and 3.6 of this EIS), but the river would maintain its free flow appearance overall. The new Chiwawa weir would replace an existing picket weir and would slightly improve the free flow of the river. Thus, the overall effect of this facility on river flows would be minimal.

During construction of the Imnaha Satellite Facility, standard best management practices would be implemented to address the effects of erosion and sedimentation. With these best management practices, short-term construction activities would introduce only limited amounts of sediment into the river. Although adverse, the impact of construction on water quality would be localized and of short duration.

### **3.7.4 Cumulative Impacts**

As described in Section 3.2.4 of this EIS, other projects in the vicinity of Proposed Action sites include renovation of existing and construction of new private residences, rehabilitation of Wallowa Lake Dam, numerous habitat restoration projects, salmon recovery projects, watershed management activities, and the Nez Perce Tribal Hatchery Program. During construction, some of these projects may have temporary minor negative effects to water quality, fish and wildlife. However, several habitat and salmon recovery projects would also result in long-term beneficial effects to Imnaha ORVs. These projects, when considered together with the Proposed Action, are not expected to result in adverse cumulative impacts to Wild and Scenic values of any Wild and Scenic River.

### **3.7.5 Consequences of Taking No Action**

The No Action Alternative would mean no change to the free flow, water quality, or Outstandingly Remarkable Values of any Wild and Scenic River. The opportunity to improve conditions in the Imnaha Wild and Scenic River by enhancing fish recovery with hatchery facilities, moving the access bridge at the Imnaha Final Rearing Facility and replacing the weir at the Imnaha Satellite Facility would be foregone.

## 3.8 Cultural Resources

### 3.8.1 Affected Environment

#### 3.8.1.1 Prehistory and History

The project sites are on lands that may have been inhabited or used by the Nez Perce, Cayuse, Umatilla, and Walla Walla tribes and, to a lesser extent, other Columbia Plateau tribes. The CTUIR (Cayuse, Umatilla and Walla Walla) lived in the Columbia River region of what is now northeastern Oregon and southeastern Washington for more than 10,000 years. They ranged over approximately 6.4 million acres, moving seasonally to harvest fish in the Columbia River lowlands, to dig roots in the foot hills of the Blue Mountains in late spring and early summer, to collect berries and hunt for deer and elk in the higher elevations in summer, and to return to the valleys for fall fishing and winter shelter. The CTUIR frequented the Columbia River and the lower regions of the Umatilla River and Willow Creek; the Walla Walla Tribe frequented the Columbia, Walla Walla, and Snake Rivers; and the Cayuse lived along the upper courses of Columbia tributaries as far as the Grande Ronde River.

The NPT lived and traveled across 17 million acres in Oregon, Washington and Idaho, including the valleys of the Snake, Clearwater and Salmon Rivers and their tributaries. The Nez Perce traveled seasonally, traveling to the lower valleys to dig root crops and fish in the Snake and Columbia Rivers in spring, moving to the high country in the summer, and returning to lower river valleys for the winter. The prehistoric record of the Clearwater River subbasin indicates an early foraging culture with a transition to semi-subterranean houses about 6,000 years ago (BPA et al. 1997). The NPT has always fished. Fish, especially chinook salmon, have served as a primary food source, trade item and cultural resource for the Tribe for thousands of years. The economy and cultural history of the Nez Perce people has evolved around northwest salmon runs (Ashe et al. 2000). The religion of the Nez Perce – their stories, legends and ceremonies regarding fish and rivers all reflect this bond (Landeon and Pinkham 1999).

One of the first historic records in this area dates from 1805 and 1806, during the Lewis and Clark Expedition as the two explorers were making their way to the Pacific. Early records also include the establishment of fur trading posts, missions and forts in the early 1800s. Fort Nez Perce (later named Fort Walla Walla) was established in 1818 and became a regional commercial center for the military, white trappers and traders and the local tribes. In the 1840s, settlers began to move westward along the Oregon Trail and in late 1848, Congress established the Territorial Government of Oregon (that covered a large area of land, including what later became the states of Washington, Oregon and Idaho). In the 1850s, the federal government negotiated treaties with several area tribes that established reservations. Although moved to reservation lands, both the NPT and the CTUIR reserved the rights to continue to fish, hunt, and gather traditional foods and medicines throughout the lands they ceded to the United States.

In the 1860s, gold was discovered in river bars near what is today HCNRA. In the late 1800s and early 1900s, mining interests shifted to hard-rock operations such as that on Eureka Bar area near the mouth of the Imnaha River and at about the same time, the area experienced an influx of homesteaders (U. S. Forest Service 2003). Early homesteaders grazed cattle and sheep on their 160-acre allotments and nearby public lands. Between 1910 and 1918, many of these original homesteads were either bought out by larger ranching operations or the lands reverted to the federal government as homesteaders were driven out by depressed livestock prices and weather unfavorable to farming and ranching (U.S. Forest Service 2003).

In current times, farming and ranching continues to support local residents and fishing in the Columbia and its tributaries continues to be a mainstay for both sustenance and cultural activities of area tribes. Nez Perce tribal elders believe that the loss of their traditional fishing sites and the decline in the Chinook salmon runs in

the Columbia River drainage is one of the greatest tragedies of this century (Landeem and Pinkham 1999). Further declines in the Columbia River salmon fishery will result in the loss of a valued food source, source of spiritual strength and decline in value of Treaty-assured fishing assets (Myer Resources 1999).

### **3.8.1.2 Surveys and Consultation**

The NPT Cultural Resource Program Archaeologist surveyed the sites for cultural resources. These surveys consisted of pre-field background research and on-site surveys to identify any cultural materials present and to gauge the likelihood of the presence of unseen cultural materials. Test excavations (shovel-surveys) were performed at two sites (Lostine River Hatchery and Imnaha Final Rearing Facility) deemed by the Tribal Archaeologist to have the potential for undiscovered cultural resources due to vegetation limiting ground visibility, past agricultural activities and a likelihood of buried cultural deposits (NPT 2002).

The Tribal Archaeologist (NPT 2002) did not observe any cultural material or note any structures eligible for listing on the National Register of Historic Places at any of the project sites. BPA has requested confirmation from the Oregon State Historic Preservation Officer (SHPO).

The CTUIR, responding to an inquiry from BPA, stated that the tribe considers the proposed sites Traditional Cultural Properties (TCPs) and that they are identified as such in their oral histories (Farrow 2002). BPA, in consultation with the CTUIR, agreed to require an on-site monitor during all proposed ground disturbing work at all sites to ensure protection of any cultural resources should they be discovered. BPA's consultation with the Oregon SHPO under section 106 of the National Historic Preservation Act has been initiated, which involves a determination of finding of no effect on cultural or historic properties, and includes the requirement for an on-site monitor as well. BPA is currently awaiting SHPO's response to that determination.

An overview of the laws and regulations protecting sites and materials of historic interest, as well as TCPs, is presented in Chapter 4.

## **3.8.2 Evaluation Criteria**

Potential impacts to cultural resources would be characterized by the degree of physical disturbance of a cultural site or degree of improvement to a cultural resource (such as traditional salmon fishery).

## **3.8.3 Consequences of the Proposed Action**

### **3.8.3.1 Lookingglass Hatchery**

Oregon Parks and Recreation Department records indicated no recorded cultural or historic sites near the Lookingglass Hatchery (Figures 2-2 and 3.9-1). During the on-site survey, no cultural materials were observed in the project area. Since no cultural materials were detected during surveys, and this is an existing facility and modifications would occur within areas already developed, no impacts to cultural resources are anticipated. Construction activity would be monitored by a person knowledgeable about cultural resources. If evidence of cultural materials is found, site work or activity would be halted until the site could be assessed. Notification of and consultation with the SHPO, NPT Cultural Resource Program and CTUIR would also occur as appropriate.

### **3.8.3.2 Lostine Adult Collection Facility**

Oregon Parks and Recreation Department records indicated no recorded cultural or historic sites near the Lostine Adult Collection Facility (Figures 2-3 and 3.9-2). During the on-site survey, no cultural materials were observed in the project area, so no impacts to cultural resources are anticipated. However, construction



activity would be monitored by a person knowledgeable about cultural resources. If evidence of cultural materials is found, site work or activity would be halted until the site could be assessed. Notification of and consultation with the SHPO, NPT Cultural Resource Program and CTUIR would also occur as appropriate.

### **3.8.3.3 Lostine River Hatchery**

Oregon Parks and Recreation Department records indicated no recorded cultural or historic sites near the Lostine River Hatchery (Figures 2-4 and 3.9-3). During the on-site survey, no cultural materials were observed in the project area. A site shovel-survey also showed no indication of cultural materials. So, no impacts to cultural resources are anticipated. However, construction activity would be monitored by a person knowledgeable about cultural resources. If evidence of cultural materials is found, site work or activity would be halted until the site could be assessed. Notification of and consultation with the SHPO, NPT Cultural Resource Program and CTUIR would also occur as appropriate.

### **3.8.3.4 Imnaha Final Rearing Facility**

Oregon Parks and Recreation Department records indicated only one cultural site in the area (35WA812), near the mouth of Dunlop and Thorn Creeks, located on the opposite side of the Imnaha River from the project area. No proposed new facilities (bridges, power lines, etc.) would be located near this site.

During the on-site survey, an irrigation ditch was observed on the southwest edge of the project site within the area of potential effect (where site disturbance or construction is expected, Figure 2-6). In addition to the irrigation ditch, an old homestead and orchard are known to exist in the project vicinity outside of the area of potential effect. A site shovel-survey showed no indication of other cultural materials. Since the ditch, homestead and orchard would be avoided by project activities, no impacts to cultural resources are anticipated. However, construction activity would be monitored by a person knowledgeable about cultural resources. If evidence of cultural materials is found or if impacts to known materials occur, site work or activity would be halted until the site could be assessed. Notification of and consultation with the SHPO, NPT Cultural Resource Program and CTUIR would also occur as appropriate.

### **3.8.3.5 Imnaha Satellite Facility**

The NPT Archeologist is conducting a cultural resource review for the proposed powerline to be located under or along the Upper Imnaha River Road connecting the site to the existing PacifiCorp substation about six miles to the north. Though no sites are expected in the road corridor, if any are discovered during survey or installation of the line, they would be avoided by rerouting the line underground or taking it overhead to avoid further disturbance of the ground. All other construction activity would be monitored and if evidence of cultural materials is found, site work or activity would be halted and the Oregon SHPO, NPT Cultural Resource Program and CTUIR would be notified and consulted regarding more detailed investigation. Since no cultural materials were detected during the site survey, and this is an existing facility and modifications would occur within areas already developed, no new impacts to cultural resources are anticipated.

## **3.8.4 Cumulative Impacts**

As described in EIS Section 3.2.4, other projects in the vicinity of the Proposed Action sites include renovation of existing and construction of new private residences, rehabilitation of Wallowa Lake Dam, numerous habitat restoration projects, salmon recovery projects, watershed management activities, and the Nez Perce Tribal Hatchery Program. These projects would avoid or mitigate impacts to cultural resources, and when considered together with the Proposed Action no adverse cumulative impacts are expected. Projects that benefit chinook, including the Proposed Action, could have a beneficial cumulative effect on that cultural resource.

### **3.8.5 Consequences of Taking No Action**

The No Action Alternative would have the no adverse impact on cultural or historic resources physically located on or in the ground at the sites. The No Action Alternative has the potential to adversely impact the salmon resources in the area due to continued stock declines if not augmented by the project.

## **3.9 Aesthetics (Visual Quality)**

### **3.9.1 Affected Environment**

#### **3.9.1.1 Regional Landscape Setting**

The project sites, along with landscape features such as main roads, towns, rivers, and mountain ranges, are depicted in Figure 1-1. Much of the area consists of basalt plateaus dissected by river canyons, ranging primarily from 2,000 to 5,000 feet elevation with a mix of grassland and shrubs at the lower elevations and scattered stands of conifers at the higher elevations concentrated on north slopes and in stream bottoms. Rangeland and some agricultural land characterize much of the lower open valleys. The Blue Mountains, with dense stands of coniferous forest, rise to 6,000 feet along the western side of this region. Hells Canyon of the Snake River, a steep gorge over 4,000 feet deep, borders the area to the east along the Oregon/Idaho border. To the south rise the Wallowa Mountains with rugged granitic peaks up to 10,000 feet, alpine meadows and dense stands of coniferous forest. The region's development pattern includes sparse settlements and rural land uses, including visible signs of agricultural and timber activities. The scenery and recreational resources also attract numerous recreational visitors and tourists to Northeast Oregon.

#### **3.9.1.2 Grande Ronde Subbasin**

The Grande Ronde River originates in the Elkhorn Range of the Blue Mountains and meanders through the Grande Ronde valley between the Blue and Wallowa Mountains, to its confluence with the Snake River in Washington 212 miles from its source. High plateaus dissected by precipitous canyons characterize the lower basin. Lookingglass Creek is one of these lower basin tributaries to the Grande Ronde. The steep-sided canyon is a mix of conifer forest, riparian streamside vegetation, and grassy slopes of native bunch grasses. Much of the surrounding area shows evidence of logging operations.

The Lostine River, also within the Grande Ronde subbasin, originates at 7,300 feet in the pristine Eagle Cap Wilderness in the heart of the Wallowa Mountains. The river flows 25 miles in a northerly direction to its confluence with the Wallowa River, several miles north of the town of Lostine. The Wallowa River flows into the Grande Ronde River about three miles downstream from where Lookingglass Creek enters the Grande Ronde.

In the vicinity of the proposed Lostine Adult Collection Facility and Lostine River Hatchery sites, the Lostine River emerges from the mountains and passes through a sparsely forested valley. Steep mountain slopes enclose the valley to the east and west. Riparian vegetation lines the riverbanks and open range and agricultural lands with rural residential development characterizes the open valley bottom. Access and views of the area are available from the Lostine River Road (County Road 551), which generally follows the river from the town of Lostine up into the mountains. The Lostine River is designated as Wild and Scenic beginning about one mile upstream of the proposed hatchery site.

**Lookingglass Hatchery** — Situated about 16 miles north of the town of Elgin, the Lookingglass Hatchery lies within a narrow canyon at an elevation of about 2,950 feet. Figure 3.9-1 presents photographs taken at the Lookingglass site (Figure 2-2). The site occupies about 11 acres of sloping terrain located on the east side of Lookingglass Creek. Jarboe Creek empties into Lookingglass Creek at the south end of the site between an existing settling basin and existing access road. The existing hatchery buildings, tanks and pavement, along with a combination of trees, riparian vegetation and grasses cover the site. The existing facilities are generally located in level areas with sparse vegetation. Existing facilities include several concrete-lined ponds, numerous shallow rectangular-shaped tanks or raceways, a concrete weir that spans Lookingglass Creek, several single story metal-clad buildings used for maintenance and storage, and a paved outdoor storage area enclosed by chain link fence. Three employee houses are on the south end of the site. Lookingglass Hatchery is accessed via a paved road that intersects the gravel county road at Palmer Junction, located about two and one quarter miles south of the site. Although not a through-road, the access road is used by the public when they visit the hatchery. Except for hatchery visitors, the existing Lookingglass Hatchery is not visible to the public due to its distance from the county road and the screening provided by intervening terrain and tree cover.

**Lostine Adult Collection Facility** — The Lostine Adult Collection Facility site (Figure 2-3) is located on the Lostine River about one mile south of the town of Lostine, within an area generally comprised of pastures, farms, corrals and scattered rural residences. An existing trout farm consisting of a residence, outbuildings and several ponds lies immediately to the northwest. Access to the site is via the Lostine River Road, then by a private road and bridge across the river to the site and the existing trout farm.

Photos of the site are shown on Figure 3.9-2. Dense riparian vegetation including a mix of willows and cottonwoods is found along the river frontage. Upland vegetation includes a mix of fir and cottonwoods. River rocks of various sizes are visible along the riverbanks as well as along areas of exposed river bottom. Situated at an elevation of about 3,470 feet, the site slopes gently to the north. Existing facilities occupy land on both sides of the river including a metal and wood outbuilding on the west side of the site, a diversion structure on the east side and a fish ladder that spans the river (Photo 5). Photo 7 shows the fish ladder and existing structures looking upstream from the private bridge.

Public views of the site and existing facility are available from places along the Lostine River Road. However, as shown in Photos 6 and 8, views of much of the site from the roadway are partially or fully screened by relatively dense vegetation. The number of potentially affected viewers is low due to light traffic volumes and the vegetation screening.

**Lostine River Hatchery** — The site for the proposed Lostine River Hatchery (Figure 2-4) lies in the steep-sided Lostine River valley where the river emerges from the Wallowa Mountains. Riparian vegetation lines the riverbanks and open rangeland with scattered rural residences predominates in the open valley bottom. Ranch buildings and a small residential subdivision are located north and west of the site. This is approximately a six-acre site of very gently sloping terrain at about 3700 feet elevation, accessible by Granger Road, a residential gravel road off the Lostine River Road.

Figure 3.9-3 presents four views toward the Lostine River Hatchery site. Portions of the site are open grasslands and pasture; in other locations the site is covered with conifers and riparian vegetation. The site is fenced and shows signs of logging and grazing and includes an existing single-story residence. The gravel access road and a powerline run down river to the temporary rearing site.

Public views of the site are available from the north end of Granger Road and the adjacent residential subdivision (Photo 10). From further away on Granger Road and from the Lostine River Road, several hundred yards across the valley, vegetation screens views of the site (Photo 9). Photos 11 and 12 show views

of the proposed intake structure location as seen from the bridge where Lostine River Road crosses the river. In general, views of the intake structure location would be limited by intervening vegetation.

### 3.9.1.3 Imnaha Subbasin

The Imnaha River watershed originates in the Wallowa Mountains with most of the watershed located in the pristine Eagle Cap Wilderness. The Imnaha River is a tributary of the Snake River and is designated Wild and Scenic. Steep canyon walls of layered basalt rim rock with scattered stands of conifers, riparian streamside vegetation and grassy slopes of native bunch grasses characterize the deep river canyon in lower reaches (*e.g.*, the Imnaha Final Rearing Facility).

Many small creeks flow into the river from the ridge to the east dividing the Imnaha River and Hells Canyon. The Upper Imnaha River Road parallels the river for much of its length and a 230kV-transmission line follows the river in the vicinity of the proposed Imnaha Final Rearing Facility and Imnaha Satellite Facility sites.

**Imnaha Final Rearing Facility** — Located approximately five miles south of the town of Imnaha, the Imnaha Final Rearing Facility site (Figure 2-6) is situated on the west bank of the Imnaha River. This ten-acre site lies between the river and the base of steep basalt canyon walls that rise to elevations of over 6,000 feet. Native grasslands predominate on the open slopes and pockets of forest and riparian vegetation are found along the river. Scattered rural residences, ranch buildings, and cleared pasture are found along the road north and south of the site. Photos 13 through 16 show views of the site (Figure 3.9-4).

The Imnaha Final Rearing Facility site primarily occupies a large pasture of introduced weedy forbs situated at an elevation of about 2,000 feet. A narrow band of dense mature riparian vegetation, including willows and shrubs, lines the riverbank on the site (Photos 14 and 15). Site access is via the Upper Imnaha River Road and across a private bridge. As shown in Photos 13 and 16, a non-continuous mix of riparian vegetation and conifers is found along the roadway. The site is currently undeveloped except for a steel bridge across the river, primitive access road, irrigation ditch and orchard. A rural ranch residence is located across the river east of the site. Photo 16 shows the view looking north from this residence. Partially screened foreground views of the site are available from places along the adjacent Upper Imnaha River Road. The number of potentially affected viewers is low due to light traffic volumes, the speed of travel past the area, and the attraction of other scenic features.

**Imnaha Satellite Facility** — The Imnaha Satellite Facility (Figure 2-8) is located on the west bank of the Imnaha River, approximately 25 miles upstream (south) of the town of Imnaha. Site access is via the Upper Imnaha River Road (a Forest Service Road at this location), which is not passable during winter months. Bands of conifers line the valley bottom and side slopes. South of the site (upstream), Forest Service campgrounds are located in park-like stands of ponderosa pine. Traveling north from the site, natural openings in the forest and cleared pasturelands are found with rural residences and ranch buildings. An existing high-voltage transmission line traverses the site along the river corridor.

The site consists of approximately six acres lying between the public roadway and the Imnaha River. Figure 3.9-5 shows four views of this site. The existing facility includes a wooden bunkhouse and parking area (Photo 18); a septic field, concrete hatchery structure enclosed by chain link fence and concrete-lined rectangular raceways (Photo 19); a weir, a fish ladder, an intake structure and generator/shop building. In addition to the existing structures, ornamental landscaping, mixed conifer forest and riparian streamside vegetation frame the site.

Photos 17 through 20 show public views of the site as seen from places along Upper Imnaha River Road. Portions of the bunkhouse, parking area, and raceway structures can be seen from these locations. The

existing weir and fish ladder entrance are visible in the distance from one spot along the road, but most of the site is screened by existing vegetation (Photo 17). The number of potentially affected viewers is low due to relatively light traffic volumes and typical winter road closures. Primary access to the upper Imnaha River is via another road, the paved Wallowa Loop Road.

#### **3.9.1.4 Public Plans and Policies Pertinent to Aesthetics**

The Land Use, Recreation and Transportation section of this EIS (Section 3.10) identifies the various land use plans or policies for areas including the Proposed Action sites. As outlined in that section, the Lookingglass Hatchery is within the area covered by Union County's land use plans. The other four sites are within the area covered by Wallowa County's land use plans. The Imnaha Satellite Facility is exempt from county regulations because it is a federal site. The two Lostine River sites and the Imnaha Final Rearing Facility site may be reviewed by Wallowa County's Natural Resources Technical Advisory Committee (Black 2002).

Two of the sites, the Imnaha Satellite Facility and the Imnaha Final Rearing Facility, are situated along the Imnaha Wild and Scenic River corridor. The Imnaha Satellite Facility is located on land administered by the Wallowa-Whitman National Forest within the HCNRA. The Imnaha Final Rearing Facility, while on private property, is located near Forest Service land (also within the HCNRA).

The visual resource management framework adopted by the Forest Service pertains to both designated Wild and Scenic River corridors and National Forest System lands. The Forest Service applies an inventory and assessment system known originally as the Visual Management System (VMS). In 1995, the Forest Service adopted the Scenery Management System (SMS), which incorporates and updates many aspects of the original VMS. As part of this system, the Forest Service has established management goals to describe the acceptable level of modification associated with land use activity in a given area. These standards or Visual Quality Objectives (**VQO**) range from "preservation" which is typically applied only to highly sensitive landscapes such as wilderness areas to "maximum modification," a standard that allows land use activity that may appear dominant in relationship to the natural landscape while not completely harmonizing with the natural setting.

The Wallowa-Whitman National Forest Land and Resource Management Plan identifies VQOs for areas within the National Forest (U.S. Forest Service 1990). In addition, the Imnaha River Wild and Scenic Management Plan (U.S. Forest Service 1993a) and the Lostine River Wild and Scenic Management Plan (U.S. Forest Service 1993b) identify VQOs for areas within the Wild and Scenic River boundaries (see also Sections 3.7 and 3.10 of this EIS).

The Forest Service applies the "retention" VQO standard to the two Imnaha sites within or near the Wallowa-Whitman National Forest (U.S. Forest Service 1996). The retention standard provides for "natural-appearing landscape where management activities are not visually evident." The Forest Service does not prohibit any specific management activities within areas designated "retention." Under the updated Forest Service SMS, the retention standard translates to a "high scenic integrity level", which means that, when viewed by the public, the natural or naturally appearing landscape character looks intact. Deviations from this landscape quality may be present but they should repeat the characteristic form, line, color, texture and pattern at a scale so as to not appear evident (U.S. Forest Service 1995). The overall goal of this Forest Service visual quality standard is for land use activities to blend substantially into the landscape and appear less noticeable. Because Forest Service authority does not extend to private land, this standard is advisory for the Imnaha Final Rearing Facility site.

The following paragraphs provide brief summaries of local and federal visual quality policies that are pertinent at each of the sites.

**Lookingglass Hatchery** — The Union County Comprehensive Land Plan outlines a series of goals related to visual resources. Guidance includes conserving open space and protecting natural, cultural, historical and scenic resources. The Plan stipulates that the following concerns be taken into account to protect visual attractiveness: 1) maintaining vegetative cover wherever practical, 2) using vegetation or other site obscuring methods to screen unsightly uses and 3) siting developments to be compatible with surrounding area uses, and that the natural characteristics of the location be recognized (Union County 1984). The county zoning ordinance provides physical development standards including minimum building setbacks and siting requirements to avoid building on steep slopes (Union County 1983).

**Lostine Adult Collection Facility and Lostine River Hatchery** — According to the Wallowa County Comprehensive Land Use Plan, the intent of the Exclusive Farm Use designation is to preserve and maintain agricultural land for farm use. The plan provides for protecting the rural character and open space activities of agricultural uses by preserving “the scenic attractiveness and living conditions desirable to farm families and other county residents” (Wallowa County 1988a). The Wallowa County Land Development Ordinance includes Development Standards to address minimum lot size and building setbacks with respect to roadways, streams and rivers (Wallowa County 1988b).

**Imnaha Final Rearing Facility** — In addition to the policies summarized for the two Lostine sites, the Timber Grazing designation also applies to the Imnaha Final Rearing Facility site. Siting requirements for Timber Grazing development include minimum setbacks from adjoining properties, clustering near or among existing structures and siting buildings close to existing roads (Wallowa County 1988b).

**Imnaha Satellite Facility** — This site lies within an area designated Timber/Commercial in the Comprehensive Land Use Plan, a zone intended to conserve forestlands. The Wallowa County Land Development Ordinance development standards require that buildings be situated close to existing roads, and that development generally be sited to minimize the amount of forestlands used for access roads, service corridors, and structures. However, as a federal site, local regulations do not apply.

The Imnaha Satellite Facility is located on Forest Service land, within the boundaries of the Wallowa-Whitman National Forest and is therefore subject to the Forest Plan policies. The Forest Service has determined that the facility site vicinity has a “retention” VQO. The retention standard provides for “natural-appearing landscape where management activities are not visually evident.” Additionally, the Hells Canyon Comprehensive Management Plan, incorporated into the Wallowa-Whitman National Forest Land and Resource Management Plan, includes a goal “to protect and enhance the special values of those rivers or river segments which are part of the National Wild and Scenic Rivers System.”

### 3.9.2 Evaluation Criteria

The visual impact assessment was based on evaluating the changes to the existing visual resources that would result from construction and operation of the proposed facilities. These changes were assessed, in part, by evaluating the “after” views provided by the computer-generated visual simulations and comparing them to the existing visual environment. Consideration was given to the following factors in determining the extent and implications of the visual changes:

- Anticipated extent of project visibility and the expected level of visual contrast.
- Relative numbers of viewers and their activities.
- View duration.
- Extent to which the affected environment contains visual resources that have been designated in plans and policies for protection or special recognition.

Particular consideration was given to effects on landscapes visible in the foreground from public roadways and residential areas. A visual impact would be characterized by noticeable changes in the existing visual character or quality of the **viewshed**. An adverse impact could occur if project facilities appeared prominent when seen by viewers considered to be highly sensitive to change and if it contrasted strongly with the existing landscape setting in terms of scale, form, or color. Where appropriate and feasible, mitigation measures could reduce the expected level of adverse impacts.

### 3.9.3 Consequences of the Proposed Action

The proposed development would alter the appearance of all five sites but would not substantially alter the existing visual character or quality of the viewsheds as seen by the public. Aesthetic measures have been included in the Proposed Action to reduce the level of anticipated visual effect. For each site except Lookingglass Hatchery, computer-generated visual simulations are presented to illustrate “before” and “after” conditions at the Proposed Action sites. No simulations were necessary at Lookingglass Hatchery because of the limited nature of the modifications to this established and relatively isolated facility.

The analysis of visual effects of the Proposed Action is based on field observations and review of the following information: local planning documents; project maps, drawings and technical data; aerial and ground level photographs of the project area; and computer-generated visual simulations. Site reconnaissance was conducted in August 2002 to observe the project area, to take representative photographs of existing visual conditions and to identify key public views appropriate for simulation. The visual simulations were based on project data provided by Montgomery Watson Harza project design engineers and produced using computer modeling and rendering techniques. The simulations (Figures 3.9-6 through 3.9-10) illustrate the scale, location and conceptual appearance of proposed facility features at four of the sites as seen from five representative public viewing locations:

- 1.) Lostine Adult Collection Facility – View from Lostine River Road (Figure 3.9-6).
- 2.) Lostine River Hatchery – View from Granger Street (Figure 3.9-7).
- 3.) Lostine River Hatchery Intake – View from the Lostine River Road Bridge (Figure 3.9-8).
- 4.) Imnaha Final Rearing Facility – View from the Upper Imnaha River Road (Figure 3.9-9).
- 5.) Imnaha Satellite Facility – View from the Upper Imnaha River Road (Figure 3.9-10).

#### 3.9.3.1 Lookingglass Hatchery

Changes in the appearance of the Lookingglass Hatchery site (Figure 2-2) would be within the existing hatchery administrative site. Many of these modifications would involve changes to the interior of existing structures. The proposed modifications that would affect the site’s outward appearance include a proposed 6-bay garage building, minor modifications to the existing fish production building, and the addition of three new raceways. Minor amounts of excavation would occur in conjunction with construction.

The proposed modifications would not be very noticeable and would not substantially alter the existing visual character of the Lookingglass Hatchery site. The site is generally not within public view except to hatchery visitors, so modifications would not affect the area’s overall visual character. No inconsistencies with Union County’s Comprehensive Land Plan related to visual quality are apparent.

### 3.9.3.2 Lostine Adult Collection Facility

Changes in the appearance of the Lostine Adult Collection Facility site (Figure 2-3) would include partial removal of the existing concrete fish ladder and replacement with a new concrete fish ladder and weir structure. Riprap would also be installed on both sides of the riverbank south (upstream) of the new facility. The existing bridge would be replaced. Grading and vegetation removal would occur at the construction staging area and along the riverbank in the vicinity of the fish ladder and bridge. Figure 3.9-6 shows a “before” view and an “after” simulated view of the Lostine Adult Collection Facility site as seen from the Lostine River Road.

The reconstructed fish ladder would be partially, and momentarily, visible to northbound travelers on the country road. Other proposed facility components including the weir structure, parking area, and riprap would generally be screened from public view by existing vegetation along the roadway. The bridge replacement would not be noticed by most motorists. The anticipated visual effects associated with the Lostine Adult Collection Facility modifications would be low given the limited visibility of project components, the brief duration of affected views, the low number of affected viewers, and the fact that the changes would not substantially alter the area’s existing visual character. No inconsistencies with the Wallowa County Comprehensive Land Use Plan relative to visual quality are apparent.

### 3.9.3.3 Lostine River Hatchery

The appearance of the Lostine River Hatchery site would change as new structures and hatchery equipment are built in an area characterized by rural residential subdivisions and confined-area grazing activities. The new facilities include a wood-sided single family residence, a wood-sided operations building, holding ponds and tanks, a concrete outfall with gravel parking area, a concrete-block incubation building, and a headbox building (Figure 2-4). A new concrete intake structure would also be located to the south near the Lostine River Road bridge (Figure 2-5). In general, the wood-sided buildings, colors and materials would be consistent with other development in the vicinity. Grading and vegetation removal including approximately 20 fir, spruce and aspen trees, would occur on about one acre of land. Site design and layout would aim to minimize tree removal. The proposed facility includes planting a row of Douglas-firs along a portion of the site’s southern perimeter near the operations building. Tree planting is also proposed between the headbox building and residence and in other strategic places within the site, including along the top of the bank located west of the facility.

Figures 3.9-7 and 3.9-8 illustrate “before” and “after” views of the Lostine River Hatchery facilities as seen from Granger Road and the Lostine River Road bridge. The proposed hatchery operations building and incubation building would be visible from Granger Road, the access road to the site (figure 3.9-7). The other proposed facility components including the headbox, raceways, parking area and outfall structure would generally not be seen by the public traveling along the Lostine River Road due to screening provided by existing and proposed vegetation, but would be visible from residences within the subdivision.

The intake would include a new concrete fish ladder and intake structure topped with a small wood-sided building. A concrete weir structure would be constructed across the river at this location. During some periods the weir would be in a more noticeable raised position with water spilling over the top and a pool of water created upstream. The simulation also shows the removal of a small group of conifer trees on the riverbank. The simulation view depicted in Figure 3.9-8 would be seen by northbound roadway travelers for a few seconds at the river crossing. Except for a relatively brief glimpse, southbound travelers would not generally see the intake.



The anticipated level of visual impact associated with the Lostine River Hatchery would be relatively low due to the limited visibility of project components, the brief duration of affected views and the low number of affected viewers. The project would be visible to some nearby residents.

To minimize visual impacts to residents, additional conifer trees would be planted along the east side of the site and south of the operations building to provide visual screening. All lighting would be directed on-site and outdoor lighting would generally be directed downward. Non-glare fixtures would be specified for outdoor lighting. Light fixtures would be installed and buildings designed to shield direct views of the lights.

No inconsistencies with the Wallowa County Comprehensive Land Use Plan relative to visual quality or the exclusive farm use designation are apparent. Adherence to Wallowa County Land Development Ordinance Development Standards relative to visual concerns would be controlled by building permits.

### **3.9.3.4 Innaha Final Rearing Facility**

The Innaha Final Rearing Facility (Figure 2-6) would include three new buildings – a storage/shop building, a single-family residence, and a bunkhouse. These buildings would be wood-sided and located as far from the river as possible within the relatively level portion of the site. Additional facility components would include ten concrete raceways (long rectangular ponds), a concrete intake structure and a concrete outfall, and a cleaning waste basin. The existing access bridge across the Innaha River would be relocated about 200 feet upstream. Project construction would involve clearing about six acres of pasture land and filling the northern section of the site up to three feet to raise the new facilities above the 100-year flood level. Most of the riparian vegetation would be retained and riparian vegetation would be replanted in the area where the existing bridge would be removed and where additional screening is desired.

Figure 3.9-9 shows “before” and “after” views of the Innaha Final Rearing Facility site as seen from Innaha River Road looking south. As shown in the visual simulation, the storage building, fill bank, cleaning waste basin and relocation of the existing bridge would be partially visible from this viewpoint. The new facilities would generally be sited within the existing pasture and located to take advantage of screening provided by existing large woody vegetation. Due to vegetation screening, the facilities would be visible to the public intermittently and for a brief duration from limited sections of the roadway. The relocated bridge would be visible from the road and would be similar to the existing bridge in appearance and degree of visibility.

Although the site is located within a Wild and Scenic River corridor with a “retention” VQO, the designation does not apply to privately owned lands (U.S. Forest Service 1993a). However, most of the on-site screening vegetation is being retained along the Innaha River and an informal planting of native trees and shrubs would be strategically planted at the site, along the south side of the Innaha River Road to screen facilities from roadway views. The buildings would exhibit a simple style, consistent with other buildings in the vicinity (*i.e.*, not starkly different). Exterior colors and materials would be chosen to blend with the surrounding natural landscape. All lighting would be directed on-site. Outdoor lighting would generally be directed downward.

No inconsistencies with the Wallowa County Comprehensive Land Use Plan relative to visual quality are apparent. Adherence to Wallowa County Land Development Ordinance Development Standards relative to visual concerns would be controlled by building permits.

### **3.9.3.5 Innaha Satellite Facility**

The Innaha Satellite Facility (Figure 2-7) modifications would include installing a new fish barrier across the river to replace an existing diversion weir, installing a new fish ladder next to the existing fish ladder,

enlarging the fish holding area, constructing a new settling basin, and modifying the existing intake structure. The existing spawning shelter would also be enlarged to accommodate a new incubation room. New powerlines would be buried in the Imnaha River Road.

Figure 3.9-10 shows a “before” and an “after” view of the Imnaha Satellite Facility site as seen from Imnaha River Road. As shown in the simulation, the new fish ladder and addition to the spawning shelter would be apparent but not particularly noticeable from the roadway. These effects would only be visible to the public from limited places along Imnaha River Road immediately adjacent to the site and from the visitor parking area. In general, as seen by the public, the facility’s appearance with proposed changes would be very similar to its current appearance, except during and immediately after construction. Given the site’s location within a Wild and Scenic River corridor and within a National Forest area with “retention” VQOs, the anticipated visual effects could represent an adverse visual effect. However, because views of the facility that would occur after that Proposed Action would not be substantially different from existing views, and because the existing facility is somewhat of a public attraction (it is open to visitors), the amount of change in visual quality is expected to be minor.

### 3.9.4 Cumulative Impacts

As described in Section 3.2.4 of this EIS, other projects in the vicinity of Proposed Action sites include renovation of existing and construction of new private residences, rehabilitation of Wallowa Lake Dam, numerous habitat restoration projects, salmon recovery projects, watershed management activities, and the Nez Perce Tribal Hatchery Program. These projects involve primarily isolated or screened views, and would not result in major long-term changes to visually sensitive resources. These projects, when considered together with the Proposed Action, are not expected to result in substantial adverse visual cumulative impacts.

### 3.9.5 Consequences of Taking No Action

The No Action Alternative would result in no changes to scenes or views at any of the proposed project sites.

## 3.10 Land Use, Recreation and Transportation

### 3.10.1 Affected Environment

The five proposed project sites are located within the Grande Ronde and Imnaha subbasins in Northeast Oregon, within Wallowa and Union counties (Figure 1-1). The proposed site on Lookingglass Creek is located in Union County. The proposed sites on the Lostine and Imnaha Rivers are located in Wallowa County. Wallowa County is located in the far northeast corner of Oregon, and is bordered by the states of Washington and Idaho. Wallowa County is home to the HCRNA, Wallowa Lake, and the Eagle Cap Wilderness.

Northeast Oregon is rural and sparsely settled. The local economy depends on agriculture, timber and tourism (Oregon Economic and Community Development Department 2001). Agricultural activities consist primarily of ranching and dryland farming. Timber is harvested from public and private forestlands. Lumber mills and related manufacturing are located in several towns in the area. Outdoor recreation and tourism draw visitors to the region and support a variety of retail and service businesses.

Most of the sites are subject to county land use regulations, which are discussed below as they apply. The rivers support chinook salmon and may be designated by the Oregon Division of State Lands (ODSL) as “Essential Habitat Streams.” As such, proposed construction activities would require a “removal-fill permit” from that state agency as well as a CWA Section 404 Permit from the USACE. Each site is at least partly

located within the 100-year floodplain of the adjacent river. Neither the Federal Emergency Management Agency nor the respective county governments, however, regulate floodplain development in the vicinity of the sites. None of the sites have been designated as prime farmland by the Natural Resources Conservation Service. Chapter 4 and Table 4-1 of this EIS contain more information about permits and approvals.

### **3.10.1.1. Lookingglass Hatchery**

Lookingglass Hatchery (Figure 2-2) is located on Lookingglass Creek, approximately 16 miles north of Elgin, Oregon within a narrow canyon, 2.2 miles upstream from the confluence with the Grande Ronde River. Lookingglass Hatchery was built on land originally owned by Boise Cascade Corporation. Adjacent land is owned and maintained by Boise Cascade and managed for timber production. The hatchery site is accessed via a public paved road that parallels Lookingglass Creek and ends at Lookingglass Hatchery.

The Union County Comprehensive Land Use Plan provides guidelines for facility development and other considerations related to county growth. The basic purposes of the Union County Comprehensive Land Use Plan are to: 1) protect the custom, culture and community stability of the county; 2) maintain the agricultural and timber basis of the county; 3) accommodate anticipated development; and 4) make provisions for those uses which may be needed by the county, but which may have undesirable characteristics such as noise, smoke, and odor (Union County 1984).

The Lookingglass Hatchery is located within the A-4 Timber-Grazing Zone. The A-4 Timber-Grazing Zone is intended to conserve and maintain agriculture and forest land throughout the county. Fish hatcheries and associated dwellings are not specifically identified as a use in the Union County Zoning Ordinance (Union County 1983). However, ORS 215.755(3) identifies caretaker residences for public parks and public fish hatcheries as a Conditional Use.

The Grande Ronde River is designated as Wild and Scenic several miles downstream of the site. Numerous outdoor recreational opportunities exist in the vicinity, including activities within the Umatilla National Forest to the north and west. Recreational activities there include sightseeing, developed and dispersed camping, picnicking, hunting, fishing, bicycling, skiing (both cross-country and downhill), wildlife viewing, hiking and backpacking.

### **3.10.1.2 Lostine Adult Collection Facility**

The Lostine Adult Collection Facility site (Figure 2-3) is located adjacent to a private trout farm, in an area of farms and pastures, one mile south of the town of Lostine. The proposed site includes an existing fish ladder and an irrigation diversion located on the east bank of the river. The town of Lostine owns the diversion and retains the water right, although the diversion is not currently in use. The site is accessed via the Lostine River Road (County Road 551), which is paved and in good condition, then via a private road and bridge. Traffic volumes are low on Lostine River Road.

The Wallowa County Comprehensive Land Use Plan provides guidelines for facility development at the Lostine Adult Collection Facility. The basic purposes of the Wallowa County Comprehensive Plan are to: 1) protect the custom, culture, and community stability of the county; 2) maintain the agricultural and timber basis of the county; 3) accommodate anticipated development; and 4) make provisions for those uses which may be needed by the county, but which may have undesirable characteristics such as noise, smoke and odor (Wallowa County 1988a). More specific guidance is provided by the Wallowa County Land Development Ordinance (Wallowa County 1988b).

The Lostine Adult Collection Facility is primarily zoned Exclusive Farm Use or EFU. This designation is intended to provide areas for continuation of existing commercial agricultural activities. The EFU zone only

allows those new uses that are compatible with agricultural activities. The propagation, cultivation, maintenance, and harvesting of aquatic species are conditionally permitted pursuant to the County's Public Hearing Review process. A small portion of the site is also zoned Existing Lot which allows for non-farm, non-forest residential use in areas with lots too small for farm and/or forest use (Jones 2002, personal communication).

The Lostine River is designated Wild and Scenic (Section 3.7 of this EIS) above the Wallowa-Whitman National Forest boundary approximately six miles upstream of the Lostine Adult Collection Facility site. The Lostine River area is popular for hiking, camping, backpacking, horseback riding, and fishing. Numerous outdoor recreational opportunities exist within the nearby Wallowa-Whitman National Forest.

### **3.10.1.3 Lostine River Hatchery**

The proposed Lostine River Hatchery site (Figure 2-4) is located about six miles upstream (south) of the town of Lostine, in the foothills of the Wallowa Mountains, in an area of scattered farms, ranches and residences. The site is accessed via Granger Road, an unpaved road providing local access to a small rural residential subdivision. The site is largely undeveloped except for a small house and outbuildings at the south end. Historically, the property was used for cattle and horse grazing. The south portion of the site has been logged resulting in a relatively open grassy area. The rest of the site is forested. An existing 16-foot wide gravel access road extends from Granger Road through the site to access the temporary acclimation site located to the north.

The Lostine River is designated Wild and Scenic (Section 3.7 of this EIS) above the Wallowa-Whitman National Forest boundary approximately one mile upstream of the Lostine River Hatchery site. Lostine River Road parallels the river and provides major trailhead access to the Eagle Cap Wilderness. The Lostine River area, especially lands within the Wallowa-Whitman National Forest and the Eagle Cap Wilderness, is popular for hiking, camping, backpacking, cross-country skiing, horseback riding, and fishing. Forest Service facilities accessed from the Lostine River Road include the Williamson, Shady, and Two Pan campgrounds and the Pole Bridge and French Camp picnic areas. The proposed hatchery site is not available for public recreation use and does not appear to be used informally.

The Wallowa County Comprehensive Land Use Plan (Wallowa County 1988a), as outlined in Section 3.10.1.2, provides guidelines for facility development at the Lostine River Hatchery. More specific guidance is provided by the Wallowa County Land Development Ordinance (Wallowa County 1988b).

The Lostine River Hatchery is primarily zoned Exclusive Farm Use or EFU. This designation is intended to provide areas for continuation of existing commercial agricultural activities. The EFU zone only allows those new uses that are compatible with agricultural activities. The propagation, cultivation, maintenance, and harvesting of aquatic species are conditionally permitted pursuant to the County's Public Hearing Review process. A small portion of the site is also zoned Existing Lot which allows for non-farm, non forest residential use in areas with lots too small for farm and/or forest use (Jones 2002, personal communication).

### **3.10.1.4 Imnaha Final Rearing Facility**

The proposed Imnaha Final Rearing Facility site (Figure 2-6) is located about five miles south (upstream) of the town of Imnaha, Oregon. Joseph, Oregon is the closest city and is located approximately 40 miles away. The proposed site is privately owned pasture, consisting of a large meadow located between steep canyon walls to the west and the Imnaha River to the east. Evidence of an old homestead is apparent on the south end of the meadow. Mature willows and shrubs grow along the riverbank. The Imnaha Final Rearing site is located within both the Imnaha Wild and Scenic River corridor (Section 3.7 of this EIS) and the HCNRA.

However, the proposed site is private property. It is not available for public access or recreation use and does not appear to be used informally.

The Wallowa County Comprehensive Land Use Plan (Wallowa County 1988a), as outlined in Section 3.10.1.2, provides guidelines for facility development at the Imnaha Final Rearing Facility. More specific guidance is provided by the Wallowa County Land Development Ordinance (Wallowa County 1988b).

The Imnaha Final Rearing Facility and surrounding lands are zoned a combination of EFU and Timberland-Grazing or T/G (Jones 2002, personal communication). The EFU zone provides areas for continuation of existing commercial agricultural activities. The EFU zone only allows those new uses that are compatible with agricultural activities. The propagation, cultivation, maintenance, and harvesting of aquatic species are conditionally permitted pursuant to the County's Public Hearing Review process. The T/G zone consists of areas for commercial farm and forest activities and permits the establishment of new uses that are compatible with agricultural and forest activities. Fish hatcheries and associated residences are permitted within the T/G zone.

The site is accessed via the Upper Imnaha River Road (County Road 551) and a steel panel bridge across the river. The Upper Imnaha River Road parallels the river most of the way to the Imnaha Satellite Facility, becoming Forest Service Road 3955. The Upper Imnaha River Road is mostly unpaved, but in generally good condition. Traffic volumes are low. The road mainly provides local access to scattered ranches and residences and some access for hiking, camping, horseback riding and fishing within the Wallowa-Whitman National Forest, including access to HCNRA, Hells Canyon Wilderness, and other destinations. Trucks transporting livestock and ranch supplies are not uncommon.

#### **3.10.1.5 Imnaha Satellite Facility**

The Imnaha Satellite Facility (Figure 2-8) is operated as a satellite of the Lookingglass Hatchery and is located about 29 miles south (upstream) of the town of the Imnaha, Oregon. The Imnaha Satellite Facility is located within the Wallowa-Whitman National Forest on land administered by the Forest Service. The existing facility operates under a Forest Service special use permit issued to the USFWS.

The Imnaha Satellite Facility and surrounding lands are designated Timber/Commercial (T/C) a zone similar to T/G. However, County regulations do not apply since the Imnaha Satellite Facility is located on federal lands. The Imnaha Satellite Facility is located within both the Imnaha Wild and Scenic River corridor (Section 3.7 of this EIS) and the HCNRA and is subject to provisions of those specific plans and the standards and guidelines of the Wallowa-Whitman National Forest Land and Resource Management Plan (U.S. Forest Service 1990).

Access to the facility is provided by Forest Service Road 3955, which is closed by snow during the winter. Most traffic on this gravel road is recreational though volumes are low. Through-traffic tends to use the paved Wallowa Mountain Loop Highway between Joseph and Halfway, Oregon, which passes within a couple miles of the site. Recreation visitors travel past or near the site on their way to trailheads further up the Imnaha River. These trailheads access lands within the Wallowa-Whitman National Forest, HCNRA and the Eagle Cap Wilderness used for hiking, backpacking, cross-country skiing, horseback riding, and fishing. Numerous established campgrounds are also located near by.

#### **3.10.2 Evaluation Criteria**

The following were used to evaluate potential impacts to land use, recreation and transportation:

- Land Use – compatibility with zoning, permitted land use, or management plan direction.

- Recreation – change to a specific recreation opportunity, resource, access or experience.
- Transportation – change to traffic volume, pattern or flow or road conditions.

### **3.10.3 Consequences of Proposed Action**

#### **3.10.3.1 Lookingglass Hatchery**

The proposed modifications to the existing Lookingglass Hatchery would be a conditionally permitted land use under the Union County zoning regulations. The Lookingglass Hatchery is an existing use and would continue to be compatible with the surrounding timber uses.

Lookingglass Hatchery would continue to remain open for visitors. The modifications would not cause losses of specific recreation opportunities or resources, and would not diminish recreation access. Over the long run, the Proposed Action would potentially enhance recreational opportunities if chinook stocks were recovered sufficiently to enhance viewing and salmon fishing.

With the exception of a temporary increase in traffic during construction, traffic is not expected to change noticeably at Lookingglass Hatchery. Given the low daily traffic volumes in the vicinity of the site, the short duration of construction, and the low numbers of trips related to hatchery operations, the Proposed Action would cause only limited transportation impacts.

#### **3.10.3.2 Lostine Adult Collection Facility**

The proposed Lostine Adult Collection Facility would be a conditionally permitted land use under the Wallowa County zoning regulations and would be subject to the County's Hearing Review process. The proposed facility would be compatible with surrounding agricultural uses and nearby constructed features such as the irrigation diversion, fish ladder and trout farm. As intended under the EFU zone, the facility would not conflict with agricultural uses.

The proposed Lostine Adult Collection Facility site is not available for public recreation use and does not appear to be used informally. Constructing and operating the facility would not cause losses of specific recreation opportunities or resources, and would not diminish recreation access. Over the long run, the Proposed Action would potentially enhance recreational opportunities if chinook stocks were recovered sufficiently to enhance viewing and salmon fishing.

The Proposed Action would affect existing roadways and traffic levels by temporarily increasing traffic during construction and slightly increasing traffic once the Lostine Adult Construction Facility becomes operational. The facility would see limited, seasonal use consistent with surrounding uses. Given the low daily traffic volumes in the vicinity of the site, the short duration of construction, and the low numbers of trips related to operations, the Proposed Action would cause only limited transportation impacts. The facility would improve access for the property owner, by replacing the bridge and providing parking and a turnaround.

#### **3.10.3.3 Lostine River Hatchery**

The proposed Lostine River Hatchery would be a conditionally permitted land use under the Wallowa County zoning regulations and would be subject to the County's Hearing Review process. The proposed hatchery would be a new land use at this location and would introduce a change adjacent to what is primarily a rural residential subdivision. The proposed facility, however, would be generally compatible with the surrounding agricultural and residential uses. In addition, the facilities incorporate design and operation measures to address issues such as aesthetics, air quality, and noise that are discussed in Sections 3.9, 3.12 and 3.13,

respectively, of this EIS. Once operational, the level of activity at the hatchery would be limited and consistent with the nearby residential use.

The Lostine River Hatchery is not available for public recreation use and does not appear to be used informally. Constructing and operating the hatchery would not cause losses of specific recreation opportunities or resources, and would not diminish recreation access. Over the long run, the Proposed Action would potentially enhance recreational opportunities if chinook stocks were recovered sufficiently to enhance viewing and salmon fishing.

The Proposed Action would affect existing roadways and traffic levels by temporarily increasing traffic during construction and slightly increasing traffic once the Lostine River Hatchery becomes operational. The Lostine River Hatchery would generate traffic from the on-site residents, one local employee and a weekly supply trip. For about three weeks in January, up to five additional round-trips per day would be generated by temporary workers hired to mark fish at the hatchery. The project includes watering Granger Road as necessary to reduce dust and paving the road following construction, which would permanently reduce dust and enhance local residential access. Section 3.12.3 of this EIS discusses potential air quality effects. Given the low daily traffic volumes in the vicinity of the site, the short duration of construction, the low numbers of trips related to operations, and the planned road improvements, the Proposed Action would cause only limited transportation impacts.

#### **3.10.3.4 Imnaha Final Rearing Facility**

The proposed Imnaha Final Rearing Facility would be a conditionally permitted land use under the Wallowa County zoning regulations and would be subject to the County's Hearing Review process. The proposed facility would be generally compatible with surrounding agricultural and residential uses and the adjacent Upper Imnaha River Road. The facility would be a new land use at this location and would convert pasture along the river to fish production. Once operational, the level of activity at the facility would be limited and compatible with the residence and road across the river. Much of the facility would be screened from view by existing riparian vegetation, which would be retained. Design considerations discussed under Section 3.9 of this EIS would enhance compatibility and maintain visual integrity.

The Imnaha Final Rearing Facility is not available for public recreation use and does not appear to be used informally. The proposed facility would be located on private land within the Wild and Scenic River Corridor, which is designated for recreation. The provisions of the Imnaha River Wild and Scenic River Management Plan serve only as guidelines for private property (U.S. Forest Service 1993a). Section 3.7.3 of this EIS provides additional discussion of potential impacts to Wild and Scenic Rivers. Over the long run, the Proposed Action would potentially enhance recreational opportunities if chinook stocks were recovered sufficiently to enhance viewing and salmon fishing.

The Proposed Action would affect existing roadways and traffic levels by temporarily increasing traffic during construction and slightly increasing traffic once the Imnaha Final Rearing Facility becomes operational. The Imnaha Final Rearing Facility would generate a few daily trips associated with the residence and bunkhouse, but the number of trips would be similar to those generated by nearby residential and agricultural uses. Potential traffic hazards at the Imnaha Final Rearing Facility would be addressed by relocating the bridge and constructing a turning lane on the Upper Imnaha River Road to increase sight distance, allow passing and accommodate a wider turning radius for fish hauling trucks accessing the site. Given the low daily traffic volumes in the vicinity of the site, the short duration of construction, the low numbers of trips related to operations, and the planned road and bridge improvements, the Proposed Action would cause only limited transportation impacts.

### **3.10.3.5 Imnaha Satellite Facility**

The existing Imnaha Satellite Facility is located on Forest Service land, within the boundaries of the Wallowa-Whitman National Forest and is subject to the goals and policies of the Forest Plan, the HCNRA Comprehensive Management Plan Draft EIS (U.S. Forest Service 1999), and the Imnaha River Wild and Scenic River Management Plan (U.S. Forest Service 1993a). The existing facility operates under a Special Use Permit from the Forest Service, which would be amended to allow the modifications in a manner consistent with the Forest Plan. A separate Special Use Permit would be required for the new powerline that would run underground about six miles along the Upper Imnaha River Road.

The Imnaha Satellite Facility is currently open to public visitors and would remain so with the modifications. The Imnaha Satellite Facility is located within the Imnaha Wild and Scenic River corridor, which is designated for recreation, and would be required to comply with the Imnaha River Wild and Scenic River Management Plan (U.S. Forest Service 1993a). Section 3.7.3 of this EIS provides additional discussion of potential impacts to Wild and Scenic Rivers. The Proposed Action would not cause losses of specific recreation opportunities or resources, and would not diminish recreation access. Over the long run, the Proposed Action would potentially enhance recreational opportunities if chinook stocks were recovered sufficiently to enhance viewing and salmon fishing.

With the exception of a temporary increase in traffic during construction, traffic is not expected to change noticeably at the Imnaha Satellite Facility. Because of snow, operation and access would likely continue to be seasonal. Given the low daily traffic volumes in the vicinity of the site, the short duration of construction, and the low numbers of trips related to hatchery operations, the Proposed Action would cause only limited transportation impacts.

### **3.10.4 Cumulative Impacts**

As described in Section 3.2.4 of this EIS, other projects in the vicinity of the Proposed Action sites include renovation of existing and construction of new private residences, rehabilitation of Wallowa Lake Dam, numerous habitat restoration projects, salmon recovery projects, watershed management activities, and the Nez Perce Tribal Hatchery Program. During construction, some of these projects may have temporary minor adverse effects to land use, recreation and transportation. However, several habitat and salmon recovery projects would also result in long-term beneficial effects on land use and recreation. These projects, when considered together with the Proposed Action are not expected to result in substantial adverse cumulative impacts to land use, recreation or transportation.

### **3.10.5 Consequences of Taking No Action**

No changes in land use, recreation or transportation would occur under the No Action Alternative.

## **3.11 Socioeconomics**

### **3.11.1 Affected Environment**

#### **3.11.1.1 Population, Employment and Income**

Wallowa and Union Counties, Oregon are defined as the area of potential socioeconomic effect since it is likely that impacts of the project would have effects beyond the communities located nearest to project sites. Wallowa and Union Counties have experienced very little population change since the 1980s while the state's



population as a whole grew by 32% (see Table 3.11-1). In general, the area's population is older, white and married (in the year 2000, the medial age of residents in Wallowa and Union Counties was 44.4 and 37.7, respectively). Within Wallowa and Union Counties, education, retail trade, forestry and agriculture, and manufacturing constitute over half of all employment. Time of year, rather than overall economic conditions of Oregon, influence employment opportunities in the two county region and, in general, the numbers of jobs have been increasing in Union County, but decreasing in Wallowa County (Oregon Employment Department 2002). Unemployment is generally below the national and state average for both counties (see Table 3.11-2). Per capita income levels for the year 2000 were substantially lower for both counties compared to the state as a whole. Wallowa County had a year 2000 per capita income of \$17,276, higher than the year 2000 per capita income of \$16,907 for Union County, but still below the \$20,940 figure for the state (U.S. Census Bureau 2001).

**Table 3.11-1. General Population of Wallowa and Union Counties 1980 - 2001.**

	1980	1990	2000	2001	Percent Change 1980-2001
Wallowa County	7,273	6,911	7,226	7,100	-2%
Union County	23,921	23,598	24,530	24,550	3%
County Totals	31,194	30,509	31,756	31,650	1.5%
Oregon Totals	2,633,105	2,842,321	3,421,399	3,471,700	32%

Sources: U.S. Census Bureau 1980, 1990, 2001; Portland State University, 2001.

**Table 3.11-2. Unemployment Rates in the Area of Potential Effect for the Proposed Action, 2001 - 2002.**

	Unemployment Rate		
	August 2001	July 2002	August 2002
Wallowa County	5.5%	5.4%	5.0%
Union County	4.2%	4.2%	4.2%
Oregon	6.2%	7.1%	6.6%
<i>Seasonally Adjusted</i>	6.7%	7.3%	7.0%
United States	4.9%	6.0%	5.7%
<i>Seasonally Adjusted</i>	4.9%	5.9%	5.7%

Source: Oregon Labor Market Information System 2002.

### 3.11.1.2 Environmental Justice

Sites associated with the Proposed Action are located within a geographic region that is classified as distressed by the State of Oregon Economic and Community Development Department (Oregon Economic and Community Development Department 2001). All of Wallowa County is considered by the department to

be distressed. Although Union County as a whole is not classified as distressed, both the cities of Elgin and Union are classified as distressed.

This distressed designation is a result of a presidential order which directed federal agencies to develop environmental justice strategies that identified and addressed disproportionately high and adverse human health or environmental effects of programs, policies, and activities on minority populations and low income populations (Executive Order 12898, February 11, 1994.). In the memorandum to heads of departments and agencies that accompanied Executive Order 12898, the President specifically recognized the importance of using procedures under NEPA to identify and address environmental justice concerns.

In response to Executive Order 12898, the EPA adopted a policy which defines environmental justice as: “The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means no group of people, including racial, ethnic, or economic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies” (U.S. EPA 1998).

The 1997 Oregon State Senate Bill 932 directed the State of Oregon Economic and Community Development Department to "give priority to counties, cities, communities or other geographic areas that are designated as distressed areas by the department, based on indicators of economic distress or dislocation, including but not limited to unemployment, poverty and job loss."

### **3.11.2 Evaluation Criteria**

The following were used to evaluate potential socioeconomic impacts:

- Changes to employment or general quality of life for minority or low-income populations or other social groups/demographics.
- Disproportionate increases in air pollution, water pollution, noise levels, hazardous materials near minority or low-income populations or distressed economic groups in Wallowa or Union Counties.
- Changes to employment opportunities.
- Changes to cost of living.
- Changes to regional economic productivity.
- Changes to county tax revenues or services.
- Changes to BPA rate payers.

### **3.11.3 Consequences of the Proposed Action**

Implementing the Proposed Action would not result in any group of people in the area, including racial, ethnic or economic groups bearing a disproportionately high share of population or employment impacts, quality of living changes or environmental consequences.

The Proposed Action would not result in measurable short- or long-term impacts to local population conditions. Most of the new full-time, seasonal and temporary workers would likely come from the local area as would most construction contractors and employees. A few very specialized labor requirements may be met with workers from elsewhere. If most contractors and workers came from outside the region, the increase to area population may be noticeable given the slow growth or decline in population over the past ten years.

Implementation of the Proposed Action would result in some additional employment opportunities in Wallowa and Union Counties. The construction phase of the Proposed Action would provide temporary employment for several dozen construction workers most of which would probably come from the local labor pool. Operation of the various proposed hatchery facilities would result in about three additional full-time employees (possibly from outside the area) and about ten additional seasonal employees (probably from within the local area). This relatively small increase in full-time and seasonal employment would result in only minimal increase in demand for support industries or government services. City tax revenues or expenses are not expected to change noticeably nor would overall regional economic productivity or cost of living be measurably changed. The direct impacts, while small, are expected to be beneficial in terms some increased employment and increased demand for goods and services.

The rates BPA charges its customers for power would not change as a result of implementing the Proposed Action. BPA funding for project improvements is authorized by law to mitigate for fish and wildlife impacts due to development of hydropower projects in the Pacific Northwest. This project would be one of many funded annually as part of an on-going program.

Implementation of the Proposed Action would result in an increase in the importance of the fisheries sector within the local economies of Wallowa and Union Counties. This could result in a slight increase in recreation and tourist activity within the two county area, resulting in benefits to both social culture and regional economic productivity.

#### **3.11.4 Cumulative Impacts**

Projects in Northeast Oregon that create new jobs and improve fisheries could combine with this project to yield cumulative benefits to local economies, especially related to recreation and tourism.

#### **3.11.5 Consequences of Taking No Action**

The No Action Alternative would not create new jobs or any secondary benefits that could be attributed to service, support, tourism, recreation, or fishing should the salmon recovery efforts be successful.

### **3.12 Air Quality**

#### **3.12.1 Affected Environment**

Under authority of the federal Clean Air Act of 1970, the EPA established National Ambient Air Quality Standards (NAAQS) for six pollutants, called criteria pollutants (Table 3.12-1). These include particulate matter, carbon monoxide, ozone, sulfur dioxide, lead and oxides of nitrogen.

On federal lands, EPA has responsibility for air quality management. In Oregon, the Oregon DEQ is charged with conducting air quality monitoring in various locations and implementing strategies to attain and maintain various air quality standards set by the EPA. Oregon DEQ is the regulatory authority for all but one of the

sites under consideration for development in the Proposed Action. The exception is the Imnaha Satellite Facility, which is on Forest Service land.

Generally in Northeast Oregon, in the spring, summer and fall, short-term periodic air quality degradation may occur during episodes of agricultural and forest management burning. In the winter, particularly in valley areas, emissions from wood-burning stoves may result in localized air quality degradation during temperature inversions.

During the late 1980s, areas within La Grande Urban Growth Boundary (UGB) exceeded NAAQS for PM10. As a result, DEQ and the EPA designated that area as non-attainment for PM10. While the area has recently demonstrated compliance with PM10 standards, it has not been officially redesignated as an attainment area by EPA (Oregon DEQ 2002). No Proposed Action sites are located within the UGB. Lookingglass Hatchery, the nearest Proposed Action site, is over 30 miles away. However, particulates can travel for hundreds of miles, so, particulates generated within the UGB may influence air quality at this site.

**Table 3.12-1: National Ambient Air Quality Standards.**

<b>Pollutant</b>	<b>Standard Value</b>	<b>Standard Type</b>
<b>Carbon Monoxide (CO)</b>		
8-hour Average	9 ppm (10 mg/m <sup>3</sup> )	Primary
1-hour Average	35 ppm (40 mg/m <sup>3</sup> )	Primary
<b>Nitrogen Dioxide (NO<sub>2</sub>)</b>		
Annual Arithmetic Mean	0.053 ppm (100 ug/m <sup>3</sup> )	Primary & Secondary
42.67	North city limits of Enterprise	1,000
<b>Ozone (O<sub>3</sub>)</b>		
1-hour Average	0.12 ppm (235ug/m <sup>3</sup> )	Primary & Secondary
8-hour Average	0.08 ppm (157 ug/m <sup>3</sup> )	Primary & Secondary
<b>Lead (Pb)</b>		
Quarterly Average	1.5 ug/m <sup>3</sup>	Primary & Secondary
<b>Particulate (PM<sub>10</sub>)</b>		
Annual Arithmetic Mean	50 ug/m <sup>3</sup>	Primary & Secondary
24-hour Average	150 ug/m <sup>3</sup>	Primary & Secondary
<b>Particulate (PM 2.5)</b>		
Annual Arithmetic Mean	15 ug/m <sup>3</sup>	Primary & Secondary
24-hour Average	65 ug/m <sup>3</sup>	Primary & Secondary
<b>Sulfur Dioxide (SO<sub>2</sub>)</b>		
Annual Arithmetic Mean	0.30 ppm (80 ug/m <sup>3</sup> )	Primary
24-hour Average	0.14 ppm (365 ug/m <sup>3</sup> )	Primary
3-hour Average	0.50 ppm (1300 ug/m <sup>3</sup> )	Secondary
Source: U.S. EPA, 2002.		

### 3.12.2 Evaluation Criteria

The following are used to evaluate potential air quality impacts:

- Change in the amount of particulate pollution relative to the NAAQS for PM 10 and PM 2.5.
- Change in ambient air quality relative to sensitive receptors or contribution to an existing air quality problem.

### 3.12.3 Consequences of the Proposed Action

Construction activities proposed at all sites would likely produce dust, resulting in temporary increased localized particulate levels. Construction vehicle exhaust could also increase particulates and carbon monoxide. These construction impacts would be localized, intermittent, and of short duration.

Construction activities associated with the proposed Lostine River Hatchery would be most likely to generate off-site dust or particulates near residences. However, the Proposed Action includes activities to control dust and particulate generation, and to prevent these substances from reaching homes and other potential receptors. These measures include: watering Granger Road and other unpaved roadways for dust abatement during dry weather, covering any stockpiled soil, and revegetating exposed areas as soon as construction is completed.

With the use of the control measures planned as part of the Proposed Action, construction activities lasting only a year or two at all sites are expected to have minor, intermittent, localized impacts that would not exceed NAAQS.

Long-term air emissions at all of the Proposed Action sites would be limited to those associated with some additional traffic, heating and cooling systems, and intermittent use of generators at the existing Lookingglass Hatchery, the Imnaha facilities and the Lostine River Hatchery. These minimal potential emissions are not expected to result in or contribute substantially to any violations of criteria pollutant standards in the region. The proposal to pave Granger Road at Lostine River Hatchery would reduce one source of road-travel related dust and particulate in the local residential subdivision.

### 3.12.4 Cumulative Impacts

Combined impacts to air quality from this project and ongoing and proposed activities in the area of the project sites is not anticipated to result in a substantial change to air quality.

### 3.12.5 Consequences of Taking No Action

The No Action Alternative would maintain current facilities and operations. No additional impacts to air quality are expected from the No Action Alternative.

## 3.13 Noise

### 3.13.1 Affected Environment

Ambient noise levels at all the project sites are typical for rural to semi-rural locations. The Lookingglass Hatchery is located at the end of a paved road that does not access any other facilities or residences. Noises from traffic, river flow, hatchery operations and hatchery residences are typical for this type of location.

The Lostine River Adult Collection Facility would be about 800 feet east of the nearest residence and about 200 feet from Lostine River Road. Road noise and some nearby farming and ranching activities are the noises typical of this area.

The proposed Lostine River Hatchery would be accessed from Granger Road, an unpaved road serving about six residences in a rural subdivision. The nearest residence is located about 250 feet southeast of the proposed hatchery garage and shop, and about 500 feet away from the other proposed hatchery

improvements. Current ambient noise levels are typical of a rural community, including traffic noise from the roadway, some noise from residences, and noise from nearby pets and livestock.

The proposed Imnaha Final Rearing Facility bridge is about 300 feet from the nearest residence. The facility residence and a shop would be about 500 feet and 750 feet, respectfully, from this residence and separated from the residence by the Upper Imnaha River Road and the Imnaha River. Road and river noise and some nearby farming and ranching activities are the sounds typical of this area.

The Imnaha Satellite Facility is set back in a forested area about 100 feet from the Upper Imnaha River Road (Forest Service Road 3995) and located over two miles from the nearest established campground. Noises from traffic, river flow, and hatchery operations (including generators) are typical of noises associated with this location.

### **3.13.2 Evaluation Criteria**

Union and Wallowa Counties do not have local noise ordinances. Excessive noise is controlled through local nuisance ordinances and the sheriffs' office enforcement policies.

Since no local noise criteria are available, this evaluation will consider whether the construction and operation of proposed facilities may constitute a reportable "nuisance noise" call to local authorities.

### **3.13.3 Consequences of the Proposed Action**

The highest noise levels from the Proposed Action would be associated with construction. Construction would typically occur up to 12 hours per day, five days per week except at the Lostine River Adult Collection Facility and the Lostine River Hatchery because of nearby residences. In those cases, contractors would be required to muffle equipment and limit periods of excessive noise to typical weekday hours (from 8 a.m. to 5 p.m., Monday through Friday). Typical construction noises would occur for a year or two at most sites, and would likely be bothersome to nearby residents but would not likely result in "nuisance noise" reports to local authorities though occasional complaints to construction staff would be expected. Construction supervisors and contract administrative personnel from NPT and BPA would be responsible for taking appropriate corrective action to control unnecessary noise levels.

Long-term noise levels at new facilities would result in either minor, local adverse impact or no change or a decrease in noise over existing conditions. The Proposed Action includes methods to reduce the amount of long-term noise from new facilities including siting facilities as far away from roads and residences as possible; using insulation or other noise reduction apparatus and techniques during construction; and locating noise-generating equipment (*e.g.* pumps, backup generators) inside buildings designed to shield noise. Improvements at the Lookingglass Hatchery may reduce long-term noise by building or improving structures for existing activities (*e.g.*, new garages and new insulation in some existing buildings). Long-term noise would be reduced at the Imnaha Satellite Facility by replacing the existing generator with a power line (keeping the generator as a backup power supply).

The proposed Lostine River Hatchery is most likely to result in noise disturbance during both its construction and its operation, because of the proximity to several nearby residences. However, the Proposed Action would limit construction activities to between 8 a.m. and 5 p.m., five days per week, except during in-stream work windows when work could occur up to 12 hours per day, six days per week. During the facility's operation, occasional noise would result from traffic to and from the site, consisting of trips by families living on site and workers employed at the site and deliveries of supplies and/or fish transport. Intermittent noise from the hatchery residents would be typical for the area, as would occasional operational noises. Enclosing

pumps and generators within buildings would effectively muffle other noise associated with the facility's operation.

### **3.13.4 Cumulative Impacts**

Cumulative noise levels are not expected to be substantially different from current conditions at any of the project sites.

### **3.13.5 Consequences of Taking No Action**

No change to noise levels is expected from the No Action Alternative.

## **3.14 Public Health and Safety**

### **3.14.1 Affected Environment**

The proposed new facilities and facility improvements are located in rural areas of Union and Wallowa Counties, having enhanced 911 services for dispatch of emergency response for fire, police, ambulance and other emergency services. The Lookingglass Hatchery and Imnaha Satellite Facility are both outside of local, rural fire districts and dispatch of nearest available fire-fighting forces would be coordinated through the Northeast Oregon Interagency Fire Center near La Grande. Emergency fire services for the Lostine Adult Collection Facility, Lostine River Hatchery and the Imnaha Final Rearing Facility would be provided by the nearest Rural Fire District, or coordinated through the Interagency Fire Center if local forces were unable to respond.

Emergency ambulance services are available out of Elgin for the Lookingglass Hatchery and out of Enterprise for the Lostine and Imnaha facilities. Emergency medical air transport services are available through Air Life out of La Grande. Both La Grande and Enterprise have hospitals.

The State Police, Union and Wallowa County Sheriffs and federal agents police their respective jurisdictions.

### **3.14.2 Evaluation Criteria**

The change in the need for emergency and other law enforcement, health and safety services attributable to construction, operation and maintenance of hatchery facilities is to be assessed.

### **3.14.3 Consequences of the Proposed Action**

Activities associated with the Proposed Action may result in some additional demands for public health and safety services in the project area. Inherent to any construction is a short term increased potential for personal injury, fire, or other accidents. Long term demand for health and safety services in the region would not change measurably with the addition of three new facilities and a few staff given the overall rate of population change and development in the region. The Proposed Action includes safety and fire protection measures such as training of staff, on-site first aid and emergency preparedness kits, equipment inspections and routine maintenance, water sources and fire extinguishers in homes and other proposed facilities. Hazardous substances would be uncommon at the facilities, would be in small amounts, and would typically be used and disposed of appropriately. The new Imnaha and Lostine facilities would pose no change to public health and safety as they would not be open to public and would not contain any components that could be seen as an



off-site danger. Truck traffic and employee travel related to all the facilities would increase risk of motor vehicle accidents slightly.

#### **3.14.4 Cumulative Impacts**

No substantial cumulative impact to human health and safety or the need for emergency or law enforcement services is expected.

#### **3.14.5 Consequences of Taking No Action**

No change in public health and safety is expected from the No Action Alternative.

### **3.15 Short-Term Use of the Environment and the Maintenance and Enhancement of Long-Term Productivity**

The Proposed action would alter the long-term productivity of soils where permanent structures or permanent modification of land would occur for locating hatchery facilities at the five proposed sites (about 10 acres total). Localized changes to plant and wildlife habitat, wetlands, hydrology and geology are expected. Most temporarily disturbed areas would be restored to naturally functioning condition through use of best management practices, vegetation reestablishment, weed control, and certain other mitigation measures described in this EIS. Ultimately, the Proposed Action would result in long-term productivity gains for ESA-listed spring/summer chinook in Northeast Oregon, which would restore an ecologically significant element to the environment and benefit many other living things, including humans.

### **3.16 Irreversible and Irrecoverable Commitment of Resources**

The Proposed Action would use nonrenewable resources such as aluminum, steel, gravel, and sand to construct facilities and the access and utilities related to them. Materials would come from a variety of outside commercial sources. The Proposed Action also would require the use of petroleum-based fuels, and incidental amounts of chemical compounds, for operation of vehicles and equipment.

The Proposed Action would permanently alter less than about 10 acres of land in the region by adding facilities, roads, pipelines and various impervious surfaces. The Proposed Action would result in the irretrievable loss of about 15,000 to 20,000 square feet of existing wetlands at the Lostine River Hatchery and the Lostine Adult Collection Facility. These are irretrievable losses rather than irreversible since these wetlands could be restored in the future. Similarly, the Proposed Action would result in some initial irretrievable loss of habitat at each site. These would be irretrievable losses rather than irreversible since most lost habitat would be restored over time through replanting and regrowth of vegetation.

The Proposed Action would result in small amounts of land irretrievably lost to livestock grazing at the Lostine River Hatchery and the Imnaha Final Rearing Facility. These would be irretrievable rather than irreversible losses because changes in management direction or the use of facilities could allow livestock grazing in the future at these sites.

### **3.17 Adverse Effects that Cannot Be Avoided**

The Proposed Action includes use of best management practices, activities and other measures to minimize impacts. The nature and requirements of hatchery construction, however, tend to involve river locations that typically include wetland areas. The Proposed Action would involve construction in wetlands at two sites, the Lostine River Hatchery and the Lostine Adult Collection Facility. The Proposed Action includes a commitment to conduct formal wetland delineations and to implement any compensatory mitigation based on the outcome of the delineations and applicable regulations. Thus, the final design of these proposed facilities would incorporate feasible measures to avoid, minimize, rectify, and reduce potential impacts to the wetlands. However, after the use of these, the Proposed Action may yet result in adverse impacts to wetlands that cannot be avoided.

Similarly, the nature of hatchery operations often involves diversions of water from nearby rivers or streams. The Proposed Action's operations would require diversion of water from the Lostine and Imnaha Rivers at the Lostine River Hatchery, Imnaha Final Rearing Facility, and Imnaha Satellite Facility sites. Generally, these localized and temporary water diversions would have only minor impacts on river flows. The Proposed Action includes strategies to pump and replace diverted water at the Lostine River Hatchery under extremely low flow conditions. However, during extremely dry or cold periods the diversion could have adverse temporary impacts to flows and potentially to some individual fish in the diverted river reaches. These are adverse impacts that cannot be avoided.



1. View of south end of Lookingglass site (not part of this project)



2. View of Lookingglass intake/downstream (not part of this project)



3. View of Lookingglass intake/upstream (not part of this project)



4. Proposed Lookingglass raceway location looking south



Existing view from Imnaha River Road looking northeast



Visual simulation of Imnaha Satellite Facility modifications



5. View from east bank of Lostine River looking northwest



6. View from Lostine River Road (County Road 551) looking south



7. View from bridge (private) looking south

\* Simulation view



8. View from Lostine River Road (County Road 551) looking northwest\*

BPA Northeast Oregon Hatchery Program ■

**Figure 3.9-2**

Lostine Adult Collection Facility Site Photographs



9. View from Lostine River Road looking northwest



10. View from Granger Road looking northwest\*



11. View from Lostine River Road looking east

\* Simulation view



12. View from Lostine River Road bridge looking east\*



13. View from Imnaha River Road looking south\*



14. View from Imnaha River Road looking south



15. View from site looking north toward Imnaha River

\* Simulation view



16. View from Imnaha River Road looking north

BPA Northeast Oregon Hatchery Program ■

**Figure 3.9-4**

Imnaha Final Rearing Facility Site Photographs



17. View from Imnaha River Road looking south



18. View from Imnaha River Road looking northeast



19. View from Imnaha River Road looking east\*  
\* Simulation view



20. View from Imnaha River Road looking southeast





Existing view from Lostine River Road looking northwest



Visual simulation of proposed Lostine Adult Collection Facility



Existing view from Granger Road looking northwest



Visual simulation of proposed Lostine River Hatchery



Existing view from Lostine River Road bridge looking east



Visual simulation of proposed Lostine River Hatchery intake structure



Existing view from Imnaha River Road looking south



Visual simulation of proposed Imnaha Final Rearing Facility

## **Chapter 4: Consultation and Coordination**

### **4.1 National Environmental Policy Act**

The National Environmental Policy Act of 1969 and its amendments (42 USC 4321 et seq.) requires federal agencies to assess the impacts that their actions may have on the environment and publicly disclose them. This EIS, prepared to meet NEPA requirements, enables BPA and cooperating agencies to fully consider and disclose the potential environmental consequences of and mitigation for the Proposed Action.

Working together, BPA with the Nez Perce Tribe, Forest Service, USFWS, CTUIR and ODFW developed a strategy to reach interested and potentially affected individuals and organizations. Their comments were used early in the process to develop key issues to guide the environmental analysis contained in this EIS.

Copies of the Draft EIS were sent to persons and organizations to review and comment on prior to final decision-making (see Appendix A). After the public comment period on the Draft EIS, responses to any comments received and any additions, clarifications or corrections to the contents of this EIS will constitute the Final EIS. After the Final EIS is prepared, the federal agencies will issue appropriate decision documents on whether to proceed with their respective actions.

### **4.2 Wildlife and Habitat**

#### **4.2.1 Federal Endangered Species Act**

The Endangered Species Act of 1973 and amendments (ESA, 16 USC 1531 et seq.) are a mandate to conserve “the ecosystems upon which endangered and threatened species depend” and to conserve and recover listed species. The USFWS and NOAA Fisheries are responsible for administering the ESA. Before making decisions that could affect any listed threatened or endangered species, federal agencies must consult with USFWS and NOAA Fisheries to ensure that such proposed actions or decisions do not jeopardize the continued existence or adversely impact the habitat of any such species.

The USFWS and NOAA Fisheries were contacted for lists of threatened and endangered species that may be affected at the project sites. Potentially affected species are discussed in EIS Sections 3.2, 3.3 and 3.4. A biological assessment will be submitted to the USFWS and NOAA Fisheries for review of possible effects. BPA will formally consult with these agencies as required by the ESA. BPA will make no decisions about the Proposed Action until the consultation process is complete. All other entities involved in this project have complied with, or are in the process of complying with, the consultation and permitting required under ESA.

#### **4.2.2 Oregon Endangered Species Rules**

State of Oregon has a policy (ORS 496.012) “to prevent the serious depletion of any indigenous species.” To help carry out this policy the State adopted the Endangered Species Rules and Sensitive Species Rule. The latter rule created a “sensitive” species classification system to help prevent naturally reproducing native species from qualifying for listing as threatened or endangered under the federal ESA. Sections 3.2, 3.3 and 3.4 of this EIS address state-listed species, their habitats and protective measures for these species.

#### **4.2.3 Fish and Wildlife Conservation**

The Fish and Wildlife Coordination Act of 1934 (16 USC 661 et seq.) requires federal agencies to consult with the USFWS and state fish and wildlife agencies when “waters of any stream or other body of water are

proposed or authorized, permitted or licensed to be impounded, diverted...or otherwise controlled or modified” by permit or license. Provisions of the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (6 USC 839 et seq.) are intended to protect, mitigate and enhance fish and wildlife of the Columbia River and its tributaries. Other federal acts and laws, the Fish and Wildlife Conservation Act of 1980 for example, encourage federal agencies to conserve and promote conservation of game and non-game species and their habitats.

BPA’s current project consultation and discussion with USFWS, NOAA Fisheries and ODFW include measures to preserve, protect and enhance resident endangered, threatened, sensitive and other species and habitats. Section 3.2 of this EIS describes measures to reduce and mitigate adverse impacts to threatened, endangered and other fish and wildlife resources.

### **4.3 Wild and Scenic Rivers**

The 1968 Wild and Scenic Rivers Act (16 USC 1271 et seq.) established a policy to protect and preserve certain selected rivers of outstanding scenic, historic, archaeological, scientific, or other similar values. The Wild and Scenic Rivers Act directs federal agencies to protect the values of designated rivers from the adverse effects of “water resources projects” within the beds and banks of designated rivers to ensure that such projects do not have a “direct and adverse effect” on the values for which the river was designated.

Sections of the Grande Ronde, Lostine and Imnaha Rivers are designated Wild and Scenic. Facilities proposed on the Imnaha River are located within the bed and banks of the designated Wild and Scenic River corridor. Considerations to ensure that the proposed project does not have a “direct and adverse effect” on river values are discussed in Section 3.7 of this EIS. The Forest Service, as the administrative agency for the Wild and Scenic Rivers Act is preparing a “determination of effect,” of the Proposed Action on the Wild and Scenic Rivers.

### **4.4 Heritage Preservation and Native American Values**

Several federal laws require that federal agencies consider potential impacts of their proposed actions on cultural and historic resources and, in some cases, protect these resources. These resources include National Landmarks, archeological sites, properties listed or eligible for listing in the National Register of Historic Places and other objects, structures, buildings, or sites that provide irreplaceable evidence of natural or human history of national, state or local significance.

The Archaeological Resources Protection Act (16 USC 470 et seq.) established requirements for the issuance of permits for any excavation or removal of archaeological resources from federal or Indian lands and applies to the Imnaha Satellite Facility. However, as discussed in Section 3.8 of this EIS, no archaeological sites have been identified at the Imnaha Satellite Facility. The Archeological and Historic Preservation Act (16 USC 469 et seq.) directs federal agencies to notify the Secretary of the Interior whenever they find that a federal project or action may cause the loss or destruction of significant scientific, prehistoric or archaeological data. The Historic Sites, Buildings and Antiquities Act (16 USC 461 et seq.) declared it a national policy to preserve historic sites and objects of national significance, and the National Historic Preservation Act (16 USC 470 et seq.) directs federal agencies to consider the effects of their actions for sites listed or eligible for listing in the National Register.

Section 106 of the National Historic Preservation Act, which applies to federally funded projects and sites, requires that an agency or official provide an opportunity for the State Historic Preservation Officer to comment on the potential effects of a project on cultural properties.

Section 3.8 of this EIS discusses the inventory of historic and cultural sites where excavation or construction is proposed.

## **4.5 Floodplain/Wetlands Assessment**

In accordance with U.S. Department of Energy regulations on compliance with Floodplain/Wetlands environmental review requirements (10 CFR 1022.12) and Executive Orders 11988 and 11990, a floodplain/wetlands assessment of the impacts of the alternatives on floodplains and wetlands is included below. BPA published a notice of floodplain/wetland involvement for this project in the Federal Register on November 23, 2001.

### **4.5.1 Resource Description**

The need and purpose of the project are described in Chapter 1. Each site is at least partly located within the 100-year floodplain of the adjacent river. Neither the Federal Emergency Management Agency nor the respective county governments, however, regulate floodplain development in the vicinity of the sites.

Wetlands that may be affected by the alternatives were preliminarily identified by biologists in the field. Although a formal wetland delineation would be accomplished should the project be implemented, wetland plants and hydrologic conditions were observed in several locations. Figures 3.4-1 and 3.4-2 show the estimated boundaries within which patches of wetland plants or conditions were observed.

### **4.5.2 Floodplain/Wetlands Effects**

Floodplain impacts are discussed in Section 3.6. Based on the current level of design information, facilities would be constructed within the floodplain at the Lostine Adult Collection Facility, Lostine River Hatchery, Imnaha Final Rearing Facility and Imnaha Satellite Facility. New facilities at the Lostine Adult Collection Facility, Lostine River Hatchery and Imnaha Final Rearing Facility would cause localized restriction and concentration of flow as well as some scouring during major storm events. New bridge abutments at the Imnaha Satellite Facility and a new weir at the Imnaha Satellite Facility would improve flows slightly compared to the current situation.

Wetland impacts are discussed in Section 3.4. Based on the current level of design information, facilities constructed at the Lostine Adult Collection Facility and the Lostine River Hatchery would impact wetlands.

At the Lostine Adult Collection Facility, proposed clearing, grading and filling for the fish ladder, access driveway and parking area would cause a net loss of about 12,000 to 15,000 square feet of wetlands. Long-term, indirect impacts may also occur as a result of potential changes to the hydrologic regime of the site due to levee construction and proposed french drains. These impacts are not currently quantifiable, but would involve changes to plant composition (resulting from changes to the wetland water supply).

Wetland habitat occurs at the Lostine River Hatchery in association with meanders and side channels of the Lostine River and small ephemeral and perennial streams feeding the mainstem river. The proposed outfall and each of the production wells, especially the primary production well, would be located in generally wet plant communities resulting from their close proximity to the mainstem river. Construction activities at the outfall site and the production wells would cause a net loss of about 3,000 to 5,000 square feet of wetlands. Activities in the wetlands would be coordinated with the USACE (Section 4.7.2) and with state and county regulatory agencies (Section 4.7.1).

### **4.5.3 Alternatives**

Under Executive Order 11988 and 11990, developments on floodplains and in wetlands are discouraged whenever there is a practical alternative. The nature and requirements of hatchery construction tends toward river locations that typically include floodplains and wetlands. The Proposed Action involves construction within floodplains. Two of the sites, the Lostine Adult Collection Facility and the Lostine River Hatchery, involve construction in wetlands. The No Action Alternative is not expected to effect floodplains or wetlands.

### **4.5.4 Mitigation**

The Proposed Action includes a number of measures to avoid or minimize project impacts. These include measures such as best management practices to minimize erosion and sedimentation and replanting with native species. The Proposed Action includes a commitment to conduct formal wetland delineations at the Lostine Adult Collection Facility and the Lostine River Hatchery and to implement any compensatory mitigation based on the outcome of the delineations and applicable regulations.

## **4.6 Wallowa-Whitman National Forest Plans**

The Imnaha Satellite Facility is sited on Forest Service lands within the Wallowa-Whitman National Forest, in the Hells Canyon National Recreation Area. Activities conducted at the site must be consistent with the Wallowa-Whitman Forest Plan and HCNRA Plan. Currently, the facility has a special use permit that would require reauthorization to complete the Proposed Action and a new permit for a power line along the access road. This is discussed in Section 3.10 of this EIS. The Imnaha Final Rearing Facility would be sited on privately owned lands within the National Forest boundary and within the HCNRA. It would require no special use permit, but would need to be consistent with certain aspects of the HCNRA Plan. As described in Section 3.10, the Forest Service would determine consistency of the Imnaha Final Rearing Facility with the HCNRA Plan through a NEPA decision document.

## **4.7 Other Consultation and Compliance Requirements**

### **4.7.1 State, Areawide and Local Plans and Approvals**

Once the NEPA process is completed, ESA consultation has been fulfilled, and the SHPO has concurred on cultural resources, permitting and other approval processes may begin. These include zoning approvals, building permits, waste water systems permits, road use permits, and others. For a complete list of permits and approvals required for each site in the proposed action, see Table 4.7-1.

The Council on Environmental Quality regulations for implementing NEPA require EISs to discuss possible conflicts and inconsistencies of a proposed action with approved state and local plans and laws. Only the Imnaha Satellite Facility is proposed on federal land where local ordinances do not apply. Since all other project elements are proposed on private land outside of incorporated communities, county plans, codes and ordinances would apply. Both the Union County and Wallowa County zoning codes would allow the construction of the proposed facilities as either permitted or conditional uses. County jurisdictions may also require approvals to work, or to place fill or structures, within floodplains. County jurisdictions may also require access permits to improve existing access roads or construct new access roads.

The proposed Lostine River Hatchery, Imnaha Final Rearing Facility, and Imnaha Satellite Facility all require water rights from the Oregon Department of Water Resources. Impacts associated with this water use are discussed in Section 3.6 of this EIS.



The ODSL requires a “removal-fill permit” or “general authorization” for all instream removal-fill activity, regardless of amount, in areas designated “essential salmonid habitat.” For other areas, permit or authorization is required for instream placement or removal of 50 cubic yards or more of material. All of the proposed instream project activities will be subject to this ODSL permit or authorization.

All buildings and structures would comply with the State of Oregon Uniform Building Code. Proposed septic systems would be permitted by the Oregon DEQ before operation.

#### **4.7.2 Clean Water Act**

The Clean Water Act (33 U.S.C. 1251 et seq.) regulates discharges into waters of the U.S. Section 401 of the Clean Water Act, the State Water Quality Certification program, requires that states certify compliance of federal permits and licenses with state water quality requirements. A federal permit to conduct an activity that results in discharges into waters of the U.S., including wetlands, is issued only after the affected state certifies that water quality standards would not be violated. The USACE administers section 404 of the Clean Water Act, which involves any discharge of dredged or fill material into waters of the U.S., including wetlands. The Proposed Action would affect about 12,000 to 15,000 square feet (about 1/3 acre) of wetlands at the Lostine Adult Collection Facility and about 3,000 to 5,000 square feet (about 1/8 acre) of wetlands at the Lostine River Hatchery. So, authorization would be sought from the USACE and the appropriate state and local government agencies in Oregon to ensure full compliance with the Clean Water Act if the Proposed Action is implemented.

#### **4.7.3 Farmland Protection Policy Act**

The Farmland Protection Act (7 USC 420 et seq.) was enacted to minimize the conversion of farmland to nonagricultural uses. The Natural Resources Conservation Service classifies certain soils in Union and Wallowa County as “prime farmland” soils and the State of Oregon also classifies certain soils as “important farmland.” No project facilities are known to be located on lands with these designations.

#### **4.7.4 Noise Control Act**

The Noise Control Act of 1972 (42 USC 490 et seq.) promotes an environment free from noise that jeopardizes health and welfare. Subsequent local, state and federal regulations and guidelines were established to protect residents and workers from excessive noise. However, no local noise standards exist for areas under consideration for Proposed Action sites. No noise in excess of state and local requirements is anticipated from this project, as discussed in EIS Section 3.13.

#### **4.7.5 Clean Air Act**

The Air Pollution Control Act of 1955 and The Clean Air Act and Amendments of 1970 (42 USC 741 et seq.) were adopted to protect and enhance the quality of the nation’s air. No Proposed Action activities or elements would violate current clean air standards, as discussed in EIS Section 3.12.

#### **4.7.6 Resource Conservation and Recovery Act, Toxic Substances Control Act and Federal Insecticide, Fungicide and Rodenticide Act**

The federal Resource Conservation and Recovery Act (42 U.S.C. 692 et seq.) regulates the disposal of hazardous wastes. The Toxic Substances Control Act (15 U.S.C. 2601) gives EPA the authority to regulate substances that present unreasonable risks to public health and the environment, such as polychlorinated

biphenyls (**PCBs**) and asbestos. The Federal Insecticide, Fungicide and Rodenticide Act (7 U.S.C. 136 et seq.) gave EPA the authority to allow and prescribe conditions of use for insecticides, fungicides and rodenticides (collectively, “pesticides”) nationwide. Construction, operation and maintenance of the Proposed Action facilities, if implemented, would meet guidelines for use, handling, and disposal of hazardous substances. Necessary permits related to these laws would be secured. Health and Safety is discussed in EIS Section 3.14.

#### **4.7.7 Environmental Justice**

Executive Order 12898 directs federal agencies to consider the effects of their programs, policies and activities on minority and low-income populations. Federal agencies are required to incorporate environmental justice concerns into their NEPA processes. Environmental justice and potential effects of the Proposed Action on minority and low-income communities is discussed in EIS Section 3.11.

**Table 4.7-1. Permits and Approvals Required for Site Development.**

Permit or Approval	Activity	Facility				
		Lookingglass Hatchery	Lostine Adult Collection Facility	Lostine River Hatchery	Imnaha Final Rearing Facility	Imnaha Satellite Facility
U.S. Army Corps of Engineers <i>Section 404 Permit*</i>	Dredge and/or fill in waters of the U.S. Water resource projects in Wild and Scenic corridor.		✓	✓	✓	✓
U.S. Forest Service <i>Special Use Permit</i>	Modification of structures or uses on USFS lands					✓
OR Department of Environmental Quality <i>Water Quality Certification</i>	Dredge, fill in and/or land clearing and grading near surface waters		✓	✓	✓	✓
OR Department of Environmental Quality <i>NPDES Permit</i>	Discharge to surface waters (either direct discharge or construction-related stormwater)	✓	✓	✓	✓	✓
OR Department of Environmental Quality <i>Septic System Permit</i>	Approval of on-site septic systems			✓	✓	
OR Department of State Lands <i>Removal-Fill Permit or General Authorization</i>	In-water dredge and/or fill		✓	✓	✓	✓
OR Water Resources <i>Water Right</i>	Use of surface water or groundwater			✓	✓	✓
OR Building Codes Division or local jurisdiction <i>Building Permit</i>	Building or remodeling large structures	✓		✓	✓	
Wallowa or Union County <i>Land Use Permit or compliance</i>	Conditional or other land use approval/compliance with local land use plans	✓	✓	✓	✓	
Wallowa or Union County <i>Flood Plain</i>	Fill in floodplain		✓	✓	✓	
Wallowa or Union County <i>Access Permit</i>	Create or improve road access		✓	✓	✓	
Pacific Power Corporation <i>Easement</i>	Easement for power lines to site			✓	✓	✓

\*Italics indicate type of permit.

## Chapter 5: List of Preparers and Reviewers

### Preparers

Bild, Elaine. Environmental Scientist/Environmental Science Associates. Education: J.D., Ph.D./Toxicology, M.P.H., A.B./Biology & Chemistry. Experience: 25 years of experience in environmental planning, assessment and NEPA process.

Cornwall, Charles. Environmental Planner and Landscape Architect/Environmental Vision. Education: M.L.A., B.S./Conservation of Natural Resources. Experience: 16 years of experience in environmental and landscape planning.

Cyr, Corrinna. Montgomery Watson Harza/Engineer. Education: B.S./Civil Engineering. Experience: four years of experience in civil and environmental engineering.

Dewey, Michelle. Environmental Scientist/Environmental Science Associates. Education: M.S./Environmental Studies, B.S./Biology. Experience: 18 years of experience in environmental monitoring, investigation and permitting.

Evans, Johanna. Compliance Specialist/Environmental Science Associates. Education: B.A./Environmental Studies. Experience: five years of experience in regulatory compliance, environmental permitting, and environmental assessment.

Fosythe, John, AICP. Senior Project Manager/Environmental Science Associates. Education M.C.R.P., B.A./Environmental Studies and Planning. Experience: 12 years of experience in environmental planning projects and environmental impact assessment.

Gale, Marsha. Environmental Planner and Landscape Architect/Environmental Vision. Education: M.C.P., M.L.A., B.L.A. Experience: 24 years of experience in environmental planning and design and directing visual studies.

Holloway, Becky. Environmental Biologist/FishPro, Inc. Education: M.S./Biology, B.S./Marine Biology. Experience: six years of experience in the fields of fish, wildlife and wetlands biology, including preparing of Environmental Assessments and Biological Assessments and Evaluations.

Hudson, Peter, R.G. Geologist/Environmental Science Associates. Education: B.A./Geology. Experience: 12 years of experience in geologic and hydrogeologic investigation and environmental impact assessment.

Full, David, AICP. Environmental Planner/Environmental Science Associates. Education: M.U.P. and B.A.U.P. Experience: 12 years of experience in environmental assessment and documentation and NEPA process.

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## Chapter 6: Glossary

This chapter contains a list of acronyms and abbreviations used frequently in this EIS and a list of terms used that may not be found in a standard desk reference.

### Acronyms

<b>BIA</b>	Bureau of Indian Affairs
<b>BPA</b>	Bonneville Power Administration
<b>CBFWA</b>	Columbia Basin Fish and Wildlife Authority
<b>CPP</b>	Current Production Program
<b>CTUIR</b>	Confederated Tribes of the Umatilla Indian Reservation
<b>CWA</b>	Clean Water Act
<b>DEQ</b>	(Oregon) Department of Environmental Quality
<b>DNA</b>	Deoxyribonucleic Acid
<b>DPS</b>	Distinct Population Segment
<b>EIS</b>	Environmental Impact Statement
<b>EPA</b>	(U.S.) Environmental Protection Agency
<b>ESA</b>	Endangered Species Act
<b>GRES P</b>	Grande Ronde Basin Endemic Spring Chinook Supplemental Program
<b>HCNRA</b>	Hells Canyon National Recreation Area
<b>HGMP</b>	Hatchery and Genetic Management Plan
<b>ICBEMP</b>	Interior Columbia Basin Ecosystem Management Program
<b>IFIM</b>	Instream Flow Incremental Methodology
<b>ISRP</b>	Independent Scientific Review Panel
<b>LSRCP</b>	Lower Snake River Compensation Plan
<b>NMFS</b>	National Marine Fisheries Service (same as <b>NOAA Fisheries</b> )
<b>NATURES</b>	Natural Rearing and Enhancement Systems (see definition in Technical Terms)
<b>NOAA Fisheries</b>	National Oceanic and Atmospheric Administration National Marine Fisheries Service
<b>NEOH</b>	Northeast Oregon Hatchery
<b>NEPA</b>	National Environmental Policy Act
<b>NPDES</b>	National Pollutant Discharge Elimination System
<b>NPCC</b>	Northwest Power and Conservation Council (formerly the <b>NPPC</b> or Northwest Power Planning Council)
<b>NPPC</b>	Northwest Power Planning Council (now the <b>NPCC</b> )

<b>NPT</b>	Nez Perce Tribe
<b>ODFW</b>	Oregon Department of Fish and Wildlife
<b>ODSL</b>	Oregon Department of State Lands
<b>ONHP</b>	Oregon Natural Heritage Program
<b>ORV</b>	Outstandingly Remarkable Values
<b>PCB</b>	Polychlorinated Biphenyls
<b>RHCA</b>	Riparian Habitat Conservation Area
<b>RM</b>	River Mile
<b>SAR</b>	Smolt-to-Adult-Return Ratios
<b>SHPO</b>	State Historic Preservation Office
<b>TCP</b>	Traditional Cultural Property
<b>THPO</b>	Tribal Historic Preservation Officer
<b>TMDL</b>	Total Maximum Daily Loads
<b>UGB</b>	Urban Growth Boundary
<b>USACE</b>	U.S. Army Corps of Engineers
<b>USGS</b>	U.S. Geological Survey
<b>USFWS</b>	U.S. Fish and Wildlife Service
<b>VQO</b>	Visual Quality Objective (see definition in Technical Terms)

### **Abbreviations**

<b>cfs</b>	cubic feet per second
<b>gpm</b>	gallons per minute

### **Technical Terms**

**303(d) List** – Pursuant to Section 303(d) of the Clean Water Act, Oregon’s Department of Environmental Quality (DEQ) maintains a list of stream segments that do not meet water quality standards.

**Acclimation** – Allowing fish to adjust to environmental variables. Hatchery practices where young fish were released directly from the hatchery without adjusting to the natural stream environment resulted in higher mortality. Acclimation allows the fish to gradually adjust to a more natural environment and become accustomed to the area in which the acclimation site is located, rather than the hatchery, so that the fish will return to the area to spawn.

**Acclimation site** – Sites at which young fish are held to allow them to become accustomed to the area (a biological process called imprinting) so that they return to that place to spawn.



**Alluvial** – Deposited by rivers; generally refers to the recent, unconsolidated material laid down in river beds, flood plains, lakes, at the foot of eroded slopes, etc.

**Anadromous** – Species of fish that hatch and initially grow in freshwater, migrate to and mature in the ocean, and return to freshwater as adults to spawn (such as salmon or steelhead trout).

**Anthropogenic** – Made or generated by a human or caused by human activity.

**Broodstock** – Adult fish used to create hatchery fish.

**Carrying capacity** – The maximum number of individuals or species (biomass) that could potentially be supported by a given habitat, as determined by prevailing physical, chemical, and biological conditions. Also, in terms of a habitat, such as a river or stream, the amount of introduced material (such as sediment) that could be accommodated without degrading the quality of the habitat.

**Chinook** (*Oncorhynchus tshawytscha*) – A species of salmon, also called king, tule, or brights.

**Chiwawa weir** – A type of barrier used to catch adult fish migrating upstream; unique because panels in the barrier are fitted with hydraulic cylinders that allow an operator to raise or lower the barrier from the river bank. The barrier gets its name from the Chiwawa River in eastern Washington where the first hydraulically operated barrier was installed.

**Cofferdam** – Temporary structure placed in a body of water to de-water or divert flow during construction of in-water structures (such as intakes, fish ladders, or weirs).

**Coho** (*Oncorhynchus kisutch*) – A species of salmon, also called silver salmon.

**Cumulative effects** – Cumulative effects are created by the incremental effect of an action when added to other past, present, and reasonably foreseeable actions.

**Domestication selection** – Natural selection for traits which affect survival and reproduction in a human-controlled environment.

**Empirical** – Based on observation or experience.

**Escapement** – Fish that are allowed to spawn naturally.

**Evolutionarily significant unit** – A population or group of populations that is considered distinct (and hence a “species”) for purposes of conservation under the ESA. To qualify as an ESU, a population must: 1) be reproductively isolated from other populations of the same species; and 2) represent an important component in the evolutionary legacy of the biological species.

**Extirpated** – Rendered extinct in a given area, or locally extinct.

**Eyed-eggs** – Life stage of a fertilized egg between the time the eyes become visible and hatching occurs.

**Flood Event** – A flood. A “50-year flood” is an event with a two percent chance of occurring in a given year. A “100-year flood” is an event with a one percent chance of occurring in a given year. A “200-year flood” has a 0.5 percent chance of occurring in a given year, and the “500-year flood” has a 0.2 percent the chance of occurring in a given year. These are considered rare, extreme events. A 100-

year flood event, for example, is not one that will occur once every 100 years although 100 years is the statistical return period. It is possible for an area to experience two 100-year events in two consecutive years.

**Forest Service** – U.S. Forest Service within the U.S. Department of Agriculture

**Formalin** – A solution of formaldehyde gas in water; effective in control of external parasites and fungal infections on fish and fish eggs.

**Fry** – Juvenile salmonid life stage following absorption of yolk sac.

**Genetic diversity** – Richness of genetic material (chromosomal makeup) in a **population** or populations.

**Genetic drift selection** – The result of a small representative sample size of a population contributing to the next generation; genetic drift can cause reduced fitness.

**Geomorphology** – The general configuration of the earth's surface and landforms.

**Heterozygosity** – In an individual that has two different chromosomes for a gene.

**Homing** – Navigational behavior that guides species during migrations.

**Hydraulic velocity barrier** – Structure built in the tail race of a weir or impoundment outlet which blocks or redirects adult fish migration to prevent injury or migration delay.

**Introgression** – The introduction of new genes into a **population** by crossbreeding between two populations; also a loss or change in population identity through crossbreeding or genetic change.

**Indigenous** – Occurs naturally in an area or environment; native.

**Instream work window** – Time period preferred by regulatory agencies for conducting instream work.

**Kelt** – An **anadromous** steelhead trout that survives spawning and migrates back to the ocean after spawning.

**Morphological** – Appearance or form. (**Morphology** – Study of structure, appearance or form.)

**Natal** – Of or relating to birth.

**Naturally reproducing** – Adult fish spawning in a stream or river regardless of parental origin, *i.e.* hatchery or wild.

**NATURES** – Fish rearing techniques aimed at producing hatchery salmon with an increased rate of post release survival. NOAA Fisheries has been cooperating with BPA on the Natural Rearing Enhancement Systems (NATURES) project to develop and evaluate new fish culture techniques designed to produce salmon that are physically and behaviorally similar to wild fish. Techniques developed and studied to date include use of more natural materials and conditions in hatchery **raceways**, underwater feeders, live food diets, predator avoidance training and other means to simulate natural conditions.

**Obermeyer gate** – A manufactured gate system fabricated by the Obermeyer Corporation; commonly refers to a type of gate that consists of a series of steel panels that are lifted or lowered by an air bladder located beneath them.

**100-year floodplain** – Land area adjacent to a stream channel which is covered with water when the stream overflows its banks during a 100-year **flood event**.

**Ordinary high water** – The highest point on the bank of a stream or river channel, where a change in vegetation or other natural mark indicates the level of the highest normal flows.

**Outplant** – Releasing artificially propagated fish into a natural system.

**Parr** – A developmental life stage of a fish; when juvenile salmonids develop bar-shaped marks on their sides and are actively feeding in fresh water.

**Pathogen** – A disease-causing agent.

**Picket weir** – A fish barrier constructed from fixed panels that can not be adjusted or cleaned easily once installed. Typically, panels are set in a fixed position in a body of water at the beginning of the fish trapping season and removed at the completion of trapping activities.

**Plasticity** – Capacity to change or modify.

**PM 2.5** – Particles (in the air) that are 2.5 microns in diameter or smaller.

**PM 10** – Particles (in the air) that are 10 microns in diameter or smaller; particles that can be inhaled into the lungs.

**Population(s)** – A group or groups of individuals of a species living in a certain area.

**Population viability** – The overall condition and long-term probability of survival of a population.

**Predation** – The harm, destruction, or consumption of prey organisms by a predator.

**Production** – Number of individuals produced from a natural environment or fish culture facilities.

**Race** – A group of individuals within a species, forming a unique variety; a particular breed.

**Raceway** – An elongated pond for holding equipment and fish for rearing juvenile or adult salmonids in a hatchery or associated facility.

**Redd** – A gravel nest where salmon or trout eggs are laid.

**Resident** – Present year round (not migratory).

**Riparian habitat** – The zone which extends from the water's edge landward where vegetation and microclimate are heavily influenced by water such as near streams, rivers, springs, ponds, lakes, or tidewater.

**Salmonid** – Fish belonging to the family of salmonidae, including salmon, trout, char, whitefish, and related freshwater and anadromous fish.

**Satellite facility** – Fish culture facility used for incubation, rearing, and **acclimation** of juvenile salmon or holding of adult **broodstock**.

**Scoping** – For an environmental impact statement, the process of defining the range of issues requiring examination in studying the environmental effects of a proposed action, generally including public consultation with interested individuals and groups, as well as with agencies with jurisdictions over parts of the project area or resources in that area.

**Sensitive species** – Species not listed as threatened, but undergoing evaluation for listing on an official threatened or endangered species list.

**Smolt** – A young salmon or steelhead migrating to the ocean and undergoing physiological changes to adapt its body from a freshwater to a saltwater environment.

**Smoltification** – The physiological changes in **anadromous** fish as they prepare to live in salt water.

**Spawn(ing)** – The act of producing or depositing eggs or sperm.

**Species** – Basic category of biological classification intended to designate a single distinct kind of plant or animal.

**Species of special concern** – Native species of which the status is of concern, but more information is needed.

**Steelhead** – **Anadromous** Pacific salmon, protected by ESA in the Columbia River Basin and Pacific Ocean.

**Stock or stocks** – A distinct subset of a fish species isolated in space or time from other subsets of the same species.

**Subbasin** – River basin within a larger river basin.

**Substrate** – The material comprising the bed of a stream; also the surface or material on which an organism grows or is attached.

**Subyearling smolts** – Juvenile salmonids that physiologically mature and migrate to the ocean when less than one year old; *e.g.*, certain stocks of fall and summer chinook.

**Supplementation** – The use of artificial propagation in the attempt to maintain or increase natural production while maintaining the long-term fitness of the target population, and while keeping the ecological and genetic impacts on non-target populations within specified biological limits.

**Taking or Take** – Relating to the ESA, a broadly defined term that may include everything from actually killing a protected species to causing harm to the species' habitat.

**Telosts** – Bony fishes, having skeletons of bones rather than cartilage.

**Viewshed** – The area from which a critical object or viewpoint is seen; also know as the “seen area” (Swarden et al. 1986). For purposes of this study, the term viewshed refers to the general area from which the project is visible, particularly from distances of less than one-half mile away.

**Visual Quality Objective (VQO)** – A management goal or standard established by the Forest Service to describe the acceptable level of modification associated with land use activity in a given area. Visual Quality Objectives range from "preservation" which is typically applied only to highly sensitive landscapes such as wilderness areas or special classified areas to "maximum modification," a standard that allows land use activity that may appear dominant in relationship to the natural landscape while not completely harmonizing with the natural setting (U.S. Forest Service 1995).

**Volitional** – In the context of releasing fish, allowing a fish to leave or migrate on their own initiative or instinct.

**Weir** – A fence or a barrier placed in a stream to catch, retain or count upstream migrating fish.

**Wild fish** – Fish that have not spent any part of their life history in an artificial environment and are the progeny of naturally-reproducing adults.

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## **Appendix A. List of Agencies, Organizations, and Persons Contacted**

The project mailing list contains about 400 contacts, including tribes; public officials; local, state and federal agencies; news media; potentially interested or affected landowners; interest groups; businesses; special districts; libraries and the media. They have directly received or have been given instructions on how to receive all project information made available so far, and they will have an opportunity to review the Draft and Final EIS.

### Tribes or Tribal Groups

Confederated Tribes of the Umatilla Indian Reservation  
Nez Perce Tribe

### Oregon Public Officials

Governor Ted Kulongoski  
US Senator Gordon Smith  
US Senator Ron Wyden  
US Representative Greg Walden  
State Senator David Nelson  
State Representative Greg Smith

### Local Governments

Counties  
Nez Perce, ID  
Baker, OR  
Union, OR  
Wallowa, OR  
Cities, OR  
Baker  
Enterprise  
Imbler  
Imnaha  
Joseph  
La Grande  
Lostine  
Union  
Wallowa

### Oregon State Government

Department of Agriculture  
Department of Environmental Quality  
Department of Fish & Wildlife  
Department of Forestry  
Department of Parks and Recreation  
Department of Transportation  
Department of Water Resources  
Division of State Lands Eastern Region



### Federal Agencies

Army Corps of Engineers  
Bonneville Power Administration  
Bureau of Indian Affairs  
Bureau of Reclamation  
Department of Energy  
Environmental Protection Agency  
Fish and Wildlife Service  
Forest Service  
NOAA National Marine Fisheries Service  
National Park Service  
Bureau of Land Management  
Natural Resources Conservation Service

### News Media

Baker City Herald  
Eastern Oregonian  
Hells Canyon Journal  
Hermiston Herald  
KWVR AM/FM  
La Grande Observer  
Lewiston Morning Tribune  
Oregonian  
Wallowa County Chieftain

### Libraries

Union Public Library  
Wallowa County Library  
Eastern Oregon State College Pierce Library Federal Depository

### Businesses, Special Interests, and Other Organizations

Andersen Perry & Associates  
Associated Ditch Companies  
Big Bend Ditch  
Blue Mountain Energy  
Blue Mountain Environmental Council  
Boise Cascade Corporation  
Bonneville Environmental Foundation  
Cove Sportsman  
Dobbin Ditch  
Eagle Cap Fishing Guides  
Eastern Oregon Solar System  
Eastern Oregon University  
General Land Office  
Grande Ronde Model Watershed Program  
Hells Canyon Lunker Landers Bass Club  
Hells Canyon Preservation Council  
High Lostine Owners Association  
Inland Empire Public Lands Council

Kelly Construction  
La Grande Lumber Company  
Montgomery Watson Harza, Inc  
Mt Harris Sportsman  
Northeastern Oregon Economic Development District  
Northwest Power and Conservation Council  
Oregon Cattlemen's Association  
Oregon Trail Electric Coop  
Oregon Trout  
Oregon Water Trust  
Pacific Rivers Council  
R Y Timber  
Sierra Club  
Stang Manor Inn  
Union County Extension Office  
Wallowa County Extension Office  
Wallowa Resources  
Wallowa Soil & Water Conservation District  
Wallowa Stock Growers  
Water For Life

Other Interested or Potentially Affected Parties, including local landowners

Approximately 300 separate contacts