

RECLAMATION

Managing Water in the West

Howard Prairie Dam Safety of Dams Seismic Corrective Action

FINDING OF NO SIGNIFICANT IMPACT AND ENVIRONMENTAL ASSESSMENT

Rogue River Basin Project, Oregon

Pacific Northwest Region

PN EA 17-01 PN FONSI 17-01



**U.S. Department of the Interior
Bureau of Reclamation
Columbia-Cascades Area Office
Yakima, Washington**

March 2017

Mission Statements

U.S. Department of the Interior

Protecting America's Great Outdoors and Powering Our Future

The U.S. Department of the Interior protects America's natural resources and heritage, honors our cultures and tribal communities, and supplies the energy to power our future.

Bureau of Reclamation

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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INTRODUCTION

As part of the Bureau of Reclamation Safety of Dams (SOD) Program, Reclamation proposes to conduct modifications to the Howard Prairie Dam. This action is necessary to correct unsafe conditions and to prevent possible loss of life, property, water storage, and other project purposes due to potential failure modes (PFM) associated with seismic risk. A seismic risk analysis for Howard Prairie Dam was conducted as part of an issue evaluation and corrective action study (CAS) that was completed by Reclamation in February 2014.

Reclamation has prepared this finding of no significant impact (FONSI) to comply with the Council on Environmental Quality regulations for implementing the procedural provisions of the National Environmental Policy Act (NEPA). The FONSI briefly describes the Proposed Action, the alternatives considered, Reclamation's consultation and coordination activities, and Reclamation's finding. The final *Howard Prairie Dam, Safety of Dams Seismic Corrective Action Environmental Assessment* (EA) fully documents the analysis.

BACKGROUND

Reclamation's Columbia-Cascades Area Office (CCAO) has authorized the Talent Irrigation District (TID) to operate and maintain the facilities in the Talent Division of the Rogue River Basin Project, including Howard Prairie Dam, Howard Prairie Delivery Canal, Hyatt Dam and Keene Creek Dam. Howard Prairie Dam and Reservoir is located on Beaver Creek, approximately 18 miles east of Ashland, Jackson County, Oregon. Howard Prairie Dam, located on the east side of the reservoir, is part of the Klamath River basin in Reclamation's Rogue River Basin Project, east of the Cascade Divide.

The project provides supplemental water for the Medford Irrigation District (MID) and the Rogue River Valley Irrigation Districts (RRVID). The MID diverts its water at Phoenix Diversion Dam, and the RRVID diverts its water at Jackson Street Diversion Dam.

The Talent Division was constructed between 1957 and 1961 and was authorized by the Act of August 20, 1954 (68 Stat. 752, Public Law 83-606). The Secretary of the Interior was also authorized to rehabilitate the irrigation works of the MID and RRVID pursuant to the provisions of the Rehabilitation and Betterment Act of October 7, 1949 (63 Stat. 724, Public Law 81-335), as amended. The Talent Division was authorized for irrigation, flood control, hydroelectric power, and for other beneficial purposes. Fish and wildlife facilities and minimum basic recreation facilities were also authorized.

The 1954 Act was amended by the Act of October 1, 1962 (76 Stat. 677, Public Law 87-727) to authorize the construction of Agate Dam and Reservoir, a diversion dam, feeder canals, and related facilities for irrigation purposes as a part of the Talent Division. Minimum basic facilities for recreation and for the conservation and development of fish and wildlife were also authorized.

The National Environmental Policy Act (NEPA) requires Federal agencies to integrate environmental consideration into their decision-making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions.

ALTERNATIVES CONSIDERED

One action alternative was considered and evaluated in the EA. A No Action Alternative was also evaluated as required by NEPA.

In 2014, Reclamation developed and evaluated five downstream and twelve upstream build alternatives in the corrective action study (CAS) for Howard Prairie Dam; a dam removal alternative, and two reservoir restriction alternatives. Evaluation of all engineering alternatives under the NEPA is not deemed appropriate, as the engineering feasibility and dam safety aspects of corrective measures and safe alternative selection requires specialized engineering and design considerations beyond the scope and intent of NEPA. The proposed Federal action is authorized under Reclamation Safety of Dams Act of 1978 (Public Law 95-578, §2, November 2, 1978 Statute 2471).

No Action Alternative

The No Action Alternative would not reduce risk to public safety, as it would not implement corrective actions to mitigate the risk determination made by Reclamation's 2014 CAS; therefore, the No Action Alternative does not meet the purpose and need, nor would this alternative comply with or adhere to Reclamation's mission statement or the Reclamation Safety of Dams Act.

CAS Preferred Alternative

The Preferred Alternative to excavate and replace liquefiable foundation material with a foundation shear key and stability berm is based on multiple criteria such as annualized failure probability, annualized life loss, and low-probability-high-consequence events, as recommended in Reclamation's 2014 CAS. The CAS Preferred Alternative is identified as the most cost effective alternative to reduce the probability of dam failure under static, seismic, and hydrologic loadings in accordance with Reclamation Policy (FAC-P02) and Interim Dam Safety Public Protection Guidelines.

PROPOSED ACTION

Reclamation identified the CAS Preferred Alternative as the Proposed Action, which is described in detail in the EA.

- The CAS Preferred Alternative involves excavation and replacement of the existing liquefiable foundation materials with compacted fill within a portion of the downstream foundation, creating a foundation shear key.
- A stability berm would be placed on the downstream side of the dam. The density of the compacted fill would be much greater than the existing foundation materials and would eliminate the possibility of liquefaction within the treatment area.
- The foundation shear key would also include filter and drain zones and a drain pipe to provide a filtered exit for seepage through the foundation.

The purpose of the Proposed Action is to maintain the authorized Rogue River Basin Project purposes to maintain the Talent Division, while also reducing the risk of failure of the Howard Prairie Dam, thereby, reducing risk to public safety downstream to within acceptable limits established by Reclamation SOD Program.

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Based on the evidence presented in the final EA, Reclamation has drawn the following conclusions about the potential impacts of the Proposed Action:

Public Health and Safety

The proposed action would reduce the risk of failure of the Howard Prairie Dam, thereby, reducing risk to public safety downstream to within acceptable limits established by the Reclamation SOD Program.

Water Resources

The preferred alternative would have no effect on water resources and irrigation. Normal operations of Howard Prairie Dam would continue uninterrupted during construction as a reservoir drawdown would not be required with this downstream alternative. Water quality impacts would not occur with this alternative as BMPs and resource avoidance

practices would be implemented in accordance with all State and Federal requirements under the Clean Water Act.

Land Resources

Temporary and minor impacts from construction activities, such as traffic disruptions, fugitive dust, and noise impacts would occur. No long-term impacts on the Cascade Siskiyou National Monument or the Pacific Crest Trail would occur with the preferred alternative. Stakeholder coordination, appropriate and effective BMPs (such as dust suppression and time of construction constraints), would be implemented to minimize temporary impacts inherent to heavy equipment operation and earth-moving construction activities.

Recreation

Long-term impacts on recreation would not occur with this alternative. Reservoir draw-down for construction would not be necessary, and the pool level would remain within the average ranges throughout the construction process. The most pronounced temporary impact would occur as a result of potential public road use disruption as haul trucks would make numerous trips to and from the area of potential effect (APE). Haul truck activity during the summer recreation season would have a temporary impact on outdoor recreation traffic and cyclists traveling to and from Howard Prairie Reservoir.

Temporary recreation impacts that would occur during construction could also result from construction noise though no blasting would occur with project implementation, and noise effects would be localized in the APE. Stakeholder coordination, especially with Jackson County and BLM, would help mitigate potential temporary impacts on recreation. Construction timing restrictions would be used to minimize the temporary impacts associated with project construction. Construction timing restrictions would confine construction operations to daylight hours and holidays would be observed to reduce construction impacts to recreationists.

Threatened or Endangered Species and Migratory Birds

With respect to Federal or State-listed threatened or endangered species or their habitats, the project may affect, and is not likely to adversely affect, Northern spotted owl. With respect to migratory birds, impacts would be temporary and minimized by the timing of vegetation removal avoiding take of any migratory bird, or the parts, nests, or eggs of such a bird.

Vegetation

Approximately 5 acres of forested land would be cleared of successional evergreens and understory shrubs for staging and implementing the project. Consideration toward minimization of vegetation removal has been determined by Reclamation and BLM resource specialists that exhibit higher value habitat characteristics. Forested areas on steep and uneven land, near roads and near Beaver Creek would not be cleared to retain visual and ecological benefits. Contractor use areas have been selected predominantly in areas previously disturbed.

Climate Change

Methodologies used as part of the risk assessment demonstrated no significant climate change impacts associated with the proposed alternative.

Environmental Justice

Environmental justice addresses the fair treatment of people of all races and incomes with respect to actions affecting the environment. Thorough analysis reflected in the EA reveals that the preferred alternative would not cause a disproportionate adverse effect on human health or environment for minorities and low income populations and communities regardless of race, color, national origin or income, or create inequity in the distribution of the benefits and risks of the proposed project.

Cultural Resources

The Oregon State Historic Preservation Officer (SHPO) responded to Reclamation's report of archaeological investigations for this project in concurrence that the project will likely have no effect on any significant archaeological objects or sites.

Historic Resources

SHPO concurred in June 2015 that the Howard Prairie Dam is eligible for listing in the National Register of Historic Places and the project represents an adverse effect by altering the appearance of the dam. SHPO and Reclamation are developing a memorandum of agreement toward mitigating the adverse effect that will be commensurate with the scale of the adverse effect and will be accessible as possible to the public. Mitigations to include a public interpretive site at Howard Prairie Resort; determination of eligibility of the Howard Prairie Damtender Complex, and if found eligible, formal documentation; and monitoring by a qualified archaeologist any ground disturbance due to project activities of equipment, materials staging areas.

Indian Trust Assets and Sacred Sites

There are no identified Indian Trust Assets or Sacred Sites within the APE for the proposed project. Correspondence was sent on May 3, 2016, to the Confederated Tribes of Siletz, Confederated Tribes of the Grand Ronde Community, Cow Creek Band of Umpqua Indians, Klamath Tribes, and Quartz Valley Indian Reservation to ascertain if they had any concerns or information pertaining to archaeological sites, areas of cultural importance, or sacred sites within or near the APE. No Tribal responses have been received.

Air Quality and Noise

Noise impacts would be localized, temporary, and limited in context and intensity. Timing of noise-generating sources would be restricted to normal construction hours of 7:00 a.m. to 7:00 p.m. Construction on holidays would not be allowed, thus limiting exposure. Upon completion of the project, noise levels would be expected to return to preconstruction conditions. Stakeholder coordination, appropriate and effective BMPs (such as well-muffled exhaust systems), would be implemented to minimize temporary impacts inherent to heavy equipment operation and earth-moving construction activities.

Cumulative Effects

Reclamation has assessed past, present, and reasonably foreseeable future projects in the Howard Prairie Dam area for significant cumulative effects. The CAS Preferred Alternative for Howard Prairie Dam would not result in a significant cumulative impact. Howard Prairie Resort's marina rehabilitation plan by Jackson County is the only planned project identified in the Howard Prairie Dam area.

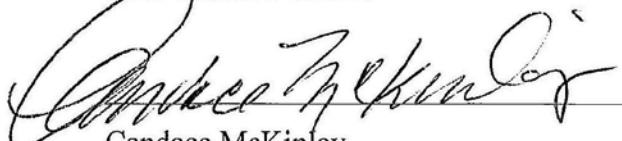
FINDINGS

- The Proposed Action will have no adverse effect on such unique characteristics as cultural resources, wilderness areas, wetlands, and riparian areas.
- There are no identified Indian Trust Assets or Indian sacred sites within the area of potential effect.
- The environmental effects of the Proposed Action do not involve unique or unknown risks.
- The Proposed Action may, but is not likely to, have adverse effect on species either currently listed or proposed for listing as candidate, endangered, or threatened species; there would be no adverse effect to designated critical habitat for these species.
- The Proposed Action would have no effect with regard to Environmental Justice.

FINDING OF NO SIGNIFICANT IMPACT

Based on the evidence and findings presented above and the environmental analysis presented in the final EA, Reclamation concludes that implementation of the Proposed Action (CAS Preferred Alternative) would not have any significant impact on the quality of the human environment or the natural and cultural resources in the affected area; therefore, Reclamation has determined that an environmental impact statement is not warranted, and this EA and FONSI satisfy the requirements of NEPA


RECOMMENDED:



Candace McKinley
Environmental Program Manager
Yakima, Washington

3/14/17
Date

APPROVED:



Dawn Wiedmeier
Columbia-Cascades Area Manager

3/15/17
Date

RECLAMATION

Managing Water in the West

Howard Prairie Dam Safety of Dams Seismic Corrective Action

FINAL ENVIRONMENTAL ASSESSMENT

Rogue River Basin Project, Oregon

Pacific Northwest Region

PN EA 17-01



**U.S. Department of the Interior
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March 2017

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Bureau of Reclamation

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Acronyms

| | |
|-------------|--|
| ADA | Americans with Disabilities Act |
| BLM | Bureau of Land Management |
| CAS | Corrective Action Study |
| CSNM | Cascade – Siskiyou National Monument |
| CEQ | Council on Environmental Quality |
| CFR | Code of Federal Regulations |
| Corps | U.S. Army Corps of Engineers |
| DOI | U.S. Department of the Interior |
| EA | environmental assessment |
| EIS | Environmental Impact Statement |
| FONSI | Finding of No Significant Impact |
| ITA | Indian Trust Assets |
| NEPA | National Environmental Policy Act |
| MID | Medford Irrigation District |
| ODEQ | Oregon Department of Environmental Quality |
| ORS | Oregon Revised Statutes |
| PFM | potential failure modes |
| SHPO | State Historic Preservation Office |
| SOD | Safety of Dams |
| RCC | roller compacted concrete |
| Reclamation | Bureau of Reclamation |
| RRVID | Rogue River Valley Irrigation District |
| TID | Talent Irrigation District |
| USFWS | U.S. Fish and Wildlife Service |

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Howard Prairie Dam Safety of Dams Seismic Corrective Action

FINAL ENVIRONMENTAL ASSESSMENT

U. S. Department of the Interior
Bureau of Reclamation
Columbia-Cascades Area Office

PN EA 17-01

1 PURPOSE OF AND NEED FOR ACTION

1.1 Introduction

By the Act of August 20, 1954 (68 Stat. 752, Public Law 83-606), Congress authorized the Secretary of the Interior to construct the Rogue River Basin Project, Talent Division, consisting of “two principal reservoirs at the Howard Prairie and Emigrant sites, together with other necessary works for the collection, impounding, diversion, and delivery of water, the generation and transmission of hydroelectric power and operations incidental thereto.”

The Talent Division was authorized for the purposes of irrigation, flood control, hydroelectric power, and other beneficial purposes. Fish and wildlife facilities and minimum basic recreation facilities were also authorized.

The Bureau of Reclamation’s Columbia-Cascades Area Office (CCAO) has authorized the Talent Irrigation District (TID) to operate and maintain the Talent Division facilities, which includes the Howard Prairie Dam, Howard Prairie Delivery Canal, Hyatt Dam, and Keene Creek Dam. The Rogue River Basin Project covers approximately 35,000 acres of irrigated cropland in three irrigation districts: TID, Medford Irrigation District (MID) and Rogue River Valley Irrigation District (RRVID).

The Project provides supplemental water for the MID and the RRVID. The MID diverts its water at Phoenix Diversion Dam, and the RRVID diverts its water at Jackson Street Diversion Dam in Medford, Oregon.

1.2 Background

Reclamation is responsible for about 476 storage dams and dikes that form a significant part of the water resources infrastructure for the 17 western United States. Reclamation’s Safety of Dams (SOD) Program (1) ensures that Reclamation facilities do not present unreasonable

risks to public safety, property, and the environment; and (2) takes appropriate action to reduce and manage risks in an efficient and cost effective manner.

The modifications proposed for Howard Prairie Dam are authorized by the Reclamation Safety of Dams Act of 1978 (Public Law 95-578) and the Reclamation Safety of Dams Act Amendments of 1984 (Public Law 98-404), 2000 (Public Law 106-377), 2001 (Public Law 107-117), and 2004 (Public Law 108-439). Together, these are referred to as the Safety of Dams Act.

Reclamation uses two guidelines to assess dam safety risk. The first guideline addresses annualized failure probability, which serves to fulfill the public trust responsibility associated with agency exposure because of dam failures (dams should not fail frequently even if the consequences are low). The second guideline addresses annualized life loss, where multiple fatalities are possible as the result of dam failure. Protection of human life is of primary importance to public agencies that construct, maintain, or regulate public works (Reclamation, 2006).

The SOD Program focuses on evaluating and implementing actions to resolve safety concerns at Reclamation dams. Under this program, Reclamation completes studies and identifies, and accomplishes the needed corrective actions on Reclamation dams. The selected course of action relies on assessments of risks and liabilities with environmental and stakeholder input to the decision-making process.

Howard Prairie Dam is a zoned earthfill structure, with a height of 100 feet and a crest length of 1,040 feet and contains 416,000 cubic yards of material. The reservoir created by the dam has a total capacity of 62,100 acre-feet (active 60,600 acre-feet). The dam is on Beaver Creek, 18 miles east of Ashland, Oregon. The damsite geology consists of hard fresh, medium-grained basalt about 29-feet thick that underlies the relative thin mantel of sandy topsoil. Unconformably underlying the basalt are lacustrine and aeolian deposits. On the left abutment, this deposit is a tuff breccia about 30 feet thick; on the right abutment these deposits consist of claystone, siltstones, and diatomite as tuff, and tuff breccia. (See Figure 1-1 and Figure 1-2).

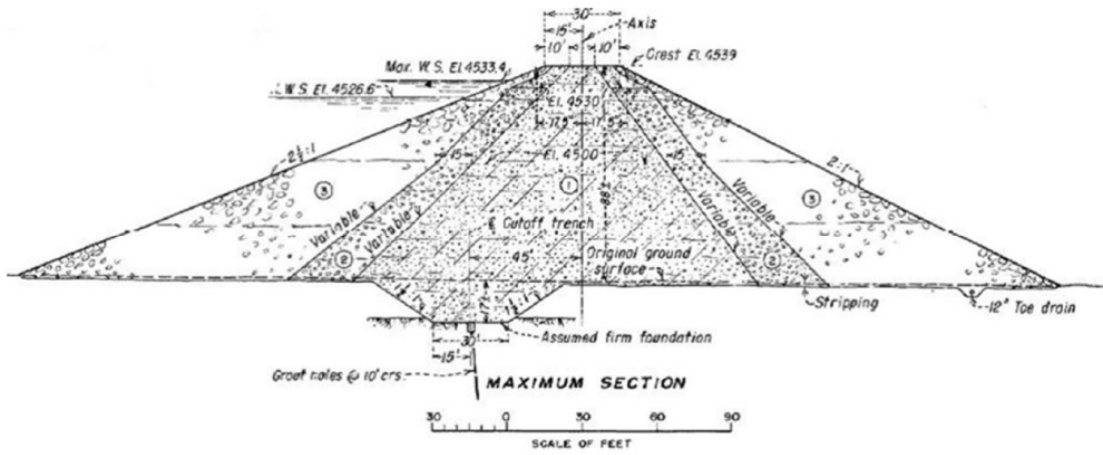


Figure 1-1. Section diagram for the existing Howard Prairie Dam.

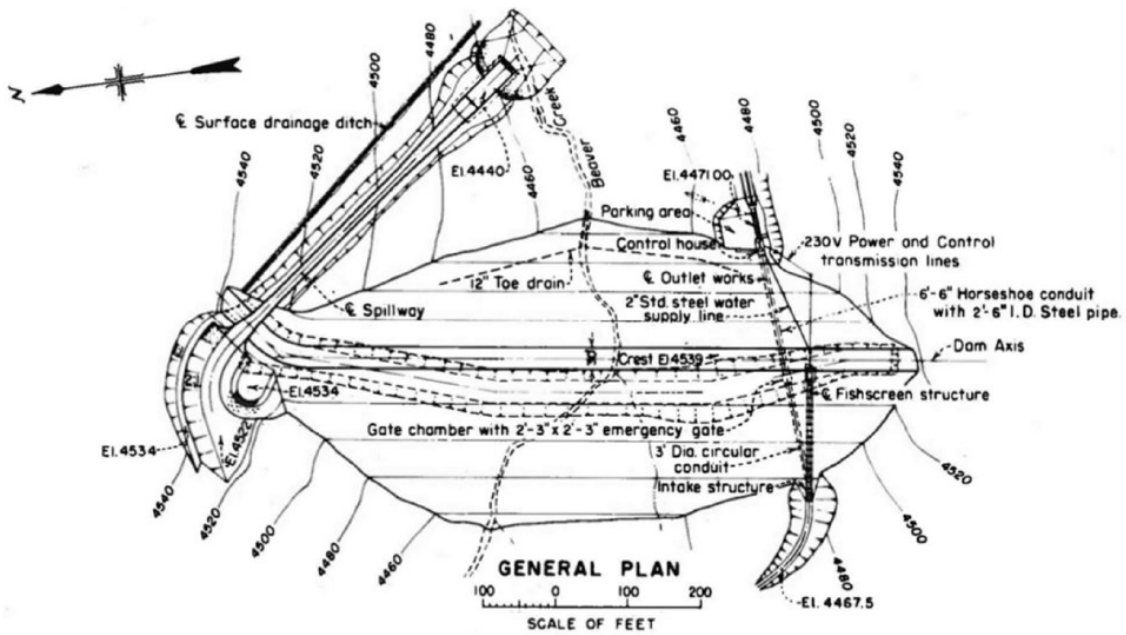


Figure 1-2. Plan view diagram for Howard Prairie Dam (as built).

1.3 Purpose and Need

The Bureau of Reclamation needs to reduce risk to public safety downstream of Howard Prairie Dam due to identified seismic risk.

The purpose of the proposed action is to (1) correct seismic risks that were above Reclamation's Public Protection Guidelines during the 2014 issues evaluation for earthquake-induced liquefaction resulting in an overtopping failure, and (2) prevent possible loss of life, property, water storage, and other project purposes due to potential failure modes (PFM) associated with a seismic or flood event.

The proposed action would maintain the authorized functions of the Talent Division, while meeting the need to reduce risk to public safety by implementing corrective actions to Howard Prairie Dam.

1.4 SOD Study for Howard Prairie Dam

In 2014, the Reclamation SOD Program's team of experts conducted a corrective action study (CAS) that developed modification alternatives that would mitigate the seismic risk, thus reducing the risk for failure of Howard Prairie Dam. The CAS included the identification of several potential alternatives through the following actions: a 2015 value planning study, an initial screening analysis of the alternatives, development of appraisal level costs, a risk-reduction analysis, and the selection of alternatives to further develop at the feasibility study level. Reclamation completed a thorough analysis of the potential feasible alternatives in accordance with *Reclamation Policy* (FAC-P02) and *Interim Dam Safety Public Protection Guidelines*.

The CAS recommended the following preferred alternative: excavate and replace liquefiable foundation materials with a foundation shear key and stability berm.

The proposed action involves excavation and replacement of the existing liquefiable foundation materials with compacted fill within a portion of the downstream foundation, creating a foundation shear key. In addition, a stability berm would be placed on the downstream side of the dam. The density of the compacted fill would be much greater than the existing foundation materials and would eliminate the possibility of liquefaction within the treatment area. The foundation shear key would also include a filter, drain zones, and a drainpipe to provide a filtered exit for seepage through the foundation. Since no improvements would be made to address upstream instability, an upstream slope failure might occur during a seismic event; however, an upstream slope failure would likely be relatively shallow resulting in a crest remnant large enough to prevent overtopping or internal erosion through cracks.

Howard Prairie Dam is subject to a Cascadia subduction zone earthquake which is strong enough to cause widespread liquefaction of the loose material comprising the upper 10 feet of the foundation. Among other analyses, a seismic risk analysis for Howard Prairie Dam was conducted as part of an issue evaluation that was completed in February 2014. The total mean

annualized probability of failure was estimated to be 1.01×10^{-3} and the total mean annualized probability of life loss was estimated to be 2.2×10^{-2} ; both probabilities are about an order of magnitude above Reclamation's public protection guidelines. The dam safety priority rating (DSPR) system provides a means for Reclamation to establish the urgency of risk management activities and the relative priority of these actions within our overall inventory of dams. The very high estimated risks contributed to the judgment that a DSPR, category 2 (urgent priority) was appropriate for Howard Prairie Dam in its current condition. The DSPR 2 is characterized by a very high failure probability and a very high annualized life loss.

1.5 Location

The Rogue River Basin Project is located near the cities of Medford and Ashland in southwest Oregon in two tributary basins to the Rogue River, Bear Creek and Little Butte Creek, and the tributaries of Jenny Creek in the Klamath Basin. Howard Prairie Dam and reservoir is located on Beaver Creek, approximately 18 miles east of Ashland, Jackson County, Oregon, east of the Cascade Divide; the dam is on the east side of the reservoir (Figure 1-3).

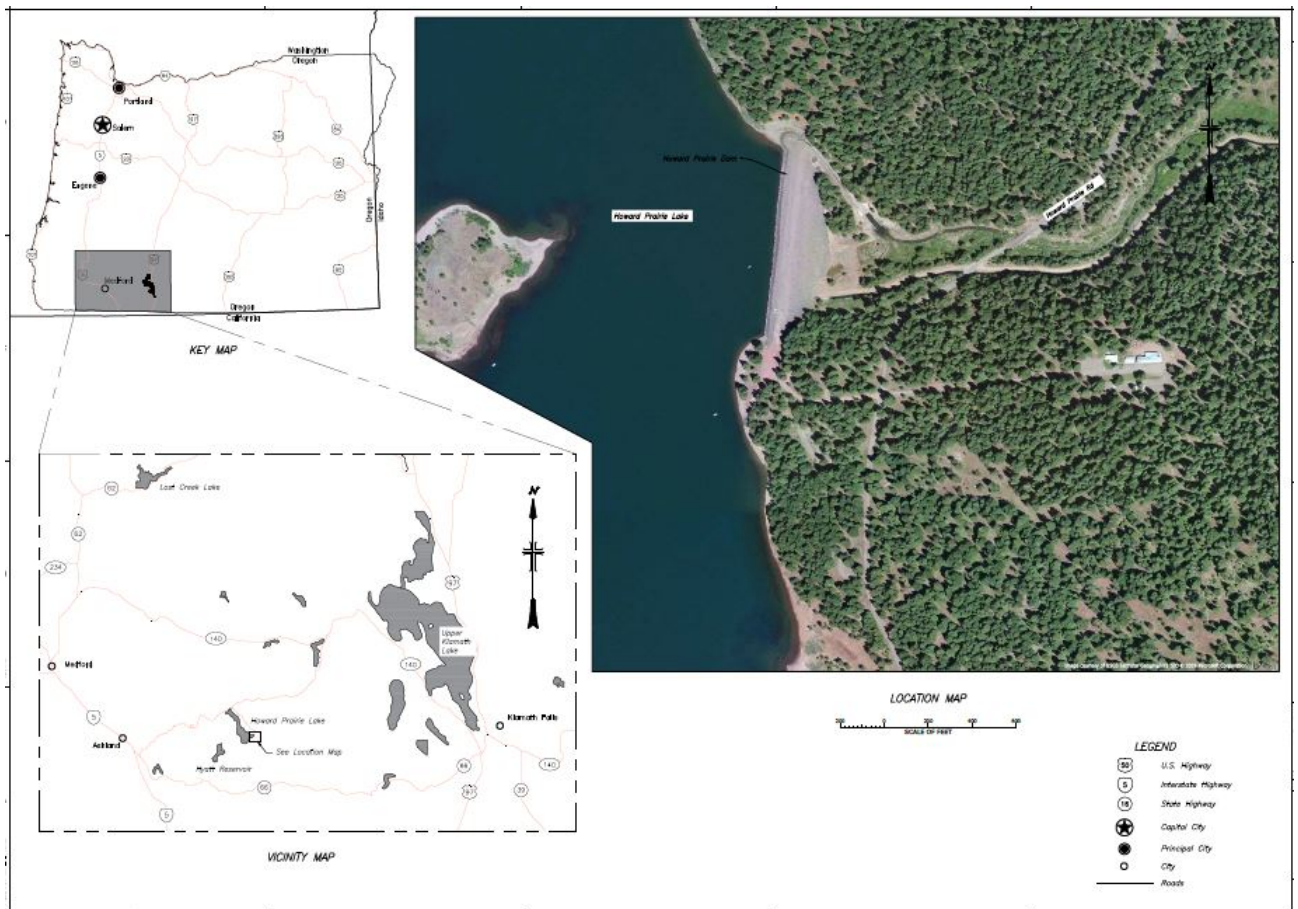


Figure 1-3. Location Map. In the top left drawing, the gray-shaded square near Oregon's southern border indicates the location of Reclamation's Howard Prairie Dam and Reservoir near Medford, Oregon, which is east of the Cascade Divide. (USGS 2001).

1.6 Authorities and Related Laws

Talent Division was constructed from 1957 to 1961, and was authorized by the Act of August 20, 1954 (68 Stat. 752, Public Law 83-606). The Secretary of the Interior was also authorized to rehabilitate the irrigation works of the MID and the RRVID pursuant to the provisions of the Rehabilitation and Betterment Act of October 7, 1949 (63 Stat. 724, Public Law 81-335), as amended. The Talent Division was authorized for irrigation, flood control, hydroelectric power, and for other beneficial purposes. Fish and wildlife facilities and minimum basic recreation facilities were also authorized.

The 1954 Act was amended by the Act of October 1, 1962 (76 Stat. 677, Public Law 87-727), which authorized the construction of Agate Dam and Reservoir, a diversion dam, feeder canals, and related facilities for the Talent Division's irrigation purposes; facilities for basic recreation and minimum conservation and development of fish and wildlife were also authorized.

The National Environmental Policy Act (NEPA) requires Federal agencies to integrate environmental consideration into the decision-making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. Based on the scope of the proposed project, it was determined that an environmental assessment (EA) would be necessary to evaluate impacts of the proposed project and to determine whether, (1) a Finding of No Significant Impact (FONSI) may be issued or (2) impacts were significant and warrant preparation of an environmental impact statement (EIS).

The Endangered Species Act of 1973 (ESA) was signed on December 28, 1973, and provides for the conservation of species that are endangered or threatened throughout all or a significant portion of their range, and the conservation of the ecosystems on which they depend. The ESA replaced the Endangered Species Conservation Act of 1969. Congress has amended the ESA several times.

National Historic Preservation Act (NHPA) was approved October 15, 1966, and establishes a program for the preservation of additional historic properties throughout the Nation, and for other purposes (Public Law 89-665; 80 Stat. 915; 16 USC 470, as amended by Public Law 91-243, Public Law 93-54, Public Law 94-422, Public Law 94-458, Public Law 96-199, Public Law 96-244, Public Law 96-515, Public Law 98-483, Public Law 99-514, Public Law 100-127, and Public Law 102-575).

Executive Order 13007 dated May 24, 1996, addresses the accommodation of sacred sites. Each executive branch agency with statutory or administrative responsibility for the management of Federal lands is required, to the extent practicable, permitted by law, and not clearly inconsistent with agency functions, to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners. They shall also avoid adversely affecting the physical integrity of the sacred sites. Where appropriate, agencies will maintain the confidentiality of sacred sites.

Executive Order 12898 was issued on February 16, 1994, and directs Federal agencies to address environmental justice in minority and low income populations. Its purpose is to focus Federal attention on the environmental and human health effects of Federal actions on minority and low-income populations with the goal of achieving environmental protection for all communities.

This EA has been prepared in accordance with the NEPA, the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations (CFR) Parts 1500-1508), the U.S. Department of the Interior regulations for the Implementation of the NEPA (43 CFR Part 46), and the *Reclamation Manual Directives and Standards* policy for implementation of the NEPA (ENV P03). This EA analyzes the potential direct, indirect, and cumulative environmental impacts associated with the proposed project to correct safety deficiencies at Howard Prairie Dam.

2 ALTERNATIVES CONSIDERED

Based on the analysis and evidence presented in the 2014 CAS for Howard Prairie Dam and value method decision-making process discussed in Section 1.4, SOD Study for Howard Prairie Dam, the *Value Analysis Final Report for Howard Prairie Dam Safety of Dams* (Value Analysis Report) was developed and finalized in 2015. The Value Analysis Report was completed by a formal value study team of experts with the diversity, expertise, and independence needed to creatively consider the issues surrounding Howard Prairie Dam.

2.1 No Action Alternative

The No Action Alternative would not reduce risks to public safety, as it would not implement corrective actions to mitigate the high risk determination made by the CAS. This alternative would not directly affect the human environment, as no modification of the Howard Prairie Dam would occur other than ongoing maintenance and operations of the dam and appurtenant facilities. NEPA regulations require the agency taking the Federal action to consider a No Action Alternative for comparative analysis purposes. In this case, the No Action Alternative would not meet the purpose and need of the proposed action; it would not address the pertinent safety concerns, nor would the No Action Alternative comply with or adhere to the Reclamation Safety of Dams Act.

2.2 CAS Preferred Alternative

This CAS Preferred Alternative involves excavation and replacement of the existing liquefiable foundation materials with compacted fill within a portion of the downstream foundation, creating a foundation shear key. A stability berm would also be constructed on the downstream side of the dam. The density of the compacted fill would be much greater than the existing foundation materials and would eliminate the possibility of liquefaction within the treatment area. The foundation shear key would also include a filter, drain zones,

and a drain pipe to provide a filtered exit for seepage through the foundation. Since no improvements would be made to address upstream instability, an upstream slope failure might occur during a seismic event; however, an upstream slope failure would likely be relatively shallow resulting in a large enough crest remnant to prevent overtopping or internal erosion through cracks.

Howard Prairie Dam is a zoned earthfill structure, with a height of 100 feet and a crest length of 1,040 feet that contains 416,000 cubic yards of material. Prior to initiating the downstream excavation within the foundation, a temporary dewatering well system around the perimeter of the excavation would be installed. Dewatering the foundation would reduce the groundwater levels and the moisture content of the soils prior to excavation; thereby, reducing the likelihood of undrained loading conditions on the excavation slopes. See drawing for Wellpoint Dewatering System Plan (Figure 2-1).

Once the foundation is dewatered, excavation would commence to remove approximately 20,000 cubic yards of liquefiable alluvium, the majority of the liquefiable foundation materials downstream of the dam to about elevation 4440, or about 20 feet deep. Filter sand and drain gravel material would be placed against the excavation faces. Since the foundation materials beneath the downstream slope of the dam would not be removed or treated, a berm would be constructed to elevation 4493, or about 30 feet high to further stabilize the embankment against downstream deformations. The overall constructed berm would be about 200 feet by 200 feet centered below the dam. See drawing for General Construction Plan in Figure 2-2.

Excavated materials will be salvaged and reused in the constructed berm by mixing with commercially provided sand and gravel in the staging area to achieve the desired compaction and stability. It is estimated that about half of the needed compacted fill material will be reused, native-excavated alluvium material. Unusable excavated material will be shaped to grade in the contractor use areas, and stabilized and seeded with a Bureau of Land Management (BLM) approved seed mix. See Site Use Map, Figure 2-3

Analyses were performed as part of the appraisal and feasibility level studies to approximate the extents of the excavation and to assist in sizing the berm. A cross-section and plan view of the CAS Preferred Alternative proposed modifications are shown in Figure 1-1 and Figure 1-2. See Figure 2-4 for design diagram for Howard Prairie Dam CAS Preferred Alternative.

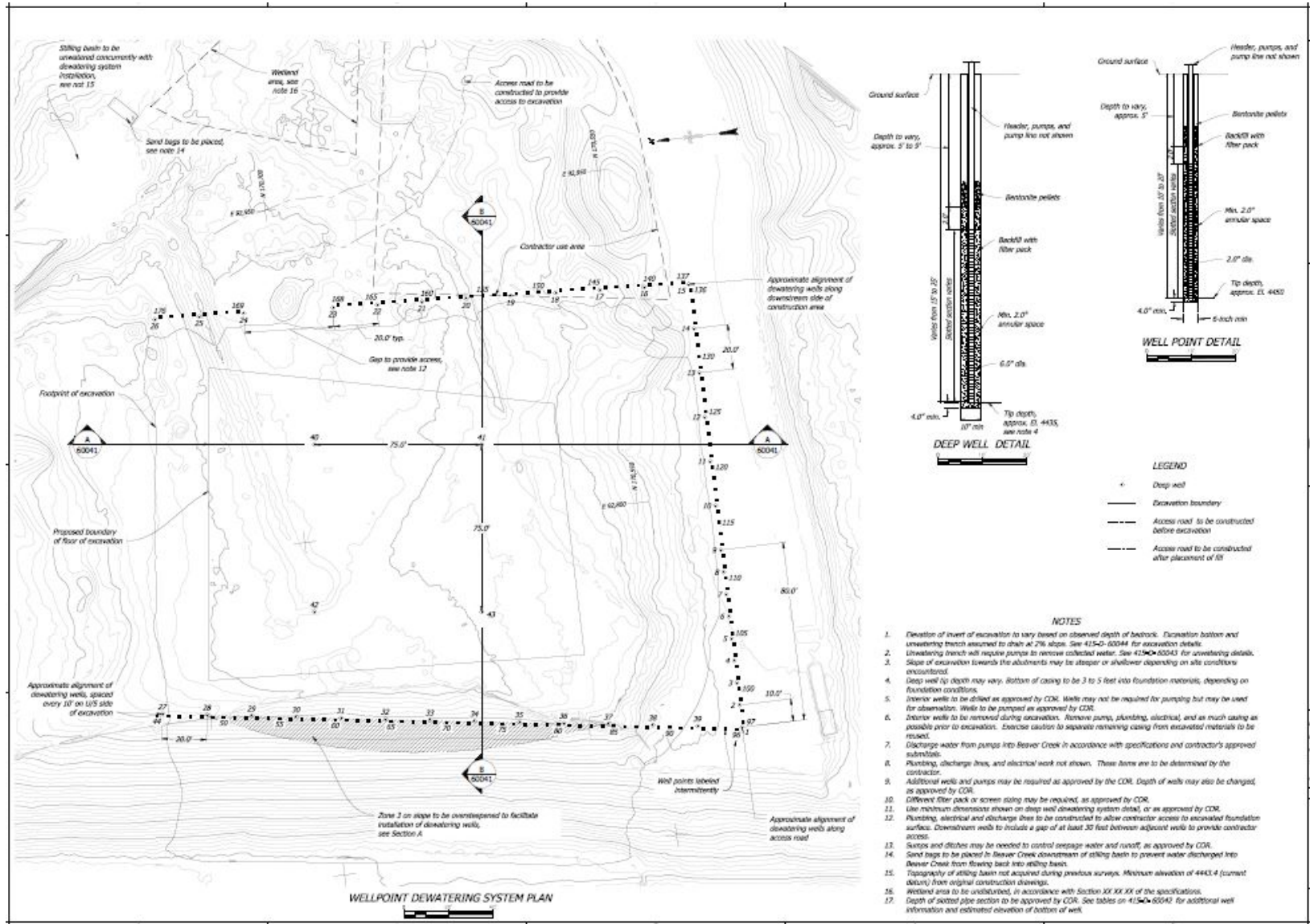


Figure 2-1. Wellpoint Dewatering System Plan.

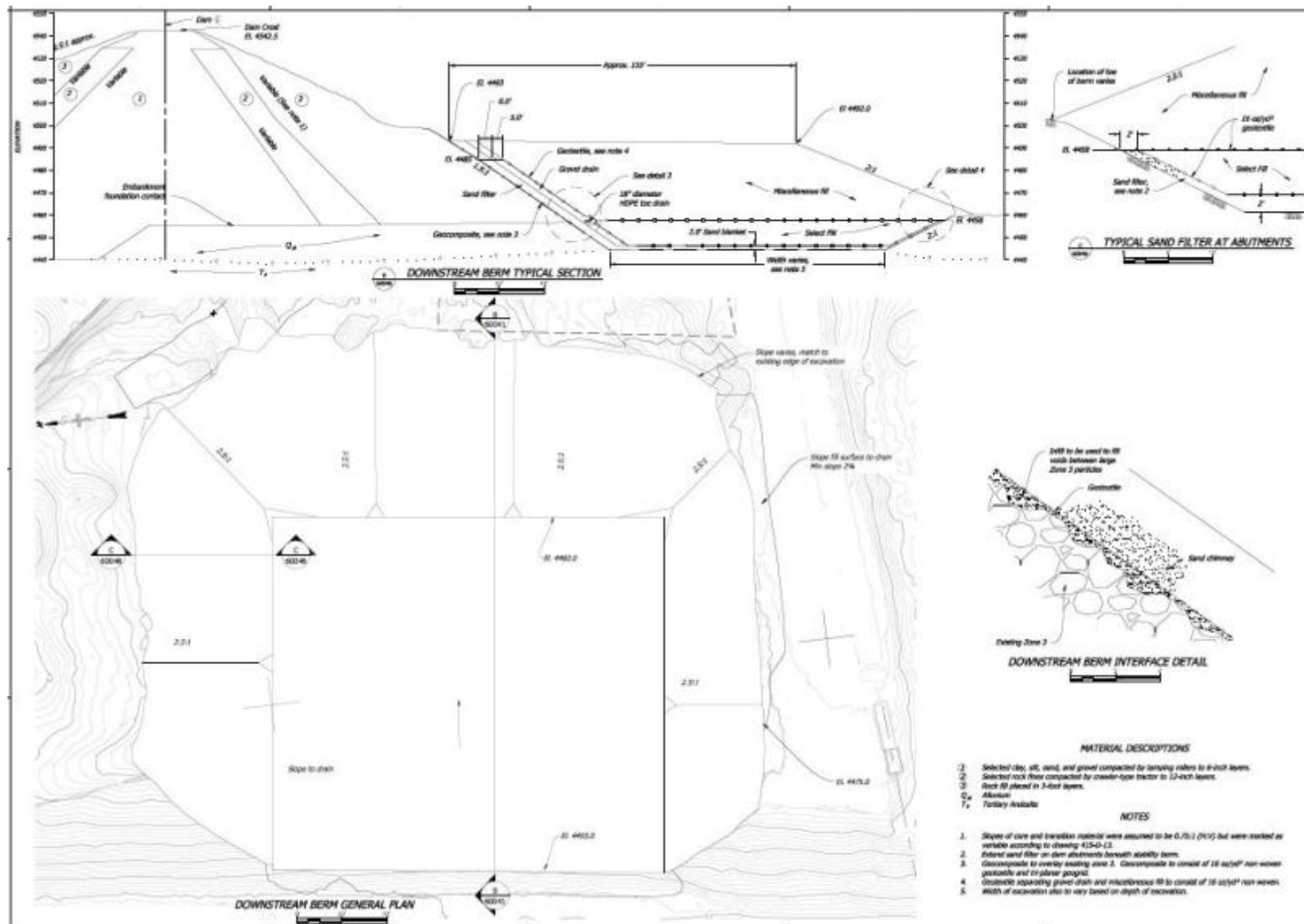


Figure 2-2. General Construction Plan.

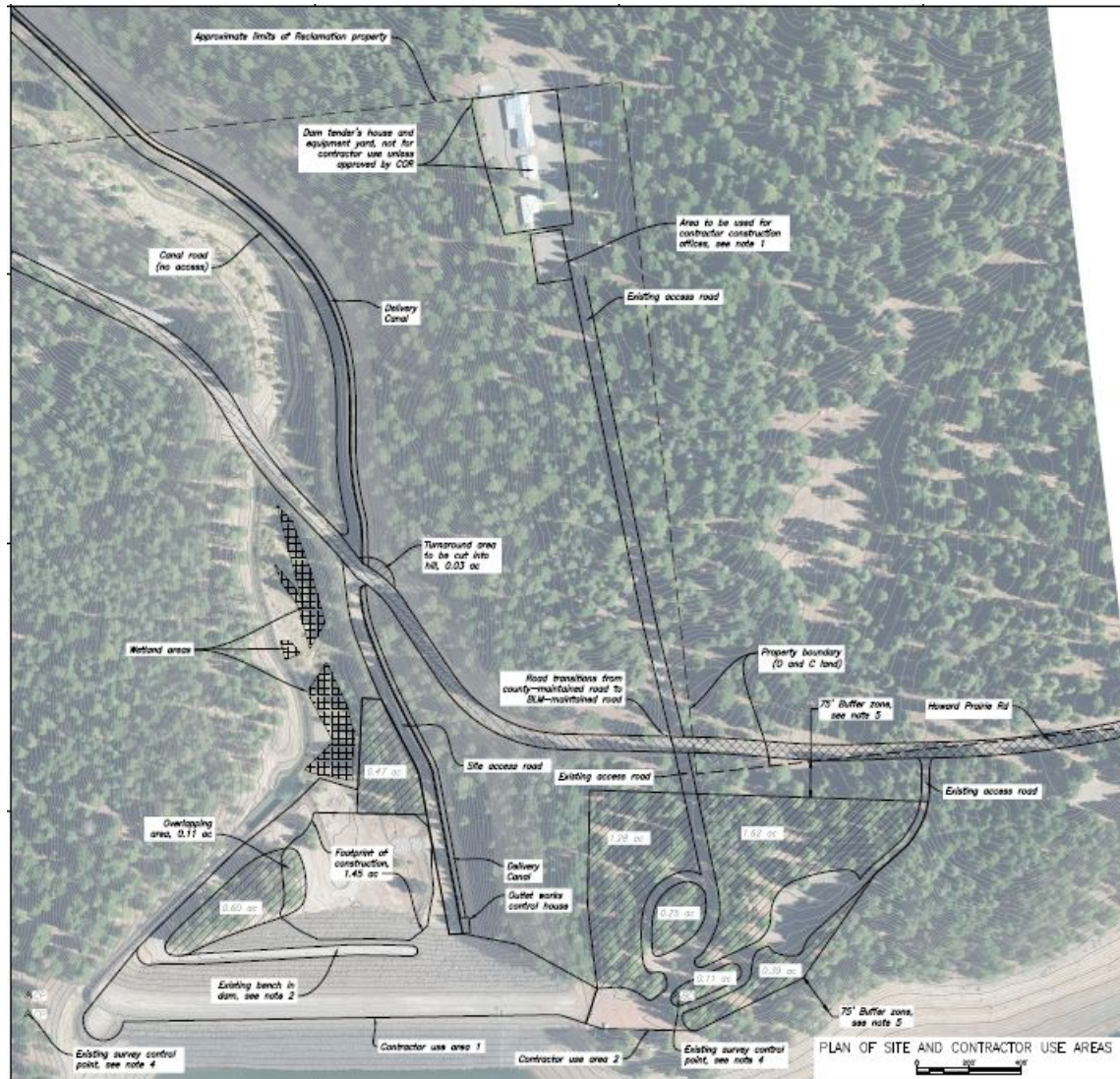


Figure 2-3. Site Use Map.

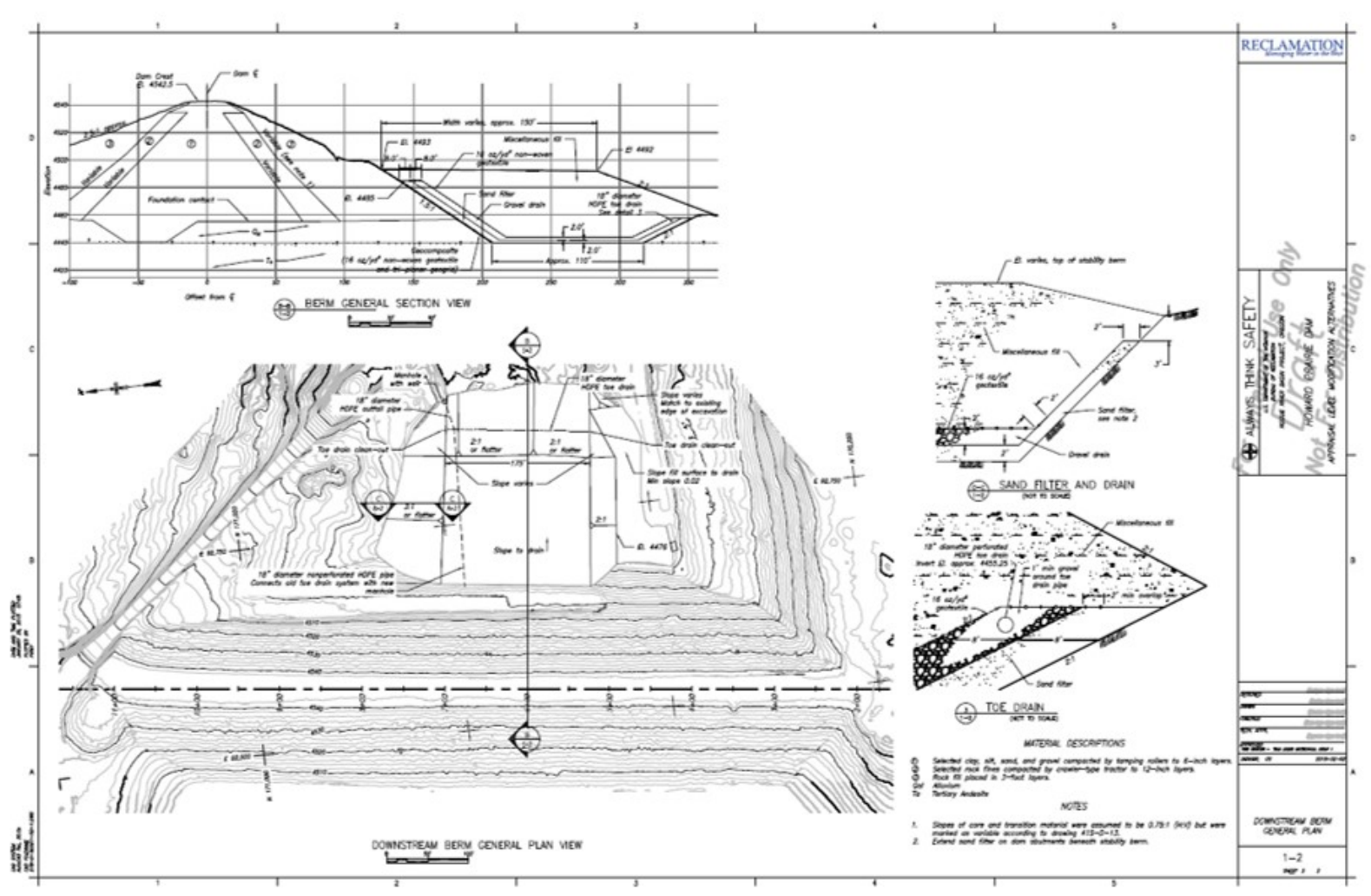


Figure 2-4. Howard Prairie Dam CAS Preferred Alternative design diagram.

2.3 Alternatives Considered or Eliminated

A dam breach alternative, two reservoir restriction alternatives, as well as five downstream modification alternatives, and twelve upstream build alternatives were developed and evaluated by the Reclamation Safety of Dams team of experts. Evaluation of the engineering alternatives under NEPA is not deemed appropriate, as the engineering feasibility and dam safety aspects of corrective measures and safe alternative selection is beyond the scope of NEPA. The alternatives considered and eliminated are outlined below to better explain the reason for the selection of the CAS Preferred Alternative and the elimination or rejection of potentially feasible alternatives.

2.3.1 Dam Breach Alternative

The dam breach alternative eliminates the risk of dam failure; however, it would not meet the purpose and need of the project, and it would result in complete loss of all the benefits provided by the reservoir. Most significant among the lost benefits is irrigation for communities within the Rogue River Basin Project, but other lost benefits include recreational, environmental, and economic benefits. This alternative would require removal of the dam and stabilization of the sediments within the reservoir, which would be very costly. Beaver Creek would flow into the Klamath River basin giving rise to inter-basin complexities and expenses. Flooding and erosion could have an adverse impact on existing infrastructure such as dams, irrigation facilities, recreation facilities, homes, businesses, and other improvements. In addition, this alternative does not meet the purpose and need of the proposed project; therefore, it was eliminated from further evaluation.

2.3.2 Reservoir Restriction Alternatives

Reservoir restriction refers to lowering the reservoir pool or, in this case, reducing the amount of water held in Howard Prairie Reservoir. Two reservoir elevations were considered: elevation 4500 and elevation 4490. A permanent reservoir restriction to elevation 4500 would reduce the estimated annualized failure probability to *Public Protection Guidelines* (section VII, Risk Reduction Analysis). A permanent reservoir restriction to elevation 4490 would achieve about the same risk reduction that the preferred alternative achieves. The reservoir capacity at the normal water surface elevation (4526.6) is about 62,000 acre-feet; the reservoir storage at reservoir elevation 4500 is about 17,000 acre-feet; and reservoir storage at elevation 4490 is about 12,000 acre-feet.

The discharge capacity of the outlet works is 170 ft³/s at normal water surface elevation 4526.6; however, releases are restricted to the Howard Prairie Delivery Canal capacity of 60 ft³/s. Modification to the existing downstream outlet works structure and canal carriage capacity would be required to maintain the reservoir restrictions. These alternatives were dismissed because of high construction cost compared to other alternatives (not including modification to increase reservoir release capacity); the economic cost resulting from a 70 percent reduction in reservoir storage and the resulting impact to power generation, recreation

and irrigation; long term ecological changes to the reservoir shoreline and vegetation; potential exposure of cultural resources; and that reconstruction of the dam may be needed after a large earthquake that causes excessive cracking.

2.3.3 Downstream Modification Alternatives

1-Concrete Shear Block

Install a concrete shear block at the downstream toe of the dam in conjunction with a compacted earth berm partially (one-third of the way) up the downstream slope. This alternative was eliminated due to cost considerations as compared to the preferred alternative.

2-Jet and Compaction Grouting

This proposal would involve jet or compaction grouting of the loose alluvial material near the downstream toe of the dam. This alternative was rejected based upon cost considerations, difficult construction requiring a specialty contractor, and difficulty in verifying foundation densification.

3-Soil Cement

This proposal consists of adding soil cement to the foundation downstream from the toe and placing a berm above the treatment zone. This alternative was dismissed because it is difficult to reliably test effectiveness of soil compaction; may not provide adequate strength gains; post-construction testing would be required; and high relative costs.

4-Drill and Install a Secant Pile Wall

This proposal consists of drilling and installing secant piles at or near the downstream toe. It is anticipated that the secant piles would function as a wall and could resist forces from a downstream slide. Each secant pile would likely be 2 to 3 feet in diameter and extend approximately 15 feet through the liquefiable alluvial material. This alternative was rejected due to high costs compared to the preferred alternative, and drilled secant piles may not provide adequate resistance to sliding forces of earthquake shaking.

5-Roller Compacted Concrete Shear Key

The purpose of this proposal was to replace the alluvium at the downstream toe with roller compacted concrete (RCC) to provide additional resistance to downstream failures. This alternative was rejected based on high cost and the need for a specialty contractor.

2.3.4 Upstream Build Alternatives

1-Reinforced Concrete Crest Slurry Wall

This alternative would increase the safety factor against stability failure on the upstream slope of the dam. It would require construction of a reinforced, concrete slurry trench-wall in the crest of the dam near the downstream shoulder. This alternative was rejected because of high cost and need for a downstream excavation and berm in addition to the reinforced concrete crest slurry wall.

2-Concrete Shear Key Block

This proposal provides a resistant force to buttress against upstream earth slide potential during a seismic event. This alternative was eliminated because a specialty contractor would be required to perform the work; higher costs; reservoir drawdown would disrupt project purposes during construction; and long-term disruption of project purposes would occur under drought conditions.

3-Roller Compacted Concrete Shear Key

This proposal would replace a portion of the alluvium at the upstream toe with RCC to provide additional resistance to upstream failures. This was rejected because of high costs, difficult construction, required reservoir drawdown, and reduced reservoir capacity.

4-Sheet Pile Structural Wall

The alternative would require installation of a sheet-pile wall along the centerline of the dam. The wall would be approximately 500 feet long and 50 feet deep. The wall would prevent overtopping of the dam during deformations of up to 40 feet. This alternative was dismissed because liquefiable materials are not removed, and it does not limit deformations as well as the other alternatives.

5-Secant Pile Wall through Centerline

Construct one row of secant piles along and near the centerline of the dam. The estimated pile width along the dam axis is 500 feet. This alternative was rejected because of constructability concerns that liquefiable materials would not be removed, and interlocking piles may be required to ensure stability.

6-Crest Widening

This alternative would increase the crest width of the dam and the associated berm downstream. The increased crest width would provide sufficient material to remain in place and prevent overtopping of the dam in the event the upstream face of the dam sloughs off during a seismic event. This alternative was dismissed because the abundance of material needed would require many hauling trips, causing impacts on local traffic and recreation; relative high costs; and potential impacts on the existing outlet works.

7-Jet and Compaction Grouting

This proposal would involve jet or compaction grouting of the loose alluvial material beneath the upstream Zone 3 of the dam. To maintain upstream embankment stability under seismic loading, it would be necessary to densify an estimated area that is 15 feet thick, 200 feet wide in the cross-valley direction centered near the maximum section of the dam, and about 40 feet wide in the upstream/downstream direction. This alternative was rejected because a reservoir drawdown would disrupt project purposes during construction; long-term disruption of project purposes would occur if drought conditions persist; and drawdown would impact water users during construction. The design team believed that jet or compaction grouting of the upstream foundation with an upstream berm could reduce seismic risk, but at a much higher cost than the preferred alternative. Also, compaction grouting could be ineffective at depths less than about 20 feet, so would have to be performed once the berm was constructed. Both a preconstruction test section and post-construction verification test would be required to confirm foundation densification. Also, difficult construction would likely require a specialty contractor.

8-Soil Cement

This alternative would strengthen the alluvium at the upstream toe to provide additional resistance to upstream failures. Major failure surfaces that contribute most to upstream deformations pass through the alluvium near the toe. Deep soil mixing is expected to increase the shear strength of the alluvium thereby providing additional resistance to upstream failures. The addition of the berm on top of the treatment area is intended to contain a portion of the failure surfaces within the treated soil and to provide additional resistance to failure surfaces that may intersect the berm. The added mass of the berm is also beneficial to the shear resistance of the underlying alluvium. This alternative was rejected because a reservoir drawdown would disrupt project purposes during construction; long-term disruption of project purposes would occur if drought conditions persist; drawdown of the reservoir would have an impact on water users during construction; difficult construction would require a specialty contractor; and the cost would be significantly higher than the preferred alternative.

9-Drill and Install Concrete Secant Piles

This proposal consists of lowering the reservoir to an estimated elevation of 4480. Once the reservoir is lowered, a temporary workbench would be constructed on the upstream face. From the bench, a series of holes would be drilled and filled with concrete and reinforcement. It is anticipated that the concrete secant piles would provide adequate resistance against upstream slide. Each secant pile would likely be 2 to 3 feet in diameter and extend approximately 15 feet through the liquefiable alluvial material. This alternative was rejected because it is a more expensive alternative; a specialty contractor would be; risk that the piles may not resist upstream movement during an earthquake; a reservoir drawdown would disrupt project purposes during construction; long-term disruption of project purposes would occur if drought conditions persist; and drawdown has an impact on water users during construction.

10-Excavate and Replace Liquefiable Materials

This alternative would excavate and replace liquefiable materials at the upstream toe across at least 200 feet along the embankment toe and extending about 50 feet upstream. It would also construct an upstream dirt berm with sheet pile driven along the centerline. Excavation and replacement of liquefiable material and the construction of the berm would be performed in above the ordinary high water mark. This alternative was rejected because it is one of the most difficult fixes to implement and would require a lengthy construction period. Also, this alternative is more expensive than the preferred alternative; reservoir drawdown would disrupt project purposes during construction; long-term disruption of project purposes would occur if drought conditions persist; and drawdown would have an impact on water users during construction.

11-Dredge Upstream Liquefiable Material and Replace with Rockfill

Dredge and remove liquefiable material upstream from the embankment. The dredged area would be along a 300 foot length (between station 5+00 and 8+00) and a 30-foot width, upstream from the embankment. The liquefiable material would be replaced with rockfill. Continue placing rockfill on the upstream embankment over the dredged area to provide additional weight. This alternative was rejected because a partial reservoir drawdown would disrupt project purposes during construction; high cost relative to other alternatives; long-term disruption of project purposes would occur if drought conditions persist; and drawdown of the reservoir would have an impact on water users during construction.

12-Roller Compacted Concrete Shear Key

This proposal would replace a portion of the alluvium at the upstream toe with RCC to provide additional resistance to upstream failures. An RCC shear block would increase the shear resistance on failure planes that pass through the upstream toe. The addition rockfill of on top of the treatment area would force failure surfaces into the shear key or through the berm. This alternative was rejected because it is more costly than the preferred alternative; requires a reservoir drawdown that would disrupt project purposes during construction; long-term disruption of project purposes would occur if drought conditions persist; drawdown would have an impact on water users during construction; and working behind a cofferdam poses greater safety risks.

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section describes the existing environment in the project area and evaluates the environmental impacts of implementing the proposed action to modify Howard Prairie Dam. Key resource areas that would likely be affected by the proposed action are analyzed in this EA, including air quality and climate change, water quality, vegetation and wetlands, fish and wildlife, threatened and endangered species, cultural resources, noise, and floodplains. In addition, this document evaluates effects on Indian Trust Assets (ITAs), Traditional Cultural Properties (TCPs), and environmental justice, as required by current Reclamation and

Department of the Interior policy. Where applicable, mitigation measures are recommended to reduce adverse environmental effects. The following resource areas will not be evaluated in this EA because they would not be impacted by the proposed action: land use, topography, and soils.

3.1 Public Safety and Health

As a result of studies performed, it has been determined that a high risk of dam failure currently exists. Dam failure due to earthquake-driven overtopping failure and earthquake-induced liquefaction would result in a likely flood wave producing medium-to-high-severity flooding, which could lead to many fatalities, property damage, and public infrastructure disruption.

The construction activities would have short-term impacts that would include increased noise, traffic, and dust. Howard Prairie Dam Access Road, Keno Road, and Dead Indian Memorial Road would be used to transport construction equipment and as a haul road for gravel and sand. Unavoidable temporary impacts would be experienced by the travelling public and recreationists in the area during the six or seven month construction period. Noise impacts would be localized in the area of potential affect (APE); noise from increased truck traffic may have an impact on recreationists using the facilities along the affected roadways. Dust would be periodic and highly localized to the APE.

3.1.1 No Action

The high probability of dam failure would persist with the no action alternative. No action would not reduce the risk of dam failure and would not meet the purpose and need of this EA.

3.1.2 CAS Preferred Alternative

The high probability of dam failure would be corrected with the implementation of the preferred alternative thereby reducing the potential impact on public safety. Construction of the preferred alternative would mitigate the potential of dam failure as a result of an earthquake. The most pronounced temporary impact would occur from the disruption of public road use, as haul trucks would make over 100 trips to and from the APE. Haul truck activity during the summer recreation season would have a temporary impact on outdoor recreation traffic and cyclists traveling to and from Howard Prairie Reservoir. A traffic control plan would be developed and implemented to reduce the impacts during mobilization and construction. Temporary noise impacts could occur during construction, although no blasting will occur, and noise effects would be localized in the APE. Well-muffled equipment would be used to reduce noise effects experienced by the public. Stakeholder coordination (especially with Jackson County Parks and BLM) would help mitigate public safety concerns and inconvenience. Timing restrictions would be used to minimize the temporary potential effect to public health and safety associated with project construction. Construction activities and equipment operation would be confine to daylight hours; holidays would be observed to reduce the potential for construction impacts on the public. Fugitive dust emissions from

project construction would be mitigated by the use of dust abatement best management practices (BMPs) at the construction site. Haul trucks carrying loads that have the potential for generating fugitive dust would require tarps.

3.2 Water Resources

Work on the Talent Division consisted of construction, rehabilitation, and improvement of the TID, MID, and RRVID facilities near Medford, Oregon, and provides for full and supplemental irrigation water for these lands. The work on the MID and RRVID included rehabilitation and betterment of Fourmile Lake Dam, Fish Lake Dam, and the numerous structures that are a part of the Main and Medford canals. Rehabilitation work on TID facilities included enlargement and extension of the distribution system. An extensive collection, diversion, storage, and conveyance system was constructed to carry excess waters of the Rogue River and Klamath River basins to the irrigated lands.

The TID consists of approximately 15,500 irrigable acres. MID has water supply for 11,500 acres, and RRVID has water supply for 8,300 acres. Additionally, the Talent Division provides electric power from the 16,000-kilowatt hydroelectric Green Springs Powerplant.

Principal features of the Talent Division include Howard Prairie Dam, Howard Prairie Delivery Canal, Keene Creek Dam, Green Springs Powerplant, the enlarged Emigrant Dam and Lake, and Agate Dam and Reservoir.

The Project supplies supplemental water for the MID and the RRVID. The MID diverts its water at Phoenix Diversion Dam, and the RRVID diverts its water at Jackson Street Diversion Dam.

To supply Project water a system of collection canals was constructed to divert surplus flows of the South Fork Little Butte Creek through a tunnel beneath the Cascade Divide from the Rogue River basin to Howard Prairie Reservoir in the Klamath River basin. Howard Prairie Dam stores diversions and Beaver Creek runoff. The Howard Prairie Dam delivery canal conveys water from the reservoir to Keene Creek Regulating Reservoir, which also regulates releases from Hyatt Reservoir. Water from Soda and Little Beaver Creeks is diverted into the delivery canal by Soda Creek Diversion Dam and Little Beaver Creek Diversion Dam. From Keene Creek Reservoir, a tunnel and conduit carry the water down to Green Springs Powerplant on Emigrant Creek. Emigrant Dam reregulates powerplant discharges for irrigation. Storage in Agate Reservoir on Dry Creek is enhanced by diverting water from Antelope Creek and Little Butte Creek.

Beaver Creek is an intermittent stream with flows that have been controlled by Howard Prairie Dam since original construction. Seeps emanating below the dam foster a small wetland complex that has been identified for avoidance during construction activities. See Site Use Map, Figure 2-3.

3.2.1 No Action Alternative

The high probability of dam failure would persist with the No Action Alternative. Dam failure due to earthquake-driven overtopping failure and earthquake-induced liquefaction, would likely result in a flood wave, producing medium-to-high-severity flooding, which could lead to many fatalities, property damage, and public infrastructure disruption. No action would not reduce the risk within acceptable standards and would not meet the purpose and need for this EA.

Seismic-induced Dam Failure

If Howard Prairie Dam were to fail, the resulting flood wave would cause dangerous flooding along Beaver Creek and Jenny Creek before entering Iron Gate Reservoir. Dam failure flows could be large enough to overtop and fail Iron Gate Dam. Failure of Iron Gate Dam would result in catastrophic flooding along the Klamath River for many miles downstream. Numerous towns, scattered residences, and tourist facilities would be flooded. The population-at-risk (PAR) upstream from Iron Gate Dam is about 60. An additional 1,900 people could be at risk if Iron Gate Dam fails as a result of a Howard Prairie Dam failure. Most life loss would likely occur as a result of an Iron Gate Dam failure. In addition, many highways and county roads as well as local utilities, bridges, and rail lines would be damaged. Water quality throughout the drainage would be adversely impacted due to erosion and sediment transport.

There are no seismic-induced dam failure inundation maps for Howard Prairie Dam. The flood inundation study that was used to estimate consequences for dam failure was completed in 1983 and was based on an extreme flood-induced failure of Howard Prairie Dam with the reservoir at the maximum water surface elevation of 4533.5 where the reservoir capacity is about 77,000 acre-feet. Flood routing, under those assumptions, overtopped Iron Gate Dam by 5 feet. A seismic-induced dam failure inundation study would use a starting reservoir elevation at the normal water surface elevation of 4526.6, where the reservoir capacity is about 62,000 acre-feet. In either case, Iron Gate Dam, an earthfill dam having a total reservoir storage capacity of about 58,000 acre-feet, would likely fail.

3.2.2 CAS Preferred Alternative

The preferred alternative would have no effect on water resources and irrigation. Normal operations of Howard Prairie Dam would continue uninterrupted during construction, as a reservoir drawdown would not be required with this downstream alternative.

Water quality impacts would not occur with this alternative as BMPs and resource avoidance practices would be implemented in accordance with all State and Federal requirements under the Clean Water Act. The U.S. Army Corps of Engineers (Corps), through their Regulatory Program, administers and enforces Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. A permit is required for work on structures in, over, or under, navigable waters of the United States. Under Section 404, a permit is required for the discharge of dredged or fill material into waters of the United States. Many waterbodies and wetlands in the Nation are waters of the United States and subject to the Corps' regulatory

authority including Howard Prairie Reservoir and Beaver Creek. This alternative is determined to be within the threshold requirements of Nationwide Permit No. 3a and 3c (Maintenance). Nationwide Permit No. 3a and 3c do not require Federal applicant permittees to submit a pre-construction notification to the Corps. Additional 401 Water Quality Certification specific conditions would be met in compliance with Oregon Department of Environmental Quality (ODEQ).

In addition, this alternative would comply with ODEQ 401 water quality general conditions to ensure water turbidity exceedances do not occur during construction. Turbidity monitoring protocols would be implemented to document water quality throughout all construction sequences. Implementation of resource avoidance and protection measures including the installation and maintenance of appropriate BMPs (such as straw wattles and retention basins) would protect Beaver Creek and adjoining wetlands in the project area.

3.3 Land Resources

The Cascade-Siskiyou National Monument (CSNM) was established by presidential proclamation of President William J. Clinton on June 9, 2000, in recognition of its remarkable ecology and to protect a diverse range of biological, geological, aquatic, archeological, and historic objects. The CSNM is the first monument set aside solely for the preservation of biodiversity. Due to several complex biological and geological factors and processes operating simultaneously, the monument contains an unusually high variety of species in a geographically small area. The CSNM was established as a new planning area independent of other Bureau of Land Management (BLM)-administered lands (<http://www.blm.gov/or/resources/recreation/csnm>).

The National Trails System Act of 1968 was created to ensure that visitors enjoy a meaningful recreation experience and to preserve the trail resources. The National Trails System Act identified and designated both National Historic and National Scenic Trails. A scenic trail is an extended trail offering maximum outdoor recreation potential allowing visitors to experience scenic, historical, natural, and cultural resources. The Pacific Crest Trail (PCT) is managed in accordance with the Comprehensive Management Plan for the Pacific Crest National Scenic Trail (USDA 1982) and the national interagency Memorandum of Understanding signed by the U.S. Forest Service, National Park Service, Bureau of Land Management (BLM), California State Parks, and the Pacific Crest Trail Association (2003). The BLM will not conduct thinning projects within 250 feet on either side of this trail (BLM, 2008).

3.3.1 No Action Alternative

This alternative would have no effect on the CSNM or the PCT unless the Howard Prairie Dam fails. See Section 1.2, Background - Safety of Dams Program, for additional information on the damaging effects of dam failure.

3.3.2 CAS Preferred Alternative

Temporary and minor impacts from construction activities, such as traffic disruptions, fugitive dust, and noise would occur. No long-term impacts on the CSNM or the PCT would occur with the preferred alternative. Stakeholder coordination, appropriate and effective BMPs (dust suppression and time of construction constraints) would be used to minimize temporary impacts inherent to heavy equipment operation and earth-moving construction activities.

3.4 Recreation

3.4.1 Jackson County Parks Outdoor Recreation

Reclamation owns the outdoor recreation facilities at Howard Prairie Reservoir, and Jackson County Parks and Recreation Department manages the facilities through a 50-year lease agreement (#14-06-100-6329) signed in 1968. Reclamation has recreation management oversight and cost-share authority to partner with Jackson County Parks to provide outdoor recreation opportunities to the public. Howard Prairie Reservoir attracts about 800,000 visitors per year, contributing millions of dollars to the local community. Jackson County Parks spends \$700,000 annually for recreation operations and maintenance and collects \$500,000 in user fees. There are seven developed recreation areas on the west and south sides offering camping, boating, sailing, fishing, hiking, picnic areas, boat ramps, marina, and resort and equestrian camping and trails. The PCT runs through the area.

The Howard Prairie Resort's (Resort) recreation facilities located along the west shore of the reservoir were developed in 1961. Campgrounds, a restaurant and store, marina, boat ramp and docks and day use facilities were completed by 1963.

The Resort is 155 acres including 1.63 miles of lake frontage. The Resort offers 200 campsites (full hook-up RV to tent sites), yurt and cabin rentals, restaurant, store, laundry facilities, restrooms with showers, trailer dump-station, fish-cleaning stations, accessible fishing jetty, hiking trails, day use areas and a full-service marina with fuel, docks and boat rentals. Basic campsites have fire rings only, and others have water, sewer and electric available.

The current marina at the Resort needs to be upgraded. Jackson County Parks and Reclamation plan to make improvements with a project that would replace the current marina with one that complies with the Americans with Disabilities Act (ADA); the marina would be available for use as long as the boat ramp is available. It is currently located approximately 12 to 16 feet higher than the end of the boat ramp, making it unusable in low water years. The new marina would be placed off the large day-use parking lot, approximately 500 feet north of its existing location (Lambert 2017).

Apserkaha Park on the south shore of Howard Prairie Reservoir is situated on 66 wooded acres and features nearly one-half mile of lake frontage (Figure 3-1). Camp facilities include a preparation kitchen and covered dining area that seats 80 people; twelve fully enclosed and lighted sleeping cabins; nine recreational vehicle (RV) sites with water and electrical

hookups; ADA compliant vault toilets; two group fire-pit gathering areas, showers; picnic tables; barbecue pits; and an easily accessible swimming beach. The Grizzly Recreation Area covers 80 acres, including 1.36 miles of lake frontage with views of Mt. McLoughlin. This park provides 21 campsites (no hookups), fishing, boating, hiking, and swimming. Klum Landing Park occupies 156 acres, including .94 miles of lake frontage. This park provides camping, a restroom and shower facility, boat ramp, fishing, boating, hiking, and swimming.



Figure 3-1. Howard Prairie Resort, County Park South.

Lily Glen Equestrian Recreation Area and Campground (Figure 3-2) near Howard Prairie Reservoir covers 40 acres and includes horse riding trails. It is used by equestrian groups throughout Oregon and Northern California. Lily Glen offers 12 campsites (no hookups) with corrals in every campsite, plus two group-camping areas that have additional corrals.

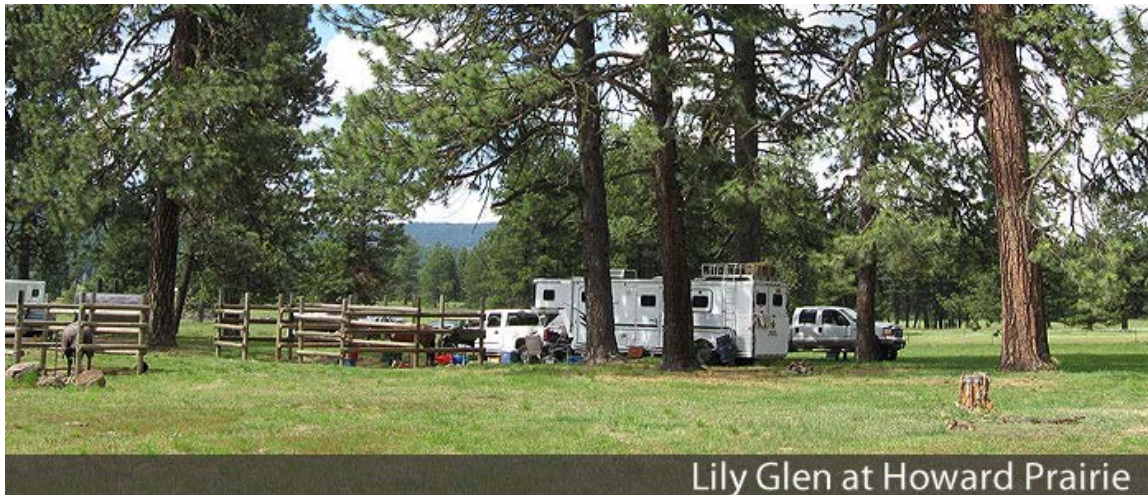


Figure 3-2. Lily Glen Equestrian Park at Howard Prairie Reservoir.

Sugar Pine Group Campground is 156 acres with .94 miles of lake frontage. This group area offers 11 basic campsites (no hookups) with 150-person capacity, a group fire ring, fire pits, barbecues, picnic tables, horseshoe pits, lake access, swim cove, greywater dumpsites and vault toilets.

Willow Point Recreation Area is located on 59 acres and includes .87 miles of lake frontage with views of Mt. McLoughlin. This park provides camping, boat ramp, fish cleaning, fishing, boating, hiking, and swimming and 41 campsites without hookups. (<http://jacksoncountyor.org/parks>).

3.4.2 Bureau of Land Management Outdoor Recreation

BLM manages the east side of Howard Prairie Reservoir. They do not have any developed outdoor recreation facilities. Outdoor recreation occurs in remote, dispersed areas, which are not officially designated recreation sites. Activities such as camping, fishing, off-road vehicle use, undeveloped boat ramps, hiking, boating, swimming and hunting occur with minimal structured BLM management oversight.

The CSNM was established by presidential proclamation of President William J. Clinton on June 9, 2000, in recognition of its remarkable ecology and to protect a diverse range of biological, geological, aquatic, archeological, and historic objects. With over 54,000 acres, CSNM is the first monument set aside solely for the preservation of biodiversity. Due to several complex biological and geological factors and processes operating simultaneously, the monument contains an unusually high variety of species in a geographically small area (BLM, 2008). Drawing from two different reports compiled by the scientific community as well as a legislation introduced in the Senate in 2015, the CSNM was expanded by presidential proclamation on January 12, 2017. This expansion will protect more than 42,000 additional acres of public land in Oregon and approximately 5,000 acres in California to increase vital habitat connectivity, watershed protection, and landscape-scale resilience for the area's unique biological values, particularly in the face of growing impacts from climate change (Whitehouse 2017).

3.4.3 No Action Alternative

This alternative would have no effect on recreation unless the Howard Prairie Dam fails. See Section 1.2, Background - Safety of Dams Program, for additional information as to damaging effects of dam failure.

3.4.4 CAS Preferred Alternative

Long-term impacts on recreation would not occur with this alternative. Reservoir drawdown for construction would not be necessary, and the pool level would remain within the average ranges throughout the construction process. The most pronounced temporary impact would occur as a result of potential public road use disruption, as haul trucks would make numerous trips to and from the APE. Haul truck activity during the summer recreation season would have a temporary impact on outdoor recreation traffic and cyclists traveling to and from Howard Prairie Reservoir. Substantive reservoir drawdown for construction would not be necessary, and the pool level would remain within the average ranges throughout the construction process. Temporary recreation impacts that would occur during construction could also result from construction noise, though no blasting would occur with project implementation and noise effects would be localized in the APE. Stakeholder coordination, especially with Jackson County and BLM, would help mitigate potential temporary impacts on recreation. Construction timing restrictions would be used to minimize the temporary impacts associated with project construction. Timing restrictions would confine construction operations to daylight hours, and holidays would be observed to reduce construction impacts on recreationists.

3.5 Threatened and Endangered Species and Migratory Birds

3.5.1 Listed Species

Mammals

Gray wolf (*Canus lupus*) – Gray wolf is a federally listed endangered species in Oregon west of highways 395 and 78. Until 2011, they were only known to occur in Oregon east of these highways. In September 2011, one radio-collared male wolf (OR-7) dispersed from the Innaha pack in northeastern Oregon. Since 2011, ODFW has been tracking OR-7's dispersal, which included some time in Northern California; ODFW's website has a map that shows their area of activity. Since March 2013, ODFW has documented that OR-7 has been most active in the southwest Cascades. In May 2014, ODFW reported that OR-7 had found a mate; in June, pups were confirmed. In January 2015, ODFW identified OR-7, his mate, and pups as the Rogue Pack, and the ODFW website's known-wolf-activity-map was updated on January 13, 2015. ODFW also identified the Keno Area of Known Wolf Activity (AKWA) at this time. In 2016, ODFW identified an AKWA for OR-33, another dispersing male. The northeast portion of the CSNM is within the Keno and OR-33 AKWAs. Effects from the proposed Howard Prairie Dam project are not expected, because the activities would not

disturb key wolf areas such as den and rendezvous sites, change prey availability, or increase public access in the area suspected to be used for denning and rendezvous sites (2017 BLM).

Birds

Northern spotted owl (*Strix occidentalis caurina*) –The U.S. Fish and Wildlife Service (USFWS) listed the Northern spotted owl as threatened under the Endangered Species Act in 1990. In 1994, the Northwest Forest Plan provided protections for the spotted owl and other species inhabiting late-successional forests in Washington, Oregon, and California. The spotted owl's first critical habitat designation came in 1992 and revised in 2008. A new final rule designating critical habitat was published in December 2012. USFWS first issued a recovery plan for the Northern spotted owl in 2008 and revised it in 2011. Several conservation public/private partnerships contribute to Northern spotted owl recovery. The two main threats to the Northern spotted owl's continued survival are habitat loss and competition from the barred owl, a species native to eastern North America.

The project location is within Northern spotted owl range; however, this site is not designated as Northern spotted owl critical habitat, and current forest conditions are not characteristic of Northern spotted owl nesting, roosting, or foraging habitat. Forest features that support nesting, roosting, and foraging are often found in older forests and include a multilayered, multispecies canopy with moderate to high canopy closure (60 to 90 percent) and key habitat and structural components, such as large cavities, broken tops, and large snags. Previously logged and historically grazed habitat in the surrounding area is not expected to support Northern spotted owl nesting, roosting, or foraging. Northern spotted owl movement through the site during dispersal is conceivable, and heavy equipment operation could potentially affect dispersal. Impacts from equipment operations would be temporary.

Amphibians, Invertebrates, and Crustaceans

Oregon spotted frog (*Rana pretiosa*) –The Oregon spotted frog was listed as threatened in 2014. This medium-sized frog ranges from 44 to 105 millimeters (mm) in body length. Females are typically larger (up to 105 mm) than males (up to 75 mm). This species breeds by 3 years old. Breeding occurs in February or March at lower elevations and in late May or early June at higher elevations. No Oregon spotted frog habitat exists within the Howard Prairie Dam project area. Most ground-disturbing activity is in forested upland habitat, which is not suitable for use for any Oregon spotted frog life stages. The small amount of wetland habitat that will be disturbed at the foot of the dam is adjacent to a highly disturbed stream channel that does not provide habitat for Oregon spotted frogs (BLM 2017).

Vernal pool fairy shrimp (*Branchinecta lynchi*) –The vernal pool fairy shrimp was listed as threatened in September 1994. Critical habitat was designated in 2003. A recovery plan was published in 2005. A 5-year review was conducted in 2007. Vernal pool fairy shrimp are translucent, slender crustaceans (relatives of lobsters, crabs, saltwater shrimp and barnacles). They are generally less than 2.5 centimeters (1 inch) in length, and swim on their backs by slowly moving their 11 pairs of swimming legs. They are unusual in that they also use these legs for breathing and feeding. They eat algae and plankton by scraping and straining them from surfaces within the vernal pool. They produce a gluey substance and mix it with their

food before eating. Fairy shrimp are defenseless, so they occupy temporary ponds where aquatic vertebrate predators cannot survive (USFWS 1994). Vernal pools do not occur within the project area.

Plants

Gentner's fritillary (*Fritillaria gentneri*) –Gentner's fritillary was federally listed as threatened without critical habitat in 1999. A recovery plan was published in August 2003. This perennial plant in the lily family (*Liliaceae*) has straight, smooth lily-type leaves that are sometimes mottled with purple. The robust stem can reach 45 centimeters (1.5 feet) high. Gentner's fritillary produces reddish-purple flowers with pale yellow streaks that measure 2.5 to 5 centimeters (1 to 2 inches) long. Flowering typically occurs from April to June (USFWS 1999). The Howard Prairie Dam project would not affect habitat and would not occur within the range of the Gentner's fritillary.

Large-flowered woolly meadowfoam (*Limnanthes floccosa ssp. Grandiflora*) –. Large-flowered woolly meadow foam was listed as endangered in 2002. Critical habitat was designated in July 2010. Large-flowered woolly meadowfoam is an annual species in the meadowfoam family (*Limnanthaceae*). Plants measure 5 to 15 centimeters (2 to 6 inches) tall and pubescence is sparse on the stems and leaves. The flowers, especially the calyx (set of outermost flower leaves) are pubescent. Flowering typically occurs from April through May (USFWS 2002). The Howard Prairie Dam project would not affect habitat and would not occur within the range of Large-flowered woolly meadowfoam.

Cook's lomatium (*Lomatium cookii*) –Cook's lomatium was listed as endangered in 2002 (USFWS 2002). Critical habitat was designated in July 2010. Cook's lomatium is a small perennial plant (1.5-5 diameter or 0.5-1.6 feet tall) in the parsley family (*Apiaceae*), with a slender, twisted taproot. The taproot often branches at ground level, forming multiple stems. An umbel of pale yellow flowers develops boat-shaped fruits 8 to 13 mm (0.3-0.5 inches) long with thickened margins. The leaves are smooth, finely dissected, and strictly basal. Flowering typically occurs from mid-March through mid-May (USFWS 2002). The Howard Prairie Dam project would not affect habitat and would not occur within the range of Cook's lomatium.

3.5.2 Migratory Birds

Migratory Bird Treaty Act (MBTA) of 1918 (16 USC. 703-712) makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to Federal regulations. The migratory bird species protected by the MBTA are listed in 50 CFR 10.13.

The original 1918 statute implemented the 1916 convention between the United States and Great Britain (for Canada) for the protection of migratory birds. Later amendments implemented treaties between the United States and Mexico, the United States and Japan, and the United States and the Soviet Union (Russia).

(<https://www.fws.gov/laws/lawsdigest/migtrea.html>)

Basically, the MBTA protects birds from people. When Congress passed the MBTA in 1918, it codified a treaty already signed with Canada (then part of Great Britain) in response to the extinction or near-extinction of a number of bird species that were hunted either for sport or for their feathers. According to the USFWS, “the MBTA provides that it is unlawful to pursue, hunt, take, capture, kill, possess, sell, purchase, barter, import, export, or transport any migratory bird, or any part, nest, or egg or any such bird, unless authorized under a permit issued by the Secretary of the Interior. Some regulatory exceptions apply. Take is defined in regulations as: pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect.” (<http://www.audubon.org/news/the-migratory-bird-treaty-act-explained>).

CSNM is situated where the Klamath, Siskiyou, and Cascade mountain ranges converge, setting the stage for a diverse range of plant and animal habitat. The monument contains the following five distinct ecoregions identified in the proclamation: (1) grassland and shrubland (including unusual rosaceous chaparral), (2) Garry and California oak woodlands, (3) juniper scablands, (4) mixed conifer and white fir forests, and (5) wet meadows and riparian forests. In addition, there are areas of old-growth forest that provide required habitat for several species.

As many as 202 bird species have been reported from the monument. In addition to its importance to particular species of concern, including Northern spotted owl, Great gray owl, Peregrine falcon, and Willow flycatcher. (Audubon Portland.org 2015).

3.5.3 No Action Alternative

This alternative would have no effect on threatened and endangered species (Gray wolf, Northern spotted owl, Oregon spotted frog, Vernal pool fairy shrimp, Gentner’s fritillary, Cook’s lomatium) and migratory birds, unless the Howard Prairie Dam fails. See Section 1.2, Background - Safety of Dams Program, for additional information on the damaging effects of dam failure.

3.5.4 CAS Preferred Alternative

Threatened and Endangered Species

This alternative would have no effect on threatened and endangered species (Gray wolf, Oregon spotted frog, Vernal pool fairy shrimp, Gentner’s fritillary, Cook’s lomatium except for Northern spotted owl which may affect but is not likely to adversely affect.

A February 6, 2017, letter of concurrence was received from the USFWS with a concurrence of “may affect, and is not likely to adversely affect Northern spotted owl,” The letter of concurrence is in agreement with the *Biological Assessment for Activities in the Cascade-Siskiyou National Monument, the Parsnip Lakes Oregon Spotted Frog Site Management Actions, and the Howard Prairie Dam Project —An Assessment of Effects to the Northern Spotted Owl and Oregon Spotted Frog Medford District Bureau of Land Management* (BLM 2017). Reclamation has determined that the removal of 5 acres of dispersal-only habitat

associated with the preferred alternative may affect, and is not likely to adversely affect Northern spotted owls in the Jenny Lend watershed for the following reasons:

- Currently the watershed has less than 50 percent in dispersal habitat. While this is usually an indicator of adverse effects to dispersal habitat, the area where the removal would occur is in an area that is already impacted by the existing dam and by recreational sites in the area. The 5 acres of removal is resulting from eight separate smaller areas, with the largest being 1.62 acres. It is unlikely these small acres of removal would have adverse impacts on dispersing Northern spotted owls.
- The removal of 5 acres of dispersal-only habitat within this watershed would not preclude owls from dispersing throughout the watershed and would result in an insignificant and discountable reduction of dispersal-only habitat in the watershed. Removing this habitat would reduce the dispersal-only habitat in watershed by only 0.01 percent.
- Removing 5 acres of dispersal-only habitat outside of critical habitat would not preclude owls from dispersing throughout the action area. Removing dispersal-only habitat would reduce the total dispersal habitat in the action area by 0.01 percent.

Migratory Birds

The impact on migratory birds would be temporary with this alternative as tree and shrub removal would be limited to the fall during non-nesting season. Temporary impacts would be due to inadvertent displacement effect on migratory birds that may use the 5-acre project area (See Figure 2-3). Displacement impacts to migratory birds during construction would be expected from the operation of heavy equipment. Project completion is expected in one season (April – November) depending on weather conditions.

Impacts on migratory birds would be minimized by the timing of vegetation removal avoiding take of any migratory bird, or the parts, nests, or eggs.

3.6 Vegetation

The area of potential effect (APE) is largely comprised of previously disturbed land as the result of Howard Prairie Dam construction, operation and maintenance, past logging practices, grazing, and recreational activities. These activities have resulted in compacted soils, hardened surfaces, and invasive plant encroachment. It is estimated that up to 100 trees over 12 inches in diameter would be removed for project purposes. The trees would be uprooted retaining the root-ball and stockpiled on site for future use in stream habitat restoration projects in the Rogue Valley. Salvaged trees and rootwads would be used in large woody material installations within the Rogue River Basin Project to satisfy the 2012 Rogue Biological Opinion requirement to increase weighted usable area for juvenile Coho Salmon. Wood plays a large role in stream channel complexity and functions. The many functions that wood plays in the streams are important for Coho Salmon habitat.

Other vegetation disturbance would include various shrub species such as Oregon grape, Birchleaf mountain mahogany, and Rabbitbrush. Shrub species and other organic detritus

would be salvaged and utilized in the restoration of the Howard Prairie Dam project area as mulch and wildlife habitat toward natural-like conditions.

3.6.1 No Action

This alternative would have no effect on vegetation and waters of the United States unless the Howard Prairie Dam fails. See Section 1.2, Background - Safety of Dams Program, additional information on the damaging effects of dam failure.

3.6.2 CAS Preferred Alternative

Approximately 5 acres of forested land would be cleared of successional evergreens and understory shrubs for staging and implementing the project (See Site Use Map, Figure 2-3). Areas were selected by Reclamation and BLM to avoid high-value habitat as much as possible. Forested areas on steep and uneven land, near roads and near Beaver Creek would not be cleared to retain visual and ecological benefits. Contractor use areas have been selected predominantly in areas previously disturbed.

3.7 Climate Change and Greenhouse Gases

Climate in this area of elevated terrain along the west slope of the southern Cascades is moderate with most precipitation (55 inches on average) falling as snow during the winter months.

Reclamation is required to consider potential climate change impacts when developing NEPA and other decision documents. The Council on Environmental Quality (CEQ) has issued draft guidance on climate change that requires Federal agencies to determine (1) whether and to what extent their actions may affect climate change, and (2) how climate change may affect their actions.

To address climate change in long-term planning, Reclamation and other Federal agencies developed a literature synthesis on climate change. Reclamation's Technical Service Center Water Resources Planning and Operations Support Group reviewed and developed a region-specific literature synthesis to address regional climate predictions. Human activities contribute to climate change primarily by releasing billions of tons of carbon dioxide (CO²) and other heat-trapping gases (greenhouse gases) into the atmosphere every year (NRC 2010). These activities are primarily responsible for the observed 1.5 degree Fahrenheit increase in 20th century annual-averaged temperatures in the Pacific Northwest (IWW 2012). Vehicles are a significant source of greenhouse gas emissions and contribute to global warming primarily through the burning of gasoline and diesel fuels. Generally, emissions have relatively short lifespans in the atmosphere, and they lose potency to cause adverse health conditions as they disperse. However, unlike other pollutants, CO² has a lifespan in the atmosphere of hundreds of years; overtime, the effects build up rather than disperse, because of the long lifespan. National estimates show that the transportation sector, including construction activities, accounts for almost 30 percent of total domestic CO² emissions. In

Oregon, construction-based emissions make up 5.4 percent of the State's consumption-based emissions (ODEQ 2013a).

Climate change poses a risk to western water management. In 2011, Reclamation released a report to Congress that shows several increased risks to water resources in the western United States during the 21st century. Specific projections include the following:

- A temperature increase of 5 to 7 degrees Fahrenheit.
- A precipitation increase over the northwestern and north-central portions of the western United States and a decrease over the southwestern and south-central areas.
- A decrease for almost all of the April 1 snowpack, a standard benchmark measurement used to project river-basin runoff.

Climate variability involves fluctuation in weather and climatic conditions during the coming months, years, and decades. Climate change involves a shift in climatic variations, usually measured over several decades.

The Pacific Northwest is best known for its vast coastline and rainy weather. The region is home to the Cascade Mountain Range that runs north and south through Washington and Oregon, resulting in large climatic differences on the western and eastern sides of the range. West of the mountains, year-round temperatures are mild, winters are wet, and summers are dry. East of the mountains is typically sunnier and drier throughout the year; winters are colder, and summers can be significantly hotter.

Over the last century, the average annual temperature in the Pacific Northwest has risen by about 1.3 degrees Fahrenheit. Temperatures are projected to increase by approximately 3 to 10 degrees Fahrenheit by the end of the century, with the largest increases expected in the summer. Precipitation in the region has seen a decline in both the amount of total snowfall and the proportion of precipitation falling as snow. Declines in snowpack and streamflows have been observed in the Cascades in recent decades. In Washington State, record low snowpack values were measured in April 2015 and in 74 percent of long-term monitoring stations. Changes in average annual precipitation in the Northwest are likely to vary over the century. Summer precipitation is projected to decline by as much as 30 percent, with less frequent but heavier downpours (<https://www.epa.gov/climate-impacts/climate-impacts-northwest>).

Air pollutants of greatest concern in Oregon are ground-level ozone (smog), PM2.5 (fine particulate matter), and air toxics. Howard Prairie Dam is located in an area of air quality attainment of PM2.5 exceedances in 2014 attributable to smoke from forest fires. Ozone (smog) did not exceed the Federal health standard in any community. Air toxics such as benzene and acetaldehyde, remain near or above the health benchmarks. Carbon monoxide, nitrogen dioxide, sulfur dioxide, lead, and PM10 (large particulate matter) were far below the Federal health standard with pollutants trending downward (ODEQ 2014 – Ambient Air Quality in Summary).

3.7.1 No Action

This alternative would have no effect on climate change and greenhouse gasses unless the Howard Prairie Dam fails. With dam failure, clean-up and restoration of flood damaged areas and facilities would emit greenhouse gasses and require the investment of energy intensive construction efforts and materials contributing to greenhouse gas and climate change.

3.7.2 CAS Preferred Alternative

Construction activities may result in a minimal increase in greenhouse gas emissions. Greenhouse gas emissions caused by construction would be caused by, primarily, equipment fuel. The proposed action would not have significant impacts on climate change.

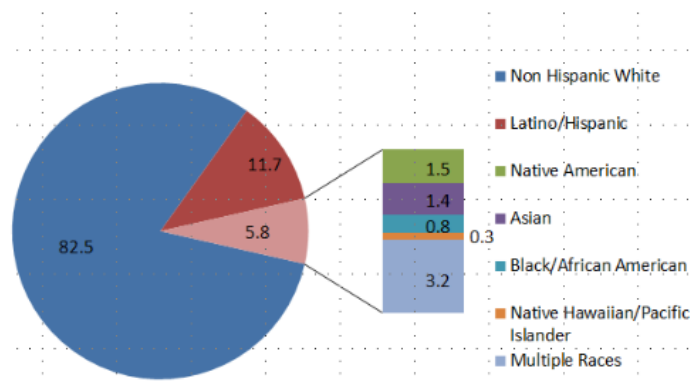
3.8 Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, dated February 11, 1994, requires agencies to identify and address disproportionately adverse human health or environmental effects of their actions on minorities and low income populations and communities, as well as the equity of the distribution of the benefits and risks of their decisions, and allow all portions of the population a meaningful opportunity to participate in the development of, compliance with, and enforcement of Federal laws, regulations and policies, affecting human health or the environment regardless of race, color, national origin or income. Environmental justice addresses the fair treatment of people of all races and incomes with respect to actions affecting the environment. To comply with the environmental justice policy, agencies are to identify and evaluate any anticipated effects, direct or indirect, from the proposed project, action, or decision on minority and low-income populations and communities, including the equity of the distribution of the benefits and risks. If a minority or low-income population is identified, appropriate outreach actions would be initiated to ensure dissemination of information and participation.

U.S. Census Data shows the Latino population grew 79 percent from 2000 to 2010. This may be underestimated, since migrant and seasonal-worker populations may not be included in census data.

Trends in Jackson County Demographics - 2013

2013 US Census data estimates that about 11.7% of the Jackson County population is Latino or Hispanic. Since migrant and seasonal worker populations may not be included in census data, the number may be an underestimate.



Source: US Census Data

Figure 3-3. Trends in Jackson County Demographics, 2013 (J. Noone 2015).

Howard Prairie Dam in Jackson County reflects a less inequitable composite than the Nation as a whole, yet does exhibit a notable level of ethnic inequity in the distribution of wealth, health services, education, employment, and other socioeconomic indices, with Latinos representing the great majority of those underserved (see Figure 3-3 and Figure 3-4).

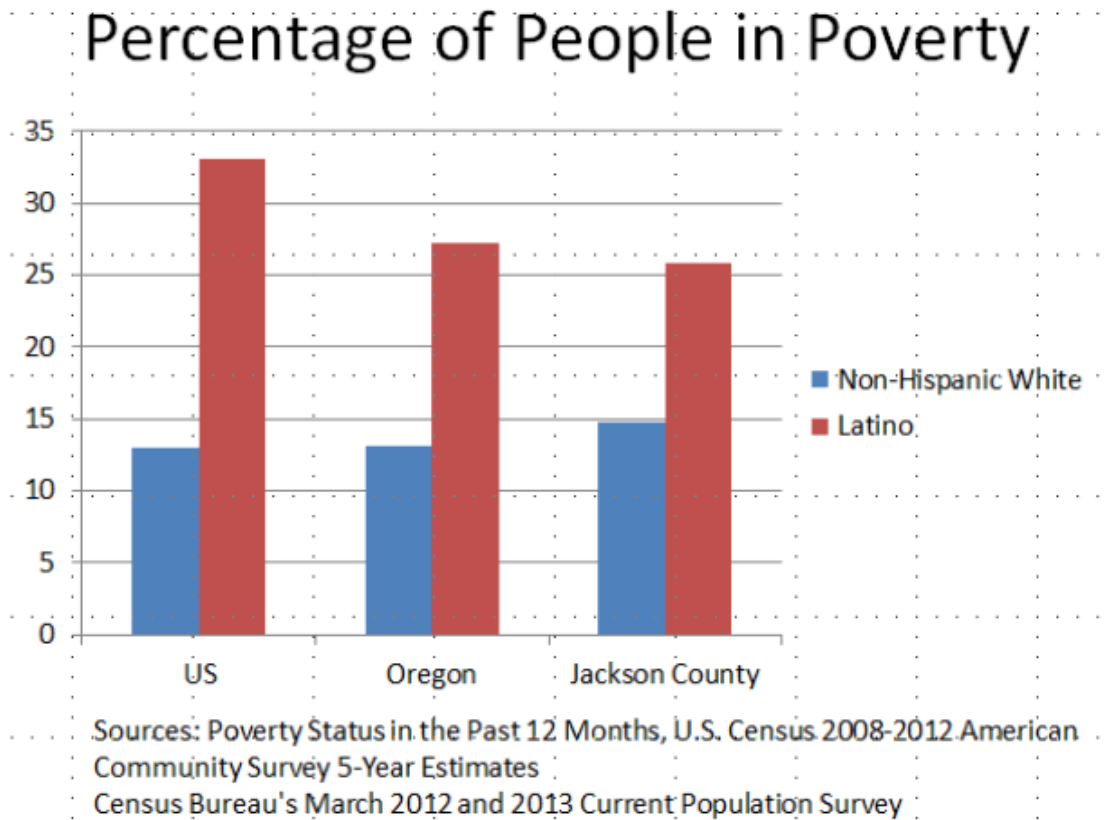


Figure 3-4. Comparison of the percentage of people in poverty for Jackson County, Oregon State, and the United States (J. Noone, 2015).

3.8.1 No Action

This alternative would have no effect on environmental justice in minority and low-income populations unless the Howard Prairie Dam fails. As a result of less water availability for beneficial use, the likely loss of agricultural-based employment would result. A substantive portion of migrant and seasonal farm labor is made up of Latinos in Jackson County. Implementation of this alternative could have a disproportionate adverse impact on low income and minority populations in the Rogue Valley.

3.8.2 CAS Preferred Alternative

The CAS preferred alternative would not have a disproportionate or adverse impact on low income and minority populations in the Rogue Valley, as no change in current system operations would occur.

3.9 Cultural Resources

The project area is situated on the Dead Indian Plateau, an area heavily forested but with gentle topographic relief within the Klamath watershed of the southern Cascades. Mt. McLoughlin, at elevation 9495 feet, rises to the northeast. Project area elevations range from 4500 to 4600 feet above sea level. The dominant peaks in the immediate vicinity are Brush Mountain (El. 6420) and Little Chinquapin Mountain (El. 5725).

Vegetation is characterized by a mixed conifer community consisting of Douglas fir, sugar pine, ponderosa pine, incense cedar, white fir, broadleaf maple, madrone, and white pine. Understory vegetation is made up of chinquapin, yew, vine maple, manzanita, ceanothus, huckleberry, salal, Oregon grape, and California blackberry. Meadow and riparian species (e.g., willow, camas, wild onion, meadow grasses, and introduced and invasive species) are found in the open prairies

The geology of the Dead Indian Plateau is based on Oligocene and Miocene volcanic activity with andesite and basalt deposits the result of numerous volcanic eruptions. Pleistocene glacial activity further contributed to the geomorphology with glacial lakes giving way with a warming climate to seasonally wet meadows or “prairies” of rich ecotones that support a variety of wildlife and plant resources. Soils are well-drained, cobbled loams (up to 36 inches deep, depending on slope) overlying weathered bedrock with slight amounts of decomposing plant material confined to the upper 1 to 2 inches. Slope within the project area ranges from 1 to 15 percent. (www.websoilsurvey.nrcs.usda.gov/app/websoilsurvey.aspx).

3.9.1 Background Data Research and Previous Investigations

While little formal documented archaeological research has been undertaken on the Dead Indian Plateau near the project area, the archaeological record of southwest Oregon reflects continuous human occupation for at least the previous 9,000 years. Isolated Clovis Points, indicative of a Paleo-Indian presence, have been found at several southern Oregon locations, including Green Springs Summit, approximately 8 miles southwest of the project area, and

Little Hyatt Lake (Grey 1994:4), approximately 7 miles southwest. Excavations in the Rogue River canyon to the west indicated established early occupation of the Rogue River drainage up to 9,000 years. To the east, excavations in the Klamath River basin by Cressman in the 1930s established early, pre-Mazama occupations extending back at least 6,600 years. Grey's analysis of artifacts from Fish Lake, approximately 10 miles north of Howard Prairie Reservoir, suggested seasonal occupation of the uplands in the southern Cascades extending back some 7,000 years.

Human use and occupation continued from the Paleo-Indian to the historic period, as attested to by the Lithia Springs' site, a prehistoric village site near the Ashland plaza (Olmo 1990; LaLande 1997), and a Shasta village excavation site at the mouth of Jenny Creek. Several prehistoric sites were recorded and tested during the 1950s and 1990s by Reclamation in the Emigrant Reservoir project area, west of and topographically lower than the APE (Newman 1959; Galm 1993).

The plateau has supported several large surveys, primarily the result of Federal timber projects. In the 1970s, Dr. J. Hopkins of Southern Oregon State College compiled student notes on known, suspected sites in the Rogue Valley and Dead Indian Plateau. Several sites near Howard Prairie Reservoir were minimally documented. Two of the so-called Hopkins sites were relocated and documented in 2006 by J. Joyer, Rogue River and Siskiyou National Forest Service archaeologist, under contract with Reclamation.

Pre-field literature search was completed by examining Reclamation's Cultural Resource GIS database, the BLM/Medford District site and survey data, and the Oregon State Historic Preservation Officer (SHPO) online archaeological and historical sites databases.

Reclamation notified the following Tribes and requested consultation in a letter dated January 20, 2012: Confederated Tribes of Grand Ronde Community, the Confederated Tribes of Siletz, and the Klamath Tribes. To date, no responses have been received.

3.9.2 No Action Alternative

This alternative would have no effect on cultural resources unless the Howard Prairie Dam fails. Dam failure would likely result in short-term impacts by exposing cultural resources to context disturbance or illegal collection resulting in an adverse effect on cultural resources. These short-term impacts on cultural resources could give rise to mitigation requirements, such as increased security measures, archaeological site recordation, data recovery and Government-to-Government communication. Long-term consequences due to disturbance and loss of cultural resources could also occur as a result of dam failure.

3.9.3 CAS Preferred Alternative

The SHPO responded to Reclamation's report of archaeological investigations for this project in concurrence that the project will likely have no effect on any significant archaeological objects or sites. In the unlikely event an archaeological object or site (i.e., historic or prehistoric) is encountered during project implementation, all ground disturbance at the location should cease immediately until a professional archaeologist can be contacted to

evaluate the discovery. Under State law (ORS 358.905-955 & ORS 97.740) archaeological sites, objects and human remains are protected on both public and private land in Oregon.

3.10 Historic Resources

The National Historic Preservation Act (NHPA) of 1966 (16 USC 470, P.L. 95-515) requires that Federal agencies complete inventories and site evaluation actions to identify historic resources that may be eligible to the National Register of Historic Places (National Register), and then ensure those resources “are not inadvertently transferred, sold, demolished, substantially altered, or allowed to deteriorate significantly.” Regulations entitled “Protection of Historic Properties” (36 CFR 800) define the process for implementing requirements of the NHPA, including consultation with the appropriate State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation.

An Administrative Draft historic context statement was submitted to Oregon SHPO in 1999, wherein the Rogue River Basin Project Historic District was determined to be eligible for the National Register. As a contributing structure to the Rogue River Basin Project Historic District, Howard Prairie dam was determined eligible by the SHPO on June 15, 2016.

3.10.1 No Action Alternative

This alternative would have no effect on historic resources unless the Howard Prairie Dam fails. Dam failure would result in adverse effect to the structure. See Section 1.2, Background - Safety of Dams Program, for additional information about dam failure.

3.10.2 CAS Preferred Alternative

SHPO concurred in June 2015 that the Howard Prairie Dam is eligible for listing in the National Register of Historic Places and the project represents an adverse effect by altering the appearance of the dam. SHPO and Reclamation are developing a memorandum of agreement (MOA) toward mitigating the adverse effect that will be commensurate with the scale of the adverse effect and will be accessible as possible to the public. While there is significant flexibility in the forms that mitigation can take, the location of the resource within a recreation area provides unique opportunities to provide education and information for the project in addition to the more standard Oregon State Level Documentation. Mitigations to include a public interpretive site at Howard Prairie Resort; determination of eligibility of the Howard Prairie Damtender Complex, and if found eligible, formal documentation; and monitoring by a qualified archaeologist any ground disturbance due to project activities of equipment, materials staging areas. Additionally, further documenting and updating of existing documentations for the Rogue River Basin Historic District will be considered. Indian Trust Assets and Sacred Sites

3.10.3 Indian Trust Assets

Indian Trust Assets (ITAs) are legal interests in property or rights held in trust by the Federal Government for federally recognized Indian Tribes or individual Indians. Trust status originates from rights imparted by treaties, statutes, or executive orders. Examples of ITAs include lands, minerals, instream flows, water rights, and hunting and fishing rights. A defining characteristic of an ITA is that an asset cannot be alienated, sold, leased, or used for easement without approval from the United States. The *DOI's Departmental Manual Part 512.2* defines the responsibility for ensuring protection of ITAs to the heads of bureaus and offices. DOI is required to protect and preserve Indian Trust Assets from loss, damage, unlawful alienation, waste, and depletion. It is the responsibility of Reclamation to determine if the proposed project has the potential to affect ITAs. There are no identified Indian Trust Assets or Sacred Sites within the area of potential effect for the proposed project. Correspondence was sent on May 3, 2016, to the Confederated Tribes of Siletz, Confederated Tribes of the Grand Ronde Community, Cow Creek Band of Umpqua Indians, Klamath Tribes, and Quartz Valley Indian Reservation to ascertain if they had any concerns or information pertaining to archaeological sites, areas of cultural importance, or sacred sites within or near the APE. No Tribal responses have been received.

3.10.4 No Action

There are no identified Indian Trust Assets or sacred sites within the area of potential effect.

3.10.5 CAS Preferred Alternative

There are no identified Indian Trust Assets or sacred sites within the APE. Reclamation notified the following Tribes and requested consultation in a letter dated January 20, 2012: Confederated Tribes of Grand Ronde Community, the Confederated Tribes of Siletz, and the Klamath Tribes. To date, no responses have been received.

3.11 Air Quality and Noise

The EPA has designated all areas in the region as meeting attainment, yet the project area does not contain an active air quality monitoring program. The nearest air quality monitoring program, located in Jackson County, provides historic air quality data reflecting “good” with a few minor various to “moderate” conditions. This rating indicates that atmospheric conditions in the area would likely limit dispersion of any potential contaminants.

The EPA defines noise as unwanted or disturbing sound. Currently, the primary noise sources within the project area include boating activity, traffic, and operational military aircraft located at Altus Air Force Base. See Figure 3-5 for average sound levels.

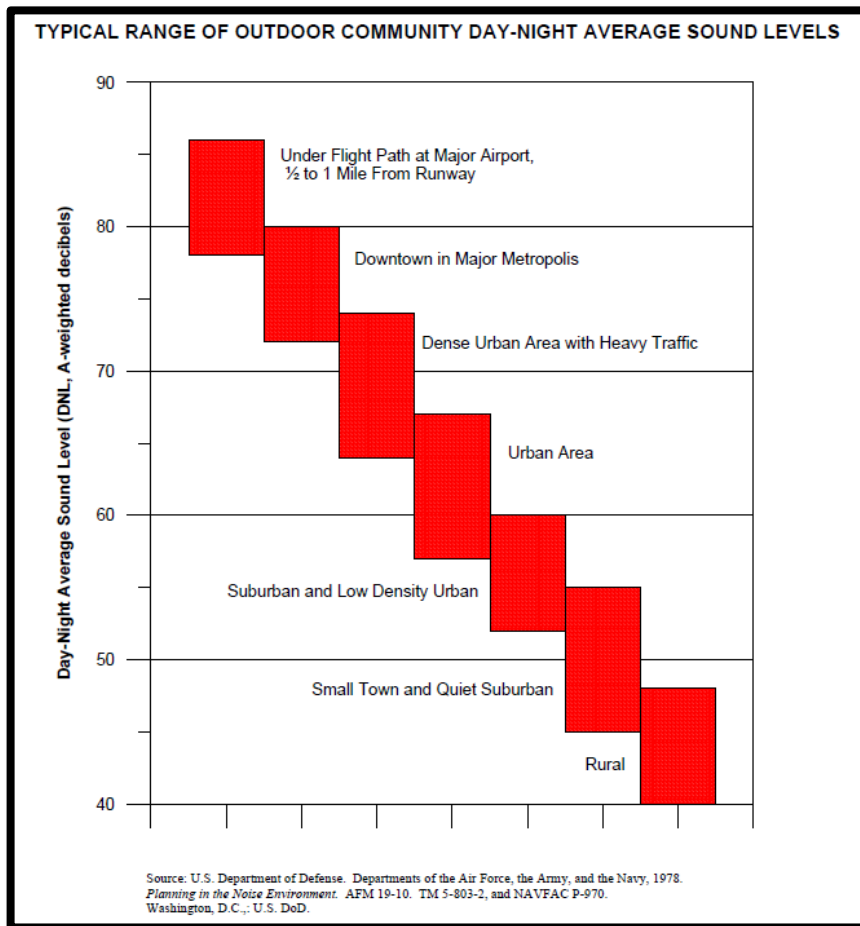


Figure 3-5. This chart provides context as to the typical range of outdoor sound levels.

3.11.1 No Action

This alternative would have no effect on air quality and noise unless the Howard Prairie Dam fails. Dam failure would likely result in restorative construction projects with associated noise and air quality impacts over a widespread area downstream of the Howard Prairie Dam.

3.11.2 CAS Preferred Alternative

Construction activities associated with the preferred alternative would result in minor localized, and short-term impacts on air quality. Trucks and other equipment operating at the worksite could have minimum and temporary increase in dust particulate and gaseous emission levels in the immediate area. Most modification construction activities would occur at the toe of the dam where soil conditions would be relatively moist, reducing the likelihood for dusty work conditions; therefore, construction activities are not expected to impact National or State Ambient Air Quality Standards annual averages for particulate of 15 micro grams per cubic meter ($\mu\text{g}/\text{m}^3$) or 35 $\mu\text{g}/\text{m}^3$ in a 24-hour period (<http://www.deq.state.or.us/aq/planning/>) [ODEQ 2014a]. The CAS Preferred Alternative

does not involve permanent, stationary sources of emissions and would not be regulated by the Clean Air Act.

Noise impacts would be localized, temporary, and limited in context and intensity. Timing of noise-generating sources would be restricted to normal construction hours of 7:00 a.m. to 7:00 p.m. Construction on holidays would not be allowed, thus limiting exposure. Upon completion of the project, noise levels would be expected to return to preconstruction conditions. Stakeholder coordination, appropriate and effective BMPs (such as well-muffled exhaust systems), would be implemented to minimize temporary impacts inherent to heavy equipment operation and earth-moving construction activities.

3.12 Cumulative Effects

Reclamation has assessed past, present, and reasonably foreseeable future projects in the Howard Prairie Dam area for significant cumulative effects. The project area is a patchwork of mostly public land with management authority largely by BLM. BLM and Reclamation share management responsibility in Reclamation-zoned land (land prescribed for water storage and delivery functions). In addition, Oregon State public land is within the area, and Jackson County manages some Reclamation-zoned land for recreation. Private land also occurs within the project area with use restrictions enforced by Jackson County, BLM, and Reclamation. There are use restrictions due to the ecological and recreational value of the area as signified by the CSNM. Reclamation's most recent EA conducted in the area, *Camper's Cove Resort Lands Encroachment EA*, resulted in a Finding of No Significant Impact (FONSI). The FONSI and the absence of any reasonably foreseeable projects in the Howard Prairie Dam area that would be adversely affected support the conclusions of the SOD modifications. The CAS Preferred Alternative for Howard Prairie Dam would not result in a significant cumulative impact. Howard Prairie Resort's marina rehabilitation plan by Jackson County is the only planned project identified in the Howard Prairie Dam area.

Implementation of the CAS alternative would benefit Jackson County marina improvement project usefulness by providing predictable reservoir levels in non-drought years and ensuring that Howard Prairie Dam continues to provide project benefits.

4 CONSULTATION AND COORDINATION

BLM has been consulted extensively and is involved in the analyses of this proposed action. In addition, Medford BLM has been involved in resource analysis and review of environmental compliance. During the development of this EA, BLM provided valuable information including the BA. In addition, BLM consulted with Reclamation on timber, wetland, and wildlife survey services toward avoiding and minimizing environmental impacts.

Jackson County Parks has been consulted on the proposed action. Jackson County has made valuable contributions to project planning and historic interpretation as part of the mitigation for impacts that would occur under the CAS Preferred alternative.

The USFWS has been consulted concerning Northern spotted owl and habitat disturbance associated with project implementation resulting in a letter of concurrence with Reclamation's determination of effect on Northern spotted owls.

The Corps was consulted regarding Section 404 and 401 water quality permitting requirements. As a result, the proposed activity is determined to be within the threshold requirements of Nationwide Permit No. 3a and 3c (Maintenance). Nationwide Permit No. 3a and No. 3c do not require Federal applicants or permittees to submit a preconstruction notification to the Corps. Additional 401 Water Quality Certification specific conditions would be met in compliance with ODEQ.

On May 3, 2016, Reclamation sent coordination letters to the following potentially affected Indian Tribes: Cow Creek Band of Umpqua Indians, Confederated Tribes of Grand Ronde Community, Klamath Tribes, Quartz Valley Shasta, and Confederated Tribes of Siletz.

TID has been an active participant in all aspects of project development and is a member of the Howard Prairie Dam SOD Project Management Team.

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