Chapter 3 – Affected Environment and Environmental Consequences

This chapter describes existing physical, biological, and natural resources that could be affected and it identifies potential impacts to those resources in the event any one of the identified alternatives were implemented.

The No Action alternative (alternative 1) describes conditions in the future if stabilization were not implemented and it provides the basis to compare the action alternatives (alternatives 2, 3, and 4). Specific impacts of each alternative are identified to the extent possible; however, if quantitative estimates were not possible, qualitative analyses are provided for comparison purposes.

The resources discussed include geology, water quality, wetlands, vegetation, fish and wildlife, threatened and endangered species, historic properties, Indian sacred sites, Indian trust assets, Cascade Siskiyou National Monument, and environmental justice. This chapter also describes cumulative effects of the alternatives and mitigation measures for each resource. The depth of analysis corresponds to the range of resource occurrence in the work area and the magnitude of potential environmental impact.

Geology

This section discusses the geology of Tyler Creek watershed, geotechnical recommendations, and potential effects of stabilizing the wasteway banks.

Affected Environment

The wasteway lies within the Tyler Creek watershed in southern Oregon along the western border of the Western Cascades geologic province. Strata in this province dip to the east and consist of folded, faulted, and slightly altered volcanic rocks from between 5 and 33 million years ago (Reclamation 1989). The rocks are generally deeply eroded and their original volcanic land forms are not easily recognized.

Western Cascade rocks underlying the watershed vary from massive, bluff forming lava flows to weak, fragmented, and landslide-prone ashflow and decomposed volcanic ash beds. The rocks consist of basaltic lava flows and angular, course fragments (breccias) of layered and altered basaltic glass (Orr et al. 1992). Some of the soils have high shrink-swell properties and are highly susceptible to landslide. A principal geomorphic feature of Tyler Creek watershed is major landslide deposits (Hicks 1993) within the deeply weathered volcanic rocks.

Wasteway Erosion and Landslides

The wasteway channel carries released flow, intermittent natural flow during periods of snow pack runoff and precipitation, and drainage from increased population and development. Water flowing through the wasteway has eroded the channel and directly led to the need for action. Excessive erosion decreases water quality and makes the streambanks less stable. Slopes adjacent to the wasteway could slide and restrict the channel with debris jams. Debris jams could cause new channels to form which could also be unstable and could erode in the same manner.

Reclamation's Geologic and Geotechnical Studies

The following discussion summarizes geologic and geotechnical studies and reports performed by Reclamation following the 1993 wasteway use. A separately bound geology appendix contains the two Reclamation studies in entirety and is available, along with this EA, for public review at website: www.usbr.gov/pn/programs/tyler/index.html.

Reclamation's Pacific Northwest Regional Geologist conducted a geologic field review of the wasteway in November 1993 (Reclamation 1993) and a geotechnical field review of the wasteway in 1997 (Reclamation 1997) to observe site conditions and provide recommendations for restoring, rehabilitating, and/or relocating wasteway alignments. The reports state the wasteway contains erodible materials that, in intermittent locations, were degraded by streamflow. Some locations with undercut and over-steepened banks caused small landslides that further impacted the channel. Ancient earthflow and landslide deposits beneath the ridge area between Tyler Creek and Schoolhouse Creek have been stable in historic time as indicated by numerous larger trees. The reports state the wasteway channel will continue to deteriorate without protection and recommend:

- resloping and protecting channel banks where erosion has created instability
- using existing rocks and downed trees to protect the channel and slopes
- using standard engineering structures for erosion protection
- downing potentially unstable trees
- removing some downed trees and erosion debris
- abandoning the central portion of the area of considerable erosion
- realigning the central portion of the wasteway to the north
- thoroughly documenting before and after channel conditions

Privately Completed Studies

Three private studies, completed following the 1993 wasteway use, are summarized here.

Hicks Reports

Rogue Valley Council of Governments (RVCOG) contracted with consulting engineering geologist Bill Hicks in 1993 (Hicks 1993) to study past and potential geologic failures in the wasteway drainage. Then in 1996, local landowners hired Mr. Hicks to report on damage to the their property (Hicks 1996).

Both reports describe wasteway erosion and landslide activity that Mr. Hicks attributes fully to discharge from the wasteway pipe outlet. He states the basic problem is that the bypass outlet was sited on a channel flowing onto a major earthflow. This earthflow mass is predominantly naturally stable under present climatic conditions except when subject to excessive impacts such as surface water diversion. He states major seismic events combined with wet periods can also destabilize these earthflows. This movement is a natural process and does not indicate massive failure is imminent without greatly increased unnatural impacts.

Mr. Hicks states the 1993 discharge into the wasteway created a major disturbance to the surrounding terrain. The only landslide activity known on the ancient Tyler Creek earthflow is along the channel downstream from the wasteway pipe outlet, along the wasteway, lower Schoolhouse Creek, and lowermost Tyler Creek. He estimates a net volume of 128,000 cubic yards of material was transported from the system during a 1980s high flow event and the 1993 event.

Mr. Hicks made several recommendations including some beyond the purposes of and need for action. His recommendations that fall within the scope of this EA are:

- not doing massive channelization/stabilization
- developing stabilization methods which would have the least overall impact
- implementing a designed biostabilization revegetation program using native grasses, shrubs, trees, and the correct vegetative successional sequence for stabilizing plant growth
- not building roads to remove trees from the channel
- not using creative, temporary solutions
- performing topographic mapping of the area to insure the overall geologic integrity of the area is not adversely affected
- surveying the land to ensure minimum impact to the surrounding environment prior to any additional road modifications or reconstruction
- letting the main failure area (*the area of considerable erosion*) attain its own equilibrium over time; a natural and relatively stable grade will eventually develop

1999 Tyler Creek Monitoring

In 1999, FOG conducted a 1-year study (FOG 2000) of contributions that mass wasting, landslides, irrigation water delivery, and livestock in the Tyler Creek and adjacent drainages make to the high nutrient level in the Bear Creek subbasin. The following is a summary of the report as it relates to geology.

The FOG report states mass wasting from an unrestored wasteway channel was the main sediment source for year round phosphorus exceedances in the Bear Creek system. The released flow over the lower surface of an ancient landslide cut a wider, deeper, and larger eroded canyon at the lip of the landslide. About 2 miles of channel were gutted and perhaps 200,000 cubic yards of material were removed. Even intentionally diverting the flow did not stop the erosion, slumping, and slope failures in the canyon area (*the area of considerable erosion*).

The FOG report pointed out several watershed activities and sources of erosion that contribute large quantities of pollutants to the watershed's river system, but are unrelated to the wasteway and Reclamation activities. These include aggressively harvesting forests, massive soil disturbance with other human-caused slope instabilities, clear cutting steeply sloping mineral soils, road construction and slurry grinding techniques, bulldozing large drainage channels, major geologic faults with movement, extensive trenching and earthmoving to install underground cables, downcutting and erosion with extensive streambank failures in other creeks, and high precipitation events.

Future Detailed Geologic or Geotechnical Studies

Current laws, agency regulations, guidelines, and policy give Reclamation authority to complete this EA, to stabilize the wasteway within existing rights-of-way, and to build access to the wasteway. The *Data Collection* section in chapter 2 describes future investigations Reclamation would perform pertinent to stabilizing the wasteway.

Environmental Consequences

Alternative 1 – No Action

The absence of preventative maintenance and bank stabilization would likely result in continued erosion of the wasteway. The potential for landslides and further erosion adjacent to the wasteway could worsen. Potentially over a very long period of time, some unstable areas may attain their own equilibrium. The No Action alternative would adversely impact the wasteway and the environment.

Alternative 2 (Preferred Alternative) – Bioengineering Combined With Standard Engineering

The preferred alternative incorporates many of the recommendations made in the previously mentioned completed studies. This alternative would reduce erosion, stabilize wasteway banks during high flows, and minimize further degradation of the wasteway and its banks. Eliminating the erosion problem would reduce the likelihood of reactivating an ancient landslide.

Standard engineering structures made of rock riprap would provide immediate protection. Bioengineered structures would rely heavily on live native vegetation to stabilize the channel. Designs for the stabilizing structures would include supporting crib structures, revegetation, root wad systems, and large boulders to serve as energy dissipaters. The full benefit of these structures would be realized after a period of a few years while the plants grew and developed root systems. The root systems and supporting structures would anchor the slopes and protect against sloughing and washouts. However, until the plants became established, water diverted through the wasteway could continue to erode the channel and make the banks less stable. The standard engineering structures in high velocity areas would reduce this effect. Annual stabilization efforts would continue until 80 to 90 percent of those areas susceptible to erosion were stabilized. Since stabilization and construction of standard engineering structures would take place during dry periods, impacts to soils and sediment runoff from vehicles accessing these sites would be minimal.

The access road would have no effect on the local geology since the road surface would not be graded and Reclamation and TID’s road use would be limited to dry periods. Storm runoff could potentially carry some sediment into Schoolhouse Creek and the wetlands; however the relatively flat grade of the road would likely keep sediment movement to a minimum.

Alternative 3 – Bioengineering Only

This alternative would result in the most natural looking corrective measure and has many similar effects as alternative 2. It incorporates many of the recommendations made in the previously mentioned completed studies. The vegetation would eventually cover the infrastructure of the bioengineered structures. Long-term use of the wasteway, especially with high volume flows, could damage restoration work and make it necessary to replant. Stabilization work would continue as needed on impacted sites depending upon the severity of existing erosion and the potential for future bank degradation with released flows. Inspection of restoration sites would be critical to the success of bioengineered wasteway stabilization. Like the preferred alternative, annual stabilization efforts would continue until 80 to 90 percent of those areas susceptible to erosion were stabilized.

Some sites could be inappropriate for bioengineering techniques. Plants and supporting structures placed in severely damaged areas with high velocities would not likely withstand the flow velocity and could easily erode; whereas standard engineering structures could have withstood the velocity. This alternative’s lack of standard engineering structures makes it less reliable and stabilization efforts could continue for more years than the preferred alternative.

The access road would have no effect on the local geology for the same reasons described for alternative 2.

Alternative 4 – Standard Engineering Only

While this alternative would incorporate a few of the recommendations from the previously mentioned completed studies, it would contradict many of the other recommendations. Stabilizing the wasteway with riprap, concrete revetments, and other standard engineering structures would immediately reduce local areas of bank erosion during periodic use of the wasteway and would provide greater certainty of success than alternative 3.

These structures would likely be more environmentally intrusive (concrete, metal, and artificial components) than the standard engineering techniques described for alternative 2. Those lengths of the wasteway with the greatest likelihood of future erosion could be completely lined with artificial structures. This alternative would be less natural and more artificial in appearance. It would drastically change the natural character of the wasteway by potentially transforming it into a channelized canal for conveyance of released water.

Standard engineering approaches would require heavy equipment to haul and install large boulders, prefabricated structures, and other construction materials; therefore, additional access to the wasteway would be needed. Since stabilization and construction of standard engineering structures would take place during dry periods, impacts to soils and sediment runoff from vehicles accessing these sites should be minimal.

Storm runoff could potentially carry some sediment into Schoolhouse Creek and the wetlands; however the relatively flat grade of the road would likely keep sediment movement to a minimum. Other access roads with steep grades could experience sediment movement during storm runoff.

Cumulative Effects

BLM's management of the Cascade Siskiyou National Monument ensures a high level of resource protection on BLM land. Doing nothing to prevent further erosion of geologic resources in and around the wasteway would cause the most damaging cumulative effects. The preferred alternative would reduce cumulative effects by involving BLM and private landowners in discussions on site-specific stabilization efforts and providing a natural and effective solution that protects the geologic resource. The preferred alternative would also stabilize the wasteway, thereby decreasing erosion impacts that could be caused by natural runoff.

While Reclamation and TID would limit their use of the access road to dry conditions, the landowner would have unrestricted use of the road.

Mitigation

Most of the access road would consist of existing pasture or existing primitive roads. Construction activities would occur during installation of culverts at Schoolhouse Creek and around the wetlands. As much as possible, road construction and bank stabilization would take place during dry periods and when flow is absent from the channel. Areas of construction would be reseeded to prevent future erosion. Reclamation would limit use of the access road to dry periods.

Reclamation would use best management practices as identified in the construction contract specifications to minimize environmental consequences caused by stabilizing activities or constructing the access road. All standard and reasonable precautions would be taken to reduce erosion during and after construction.

Water Quality

Reclamation has no water quality data specific to the wasteway, thus this analysis is based on data gathered by other agencies and Section 303(d) of the Clean Water Act. This water quality discussion reflects the 2002 ODEQ 303(d) listing and identifies known water quality conditions and how implementing any of the four alternatives could potentially affect water quality.

Affected Environment

Tyler Creek wasteway lies within the 5,600-acre Tyler Creek subwatershed (within the middle Rogue subbasin) which has its headwaters to the east in the Siskiyou Mountains (FOG 2000). Water diverted into the wasteway flows into Schoolhouse Creek, Tyler Creek, Emigrant Creek, and then into either Ashland Lateral or Emigrant Lake. Although extended periods of wasteway use may reduce bank stability and increase sediment concentrations, other factors independent of wasteway use impact water quality in the three creeks, Ashland Lateral, and Emigrant Lake.

The Clean Water Act requires that states develop a 303(d) list and total maximum daily loads (TMDLs). The 303(d) list includes water bodies where water quality impairs or threatens the established beneficial uses. The TMDLs address the pollutants causing the beneficial use impairment. ODEQ is responsible for the 303(d) list and TMDL development for Oregon.

Although many water reaches within the Rogue River basin are included on the 303(d) list, only two (Tyler Creek between River Miles 0.7 and 0.0 and Emigrant Creek between River Miles 8.8 and 5.6) are potentially affected by wasteway flows or by the proposed action (figure 3-1). According to the 303(d) Bear Creek Watershed Assessment and TMDL, water temperature during the summer is the only listed water quality deficiency for the streams potentially affected by the proposed action. Degraded water quality in the watershed will be addressed outside this EA through the TMDL process.

Water Temperature

Problems occur in streams when the water temperature during the summer becomes too high for many aquatic organisms to function normally. High water temperature is caused by solar heating, but is worsened by low flow and lack of riparian vegetation. The lack of vegetation reduces shade, thereby increasing the amount of solar heating of the stream. High water temperature can lead to changes in aquatic species composition (FISRWG 1998). ODEQ's applicable water temperature criterion[2] for this area is 64 °F. Figure 3-1 shows the water bodies within the wasteway area that are considered temperature limited as compiled from the 2002 Oregon 303(d) listing.

ODEQ listed Tyler Creek (River Mile 0 to 4) for exceeding the water temperature criterion based on data provided by FOG from sample sites upstream from Hobart Creek (River Mile 2.8). ODEQ reported from these data that the 7-day average maximum temperature in 1996 for Tyler Creek was 68.6 °F and 78.1 °F in 1997 (ODEQ 2001). The upper reaches of Tyler Creek (upstream from River Mile 0.7 at the Schoolhouse Creek confluence) are unaffected by

[2] On March 31, 2003, U.S. District Court Judge Ancer Haggerty, ordered the Environmental Protection Agency to void its earlier approval of Oregon's water temperature standards. Oregon has initiated rulemaking and is working in concert with the ODFW, EPA, NOAA Fisheries, and U.S. Fish and Wildlife Service to develop new temperature standards. Water quality discussions relative to temperature in this EA reflect Oregon's existing temperature criteria.

wasteway flows. Hobart Creek at the mouth (River Mile 0 to 0), although listed for exceeding the water temperature criterion, is also unaffected by wasteway flows.

ODEQ listed Emigrant Creek (River Mile 5.6 to 15.4) based on FOG data. The 7-day average maximum temperature at two Emigrant Creek sites in 1996 was 67.9 and 67.6 °F. Four sites within Emigrant Creek exceeded the temperature criterion in 1997 with recordings of 67.5, 66.7, 66.5, and 68.9 °F. Emigrant Creek upstream from River Mile 8.8 is unaffected by wasteway flows.

BLM collected water temperature data in the Tyler Creek watershed during mid-summer audits in 1999 (Montfort 2002). These data do not confirm FOG data downstream from the wasteway's confluence with Schoolhouse Creek [not a 303(d) listed stream] showing water temperatures exceed the ODEQ temperature criterion for salmonid rearing. BLM's 1999 Schoolhouse Creek (upstream from the middle culvert) data show the 7-day average maximum water temperature to be 57.7 °F. Since Reclamation did not operate the wasteway in 1999, these data provide baseline temperature conditions in the area.

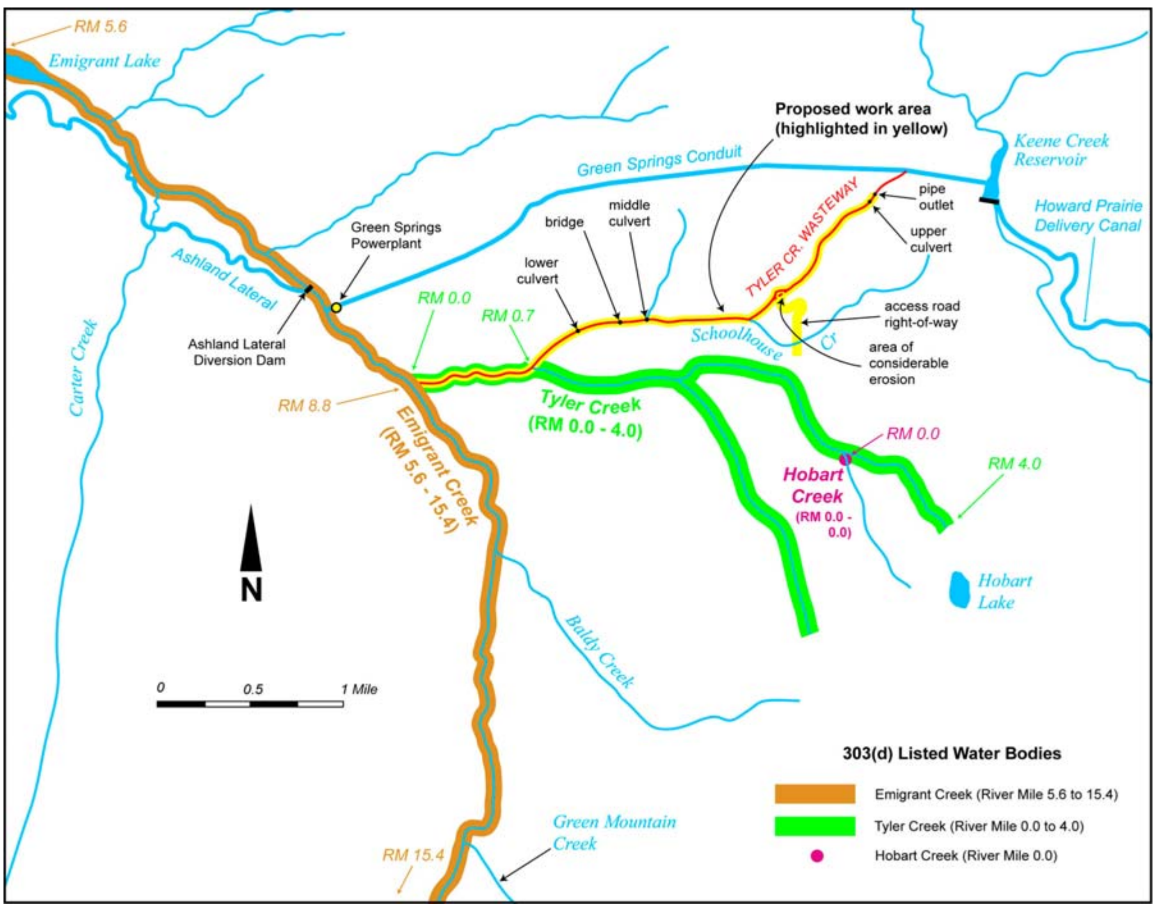

Figure 3-1. Streams near Tyler Creek wasteway exceeding summer water temperature standards [based on 2002 Oregon State 303(d) list]

Sediments

Water in the wasteway channel flows over volcanic deposits and causes natural increased turbidity. This process occurs with spring runoff, heavy precipitation, runoff from development, and Reclamation's use of the wasteway. This flow undercut some of the wasteway banks resulting in an unspecified volume of sediments being scoured out and moved downstream. The suspended materials most likely settled out in lower Tyler Creek, Emigrant Creek, and potentially downstream in Emigrant Lake. Some sediment may enter Ashland Lateral.

The FOG (2000) report discusses a 1990 timber harvest on Hobart Creek that caused 150,000 cubic yards of mud, boulders, and vegetation to flow into Hobart Creek. Rains mobilize the slide and the turbidity is visible where Tyler Creek passes beneath Buckhorn Springs Road on the valley floor. This level was 400 percent greater than any other stream turbidity level encountered but equaled the 400 nephelometric turbidity units (NTU) measured in 1998 in Schoolhouse Creek that appears to have been related to landslide movement following 1-inch of rain in the previous week. FOG checked Tyler Creek at Hobart Creek, as well as Schoolhouse Creek at the middle and upper culverts, for turbidity at the same time but found no appreciable turbidity. A dramatic increase in bedload and sediment transport into Tyler Creek has been observed, with angular tan gravel, sand, and silt aggrading many pools to the mouth of Emigrant Creek. Peak turbidity in Hobart Creek in early May did not coincide with peak flow in late February for Hobart and Tyler Creeks.

Nutrients

FOG (2000) collected monthly ortho-phosphorus and/or total phosphorus during 1999 at 25 sites. Eighteen of the sites were in the Tyler Creek subwatershed. The remainder of this nutrient discussion is based on phosphorus and streamflow information presented in the FOG report.

FOG intended to collect and analyze wasteway water samples for their study, but Reclamation had no reason to release water into the wasteway during 1998 or 1999, thus the wasteway upstream from Schoolhouse Creek was dry on all sampling days. Data from watershed sites outside the wasteway provide a baseline description of phosphorous levels potentially occurring in the watershed. However, the direct wasteway contribution to the watershed for phosphorus and other nutrients remains unknown.

While the FOG report describes the wasteway as a main source of sediment, it states that until their 1999 study, there was a data gap in phosphorous levels along the east side of the Bear Creek subbasin. It further states that phosphorous levels measured at multiple project sites, including immediately below Greensprings Powerplant, did not exceed the Bear Creek total phosphorous TMDL limit of 0.08mg/L.

The FOG study shows phosphorous levels in the Green Springs Powerplant discharge remained lower than the Bear Creek phosphorous TMDL. The study states the TID/Reclamation water delivery system contains little reactive phosphorus and does not contribute to phosphorous exceedances in the Bear Creek system when the irrigation water is confined within man-made canals, channels, and other TID/Reclamation facilities. In 1999, total phosphorous levels in these facilities were within the Bear Creek limit.

The report states it is clear that the dilution effect of TID water transfer through the powerplant does not appear to increase the total phosphorous level in the Tyler Creek area. Other activities (i.e., grazing, agriculture, and forestry) may contribute large quantities of sediment, turbidity, and soluble phosphorus into the Bear Creek system through the Tyler Creek project area. These human-caused sediments and natural sediments likely settle out in Emigrant Lake and perhaps, are remobilized by recreational boating as the reservoir is drawn down.

Storm events send additional pulses of suspended sediment believed to be high in phosphorus into the streams. Generally, turbidity levels and total suspended solids increase with storm water flows; anecdotal data indicate Schoolhouse Creek turbidity has decreased since the 1993 use of the bypass. No data were gathered during earlier storm events. RVCOG believes erosion is a major water quality problem in Tyler Creek. A significant portion of the phosphorous load probably results from a few annual peak runoff events transporting eroded materials and phosphorus into the stream.

The FOG study offers some evidence for the relative phosphorous contribution from specific areas of the Schoolhouse drainage. Surface waters gain phosphorus between the upper culvert and lower culvert on Schoolhouse Creek, but it appears this may be due to the addition of ground water to any surface flow in dry months. Schoolhouse Creek at the upper culvert and at the middle culvert were dry at the surface for 2 to 6 months, yet flow was observed at the lower culvert. About ten springs, mostly perennial and including the original Greensprings, are present in the Schoolhouse Creek drainage. Ground water seeps into the eroded channel. Other ground water sources may exist. Monthly monitoring at the lower Schoolhouse Creek culvert just upstream from the confluence with Tyler Creek found total phosphorus exceeded the Bear Creek TMDL limit most of the year.

The Hobart landslide and the Carter Creek erosion routinely caused 100 to 400 NTU increase above background data during storm events. No detectible nitrate or nitrite was found in samples indicating nitrate and nitrite levels are below the detection limits for the test methods used. The FOG report concludes testing of wasteway flows is critical to understanding the wasteway's contribution of phosphorus to the drainage.

Drinking Water

The city of Ashland gets its water supply from two sources. Most years, Ashland gets its drinking water supply by exercising a water exchange with willing parties on the East Fork Ashland Creek. Ashland Creek (the city's main water source) and its water quality are unaffected by wasteway flows since Ashland Lateral water enters a siphon and is piped beneath Ashland Creek. The two water sources do not intermix. Infrequently, when Ashland Creek water is unavailable, Ashland gets its drinking water from Ashland Lateral. Wasteway diversions flow 1.4-miles down Emigrant Creek to the Ashland Lateral diversion dam. Most of the diversions enter Ashland Lateral. The flow travels 12 miles to the city of Ashland. Any sedimentation generated by using the wasteway would likely settle out in Emigrant Creek and the lateral. Most likely, sedimentation from wasteway use would not enter the city's water supply.

Environmental Consequences

Alternative 1 – No Action

The wasteway's baseline water quality conditions occur under the No Action alternative. Tyler Creek would continue to exceed ODEQ's salmonid rearing water temperature criterion. Bank erosion in the wasteway would continue the process of washing an unquantified amount of sediment downstream, especially during heavy spring runoff. Phosphorus, nitrogen, and other chemical nutrients present in wasteway sediments would continue to leach into the creek and reservoir waters downstream. Implementation of a TMDL in this watershed will continue with or without stabilization efforts, thus improving water quality over time.

Alternative 2 (Preferred Alternative) – Bioengineering Combined with Standard Engineering

Stabilizing the wasteway with a combination of standard engineering and bioengineering techniques would reduce erosion along the channel banks resulting in reduced levels of sediment and nutrients released downstream. Sites stabilized with standard engineering techniques would have an immediate reduction in localized erosion. Slightly lower water temperatures could occur with increased vegetation and riparian shade along the wasteway.

Diverting water from Keene Creek Reservoir into the wasteway would likely decrease Schoolhouse Creek water temperatures since the reservoir is generally cooler than shallow natural summer flow through the wasteway. Following stabilization, water released through the wasteway would somewhat decrease Emigrant Creek water temperature in the 1.2-mile reach between the mouth of Tyler Creek and the Green Springs Powerplant discharge.

Construction activities would be timed to occur when the wasteway was dry; however, rain, runoff, and emergency wasteway use cannot always be predicted. Therefore, if any of these events caused flow through the wasteway that coincided with stabilization activities or access road construction, temporarily increased water temperature, sediment movement, and turbidity could potentially occur. The required permits would address these issues. Compliance with these permits would mitigate short-term water quality impacts. The removal of vegetation should be assumed to have short-term negative impacts; however, the positive long-term impacts of revegetation would outweigh these negative impacts. Until plants became established, and if water were flowing through the wasteway, the water temperature may temporarily increase somewhat.

Alternative 3 – Bioengineering Only

Sites where standard engineering techniques would be used for the preferred alternative would instead be stabilized under alternative 3 with live vegetation. Erosion and the release of sediment and nutrients would continue in these high velocity areas as plants may continue to wash out. The levels of sediment and nutrients would be less than under the No Action alternative. Because of continued erosion in high velocity areas, vegetation in these areas would likely take longer to become well established, thereby extending the time for water quality to improve. Slightly lower water temperatures could occur with increased vegetation and riparian shade along the wasteway.

Alternative 4 – Standard Engineering Only

This alternative would provide the fastest reduction of erosion, sedimentation, and nutrients. Water temperature could increase with removal of local vegetation.

Storm events could potentially increase silt discharge from the access roads to the wasteway channel and could affect water quality. Road design and permitting would address these issues. Without gravel or paving on steep graded roads, silt loads during storm events could be greater than if the roads were graveled or paved.

Cumulative Effects

Past activities beyond Reclamation's jurisdiction (livestock grazing, aggressive timber harvests, massive human-caused soil disturbances, clearing of all vegetation from steep slopes, public road construction and repair, terracing of slopes, extensive trenching and earthmoving, extensive streambank failures outside the wasteway area), as well as large precipitation events and the natural process of erosion, contributed to the watershed's water quality problems. Future pollution from these activities and similar land uses on public and private land could keep the Tyler Creek subwatershed an area of water quality concern. Organizations should continue monitoring the water quality to identify trends early and prevent further water quality decline.

Water quality improvements in watershed tributaries would help reduce cumulative water quality effects within the watershed. The preferred alternative is designed to improve water quality. It would reduce cumulative effects by reducing wasteway erosion and, thereby reducing sediment and nutrients released from the wasteway. The preferred alternative's increased vegetation and riparian shade could slightly lower water temperatures.

Mitigation

As much as possible, road construction and bank stabilization would take place during dry periods and when flow is absent from the channel. Reclamation will consult with ODFW regarding in-water work periods.

Construction activities would occur during installation of culverts at Schoolhouse Creek and around the wetlands. Once the culverts were in place, backfill, and then rock, placed around the culverts would improve stability and reduce channel erosion. A graveled road surface near the culverts would reduce sediment movement into the waterway. Reclamation would use best management practices as described in the construction contract specifications to minimize environmental consequences caused by stabilizing activities or constructing the access road. All standard and reasonable precautions would be taken to reduce erosion and limit sediment during and after construction. Areas of construction would be reseeded to prevent future erosion.

A locked gate would block the entrance of the access road at Tyler Creek Road. Reclamation, its agents, successors, and assigns would perform inspection and maintenance during dry periods. Should a need arise to access the wasteway during non-dry periods, Reclamation and TID would use foot traffic within the acquired right-of-way. Should a rare instance require immediate vehicular access for emergency stabilization repairs during a wet period, Reclamation would also repair the access road as necessary.

Wetlands

Wetlands have two major characteristics:

- soils free of oxygen during the growing season due to saturation (hydric soils)
- vegetation tolerant of those soils (hydrophytic vegetation).

Wetlands have many important environmental functions such as providing high-quality habitat for fish and wildlife, flood water storage, sediment removal, and ground water recharge.

Affected Environment

Reclamation accompanied ODSL on a 2000 site visit to examine the proposed wasteway access road alignment and identify wetlands as defined by the Clean Water Act. ODSL identified a 1/4- to 1/2-acre wetland adjacent to the proposed access road alignment as shown in figure 3-2. The entire wetland area is inundated but the surface water decreases in size after spring runoff stops. Evaporation and the lack of precipitation also reduce the surface water. The wetland is occupied by common wetland species, such as sedges and rushes.

ODSL identified no emergent wetlands within the wasteway channel.

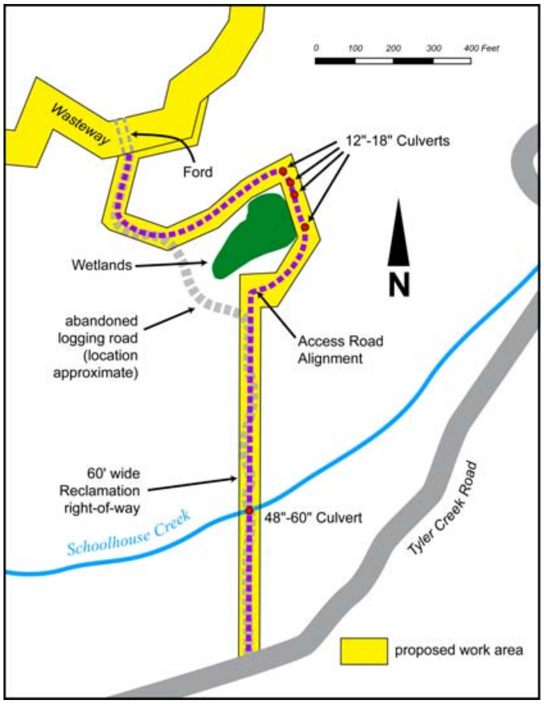

Figure 3-2. Wetlands adjacent to the proposed access road alignment

Environmental Consequences

Alternative 1 – No Action

The No Action alternative would have no beneficial or adverse impacts on wetlands.

Alternative 2 (Preferred Alternative) – Bioengineering Combined With Standard Engineering

A goal of the preferred alternative is to preserve the local wetland ecosystem. Reclamation would obtain a removal/fill permit from ODSL and a CWA 404 permit from the Corps prior to road construction. In all, less than 50 square feet of wetlands could be affected. Culverts would be installed where the road would intersect small intermittent tributaries entering the wetlands. The permit application would specify quantities of material to be removed and fill material to be placed while installing the culverts. The road alignment would minimize wetland impacts to the extent possible while remaining within the Reclamation rights-of-way. The permits could be conditional on mitigation, timing of work, and other construction limitations at the discretion of the Corps and ODSL. No quantifiable impacts would occur at the small culverts around the perimeter of the wetlands or in the way the wetland functions.

Streambank stabilization efforts within the wasteway would not affect emergent wetlands.

Alternative 3 – Bioengineering Only

Alternative 3 would have the same impacts as the preferred alternative (alternative 2).

Alternative 4 – Standard Engineering Only

Alternative 4 would have the same impacts as alternative 2; but, additional access roads could potentially affect other wetlands. If wetlands were identified in the vicinity of a potential access road site, Reclamation would take the same precautions to protect and preserve those wetlands as identified for alternative 2.

Cumulative Effects

The Corps and ODSL regulate the loss (from dredge and fill activities) of wetland habitat through permitting programs that track the loss and creation of wetlands. While replacement wetlands are less likely to function as well as naturally occurring wetlands, they are better than losing wetlands and are a means of preserving wetland values. The small area affected by the preferred alternative would not significantly alter wetland values.

Mitigation

The Corps and ODSL, through the CWA 404 permitting process, would determine how Reclamation would mitigate for the loss of the wetlands, change in character of wetlands, or damage to wetlands. Mitigation often involves replacement in nearby similar habitats by creating a new wetland or restoring and expanding an existing wetland. The replacement wetlands typically would be 1.5 to 3 times larger than the lost wetlands. The permits would specify the exact ratio and should prevent an overall loss of wetlands values. Reclamation would be committed to following all conditions of State of Oregon and Corps permits.

Vegetation

This section discusses the diversity of plants and the riparian plant community within and adjacent to the wasteway.

Affected Environment

The wasteway lies within a climatic zone that should support revegetation efforts by both seeding and transplanting. The mean annual precipitation at Ashland, Oregon, is approximately 19.5 inches and the mean annual temperature is 52.1 $^{\circ}$F. Precipitation at the wasteway is likely slightly higher because of the higher elevation, and temperatures are likely slightly lower. (Reclamation 2001)

Riparian vegetation growing in the moist habitat adjacent to the wasteway provides:

- substrate support
- shade cover that keeps water temperatures cooler
- nutrients to the aquatic ecosystem
- structural habitat for a variety of wildlife.

Table 3-1 contains a list of understory vegetation within the affected riparian zones directly adjacent to the wasteway channel. The channel bottom and streambanks are characterized by dominant vegetation consisting of willows (*Salix* spp.), snowberry (*Symphoricarpos* spp.), alder (*Alnus* spp.), currant (*Ribes/Rubus* spp.), sedge (*Carex* spp.), and various grasses. Upland sites adjacent to streambanks and/or lower riparian sites were dominated by varying forb/grass associations in the understory with mixed conifer overstory. (Reclamation 2001) Many of the same vegetation species inhabit the access road corridor.

Disturbances such as erosion, livestock grazing, and human activities can be detrimental to riparian zone plants. Recolonization of a riparian zone often occurs from nearby plant sources when the environmental conditions (such as a plentiful water supply, adequate soils, and sunlight) are right. This natural process is occurring throughout the wasteway and within the area of considerable erosion with recovery of native herbaceous and woody vegetation (Reclamation 2001). Natural recolonization and succession of plant communities can be a slow process. Manual revegetation can often occur over relatively short time periods; therefore, revegetation techniques can speed up the natural process.

Table 3-1. Vegetation Found in the Local Vicinity of the Work Area

Scientific	Common
Grasses/Sedges	
Festuca arundinacea	Tall fescue
Elytrigia elongata	Tall wheatgrass
Bromus japonicus	Japanese brome
Bromus tectorum	Downy brome
Hordeum pusillum	Little barley
Bromus carinatus	California Brome
Carex spp., *Eleocharis* spp.	Sedge
Poa pratensis	Kentucky bluegrass
Blepharoneuron tricholepis	Pine dropseed
Festuca thurberi	Thurber fescue
Festuca spp.	Other fescue(s)
Forbs	
Vicia americana	American vetch
Liatris spp.	Gayfeather
Lesquerella spp.	Bladderpod
Centaurea solstitialis	Yellow starthistle
Asclepias spp.	Milkweed
Lupinus spp.	Lupine
Calochortus spp.	Lily
Thermopsis spp.	Golden banner
Geum macrophyllum	Mountain avens
Rubus parviflorus	Thimbleberry
Smilacina spp.	False Solomon’s seal
Potentilla spp.	Herbaceous cinquefoil
Rubus spp.	Blackberry
Lathyrus spp.	Peavine
Shrubs	
Salix lucida spp. *lasiandra*	Pacific willow
Salix spp.	Willow
Symphoricarpos spp.	Snowberry
Fraxinus latifolia	Oregon ash
Calocedrus decurrens	Incense cedar
Alnus spp.	Alder
Rosa spp.	Wild rose
(Reclamation 2001)	

Environmental Consequences

Alternative 1 – No Action

The absence of preventative maintenance and bank stabilization would likely result in continued erosion of the wasteway banks and loss of vegetation. The potential for further loss of existing vegetation from landslides and erosion could worsen under the No Action alternative.

Alternative 2 (Preferred Alternative) – Bioengineering Combined With Standard Engineering

Stabilizing the wasteway would have an overall positive effect by preserving and increasing the riparian vegetation along the wasteway. The preferred alternative would result in some loss of riparian vegetation, particularly in those areas where standard engineering techniques were used. Backfilled and riprap armament structures would protect upslope plants from disturbance caused by further erosion. Bioengineering techniques would increase the overall amount of vegetation within the wasteway channel. Some temporary loss of vegetation could occur during installation of standard engineering and bioengineered structures but would be replaced with native plants. The lost vegetation would, however, be replaced with native plantings that would stabilize disturbed and eroding banks, enrich the stabilizing structures, and function as riparian habitat. The removal of vegetation should be assumed to have short-term negative impacts; however, the positive long-term impacts of revegetation would outweigh these negative impacts. The removal of vegetation outside the riparian zone would not affect the amount of channel shade.

The removal of some trees and vegetation would be unavoidable along some reaches of the access road. The removal of trees and plants to build the access road would be an irretrievable loss.

Alternative 3 – Bioengineering Only

This alternative would preserve and increase riparian vegetation along the wasteway. Some temporary loss of vegetation could occur during installation of bioengineered structures but would be replaced with native plants. The additional riparian vegetation would add more cover to the wasteway and keep water temperatures lower. Planting native vegetation would stabilize disturbed and eroding banks, enrich the stabilizing structures, and function as riparian habitat.

This alternative would also have unavoidable removal of some trees and vegetation along some reaches of the access road. The removal of trees and plants to build the access road would be an irretrievable loss.

Alternative 4 – Standard Engineering Only

A greater amount of vegetation would be lost under this alternative due to the nature of standard engineering techniques. Concrete revetments, riprap banks, and other standard engineering techniques offer the least possibility for restoring and increasing riparian vegetation along the wasteway. All vegetation would be removed from localized areas of the channel bank where standard engineering structures would be placed. No further significant vegetation loss would be expected once the stabilization efforts were complete. Those lengths of the wasteway with the greatest likelihood of continued erosion could be completely lined with these artificial structures.

This alternative would also have unavoidable removal of some trees and vegetation along some reaches of the access road and along the road paralleling the wasteway. The only standard engineering structures that would be built on the access road would comply with right-of-way restrictions stipulating installation of a ford crossing the wasteway and culverts at locations on the wetlands perimeter. The removal of trees and plants to build the access roads would be an irretrievable loss.

Cumulative Effects

BLM's management of the Cascade Siskiyou National Monument ensures a high level of resource protection on BLM land and the surrounding area. Doing nothing to prevent further loss of vegetation in and around the wasteway would cause the most damaging cumulative effects. The preferred alternative would reduce cumulative effects by involving BLM in discussions on site-specific stabilization efforts and providing a natural and effective solution that protects the vegetation resource. The preferred alternative would also stabilize the wasteway, thereby decreasing vegetation impacts that could be caused by runoff from the increasing development.

Mitigation

Reclamation would involve private and Federal landowners in determining how to stabilize the channel banks and essentially mitigate for current adverse conditions. The design of the preferred alternative reduces the amount of cleared, unvegetated soils by using local native plant species for reseeding and revegetation; thereby reducing the possibility of introducing noxious weeds. Efforts would be made to build stabilizing structures from already downed trees that may be causing or could cause bank erosion. To avoid cutting live trees, Reclamation would acquire untreated wooden logs if additional logs were needed to build the stabilizing structures.

Where possible, the access road would dodge most trees. Trees cut for construction of the access road would be laid along the side of the access road for the landowner's use. Slash or debris created during construction of the road but not used for wasteway bank stabilization would be burned, chipped, or buried onsite.

Fish and Wildlife

This section discusses fish and wildlife that potentially carry out life activities within the wasteway area based on life history traits and habitat requirements. Discussion of federally listed Endangered Species Act species is in the *Threatened and Endangered Species* section of this chapter.

Affected Environment

The wasteway lies high within the upper Rogue River basin and a few miles east of the Klamath-Siskiyou Ecoregion (KSE) boundary (figure 3-3). Riparian zones provide a complex habitat structure for a high degree of biologically diverse species. Habitat in the vicinity of the wasteway is well suited for a variety of animal life due to the combination of climate, geology, hydrology, and vegetation (Kauffman et al. 2001). The nearby KSE has exceptionally high species diversity. Where documented animal life specific to the wasteway is lacking, the following discussion is based on known species found in the KSE.

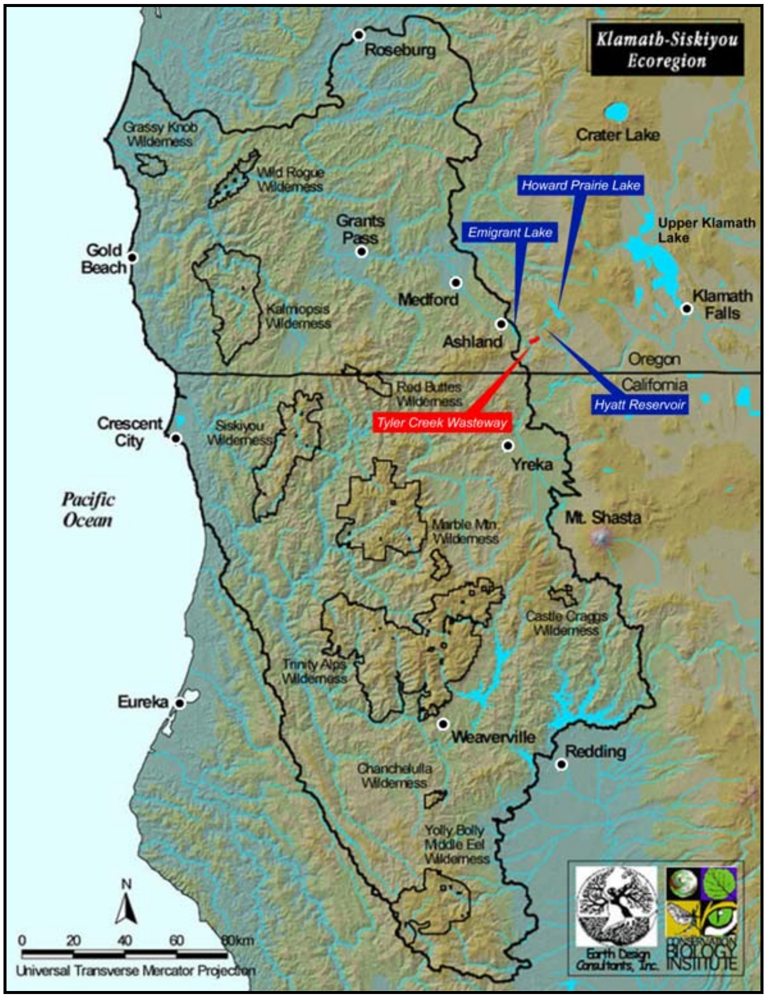

Figure 3-3. Tyler Creek wasteway in relation to Klamath-Siskiyou Ecoregion

Fish

Emigrant Dam restricts the natural migration of anadromous fish beyond the dam. ODFW stocks Emigrant Lake with hatchery rainbow trout and surplus hatchery summer and winter steelhead, thereby giving them access upstream from Emigrant Lake into Emigrant Creek and its tributaries. During the infrequent periods of wasteway flow, these game and nongame species, consisting of cutthroat trout (*Oncorhynchus clarkii*), suckers (*Catostomus* sp.), dace (*Rhinichthys* sp.), and reticulate sculpin (*Cottus perplexus*), could be present in the lower reach of the wasteway.

Amphibians and Reptiles

The KSE supports 38 native species of reptiles and amphibians (Bury and Pearl 1999). Several species are distributed within the northern and southern boundaries of the KSE but could extend beyond the eastern boundary. The overlap of these species accounts for much of the amphibian and reptile richness in the region (Bury and Pearl 1999). Amphibians have moisture requirements that make proximity to water sources crucial to their survival and reproduction. Much of the upper wasteway channel (upstream from Schoolhouse Creek) is dry all or most of the year and is not likely to be occupied. However, occasional minor spring seepage pools in depressed areas scattered throughout the reach could have reptiles and amphibians. The lower wasteway channel (downstream from where the wasteway joins Schoolhouse Creek) has a more consistent water source from springs and precipitation and is likely to be occupied by the following species (Bury and Pearl 1999; FOG undated; Csuti et al. 1997):

> Northwestern salamander (*Ambystoma gracile*), long-toed salamander (*Ambystoma macrodactylum*), Pacific giant salamander (*Dicamptodon tenebrosus*), clouded salamander (*Aneides ferreus*), ensatina (*Ensatina eschscholtzii*), roughskin newt (*Taricha granulosa*), Western toad (*Bufo boreas*), Pacific tree frog (*Hyla regilla*), Cascades frog (*Rana cascadae*), Northern alligator lizard (*Elgaria coeruolea*), western rattle snakes (Crotalus viridis) rubber boa (*Charina bottae*), racer (*Coluber constrictor*), ring-neck snake (*Diadophis punctatus*), gopher snake (*Pituophis melanoleucus*), terrestrial garter snake (*Thamnophis elegans*), and the common garter snake (*Thamnophis sirtalis*).

Birds

Riparian habitat along the wasteway channel has the potential to support many bird species. Migratory birds breeding locally could find sufficient food, water, nest materials, and cover habitat along the wasteway to use during critical breeding and nesting periods of their life histories. The wasteway riparian habitat could also support wintering and resident species. Trail et al. (1997) provides a comprehensive list of breeding birds found in the KSE.

Mammals

Water in the wasteway channel is likely to attract several mammal species that would not normally remain close to the wasteway. A wide variety of mammals (particularly rodents, rabbits, mustelids, black-tailed deer, cougars, bats, raccoons, and many others) are likely to be present in the uplands adjacent to the wasteway. Some mammals, including shrews, could reside along the wasteway.

Environmental Consequences

Alternative 1 – No Action

The absence of preventative maintenance and bank stabilization would likely result in continued erosion of the wasteway. The potential for landslides and further erosion could worsen as would downstream water quality from an increase in suspended sediments. Increased sediment in streams can cause negative biological impacts. Sedimentation from the wasteway would likely settle out in Emigrant Creek or Ashland Lateral. Minimal levels of sedimentation may affect aquatic and semi-aquatic species. Upland species would not be affected.

No new vegetation would be planted. Shade and habitat in riparian zones would be dependent upon natural recolonization of plants on bare soils exposed by unstable, eroding banks. No trees would be removed from the upland area where an access road might have been built under alternatives 2, 3, or 4.

Alternative 2 (Preferred Alternative) – Bioengineering Combined With Standard Engineering

Aquatic and semi-aquatic species would benefit from the preferred alternative because of potential water temperature and water quality improvements created by the planted vegetation. Better water quality in Emigrant Creek and Emigrant Lake would improve aquatic conditions for resident fish and other aquatic life.

The access road culverts would not affect aquatic species since these structures would be sized appropriately for expected runoff, to not impede flow, and to have the least impact on drainage characteristics surrounding the wetlands. They would be placed to allow for passage of aquatic species.

Upland species would benefit from increased riparian vegetation which provides habitat and resources. Removing trees and herbaceous plants to build the access road would reduce some existing habitat. Human presence and the use of construction equipment could cause temporary localized disturbances to fish and wildlife.

Alternative 3 – Bioengineering Only

Alternative 3 would have the same benefits and impacts as the preferred alternative (alternative 2).

Alternative 4 – Standard Engineering Only

Standard engineering structures would prevent vegetation growth where the structures were placed and would reduce habitat for terrestrial, riparian zone, and semi-aquatic species such as song birds, salamanders, frogs, and shrews. The structures would immediately control erosion and reduce sediment and turbidity in the wasteway flow. Water quality, except temperature pollution, would improve. Human presence and the use of heavy construction equipment could cause temporary disturbances to riparian zone, aquatic, and semi-aquatic wildlife. Overall, this alternative would be the least beneficial to wildlife species because of loss of potential habitat resources.

Alternative 4 would have significant impacts on fish populations inhabiting the lower reach of the wasteway because removal of streambank vegetation would increase water temperatures and reduce cover.

Localized lengths of the wasteway with the greatest likelihood of continued erosion could be completely lined with these artificial structures. This type of channelization would increase the flow velocity and is known to cause adverse environmental impacts to fish, the prey base for wildlife, and watershed systems.

Cumulative Effects

The preferred alternative would reduce cumulative effects by reducing erosion and improving water quality, thereby improving conditions for fish and wildlife. Stabilizing the wasteway would be done in concert with other efforts to preserve and protect local fish and wildlife species. Other land uses affecting terrestrial and aquatic habitats in the area would be unaffected by the preferred alternative.

Mitigation

Reclamation would use best management practices (as outlined in the construction contract specifications) to minimize environmental consequences caused by stabilizing activities or constructing the access road. All standard and reasonable precautions would be taken to reduce erosion and limit sedimentation during and after construction. Proper planning would produce efficiency and timely completion of construction activities with the least amount of people and heavy equipment working at any given time.

As much as possible, road construction and bank stabilization would take place during dry periods and when flow is absent from the channel. Reclamation will consult with ODFW regarding in-water work periods.

Threatened and Endangered Species

Reclamation requested information in March 2001 from National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries), and U.S. Department of the Interior, Fish and Wildlife Service (USFWS), on listed or proposed threatened and endangered plant and animal species that could be present in the proposed wasteway work area. The USFWS response indicates the Gentner's mission-bells (endangered), bald eagle (threatened), Northern spotted owl (threatened), and coho salmon Southern Oregon/Northern California Coast Evolutionarily Significant Unit (SONCC ESU) (threatened) could be present in the Rogue River Basin Project. NOAA Fisheries indicates threatened coho salmon could occur within the basin and directed Reclamation to their website in lieu of a written response.

Reclamation requested updated species listings from USFWS in October 2001 and May 2003. The 2001 USFWS response includes these same species; however, the 2003 USFWS response did not mention the coho salmon SONCC ESU. Attachment A contains copies of the species correspondence.

Gentner's Mission-Bells

Affected Environment

USFWS listed Gentner's mission-bells (*Fritilaria gentneri*) as an endangered plant species in December 1999 (USFWS 1999a) but has not yet published a recovery plan or designated critical habitat. The long-term vigor and viability of this species is dependent upon a breeding population greater than 500 plants. Total counts for this species barely exceed this number (USFWS 1999a).

Gentner's mission-bells is a perennial herb belonging to the lily family (*Liliaceae*). It has a fleshy bulb and a sturdy stem that grows 20-28 inches high. The stems and leaves have a blue-tinted waxy coating. The leaves are arrow-shaped, grow 3-6 inches long, and are often whorled. The bell-shaped flowers are 1.4-1.6 inches long and are reddish purple with pale yellow streaks. The flowers are solitary or in groups of up to five on long pedicels. The flowering season is from April to June; however, not every plant will flower each season. Many of the plants remain dormant for 1 to several years and will not produce above-ground stems and flowers. Reproduction occurs when bulblets break off and form new plants (USFWS 1999a).

Gentner's mission-bells is restricted to scattered locations within the Rogue and Illinois River drainages in Jackson and Josephine Counties in southwestern Oregon. Gentner's mission-bells grows in forest openings within three habitats: oak woodlands dominated by Oregon white oak, mixed hardwood forests dominated by Pacific Madrone, and coniferous forests dominated by Douglas-fir.

Gentner's mission-bells is found at elevations between 600 and 4450 feet (ONHP 2000a). Over half of the known occurrences of Gentner's mission-bells are found at elevations higher than 2400 feet (ONHP 2000a). Those occurrences below elevation 2400 feet are localized in a central cluster within a 30-mile radius of the Jacksonville Cemetery. The remaining plants exist as single individuals or occasional clusters widely distributed across the area. Landownership varies from the BLM's Medford District, the city of Jacksonville, Southern Oregon University, District 8 of the Oregon State Department of Transportation, and private individuals. Gentner's mission-bells do not inhabit cultivated cropland.

The Oregon Natural Heritage Program database indicates the closest Gentner's mission-bells are approximately 5 miles southeast of the wasteway in Soda Mountain Wilderness near upper Dutch Oven Creek drainage. The database does not identify any plants within the proposed work area (ONHP 2000a).

The principle threat to Gentner's mission-bells is habitat loss caused by both fire suppression and urban development. Oak woodlands within the Rogue River Basin Project area are becoming more thickly wooded and less grassy due to fire suppression to protect the increasing number of homes. Residential development makes prescribed burning difficult. Records indicate natural fires occurred every 12-15 years and these frequent, low-intensity fires maintained the open canopy normally found within oak woodlands. The transformation from a grassy understory to a shrub understory, along with a dense, closed canopy, is excluding Gentner's mission-bells (USFWS 1999a). Urban development within this centralized area is destroying Gentner's mission-bells habitat at a rapid rate. (USFWS 1999a).

Environmental Consequences

Alternative 1 – No Action

There is no demonstrated or known presence of Gentner's mission-bells in the wasteway area. Therefore, the No Action alternative would not affect this species.

Alternative 2 (Preferred Alternative) – Bioengineering Combined With Standard Engineering

There is no demonstrated or known presence of Gentner's mission-bells in the wasteway area. If any plants were found, Reclamation would avoid activities that would negatively impact individuals and their habitats. The preferred alternative would, therefore, have no effect on this species.

Alternative 3 – Bioengineering Only

This alternative would result in similar effects as the preferred alternative. There would be no effect on Gentner's mission-bells.

Alternative 4 – Standard Engineering Only

This alternative would have the greatest potential to alter habitats and create disturbance in the wasteway work area. However, as discussed under the preferred alternative, these actions would have no effect on Gentner's mission-bells.

Bald Eagle

Affected Environment

USFWS currently lists the bald eagle (*Haliaeetus leucocephalus*) as threatened in the 48 contiguous states. The historic distribution of bald eagles included most of the North American continent. The widespread use of organochloride pesticides contributed to a steep decline in reproduction from 1947 to 1970 (USFWS 1986). Habitat degradation, illegal harassment and disturbance, poisoning, and a reduced food base also contributed to the decline. By 1978, the bald eagle was federally listed as a threatened species in five states and as an endangered species in the remaining 43 states. USFWS (1986) approved a bald eagle recovery plan for the Pacific Recovery Region. Bald eagle populations have increased steadily since its Endangered Species Act (ESA) listing as threatened. The improvement is a direct result:

- of bans on DDT and other persistent organochloride pesticides
- habitat protection
- a growing public awareness of the bald eagles' plight.

Due to the overall population increase, USFWS (1995a) reclassified the bald eagle from endangered to threatened in the continental states. The number of bald eagles in the Pacific Recovery Region is five times what it was when the recovery plan was written (USFWS 1999b).

Bald eagles need suitable habitat and a prey base to thrive and reproduce. Suitable habitat includes, but is not limited to, large nesting and perching trees which are subject to minimal disturbance by humans, especially during the breeding season (January through mid-August). Eagles forage over large, open bodies of water by catching fish in their powerful talons or by stealing fish caught by Osprey. Their large size and long wingspan would make hunting in forest or dense woodlands difficult. Eagles prey primarily on fish, but will also consume birds, mammals, and carrion.

Two bald eagle nesting territories are in the vicinity of the proposed work area. One nest is approximately 2 miles southwest of Emigrant Lake and about 6 miles west of the wasteway. The other is situated close to the Hyatt Reservoir shoreline about 5 miles northeast of the wasteway. Both nests are closer to their respective reservoirs than to either the wasteway or Schoolhouse Creek. The large, open-water, fish-stocked Emigrant Lake and Hyatt Reservoir would attract eagles occupying these nesting territories. In recent years, both of these nesting territories have fledged eaglets (Isaacs and Anthony 2002).

Creeks within the proposed work area are relatively small and enclosed with canopy cover that makes it difficult for bald eagles to locate, pursue, and capture live prey.

Environmental Consequences

Alternative 1 – No Action

No bald eagle nests currently exist in the proposed work area. The habitat is unsuitable for this species' life history, making it unlikely a nesting territory would be established in the proposed work area. The only potential presence of bald eagles would be occasional migrants passing over the area. Continued sediments and nutrients from wasteway erosion may occasionally diminish water quality in Emigrant Lake, and in turn, may affect fish prey populations used by the resident nesting eagles and winter migrants. However, these occasional episodes are not likely to alter or limit the fish populations to a significant degree. This alternative would have no effect on bald eagles.

Alternative 2 (Preferred Alternative) – Bioengineering Combined With Standard Engineering

No bald eagle nests currently exist in the proposed work area. The habitat is unsuitable for this species' life history, making it unlikely a nesting territory would be established in the proposed work area. The only potential presence may be from occasional migrants passing over the area.

Construction activities would be timed to occur when the wasteway was dry; however, rain, runoff, and emergency wasteway use cannot always be predicted. Therefore, if any of these events caused flow through the wasteway that coincided with stabilization activities or access road construction, some sediments could be carried downstream to Emigrant Lake and temporarily affect prey fish populations.

Overall, the preferred alternative would result in a permanent reduction in wasteway sediments reaching Emigrant Lake. Therefore, this alternative would not affect bald eagles.

Alternative 3 – Bioengineering Only

Like the preferred alternative, this alternative would not affect bald eagles.

Alternative 4 – Standard Engineering Only

Like the preferred alternative, this alternative would not affect bald eagles.

Northern Spotted Owl

Affected Environment

USFWS listed the northern spotted owl (*Stix occidentalis caurina*) as threatened under ESA on July 23, 1990, and designated critical habitat in January 1992. Oregon lists this species as a State threatened species. The primary reason for the northern spotted owl population decline is loss and fragmentation of habitat due to timber harvest (USFWS 1995b). USFWS published guidelines in their Northwest Forest Plan adopted in 1994 for timberland management within the northern spotted owl range; however, a final northern spotted owl recovery plan has not been published.

Northern spotted owl habitat occurs in mountainous areas with old growth forest characterized by multilayered canopy and uneven-aged stands with overstory trees ranging in age from 230-600 years old (Marshall et al. 1996). The owls nest in cavities or on platforms created by abandoned raptor nests, squirrels nests, debris accumulations, and mistletoe brooms (Marshall et al. 1996). Northern spotted owls are primarily nocturnal predators of small mammals such as northern flying squirrels, woodrats, and red tree voles (Marshall et al. 1996, USFWS 1995b).

Over 150 northern spotted owl breeding territories exist near Rogue River Basin Project (ONHP 2000b). However, northern spotted owls do not forage on fish or other aquatic species that would attract them to project reservoirs nor do they depend on habitat provided by project facilities. Most of the breeding territories are above elevation 3500 feet in mature or old growth forest.

Two northern spotted owl critical habitat units (OR-37 and OR-38) occur within the Rogue River Basin Project area (Arnold 2001). One of these critical habitat units is near Hyatt Reservoir and Howard Prairie Lake under BLM management. The other is near Fish Lake under U.S. Forest Service management. Neither of these units falls within the wasteway work area. No northern spotted owl activity centers occur within 2 miles of the wasteway in any direction according to BLM Ashland Resource Area data on spotted owl activity centers (Arnold 2002).

Environmental Consequences

Alternative 1 – No Action

Continued sediments and nutrients from wasteway erosion may occasionally diminish the water quality. However, since no northern spotted owl activity centers occur within 2 miles of the wasteway in any direction, it is expected that these occasional episodes would not affect northern spotted owl populations.

Alternative 2 (Preferred Alternative) – Bioengineering Combined With Standard Engineering

Construction activities would be timed to occur when the wasteway was dry; however, rain, runoff, and emergency wasteway use cannot always be predicted. Therefore, if any of these events caused flow through the wasteway that coincided with stabilization activities or access road construction, temporarily increased turbidity could potentially occur. The required permits would address these issues. The resulting sediments and nutrients may temporarily diminish the water quality. However, since no northern spotted owl activity centers occur within 2 miles of the wasteway in any direction, it is expected that neither this temporary episode nor construction activities would affect this species.

There would be an overall permanent reduction of sediments and nutrients as a result of the preferred alternative. This alternative would reduce harmful effects but would have no effect on northern spotted owl populations.

Alternative 3 – Bioengineering Only

This alternative would result in similar effects as the preferred alternative. However, temporary and long-term wasteway sedimentation would be reduced even more than in the preferred alternative. There would be no effects on spotted owls.

Alternative 4 – Standard Engineering Only

This alternative would have the greatest potential to alter habitats and create disturbance in the wasteway work area. However, as discussed under the preferred alternative, these actions would have no effect on spotted owls. The temporary effects of construction would be overshadowed by the long-term benefits of reduced sedimentation and nutrients to the downstream and

Emigrant Lake ecosystems. Therefore, as explained for the preferred alternative, this alternative would not affect spotted owls.

Southern Oregon/Northern California Coasts ESU Coho Salmon

Affected Environment

Coho Salmon

Coho salmon (*Oncorhynchus kisutch*) are anadromous and semelparous. Coho salmon spend approximately the first half of their life cycle rearing in streams and small freshwater tributaries. The remainder of the life cycle is spent foraging in estuarine and marine waters of the Pacific Ocean prior to returning to their stream of origin to spawn and die (NOAA Fisheries 2002).

NOAA Fisheries (1997) listed the SONCC ESU as threatened on May 6, 1997, due to the extreme population loss and then published a final rule (NOAA Fisheries 1999) effective June 4, 1999, designating critical habitat for SONCC ESU that includes Bear Creek and its tributaries downstream from Emigrant Dam. Emigrant Dam prevents passage of anadromous fish into upper Emigrant Creek, Tyler Creek, Schoolhouse Creek, and the wasteway. The effects of the preferred alternative would not continue downstream from the dam. Therefore, consultation on this species is not required.

Essential Fish Habitat

Essential fish habitat is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The following interprets this definition. “Waters” include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include areas historically used by fish where appropriate. “Substrate” includes sediment, hard bottom, structures underlying the waters, and associated biological communities. “Necessary” means habitat required to support a sustainable fishery and a healthy ecosystem. “Spawning, breeding, feeding, or growth to maturity” covers a species’ full life cycle.

The Magnuson-Stevens Fishery Conservation and Management Act requires Federal agencies to consult with NOAA Fisheries regarding potential adverse effects their actions may have on essential fish habitat [Section 305 (b)(2)]. This includes Federal agencies which fund, permit, or carry out activities that may adversely impact essential fish habitat of federally managed fish species.

The geographic extent of freshwater essential fish habitat for the Pacific salmon fishery is specifically defined as all currently viable waters and most of the habitat historically accessible to salmon within certain U.S. Geological Survey hydrologic units (PFMC 1999). The Pacific Fisheries Management Council (PFMC 1999), under Appendix A of Amendment 14 to the Pacific Coast Salmon Plan on fishery management, identified and described essential fish habitat for SONCC coho and Chinook salmon in the middle Rogue River hydrologic unit. All essential fish habitat located upstream from Emigrant Dam is currently inaccessible to SONCC coho and Chinook salmon. The species distribution map in figure 3-4 shows that identified essential fish habitat for SONCC coho and Chinook salmon is outside the proposed Tyler Creek wasteway stabilization work area.

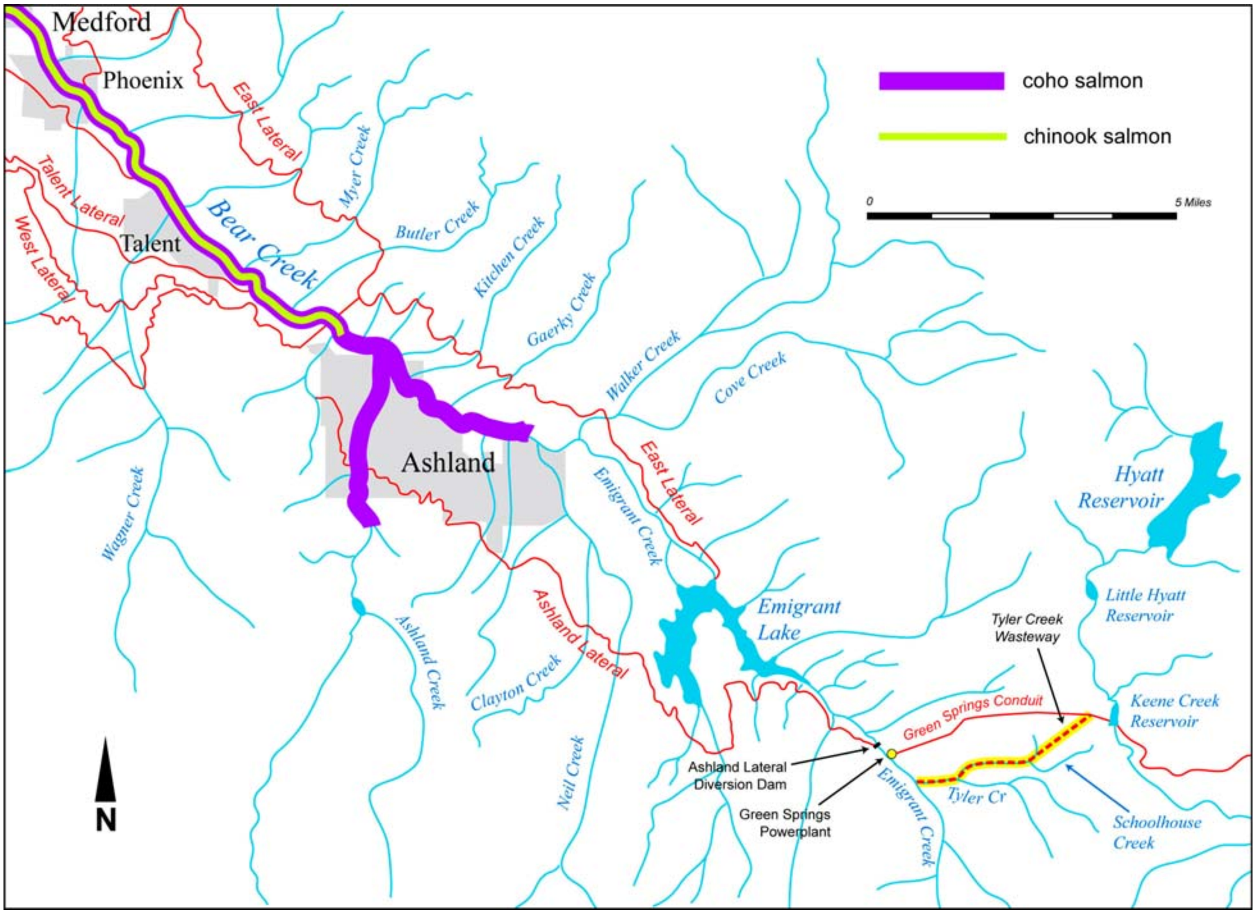

Figure 3-4. Anadromous Fish Distribution Map

Environmental Consequences

Coho Salmon

Since Emigrant Dam prevents passage of anadromous fish into river reaches upstream from the dam, there is no demonstrated or known presence of coho salmon in the wasteway area. Continued sediments and nutrients from wasteway erosion may occasionally diminish the water quality in Emigrant Lake. However, these occasional episodes would not alter the downstream coho salmon population. None of the four alternatives would affect coho salmon.

Essential Fish Habitat

The preferred alternative is unlikely to have any adverse impacts to essential fish habitat. Stabilization efforts would reduce wasteway bank erosion resulting in the release of less sediment and nutrients. Slightly lower water temperatures could occur over time with increased vegetation and riparian shade along the wasteway channel. The quality and quantity of essential fish habitat in the Rogue River basin would either remain unchanged or increase with implementation of the preferred alternative.

Species Comparison Table

Table 3-2 summarizes the effects the alternatives would likely have on the federally listed threatened or endangered species.

Table 3-2. ESA Species Effects

	Alternative 1 No Action (baseline for comparison)	Alternative 2 Preferred Alternative Bioengineering Combined With Standard Engineering	Alternative 3 Bioengineering Only	Alternative 4 Standard Engineering Only
Gentner's mission-bells	no effect	no effect	no effect	no effect
Bald eagle	no effect	no effect	no effect	no effect
Northern spotted owl	no effect	no effect	no effect	no effect
Coho salmon	no effect	no effect	no effect	no effect

Cumulative Effects

The alternatives would have no effect on the four federally listed species. Cumulative effects are, therefore, not an issue.

Mitigation

None of the alternatives would be expected to adversely affect the four federally listed threatened and endangered species; therefore, no mitigation is needed.

Historic Properties

Affected Environment

Historic properties include prehistoric and historic archeological sites, buildings, and historically important places eligible for inclusion in the National Register of Historic Places. Historic properties are also places of special heritage value to contemporary communities (often, but not necessarily, Indian communities) because of their association with cultural practices or beliefs important in maintaining the cultural identity of that community.

Early Occupation of Southwest Oregon

Limited archeological evidence exists for occupation of southwestern Oregon prior to around 6,500 years before present (BP). Available evidence indicates populations from that time until about 2,250 BP were groups of highly mobile hunter-gatherers who moved with some seasonal regularity through a territory to obtain food and raw materials. Groups seem to have become less mobile through time, centering their seasonal movements around semi-permanent base camps and placing greater reliance on riverine resources. By 2,250 BP, groups seem to have maintained permanent villages from which members traveled to collect resources.

The Takelma, Molala, and Shasta tribes were living in southwestern Oregon by the time Euro-American's entered the area. Recent analysis suggests the Latkawa Takelma occupied much of the valley, while Shasta territory extended north only as far as modern Ashland. Since both tribes have place names and stories for Bear Creek valley locations, it is likely their territories overlapped in this area. Takelma and Shasta lifeways appear to have been broadly similar. Both lived in relatively permanent villages much of the year. These villages were located on terraces along principal rivers, often at the confluence of tributaries or near economically important resource locations. Small family groups traveled in a predictable pattern from those villages to various places from late spring to fall to obtain seasonally available food. Plant foods contributed the bulk of the daily diet, with acorns and camas being dietary staples. Fishing, especially for salmon, was a significant economic and social activity, although hunting supplemented the diet.

Euro-Americans first entered the area in 1826-1827. The Rogue River and Bear Creek valleys became a primary travel route between Oregon and California during the 1830s. Gold was discovered in 1851 near what became the city of Jacksonville, Oregon. Miners and other settlers flocked to the area bringing disease and driving the Indian people from their lands. The upper Rogue River Indian groups signed a treaty in 1853 establishing a reservation northwest of Medford. Attacks on the Indians in 1855 caused many to leave the reservation to fight. The fighting ended in 1856. The reservation was then abolished and the Indians who had survived disease and warfare were forced to relocate to reservations elsewhere in Oregon.

Existing Wasteway and Access Right-of-Way Conditions

The area of considerable erosion caused Reclamation to reroute released flows into a second natural intermittent stream channel which then returns the water to the original wasteway channel. This area is wooded, and fallen leaves and duff obscure the ground surface. Similar conditions are present along the wasteway channel upstream from the area of considerable erosion, while downstream, there is a mixture of wooded areas and open fields. Visibility is limited in all areas due to duff or grasses.

The first 1,000 feet of the access road right-of-way corridor crosses land that is used for agricultural purposes, and where no roadway presently exists. Grass (planted pasture or hay) is thick in this area. Schoolhouse Creek and several shallow, ephemeral surface drainages cross this segment of the right-of-way. The last 700 feet of the right-of-way corridor extend through woods where timber harvesting has occurred, and there is an abandoned roughly graded vehicle trail. Fallen leaves and duff obscure the ground in this wooded area.

Archeological Investigations

In October 2000, Reclamation contracted with Heritage Research Associates, Inc., (HRA) for an intensive pedestrian archeological survey of lands that would be impacted by the proposed stabilization efforts as defined at that time. In addition to the survey, HRA was to dig exploratory shovel probes in specified areas. The survey and exploratory probing methods and results are reported in HRA Report No. 238 (Oetting 2000), and are summarized below.

The archeological survey covered the area of considerable erosion and its access, including:

- the channel immediately upstream from the eroded area
- the eroded area, where stabilization would occur
- the second channel used to reroute released water around the area of considerable erosion
- the land between the two channels
- the entire right-of-way corridor for the access road

Survey methods used in the wasteway area varied depending upon ground conditions. The area between the two channels was surveyed at 10 meter (32 foot) intervals. Along the two channels, the survey extended 10 meters back from the bank, beyond the area that might be disturbed by either future erosion or bank stabilization actions. At both the wasteway channel upstream from the area of considerable erosion and at the rerouted channel, HRA surveyed with one archeologist walking in the channel examining the channel banks, while two archeologists surveyed the ground above the bank. At the area of considerable erosion, survey was confined to the ground beyond the eroding edge as it was unsafe to walk inside that section of the channel. The access road right-of-way corridor was walked at 5 meter (16 foot) intervals. One sparse scatter of prehistoric artifacts (later designated as site 35-JA-492) was identified during the survey.

Visibility was relatively poor (10 to 20 percent) throughout the survey areas due to thick grass or from leaf or duff cover. Reclamation's survey contract with HRA required that they dig exploratory shovel probes when there was poor surface visibility at locations where there might be construction disturbance. They were also required to probe a specific section of the access corridor parallel to a location where a landowner reported finding archeological material on his property about 150 feet outside of the road corridor. HRA excavated 15 site discovery shovel probes. Each was 30 cm (12 in) in diameter, was excavated in 10 cm (4 inch) levels, and all fill was screened through 1/8-inch mesh. HRA placed probes at the following locations:

- two along the wasteway where stabilization would occur
- two in the specified section of the access corridor parallel to the reported archeological site
- five where road culverts would be installed
- four at a location where environmental conditions indicated a site might be present but hidden by vegetation, and
- two near where the sparse artifact scatter (site 35-JA-492) had been recorded.

The probes identified two additional prehistoric material scatters (sites 35-JA-293 and 35-JA-494). All three recorded sites were located within the access road corridor on privately owned land. Further test excavations were needed to determine the character and physical integrity of the sites. In Oregon, a State permit must be obtained before completing archeological test excavations on private land. Therefore, once HRA determined these locations were indeed archeological sites, they halted subsurface examination until a State permit could be obtained.

The State Historic Preservation Office (SHPO) issued a State permit (number AP-477) to HRA in June 2002 for test excavations, and HRA completed the test excavation the next week. Consistent with Reclamation's specification, test excavations were limited to the portion of each site located within the 60-foot-wide right-of-way corridor. The methods used and test excavation results are reported in HRA Report No. 258 (Oetting 2002). The following summarizes the site findings from all phases of investigation.

Site 35-JA-492 is a lithic scatter site located in the northern portion of the road access corridor. The site was discovered during the site survey, and two probes were excavated at that time, followed in 2002 by more extensive test excavation. A small quantity of waste flakes and two flaked stone tools were found scattered on the surface across a 25 by 30 meter area. The tools were a chert narrow-necked projectile point mid-section fragment, and a large basalt used flake. Enough remained of the point fragment to demonstrate that it was a narrow-necked style commonly used during the last 2,200 years. Test excavations yielded very little additional cultural material. Subsurface materials were largely confined to a very small area consistent with the surface artifact concentration, and all material was confined to the top 10 cm of soil. Except for the two tools noted on the surface, all materials found were unmodified chert, obsidian, or basalt flakes, and most were small interior specimens. No features were noted. The site was assessed to be a low-density surface artifact scatter with little potential to yield additional information.

Site 35-JA-493 is located on a small terrace. No surface material had been found at the site location during survey. However, since it seemed to be an area where a site might be expected to occur and the grass cover was very dense, HRA excavated two discovery probes to test subsurface soils. One of the probes yielded two flakes in the top 10 cm. The ground surface in that immediate area was then inspected on hands-and-knees, and a small number of additional flakes was found in small bare spots near a bedrock outcrop. Test excavations in 2002 indicated that, at least within the right-of-way, the site is a rather sparse lithic scatter with most of the material confined to the surface and top 20 cm of soil. Only lithic debitage and two square nails were found. The flakes were chert and obsidian, and most were interior specimens 1 to 2 cm in size. The two square nails do not appear to be associated with an identifiable early historic period feature within the right-of-way. The site appears to have been disturbed by plowing in the past. Site deposits within the right-of-way were assessed to have little potential to yield significant information that would increase our understanding of prehistoric life in the area or region. It is possible that the tested area may represent the west edge of a larger site, but that area lies beyond the right-of-way corridor and Reclamation's proposed work area.

Site 35-JA-494 is located in the south half of the road corridor. No surface evidence of a site had been found during survey. However since this section parallels the archeological site reported about 150 feet outside the corridor, two discovery probes were excavated in the area. Both probes yielded interior flake specimens 1 to 2 cm in size. Intensive examination of the surface then occurred near the probes, but no additional materials were found. The grass is extremely dense in the area, with no bare spots. Extensive additional testing was completed in 2002. Testing revealed much more cultural material, extending to a greater depth. However, again the material was essentially limited to unmodified lithic debitage – 236 flakes were recovered, one core, one biface fragment, and one animal bone fragment. There was no evidence of features, either prehistoric or historic period in origin. Also, the site appeared to be rather disturbed. Test units revealed mottled soils indicating that leveling or soil redistribution has occurred at the site. This interpretation is supported by discovery of a glass fragment between 10 and 20 cm below surface and a button between 30 and 40 cm below surface. Material density and distribution indicates that this site may extend well beyond the area tested within the right-of-way corridor. It is possible that those untested areas have historically significant deposits. However, it was determined that deposits within the right-of-way have limited physical integrity and lack the kind and variety of materials that could provide significant new information about area history or prehistory.

In September 2002, Reclamation initiated consultations with the SHPO and interested Indian tribes about the eligibility of site deposits within the right-of-way corridor for listing on the National Register of Historic Places (National Register). Tribes notified were the Cow Creek Band of the Umpqua Tribe of Indians, the Confederated Tribes of the Siletz Indians, the Klamath Tribes, and the Confederated Tribes of the Grand Ronde Community of Oregon (the Grand Ronde Tribes). On October 17, 2002, the SHPO indicated they concurred with Reclamation's determination that the deposits within the right-of-way were not eligible to the National Register. Attachment B contains a copy of this correspondence.

In a letter dated October 28, 2002, (attachment C) the Grand Ronde Tribes indicated they believe the sites were culturally significant, and that materials might be discovered during ground disturbing actions. They requested notification in the event of any discovery. No other tribe responded. Reclamation considered the Grand Ronde Tribes' response, and retained the determination that the site deposits within the right-of-way are not eligible to the National Register.

In June 2002 while completing the test excavations, HRA conducted an archeological survey of the wasteway downstream from the area of considerable erosion. The survey began near the confluence of the wasteway with Schoolhouse Creek and extended downstream to the confluence of Tyler Creek with Emigrant Creek. Within this reach, HRA examined an area extending approximately 100 feet to each side from the wasteway's centerline. HRA recorded three isolated finds (IF):

- a section of a wooden flume (IF-1)
- an artifact scatter (IF-2)
- an isolated artifact (IF-3).

IF-1 clearly lies beyond the potential work area and, therefore, will not be considered further in this EA. IF-2 consisted of four flakes and one fire-cracked rock scattered over a 10 by 20 meter area on a terrace about 5 meters from the creek bank. IF-3 was a single chert flake about 20 meters from the creek bank on a bench that appears to have been leveled and plowed in the past.

In June 2003, HRA conducted an archeological survey approximately 100 feet wide centered on the wasteway's centerline and upstream from the area of considerable erosion. No prehistoric sites or isolated finds were recorded, and there appears to be little likelihood of undetected prehistoric sites. One scatter of 20th Century trash was found, consisting of sheet metal and a cable. It does not appear to be an historically significant site (Oetting 2003).

HRA also completed limited shovel testing at the locations of IF-2 and IF-3 by excavating a line of 50-cm-diameter test holes about 20 feet from the bank's edge. This indicated that archeological sites are present at both sites (Oetting 2003). Both sites are on private land; therefore in conformance with State law, the shovel testing was halted as soon as it was clear that archeological sites were present. Reclamation does not anticipate completing further investigations at these sites, since no ground disturbing actions are proposed in the area, and the creek appears to carry the flow without causing erosion.

Environmental Consequences

Alternative 1 – No Action

Continued wasteway channel erosion would have no effect on historic properties upstream from or within the area of considerable erosion, as no sites were found there. It appears unlikely that using the creek as a wasteway would impact IF-2 or IF-3 since no cultural material was visible in the streambank and the bank does not appear to be actively eroding at either site (Oetting 2003).

There would be no effect to the three archeological sites identified in the access road right-of-way since Reclamation would not construct the access road under the No Action alternative.

Alternative 2 (Preferred Alternative) – Bioengineering Combined With Standard Engineering

Ground disturbing actions associated with wasteway bank stabilization in the area of considerable erosion or along the wasteway upstream from that area would have no effects on historic properties, as no sites were found in those sections of the wasteway.

Sites 35-JA-492 and 35-JA-493 both lie near areas where ground disturbance would occur during wasteway access construction. Associated excavation may extend into site deposits within the right-of-way. If construction excavation occurs within those sites, archeological deposits would be destroyed. Construction actions in the vicinity of 35-JA-494 would be limited to sinking several post holes to allow installation of a gate. Use of the unimproved access route would occur within the right-of-way across all three sites. Reclamation would drive over the unimproved ground surface during dry-weather conditions as stipulated in the right-of-way agreement. Standard vehicles or farm equipment already drive over this land. Therefore, Reclamation's dry-weather use of the access would not cause further damage to the landscape or the resources on that land.

The National Historic Preservation Act holds Federal agencies accountable for impacts to historic properties that are eligible to the National Register. The portions of all three sites within the right-of-way corridor have been determined in consultation with the SHPO to be not eligible to the National Register. Therefore under National Historic Preservation Act, there is no effect to these sites from the preferred alternative, even if damage occurs to site deposits within the corridor. Attachment B contains SHPO's concurrence with Reclamation's findings.

The creek channel in the vicinity of sites IF-2 and IF-3 is well incised and eroded to basal cobbles. It is stable and appears to have the capacity to carry flows without triggering bank erosion. No cultural features or materials were exposed in the banks. No further investigations are proposed at these site locations. Therefore, continued use of the creek channel as a wasteway appears unlikely to impact archeological deposits at IF-2 and IF-3.

Alternative 3 – Bioengineering Only

Impacts would be the same as for the preferred alternative (alternative 2).

Alternative 4 – Standard Engineering Only

Impacts would be the same as for the preferred alternative (alternative 2).

Cumulative Effects

The three archeological sites impacted by access improvements are located on private property. Two of the sites have clearly been used and appear to still be used for agricultural purposes (pasture and/or hay). The third site has had past timber harvest. The landowner retains the right under Reclamation's easement to personal use of the access road corridor. This might include grazing, harvesting crops, or driving the route with his own vehicles to access his land. These potential impacts would occur under all four alternatives. Preferred alternative actions taken to minimize potential impacts would also minimize cumulative effects.

Mitigation

No mitigation would be necessary for continued use of the wasteway or for stabilization under any of the action alternatives (2, 3, or 4). No historic properties were found near or upstream from the area of considerable erosion. Using the wasteway is not impacting deposits at IF-2 or IF-3 and is unlikely to do so in the reasonably foreseeable future.

No mitigation would be necessary for road access improvements or use, as the portions of the three archeological sites within the right-of-way corridor were determined to be not eligible to the National Register. However, Reclamation does commit to several actions with the objective of minimizing impacts to the site deposits. Minimizing efforts are appropriate because the deposits within the corridor are segments of larger sites and because the Grand Ronde Tribes indicated the sites have cultural significance for their tribe. Actions to minimize potential impacts are:

- inspect initial soil excavation at site 35-JA-493 to ensure immediate detection in the unlikely event of discovery of potentially significant subsurface deposits that were not revealed during test excavations
- align the access road route across 35-JA-493 and across the west side of the right-of-way
- align the access road route across 35-JA-494 and across the east side of the right-of-way

If test excavations reveal that IF-2 or IF-3 is eligible to the National Register, and if on-going use of the wasteway channel is damaging those sites, Reclamation would use a stabilization method in that area to have the least impact to site deposits. If sites are found elsewhere along the channel, this same strategy would be applied. Determinations of eligibility, impact, and stabilization method would occur in consultation with the SHPO and interested tribes.

Reclamation would also comply with National Historic Preservation Act concerning discovery situations. If any archeological sites other than 35-JA-492, 35-JA-493, and 35-JA-494 were encountered during construction, work would halt immediately in the area of the find and a Reclamation archeologist would be notified. Also, if unanticipated deposits were found within the boundaries of the three recorded sites that appear to be of the quality to meet eligibility criteria for the National Register, work would also halt in that location and a Reclamation archeologist would be notified. Reclamation would make an initial assessment of the discovery, and if warranted, notify the SHPO and interested tribes and reinitiate site evaluation actions. Reclamation would also comply with requirements of State of Oregon burial laws if human remains were encountered. This would include an assessment of whether the remains are Indian or Euro-American in origin, and tribal notifications and consultations if they are of Indian origin.

Indian Sacred Sites

Affected Environment

Executive Order 13007 defines Indian sacred sites as "any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion." The provisions of Executive Order 13007 apply only to Federal lands. More than half of the length of the wasteway is on private lands to which traditional practitioners have no access.

Environmental Consequences

Reclamation has not yet consulted with tribes on the potential for sacred sites being located on Federal lands within the proposed work area. Should any areas on Federal land be identified as needing wasteway stabilization, Reclamation would notify tribes and ask if they have any issues. At this time, Reclamation cannot determine if sacred sites would be affected.

Indian Trust Assets

Indian trust assets (ITA) are legal interests in property held in trust by the United States for Indian tribes or individuals. Examples of ITA's are lands, minerals, hunting and fishing rights, and water rights. The United States has trust responsibility to protect and maintain rights reserved by or granted to Indian tribes or individuals by treaties, statutes, and executive orders. Reclamation policy is to protect ITA's from adverse impacts of its programs and activities and to enable the Secretary of the Interior to fulfill responsibilities to Indian tribes.

Affected Environment

No Indian owned lands, federally recognized Indian reservations, or ceded lands have been identified within the work area where traditional use rights (such as hunting, fishing, and gathering) are retained by federally recognized Indian tribe.

Environmental Consequences

None of the four alternatives would impact ITA's.

Cascade Siskiyou National Monument

Affected Environment

President Clinton signed a proclamation June 9, 2000, creating the 52,947-acre Cascade Siskiyou National Monument in south central Oregon. BLM designated the area as an Ecological Emphasis Area in its 1994 Northwest Forest Plan and its 1995 Resource Management Plan because of the unique ecological and biological characteristics (Clinton 2002). A portion of the wasteway lies within the monument as shown on figures 1-2, 1-4, and 3-5.

The monument, 25 miles southeast of Medford along the Oregon/California border, includes Soda Mountain and surrounding lands at the intersection of three ecological regions: Coast, Klamath, and Eastern Cascade slopes. The designation protects the extraordinary ecological value of these regions and their associated flora and fauna from resource exploitation and habitat degradation. It also places a permanent timber harvesting moratorium on the area.

Species from each ecological region meet and mix in the diverse habitats provided by the area's unique combination of biological, geological, hydrological, climatological, and topographical features. The monument is home to a variety of rare species of plants and animals whose survival in this region depends upon its continued ecological integrity. The area supports an exceptionally high diversity of fauna, including one of the highest diversities of butterfly species in any area of the United States. The area also contains old-growth habitat crucial to the threatened Northern spotted owl.

The area contains both public Federal lands managed by BLM and numerous private land holdings. The Presidential proclamation gave BLM 3 years to develop a management plan for the area. The guiding principles for managing the monument are to protect, maintain, restore, and enhance relevant and important resources. BLM currently manages the monument under an interim management policy. Much of the private land has historically been managed for commercial purposes such as grazing and timber harvest (Boise Cascade 2002). Grazing continues while BLM studies whether continued livestock use is compatible with the protective purposes of the monument (Clinton 2002).

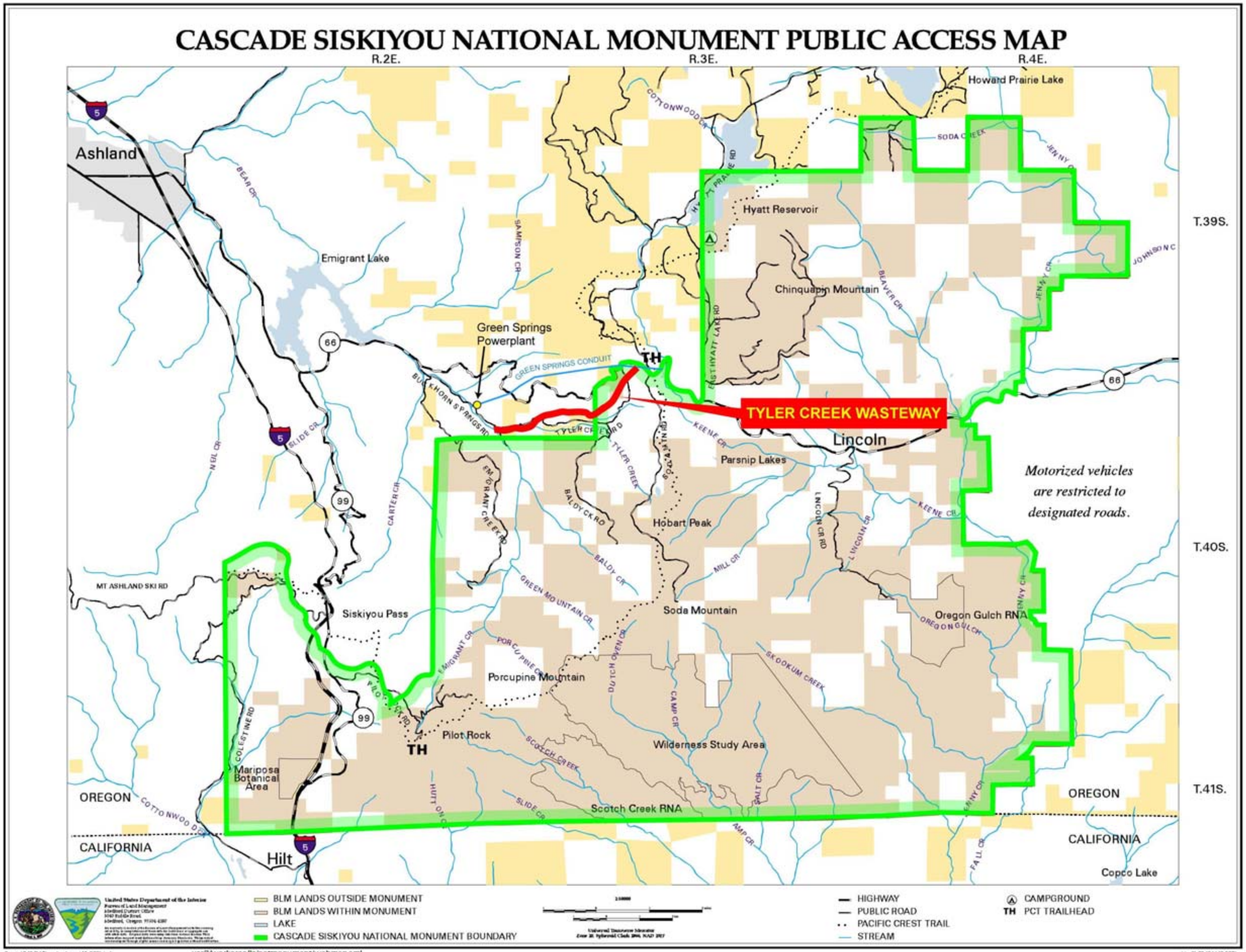

Figure 3-5. Wasteway in relation to Cascade Siskiyou National Monument

Environmental Consequences

Reclamation will continue cooperating with BLM to ensure its actions are in agreement with monument management goals. Reclamation actions would have the same environmental consequences whether within the monument or outside monument boundaries. Environmental consequences are therefore discussed under the headings of each specific natural resource (e.g. vegetation, water quality, etc.).

Cumulative Effects

BLM's management of the Cascade Siskiyou National Monument ensures a high level of resource protection on BLM land. Doing nothing to prevent further erosion in and around the wasteway would cause the most damaging cumulative effects. The preferred alternative would reduce cumulative effects by involving BLM and private landowners in discussions on site-specific stabilization efforts and providing a natural and effective solution that protects the resources. The preferred alternative would stabilize the wasteway, thereby decreasing erosion impacts that could be caused by natural runoff. Implementing either alternative 2 (the preferred alternative) or 3 would be in agreement with BLM's management plan.

Mitigation

Mitigation discussion is under the headings of each specific natural resource (e.g. vegetation, water quality, etc.) since mitigation within the monument would be no different than outside monument boundaries.

Environmental Justice

The 1994 Presidential Executive Order 12898 (EO) mandates Federal agencies to identify and address any impacts their actions would have on environmental justice with regard to human health as well as social and economic issues. The EO identifies environmental justice as "disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." The EO is designed to protect minority and low-income communities from discrimination of a disproportionately more hazardous or degraded human environment being imposed by a Federal action. It also emphasizes that Federal agencies provide minority and low-income communities with an opportunity for public participation and access to information relating to human health or the environment.

Affected Environment

The wasteway is in a rural and predominately white community (as shown in table 3-3) in Jackson County, Oregon. The county's population increased by 23.8 percent from 1990 to 2000. This growth rate is slightly higher than the State's overall population growth.

Table 3-3. 2000 Jackson County, Oregon, Census Statistics

U.S. Census Bureau 2000 Statistic	Jackson County	Oregon State
Total population	181,269	3,421,399
Population Percentage of Change (1990 to 2000)	+23.8	+20
White	91.6	86.6
Hispanic or Latino	6.7	8
American Indian or Alaska Native	1.1	1.3
Asian	0.9	3
Black or African American	0.4	1.6
Native Hawaiian or Pacific Islander	0.2	0.2
Other races	2.9	4.2
Persons below poverty	13.8	11.6
Children below poverty	20.3	16.3

The expanding human population along the wasteway has increased water usage. The number of property subdivisions and wells along the wasteway has increased since 1960.

Environmental Consequences

None of the four alternatives would cause disproportionately adverse social, economic, or human health impacts to local minority or low-income populations, therefore, mitigation would not be required.