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

(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 Imnaha Final Rearing Facility

Construction of the proposed Imnaha 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 Imnaha 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 Imnaha Satellite Facility

Modifications to the Imnaha 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 Wallowa subbasin in which the Lostine River is located. Oregon DEQ's target date for completion of TMDLs for the Wallowa 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 (**ORV**s) 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[1] 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.

[1] 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[2] will directly and adversely affect the values for which the river was designated.[3] 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).

[2] 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).

[3] 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.

Outstandingly Remarkable Value	Effects of the Proposed Action
Scenic – 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.	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. 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. See also EIS Section 3.9 for more information on visual resource impacts of the Proposed Action.

Outstandingly Remarkable Value	Effects of the Proposed Action
Recreation – Located within the HCNRA, popular pursuits include hunting, fishing, sightseeing, horseback riding, hiking, snowmobiling, and camping. 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. Much of the river (>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. 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.	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. 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. 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. See also Section 3.10 of this EIS for more information on recreational impacts of the Proposed Action.
Fisheries – 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.	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. See also Section 3.2 of this EIS for more information on fisheries impacts of the Proposed Action.

Outstandingly Remarkable Value	Effects of the Proposed Action
Wildlife – 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. ESA-protected and U.S. Forest Service sensitive species within the corridor are an important part of the ORV. The ability to view a variety of wildlife in the corridor is also important.	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. 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. See also Section 3.3 of this EIS for more information on wildlife impacts of the Proposed Action.
Historic/Prehistoric – Nez Perce historic and prehistoric sites, as well as Euro-American historic sites, are included in this value.	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. See also Section 3.8 of this EIS for more information on impacts of the Proposed Action on historic and prehistoric sites.
Vegetation/Botanical – Emphasis is on the ESA-protected or U.S. Forest Service sensitive species of plants. 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.	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. See also Section 3.3 of this EIS for more information on vegetation impacts of the Proposed Action.

Outstandingly Remarkable Value	Effects of the Proposed Action
Traditional Value/Lifestyle Adaptation – This relates to the lifestyle that has evolved and is representative of the early Euro-American settlers within the Imnaha River corridor. 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.	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. Because the Imnaha Satellite Facility already exists, no change in traditional values or lifestyles would be expected due to the minor modifications proposed there. 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. See also Section 3.8 of this EIS for more information on impacts of the Proposed Action to traditional values and lifestyle.

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.