



ENVIRONMENTAL ASSESSMENT for the ARRA ROGUE RIVER RESTORATION - GOLD RAY DAM PROJECT



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Table of Contents

1.0	INTRODUCTION	1-1
1.1	Background	1-1
1.2	National Environmental Policy Act.....	1-1
1.3	Proposed Action.....	1-4
1.4	Purpose and Need for Proposed Action	1-4
1.5	Applicable Regulatory Requirements and Coordination.....	1-4
1.5.1	Public and Agency Involvement	1-4
1.5.2	Permitting.....	1-6
1.5.3	Tribal Coordination.....	1-6
1.6	Document Organization	1-6
2.0	DESCRIPTION OF PROPOSED ACTION AND NO ACTION ALTERNATIVE	2-1
2.1	Action Alternatives.....	2-1
2.1.1	Dam Removal (Alternative 1)	2-1
2.1.2	Dam/Fish Ladder Rehabilitation/Reconstruction (Alternative 2).....	2-5
2.2	No Action Alternative	2-8
3.0	AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES	3-1
3.1	Geology and Soils	3-1
3.1.1	Affected Environment	3-1
3.1.2	Environmental Consequences	3-1
3.2	Land Use and Recreation.....	3-2
3.2.1	Affected Environment	3-2
3.2.2	Environmental Consequences	3-5
3.3	Water Quality and Resources.....	3-7
3.3.1	Affected Environment	3-7
3.3.2	Environmental Consequences	3-9

3.4	Wetlands and Floodplains.....	3-12
3.4.1	Affected Environment	3-12
3.4.2	Environmental Consequences	3-18
3.5	Aquatic Biology	3-22
3.5.1	Affected Environment	3-22
3.5.2	Environmental Consequences	3-24
3.6	Terrestrial and Avian Wildlife	3-27
3.6.1	Affected Environment	3-27
3.6.2	Environmental Consequences	3-28
3.7	Vegetation	3-29
3.7.1	Affected Environment	3-29
3.7.2	Environmental Consequences	3-31
3.8	Cultural and Historic Resources	3-32
3.8.1	Affected Environment	3-32
3.8.2	Environmental Consequences	3-33
3.9	Visual Quality and Aesthetics.....	3-34
3.9.1	Affected Environment	3-34
3.9.2	Environmental Consequences	3-35
3.10	Transportation.....	3-35
3.10.1	Affected Environment	3-35
3.10.2	Environmental Consequences	3-37
3.11	Air Quality.....	3-37
3.11.1	Affected Environment	3-37
3.11.2	Environmental Consequences	3-37
3.12	Noise.....	3-38
3.12.1	Affected Environment	3-38

3.12.2	Environmental Consequences	3-38
3.13	Human Health and Safety.....	3-38
3.13.1	Affected Environment	3-38
3.13.2	Environmental Consequences	3-39
3.14	Socioeconomic and Environmental Justice	3-40
3.14.1	Affected Environment	3-40
3.14.2	Environmental Consequences	3-41
3.15	Cumulative Impacts	3-42
3.15.1	No Action.....	3-42
3.15.2	Dam Removal	3-42
3.15.3	Dam Rehabilitation.....	3-43
3.16	Irreversible and Irretrievable Use of Resources	3-43
3.16.1	No Action.....	3-43
3.16.2	Dam Removal	3-43
3.16.3	Dam Rehabilitation.....	3-43
4.0	LIST OF PREPARERS AND AGENCIES CONSULTED	4-1
4.1	List of Preparers.....	4-1
4.2	Agencies and Other Entities Consulted	4-1
5.0	ABBREVIATIONS AND ACRONYMS	5-1
6.0	REFERENCES.....	6-1
7.0	APPENDICES.....	7-1
Appendix A: Scoping Summary		
Appendix B: Project Drawings		
Appendix C: DRAFT Fish Salvage Plan		
Appendix D: DRAFT Gold Ray Dam Project Rehabilitation Technical Memo		
Appendix E: Summary of Comments on Draft EA with NMFS Responses		

List of Tables

Table 1: Gold Ray Dam Permits and Clearances.....	1-6
Table 2: Summary of Estimated Rehabilitation Costs – Gold Ray Dam	2-8

List of Figures

Figure 1: Vicinity Map	1-2
Figure 2: Gold Ray Dam and Related Structures	1-3
Figure 3: Project Area.....	2-2
Figure 4: Dam Removal Schematic	2-4
Figure 5: Dam Rehabilitation Elements.....	2-7
Figure 6: Oregon Water Resources Department Recognized Wells and Points of Diversion.....	3-10
Figure 7: Wetlands	3-13
Figure 8: Rogue River 100-year Floodplain	3-20
Figure 9: Representative Views of the Rogue River Upstream and Downstream of Gold Ray Dam	3-36

EXECUTIVE SUMMARY

In 2009, Jackson County applied for and received a National Oceanic and Atmospheric Administration (NOAA) Coastal and Marine Habitat Restoration Project Grant under the American Recovery and Reinvestment Act (ARRA) to remove the Gold Ray Dam for the purpose of improving fish habitat and passage. The grant was separated into two phases; a first phase that included conducting environmental and other studies to determine the feasibility of removing the dam and a second phase that included the removal of the dam and associated structures. NOAA released the funding for the first phase of the project to the County but delayed the release of funding for phase two until after the National Environmental Policy Act (NEPA) analysis could be completed.

National Marine Fisheries Service (NMFS), as the administrator of the grant, must comply with the NEPA requirements to assess the potential impacts of the proposed action on the natural and human environment. In early May 2010, Jackson County, as the dam's owner, decided dam removal is the best option for addressing their long-term interests as the owner of the dam.

NMFS is proposing to release funding to Jackson County, Oregon to improve fish passage at the Gold Ray Dam on the Rogue River near Medford, OR. The dam owner, Jackson County, has been working with NMFS and additional project partners to explore the option of dam removal. The purpose of the project is two-fold: (1) to address inadequate fish passage and improve native fish habitat on the Rogue River at Gold Ray Dam; and (2) to address the short- and long-term financial and liability impacts of the dam to Jackson County, Oregon.

The proposed action consists of NMFS' release of funding for the removal of the Gold Ray Dam located on the Rogue River approximately six miles from Medford, OR.

The dam removal consists of the following activities: Removal of the existing concrete dam and related structures, including fish ladders, remnants of the log crib dam, the power canal (forebay and tail race), and the power house and associated structures (such as the forebay retaining wall). To reduce the potential for erosion of fine sediments and support existing wetlands and land uses, restoration of the riverbanks at the mouth of Lower Kelly Slough, Tolo Slough, and Bear Creek would be undertaken. The restoration would likely consist of a combination of large wood, boulder ballast rocks, and soil bioengineering for vegetation establishment and long term stability (e.g., plantings, soil mats).

Following removal of the dam and appurtenant structures, disturbed areas would be restored to reestablish the original site topography and vegetation. Soil used for temporary access in dam removal would be distributed on the north side of the riverbank to create topography similar to historic conditions. Haul routes would be scarified and decompacted to encourage soil fertility and plant growth. The exposed areas around the former dam site would be planted with native vegetation that is ecologically appropriate for the riparian area.

The proposed action responds to the project purpose of improving fish passage and native fish habitat and reducing Jackson County's long-term liability associated with ownership of the dam.

Alternatives to the proposed action include a No Action Alternative and a dam rehabilitation alternative. The No Action Alternative would involve taking no action to improve fish passage and habitat or reduce Jackson County's cost and safety liabilities associated with ownership of Gold Ray Dam. Existing facilities would continue to be substandard with regard to fish passage and structural and seismic stability. The dam rehabilitation alternative would rehabilitate and stabilize the dam, reconstruct the fish ladder,

and reconstruct power generation facilities, including adding fish screens to exclude fish from the power canal and tail race. Of the three alternatives analyzed, the proposed action (Alternative 1, Dam Removal) is found to best meet the purpose and need for action.

As part of this analysis, the environmental impacts of each alternative were addressed. The following table provides a summary of these impacts for the alternatives:

Summary of Impacts

Resource Area	Anticipated Environmental Effects		
	No Action Alternative	Alternative 1 (Dam Removal)	Alternative 2 (Dam Rehabilitation)
Geology and Soils	<ul style="list-style-type: none"> - No direct impact; - Sediment would continue to accumulate behind Gold Ray Dam. 	<ul style="list-style-type: none"> - Temporary disturbance of upland soils and sediments by construction activities. - Drawdown of the impoundment would cause release of some of the accumulated sediments behind the dam. - Removal of dam would restore more natural processes of sediment transport to the Rogue River. 	<ul style="list-style-type: none"> - Temporary disturbance of upland soils and sediments by construction. - Accumulated sediments would remain in place.
Land Use and Recreation	<ul style="list-style-type: none"> - No direct impact; - No changes to current land use or recreation activities 	<ul style="list-style-type: none"> - Temporary effects on recreation during removal - No impacts to Wild & Scenic or State Scenic portions of Rogue River - Rogue River would be free-flowing allowing river users to experience uninterrupted river use throughout the entire reach. - Potential for low rapids and swift water attractive to rafters, kayakers and some canoers. - Increase some fishing/boating opportunities; decrease in others (related to flatwater conditions behind dam). 	<ul style="list-style-type: none"> - Temporary adverse effects on recreation during construction. - No long term impact to recreation and land use. - No impacts to Wild & Scenic or State Scenic portions of Rogue River
Water Quality and Resources	<ul style="list-style-type: none"> - Sediment transport and the habitat values for native fish would continue to be reduced and elevated water temperatures in side channels would remain unsuitable for native coldwater fish. 	<ul style="list-style-type: none"> - Temporary water quality impact during construction. More natural hydrologic and sediment transport processes would be reestablished. - Wells upstream of the dam could be affected by lower water levels. - Surface water intakes downstream of dam could be temporarily affected by turbidity and/or sediment transport. - Lower Kelly Slough and Tolo Slough, would likely revert to narrow channels, decreasing backwater ponds with high summer water temperatures. 	<ul style="list-style-type: none"> - Temporary water quality impact during construction due to increased turbidity. - No impact long term, however water quality would continue to be degraded and habitat values for native fish would continue to be reduced.

Summary of Impacts

Resource Area		Anticipated Environmental Effects	
	No Action Alternative	Alternative 1 (Dam Removal)	Alternative 2 (Dam Rehabilitation)
Wetlands and Floodplains	<ul style="list-style-type: none"> - No impact to wetlands - No change to floodplains. 	<ul style="list-style-type: none"> - Construction effects to wetlands would be temporary and would result in a short term loss of wetland functions. - Existing wetlands are expected to become drier with the drop in river levels. - With the lower river level newly exposed banks in some areas would likely become new wetlands. - No change to wetlands downstream of the dam. - Effects to the floodplain upstream and downstream of the dam would be minimal. 	<ul style="list-style-type: none"> - Temporary construction effects to wetlands resulting in a short term loss of wetland functions. - One artificially created wetland (from water leaking from forebay) would cease to exist. - No impact to floodplains.
Aquatic Biology	<ul style="list-style-type: none"> - No change; Gold Ray Dam would remain as an impediment to fish passage for both migratory and resident fish species. 	<ul style="list-style-type: none"> - Short term adverse impacts to aquatic habitat and fish during dam removal (turbidity, removal of riparian vegetation, fish handling). - Restoration of the natural river channel/functions and sediment transport processes would benefit Rogue River fisheries. - Populations of nonnative warm water species adversely affected by dam removal 	<ul style="list-style-type: none"> - Short term adverse impacts to aquatic habitat and fish during in-water work (turbidity, removal of riparian vegetation, fish handling). - Improved fish passage by reconstructing ladder to comply with NMFS and ODFW's guidelines; however, fish would still have to navigate through an artificial structure. - Dam would continue to create unfavorable habitat conditions for native fish
Terrestrial Wildlife	No Impact.	<ul style="list-style-type: none"> - Temporary construction impacts would disturb wildlife. - No long-term changes. 	<ul style="list-style-type: none"> - Temporary construction impacts would disturb. - No long-term changes
Vegetation	No Impact.	<ul style="list-style-type: none"> - Vegetation would be removed for construction; disturbed area will be replanted. - Vegetation composition will change following the change in upstream surface water levels. 	<ul style="list-style-type: none"> - Vegetation would be removed for construction; disturbed area will be replanted.
Cultural and Historic Resources	No impact, however the condition of the dam and associated structures would continue to deteriorate over time.	<ul style="list-style-type: none"> - Adverse effect on the archaeological resources and historic property, however components of the dam and appurtenances would be documented and salvaged prior to removal and following dam removal, a reconnaissance-level archaeological survey of the formerly submerged areas. 	<ul style="list-style-type: none"> - Dam rehabilitation would affect the structures that contribute to the eligibility of the Gold Ray Dam for the National Register of Historic Places. - Potential to disturb archeological resources.
Visual Quality and Aesthetics	No Impact.	<ul style="list-style-type: none"> - Temporary visual impacts during construction. - Visual quality of upstream area would change; previously submerged areas would become exposed and would appear like the downstream stretch of river over time. 	<ul style="list-style-type: none"> - Temporary visual impacts from during construction. - Power transmission lines and facilities would detract from the scenic quality of the area.

Summary of Impacts

Resource Area		Anticipated Environmental Effects	
	No Action Alternative	Alternative 1 (Dam Removal)	Alternative 2 (Dam Rehabilitation)
Transportation	No Impact.	<ul style="list-style-type: none"> - Temporary traffic delays during construction. - Long term increase in recreation related traffic. - Leaving abutment on south bank would preserve rail line. 	<ul style="list-style-type: none"> - Temporary traffic delays during construction.
Air Quality	No Impact.	<ul style="list-style-type: none"> - Temporary air quality effects during construction 	<ul style="list-style-type: none"> - Temporary air quality effects during construction
Noise	No Impact.	<ul style="list-style-type: none"> - Temporary noise effects during construction. - Slight decrease in noise levels, water no longer cascading over dam. 	<ul style="list-style-type: none"> - Temporary noise effects during construction. - Power generating equipment would add to the noise level in the general vicinity.
Human Health and Safety	No change; Gold Ray Dam would remain as a safety hazard and liability risk for Jackson County.	<ul style="list-style-type: none"> - Eliminate the public safety hazards and liability risk for Jackson County. - Short-term risk to public safety during demolition. - No adverse impacts associated with accumulated sediments. - Limited road access to some areas opened to recreational use 	<ul style="list-style-type: none"> - Alleviate some safety concerns because the dam structure would be reinforced to decrease the likelihood of failure. - Would continue to pose a hazard to boaters and trespassers.
Socioeconomic and Environmental Justice	No Impact.	<ul style="list-style-type: none"> - Construction would result in short term increase in economic activity in Jackson County. - Free-flowing conditions would be beneficial for fishing guides that focus on native fishes, and would have adverse effects on guides that focus on the existing warm water fishery upstream of the dam. - Would benefit rafting guide services. - Potential impacts to water users if dam removal resulted in loss of water use from surface water intakes or wells. 	<ul style="list-style-type: none"> - Construction would result in short term increase in economic activity in Jackson County. - Dam rehabilitation, and specifically the rehabilitation of power generation at the dam, would not be cost effective and would not provide an economic benefit for Jackson County.
Cumulative Impacts	No Impact.	<ul style="list-style-type: none"> - Beneficial cumulative effect on native fish and fish habitat by removing the barriers to fish migration and therefore providing 153 miles of the Rogue River (from Lost Creek Dam to the mouth), and more than 330 mile including tributaries, free of human-made barriers. - Restoring a more natural sediment transport dynamic in the Rogue River. - Largely eliminate the backwater area and the associated fishing and other recreation opportunities. 	<ul style="list-style-type: none"> - Cumulative benefit to fish passage by improved fish ladder. - No change to native fish habitat..

NMFS' proposed action includes the avoidance, minimization and mitigation measures summarized in the table below to avoid and lessen the anticipated environmental effects of the dam removal.

NMFS prepared a Draft EA and made it available for public review and comment. NMFS received comments on the EA from more than 900 individuals, organizations, and government agencies. A public meeting was held on March 16, 2010 and more than 100 people attended and provided comments on the project. NMFS reviewed and considered all comments. This Final EA incorporates revisions based on public comments and updated information. NMFS will consider the information in this Final EA in making its decision on a selected alternative for the Gold Ray Dam Project.

Summary of Proposed Avoidance, Minimization and Mitigation Measures

Resource Area	Proposed Measures
Geology and Soils	<ul style="list-style-type: none"> - Use construction best management practices (BMPs): <ul style="list-style-type: none"> - Use a floating silt curtain placed downstream to minimize sediment. - Restore the riverbanks at the mouths of Lower Kelly Slough, Tolo Slough, and Bear Creek in accordance with the restoration plan. - Regrade and revegetate disturbed areas to reestablish the original site topography and vegetation. - Prepare and implement an Erosion and Sedimentation Control Plan (ESCP).
Land Use and Recreation	<ul style="list-style-type: none"> - Coordinate with Oregon State Marine Board (OSMB) regarding recommended measures that would reduce the risks to boaters during construction.
Water Quality and Resources	<ul style="list-style-type: none"> - Use BMPs to minimize the impacts of construction activities to water quality. - Monitor the effects of changing upstream water levels on intakes for Points of Diversion (PODs) following dam removal. If changing water levels cause existing intakes to no longer reach Rogue River flows, Jackson County will negotiate with water users to extend the intakes. - Perform tests on legal wells to determine the wells' water level and production prior to dam removal. Wells will be tested following dam removal to determine if there is a change in the water level or production. If Jackson County determines that there has been an impact to permitted and legal wells due to removal of the dam that affects the well owners' access to water, they will work with each well owner to mitigate the impact. - Assess each individual pump location for permitted PODs. Following dam removal, Jackson County will inspect intake and pump sites at the request of landowners. If adverse effects to intakes occur as a result of dam removal, Jackson County will coordinate with landowners to determine the appropriate solution on a site-by-site basis, with the understanding that the landowners will be responsible for maintenance associated with baseline conditions (i.e., prior to dam removal). - Monitor sediment transport and flow conditions; monitoring information will be shared with adjacent property owners.

Summary of Proposed Avoidance, Minimization and Mitigation Measures

Resource Area	Proposed Measures
Wetlands and Floodplains	<ul style="list-style-type: none"> - Use BMPs to minimize erosion and sedimentation to wetlands. - During construction, contractor will not store equipment or supplies on site between work periods and will stabilize disturbed areas following construction. - Restore temporarily impacted wetlands to pre-existing conditions following dam removal. - Assess and restore riverbanks at Lower Kelly Slough, Tolo Slough, and Bear Creek to avoid severe erosion, in accordance with the restoration plan. - Conduct long term monitoring of the river and associated riparian areas following construction. If, during the monitoring, unanticipated loss of wetlands is evident, then additional restoration measures will be identified and implemented in accordance with the USACE permit. - Restoration efforts will be completed by the contractor immediately following the removal of the dam will include restoring temporarily affected areas to preconstruction contours, as feasible, and establishing native vegetation.
Aquatic Biology	<ul style="list-style-type: none"> - Activities performed by the contractor in the river channel will be completed during the ODFW-approved in-water work period. - Maintain fish passage throughout construction, with the exception of a 3-to-5 day period where fish passage through the area would not be provided due to the transition between the phases. - Portions of the former reservoir would be replanted by the contractor in accordance with the restoration plan to encourage growth of native vegetation and reestablishment of the riparian vegetation. - Fish salvage will be conducted in accordance with the fish salvage plan.
Terrestrial Wildlife	<ul style="list-style-type: none"> - Contractor will limit use of security lighting at night during construction to within the established staging and construction limits. Lighting would be limited to the areas immediately adjacent to the dam site to minimize disturbance to terrestrial wildlife. - Trees felled to clear areas for construction will be placed along the margins of the site to provide cover for birds, reptiles, and small mammals. - Minimize the areas of disturbance to only those that are necessary, dispose of excavated invasive and noxious weeds to prevent reestablishment, minimize area of soils exposed to reduce dust that can bury native plants, maintain clean work areas with proper litter control and sanitation to prevent wildlife attraction, dispose of human refuse in containers that can be sealed and protected from wildlife. - Replant temporarily disturbed areas with native vegetation and manage it to minimize reestablishment of noxious weeds.
Vegetation	<ul style="list-style-type: none"> - Use BMPs to eliminate or minimize effects of erosion, sedimentation and accidental fuel or oil tank leaks. - Use BMPs to properly dispose of stormwater, and prevent it from entering vegetated areas and damaging plants and wildlife. - Use BMPs to minimize spread of noxious weed seeds. - Newly disturbed areas will be replanted with native vegetation and managed by contractor to minimize reestablishment of noxious weeds. - Conduct long-term monitoring to track vegetation establishment and effects of high flows on vegetation.
Cultural and Historic Resources	<ul style="list-style-type: none"> - NMFS will enter into a Memorandum of Agreement with the Oregon State Historic Preservation Office that will include the specific steps that Jackson County will take to mitigate the adverse effect on the historic property (Gold Ray Dam) and associated archaeological resources. Mitigation will include salvaging and documenting key components of the dam and powerhouse. - During construction, identified archeological resources would be avoided to the extent practicable. - Following dam removal, Jackson County will coordinate a reconnaissance-level archaeological survey of the formerly submerged areas upstream of the dam to determine if any significant archaeological sites are located there; a management plan will be developed based on the findings of the survey.

Summary of Proposed Avoidance, Minimization and Mitigation Measures

Resource Area	Proposed Measures
Transportation	<ul style="list-style-type: none"> - To avoid impacts to the south bank of the river, the dam abutment on the south bank of the river will be left in place as part of dam removal. This will provide continued stability to the bank adjacent to the railroad and road. - Use cautionary signage and flaggers, as needed, during construction to minimize transportation impacts. - Contractor will limit work to daylight hours, provide notice to adjacent landowners regarding planned activities, and establish a communication protocol to respond to public inquiries and comments.
Noise	<ul style="list-style-type: none"> - Contractor will limit construction activities to daylight hours, provide notice to adjacent landowners regarding planned activities, and establish a communication protocol to respond to public inquiries and comments.
Human Health and Safety	<ul style="list-style-type: none"> - Implement conditions to protect public safety during and after dam removal, including posting signs at upstream and downstream project boundaries and ramps instructing boats of the hazards and to keep out of the project area. - Work with emergency responders to develop an emergency response plan for this section of the river following construction.
Socioeconomic and Environmental Justice	<ul style="list-style-type: none"> - Jackson County will assess privately owned water intakes prior to dam removal, assess current maintenance, and develop plans to address potential impacts, if any, of turbidity and sediment transport to individual water intakes and impacts, if any, of dam removal on legal wells.

1.0 INTRODUCTION

1.1 Background

Gold Ray Dam is located on the Rogue River in Jackson County, Oregon, approximately six miles northwest of Medford (Figure 1).

The original log crib dam was constructed in 1904 for the purpose of generating electricity. The existing concrete dam, which is 38 feet high and 360 feet long, was constructed immediately downstream of the log crib dam in 1941 due to the deteriorated condition of the log dam. Remnants of the log dam remain in place.

Gold Ray Dam was operated as a hydroelectric facility until 1972 when it was closed by PacifiCorp and ownership was transferred to Jackson County (Jackson County, 2009a). The County has retained ownership of the dam and approximately 280 acres adjacent to it on the north side of the river. Existing facilities associated with the dam include the powerhouse (with associated forebay and tailrace), fish ladders, and an Oregon Department of Fish and Wildlife (ODFW) fish counting station. Figure 2 shows the location of the dam and associated features described above.

Because of the dam's age, the fish ladders do not meet current fish passage design criteria established by ODFW and National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS). In addition, leaks in the dam and fish ladder create false attraction flows that result in fish mortality and disrupt upstream fish migration. Further, the dam and associated facilities are in a deteriorated condition, posing life safety, maintenance, and liability concerns for Jackson County.

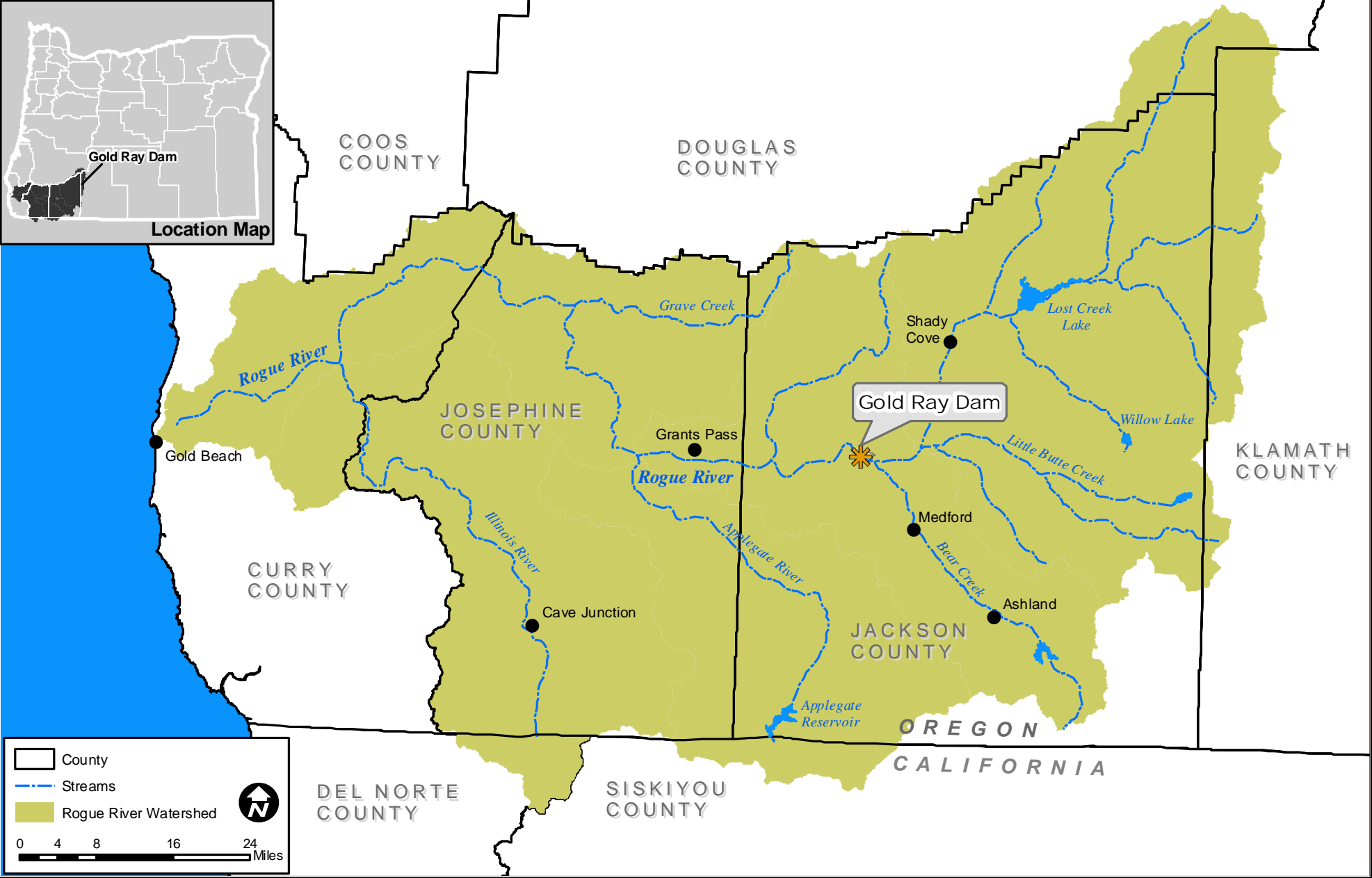
In 2009, Jackson County applied for and received an NOAA Coastal and Marine Habitat Restoration Project Grant under the American Recovery and Reinvestment Act (ARRA) to remove the Gold Ray Dam for the purpose of improving fish habitat and passage. The grant was separated into two phases; the first phase that included conducting environmental and other studies to determine the feasibility of removing the dam and a second phase that included the removal of the dam and associated structures. NOAA released the funding for the first phase of the project to the County but delayed the release of funding for phase two until after the National Environmental Policy Act (NEPA) analysis could be completed.

NMFS is proposing to release funding to Jackson County, Oregon to improve fish passage at Gold Ray Dam on the Rogue River near Medford, Oregon. The dam owner, Jackson County, has been working with NMFS and additional project partners to explore the option of dam removal.

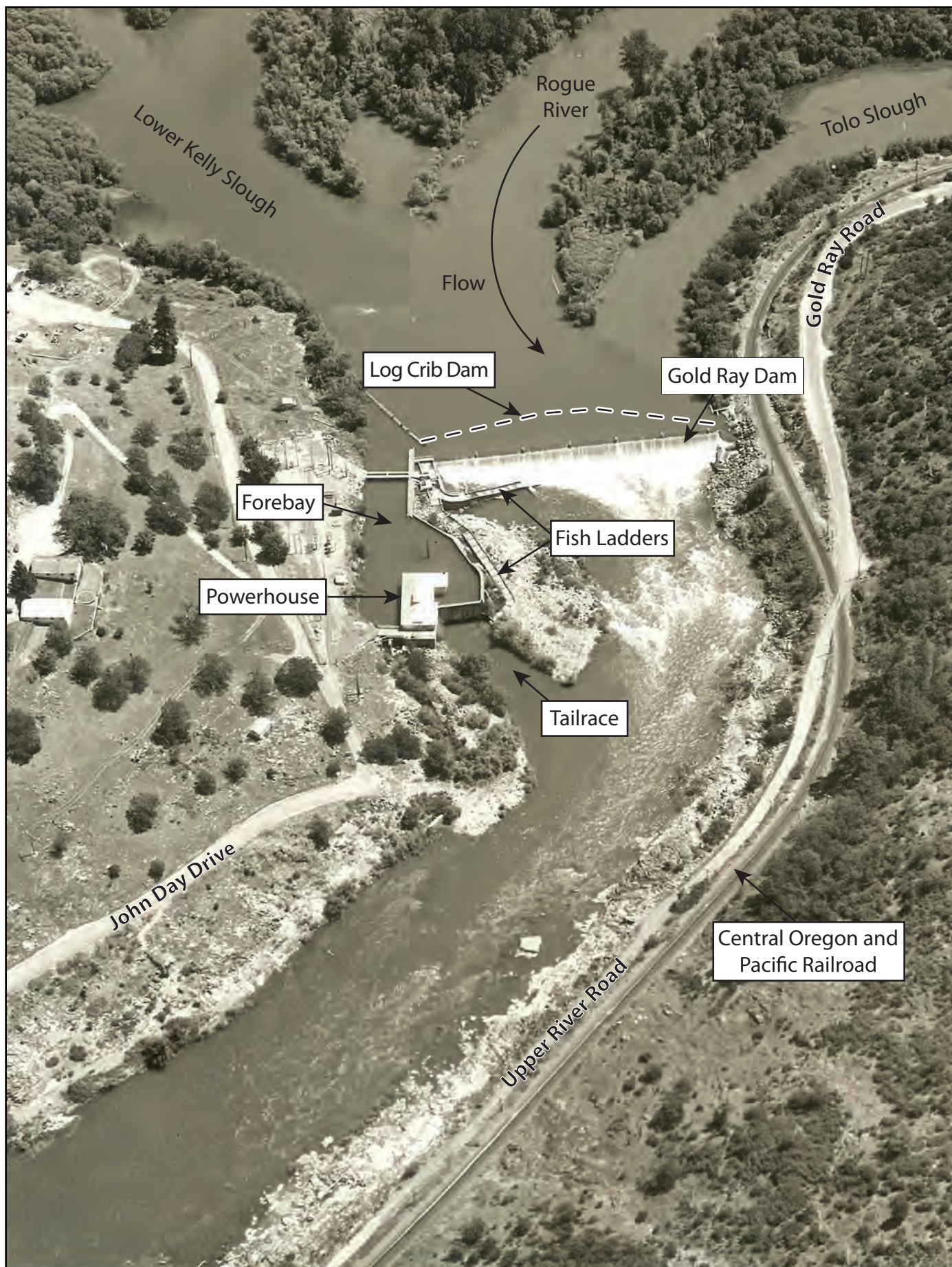
NMFS, as the administrator of the grant, must comply with the National Environmental Policy Act (NEPA) requirements to assess the potential impacts of the proposed action on the natural and human environment. In early May, Jackson County, as the dam's owner, decided that dam removal is the best option for addressing their long-term ownership of the dam.

1.2 National Environmental Policy Act

The National Environmental Policy Act (42 USC § 4321-4347), or NEPA, establishes a national environmental policy and provides a framework for planning and decision making by federal agencies. NEPA directs federal agencies, when planning projects or issuing permits, to conduct environmental reviews to consider the potential effects on the environment of their proposed actions. This process includes interagency coordination and public participation in planning and decision making. In summary, NEPA is intended to promote informed decision making by government agencies and public participation in the process, where appropriate.



Vicinity Map
FIGURE 1



Gold Ray Dam and Related Structures

FIGURE 2

The Council on Environmental Quality (CEQ) was established by NEPA and has developed regulations for the law's implementation (40 CFR 1500). NOAA's policies and guidelines for implementing NEPA are described in NOAA Administrative Order 216-6. A Draft Environmental Assessment (EA) was prepared in accordance with the CEQ regulations and NOAA procedures. The Draft EA was made available on February 25, 2010 for public review and comment. Notice of availability was provided to the interested parties list maintained by Rogue Valley Council of Governments (RVCOG), as well as through local media and on the RVCOG Website.

Comments were received through March 26, 2010 (a 30-day comment period), and a public meeting was held on March 16, 2010, to provide information and gather public input. More than 900 individuals and agencies submitted comments on the Draft EA. NMFS reviewed and considered all comments provided. Appendix E presents a summary of the comments along with NMFS' responses to the comments.

The information in the Draft EA and the public comments were used by Jackson County's Board of Commissioners in making its decision regarding the proposed action.

1.3 Proposed Action

The proposed action is for NMFS to release funding to Jackson County to improve fish passage and habitat conditions at the Gold Ray Dam on the Rogue River near Medford, Oregon. The removal of the dam will also address the short- and long-term liabilities posed to Jackson County by Gold Ray Dam.

1.4 Purpose and Need for Proposed Action

The purpose of the proposed action is two-fold: (1) to address inadequate fish passage and improve native fish habitat on the Rogue River at Gold Ray Dam; and (2) to address the short- and long-term financial and liability impacts of the dam to Jackson County, Oregon.

ODFW has identified Gold Ray Dam as one of the top priorities for fish passage improvement in its Oregon Statewide Fish Passage Priority List (ODFW, 2009). ODFW has ranked the dam itself as the fifth greatest barrier to fish passage in Oregon; the existing fish ladder at the dam does not meet current fish passage standards and poses a substantial impediment to fish passage (ODFW, 2009).

Gold Ray Dam is a 70-year-old concrete structure that will, if retained, require substantial investment in repairs to the dam, powerhouse, forebay retaining walls, site security, and fish ladders as well as to address the dam's structural and seismic stability. The dam is readily accessible to the public, both by the river and via the surrounding areas, and is a safety hazard to individuals that may boat near it or climb on or around it. Further, Jackson County regularly maintains the dam and appurtenant facilities, and incurs significant costs when responding to events such as flooding, debris accumulation, boating accidents, and other emergencies. The County desires to minimize these cost and liability issues.

1.5 Applicable Regulatory Requirements and Coordination

The following sections describe local, state, and federal regulatory requirements that must be addressed as part of the NEPA process, as well as coordination with the public, tribes, and government agencies.

1.5.1 Public and Agency Involvement

Public involvement and coordination with local, state, and federal resource management agencies is a vital component of the NEPA process. NMFS and Jackson County have engaged the public in a variety of ways during the development of this EA. A public meeting hosted by Jackson County and RVCOG was

held on August 18, 2009, in White City, Jackson County, Oregon, to solicit general input from the public about proposed dam removal. Approximately 116 people attended that meeting.

A NEPA scoping meeting was held on November 8, 2009, in White City, Oregon. The meeting was attended by approximately 105 people and 44 comments were received as of January 2010. Comments were received by mail and e-mail throughout preparation of the EA. A summary of the scoping meeting and public comments received is included in Appendix A.

In addition, Jackson County and RVCOG participated in multiple meetings with specific stakeholders, such as neighboring property owners, historical societies, civic groups, and fishing and boating groups, during the EA preparation. Input from those groups was integrated into the EA scope and analysis. (see Appendix A).

The Draft EA was made available for public review and comment (see Section 1.2) and a public meeting to gather input and present project information was held on March 16, 2010. The meeting involved an informational presentation on the project and project information stations that allowed meeting participants to ask questions and provide comments directly to project staff. The format of the public meeting was consistent with the standard practice of NMFS and other federal agencies for public meetings related to an EA. More than 100 people attended that meeting. More than 900 individuals and agencies submitted comments on the Draft EA (Appendix E presents summaries of comments and NMFS' responses). NMFS has reviewed and considered all comments received during the scoping and Draft EA comment processes.

An interagency review team that included representatives of the agencies listed below was formed and met monthly during the preparation of the EA.

- ◆ Jackson County Roads and Parks Department
- ◆ RVCOG
- ◆ NMFS
- ◆ U.S. Army Corps of Engineers (USACE)
- ◆ U.S. Fish and Wildlife Service (USFWS)
- ◆ ODFW
- ◆ Oregon Department of State Lands (DSL)
- ◆ Oregon Water Resources Department (OWRD)
- ◆ Oregon Department of Environmental Quality (DEQ)
- ◆ Oregon Watershed Enhancement Board (OWEB)

This working group provided input to the project team on the regulatory requirements, environmental resources, and overall direction of the project.

1.5.2 Permitting

Prior to initiation of any proposed action, Jackson County would need to apply for a Joint Permit from the USACE and Oregon DSL to address the requirements of the following regulatory programs: Clean Water Act (Sections 401 and 404) and Oregon Removal-Fill Law. In addition to the Joint Permit, other permits and clearances must be secured prior to taking action. Table 1 provides a listing of permits and clearance likely to be required by this project.

Table 1: Gold Ray Dam Permits and Clearances

Agency	Permit/Consultation/Clearance Potentially Required
NMFS and USFWS	Endangered Species Act Section 7 Consultation
USACE	Clean Water Act Section 404 Permit
Oregon DSL	Removal-Fill Law Permit
Oregon DEQ	Clean Water Act Section 401 Water Quality Certification
ODFW	Fish Passage Plan approval
Jackson County	Floodplain Permit
Oregon State Historic Preservation Office	National Historic Preservation Act Section 106 Consultation

1.5.3 Tribal Coordination

NMFS has coordinated with the Cow Creek Band of Umpqua Tribe of Indians, Confederated Tribes of the Grand Ronde, and the Confederated Tribes of the Siletz. These are the federally-recognized tribes with treaty rights in the project area. NMFS has provided information on the project and requested input regarding the project from the tribes during the preparation of the EA. The tribes received cultural resources survey reports and continue providing input through the development of the EA. NMFS will continue to coordinate with the tribes during the project.

1.6 Document Organization

This EA has been prepared in compliance with NEPA and other relevant federal and state laws and regulations. It provides a discussion of the direct, indirect, and cumulative environmental impacts that are likely to result from the proposed action and alternatives.

The document is organized into the following parts:

- ◆ Executive Summary
- ◆ Introduction: This section includes information on the background of the proposed action, the requirements of NEPA, the purpose and need for the proposed action, and the applicable regulatory requirements and coordination efforts.
- ◆ Description of the Proposed Action and Alternatives, including the No Action Alternative.
- ◆ Affected Environment and Environmental Consequences: This section describes the environmental effects of implementing the alternatives. The analysis is organized by resource area. Under each resource, the affected environment is described first, followed by the anticipated effects of the alternatives.

- ◆ List of Preparers and Agency Consultation: This section provides a list of preparers of the document and the agencies consulted during the development of this EA.
- ◆ Abbreviations and Acronyms
- ◆ Reference: This section provides a listing of the literature and other sources cited in this EA.
- ◆ Appendices: Appendices A through D are the same as those in the Draft EA. Appendix E presents summaries of the comments on the Draft EA that were submitted by the public and agencies, along with NMFS' responses to those comments. Due to the high volume of comments, NMFS grouped repeated comments into summaries. NMFS reviewed and considered all comments submitted by the public and agencies.
- ◆ Following the completion of the Final EA, findings regarding the significance of impacts were made and NMFS determined that a Finding of No Significant Impact (FONSI) is appropriate for this proposed action. For convenience, the FONSI is provided following the Executive Summary.

2.0 DESCRIPTION OF PROPOSED ACTION AND NO ACTION ALTERNATIVE

This section of the EA describes the process employed by NMFS to develop and consider a range of alternatives consistent with the requirements of NEPA. Alternatives are actions that can be reasonably expected to meet the purpose and need (see Section 1.4). NMFS considered what actions could reasonably address the purpose and need in light of public scoping comments. NMFS determined that a dam removal alternative and a dam rehabilitation alternative were reasonable and representative of a range of reasonable actions. NMFS coordinated with Jackson County to develop plans for these two “action” alternatives to assess their likely environmental impacts, as well as the short- and long-term costs associated with each alternative. Figure 3 shows the project area. These alternatives are described in detail below.

In addition to the two action alternatives, the No Action Alternative was also reviewed. The No Action Alternative is included in any NEPA analysis, and it represents what would happen if a proposed action did not take place. It provides a basis for understanding the impacts (both positive and negative) of the action alternatives.

2.1 Action Alternatives

2.1.1 Dam Removal (Alternative 1)

Alternative 1 would remove Gold Ray Dam and the related structures (see Figure 3) and restore the river to near natural flow conditions, as regulated by Lost Creek Dam upstream. The removal of Gold Ray Dam would address the fish passage and habitat and County liability issues of the purpose and need by removing the impediment to fish passage, expanding available habitat for native fish, and removing the facilities that pose cost and safety hazard concerns for the County. The proposed sequence and method of dam removal and site restoration are described below.

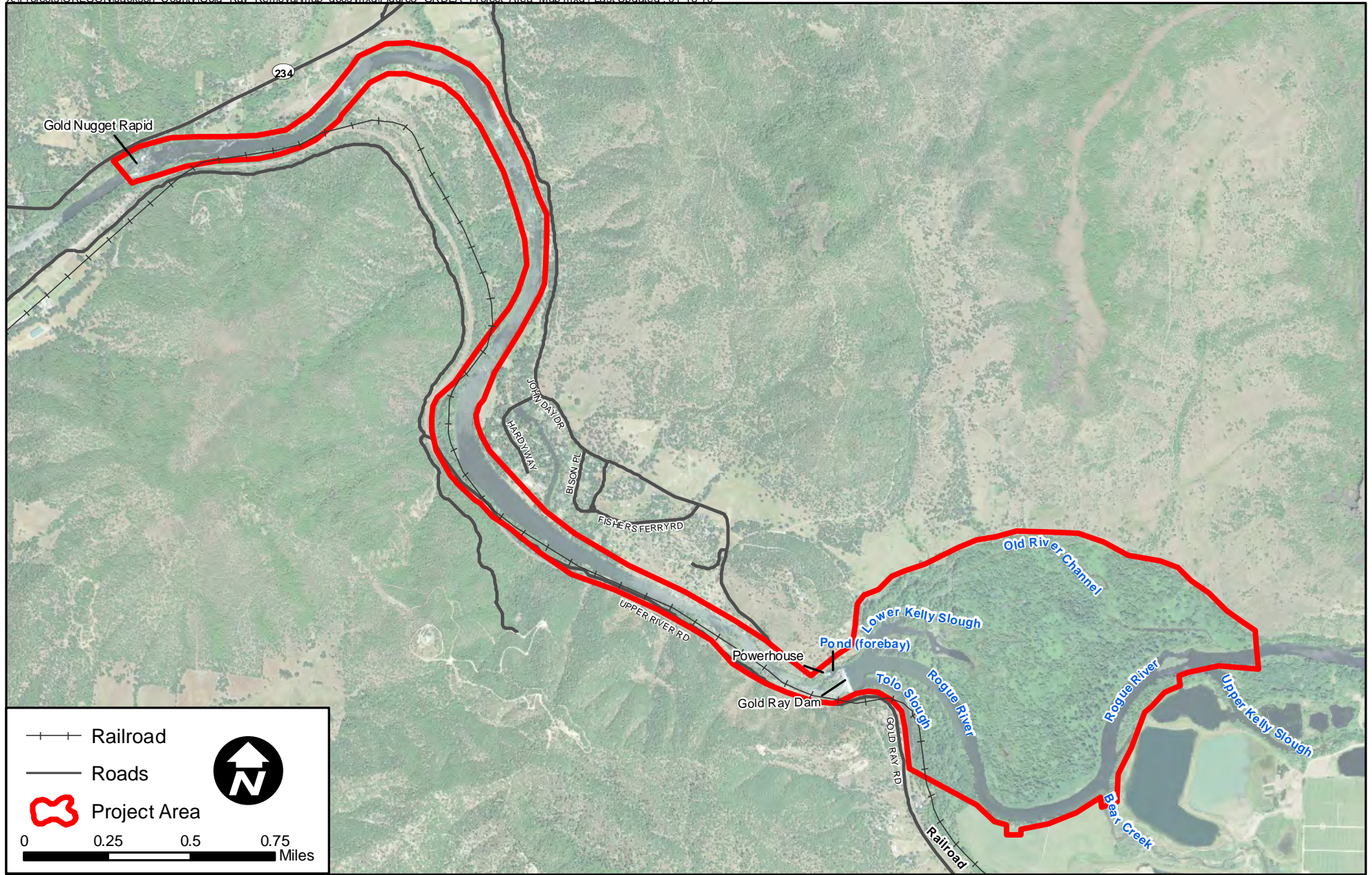
2.1.1.1 Work Area Isolation and Dam Removal

Alternative 1 would remove the following:

- ◆ Existing concrete dam and related structures, including fish ladders
- ◆ Remnants of the log crib dam
- ◆ Power canal (forebay and tail race)
- ◆ Power house and associated structures (such as the forebay retaining wall).

The removal of the dam would occur in two phases over one in-water work season.¹ The first phase (Phase 1) would demolish the southern half of the log crib and concrete dams, removing a large portion of the dam to accommodate the flow of the river. The second phase (Phase 2) would remove the remaining northern portion of the log crib and concrete dams and associated structures on the north riverbank, including the fish ladders, power canal retaining walls, and power house. Separating the removal process into two phases allows for continued fish passage and a controlled drawdown of the reservoir to improve fish salvage efficiency. During the transition between the phases, there would be an approximately 3-to-5 day period where fish passage through the area would not be provided.

¹ The Oregon Department of Fish and Wildlife (ODFW) has established guidelines to provide the public a way of planning in-water work during periods of time that would have the least impact on important fish, wildlife, and habitat resources. Within the project area, ODFW’s recommendation for in-water work is June 15 to August 31. It is anticipated that an in-water work extension will be needed to complete removal of the dam; ODFW has indicated through the interagency review team that an in-water work extension is acceptable.



Project Area Map
FIGURE 3

Appendix B presents details on the dam removal process and sequence, and Appendix C details the Draft Fish Salvage Plan (including fish passage) for dam removal. Figure 4 illustrates the activities associated with each proposed phase of dam removal. Detailed information is provided in Appendix B.

Cofferdams² would be placed in different locations for each phase of demolition to create isolated areas with no water flow and minimize the risk of contamination from construction-related materials. Cofferdams would be constructed from large angular rock and bulk bags containing sand and gravels. For Phase 1, a cofferdam would be constructed around the southern half of the dam to direct flows to the northern portion of the main river channel and isolate the backwater area of Tolo Slough just upstream and south of the dam. Fish would be collected (i.e., salvaged) from the isolated area immediately after the cofferdam is in place and moved to areas where they would not be stranded and potentially harmed from the diversion of river flows to the north side of the channel. Access to the site would be via the Central Oregon and Pacific Railroad on the south side of the river (see Figure 4). Fish passage would be maintained through the existing fish ladder. Appendix C presents details on how fish salvage would occur.

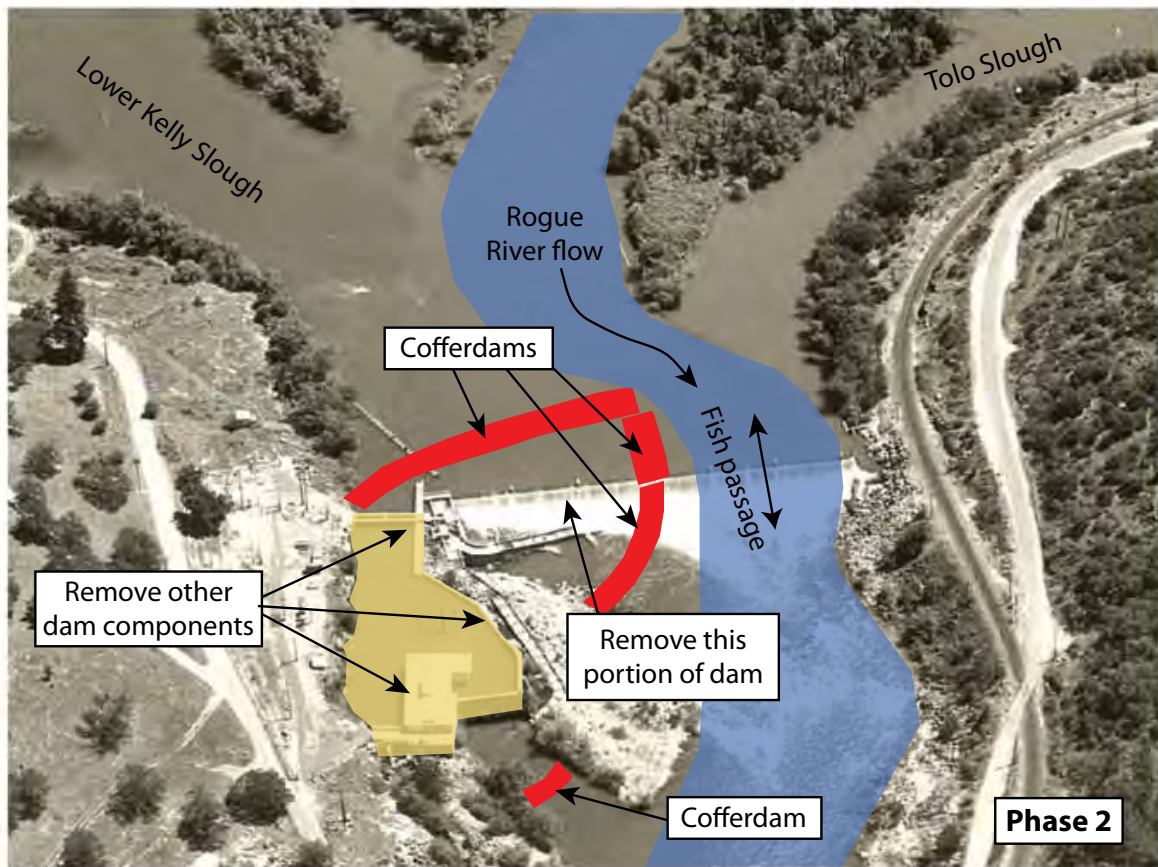
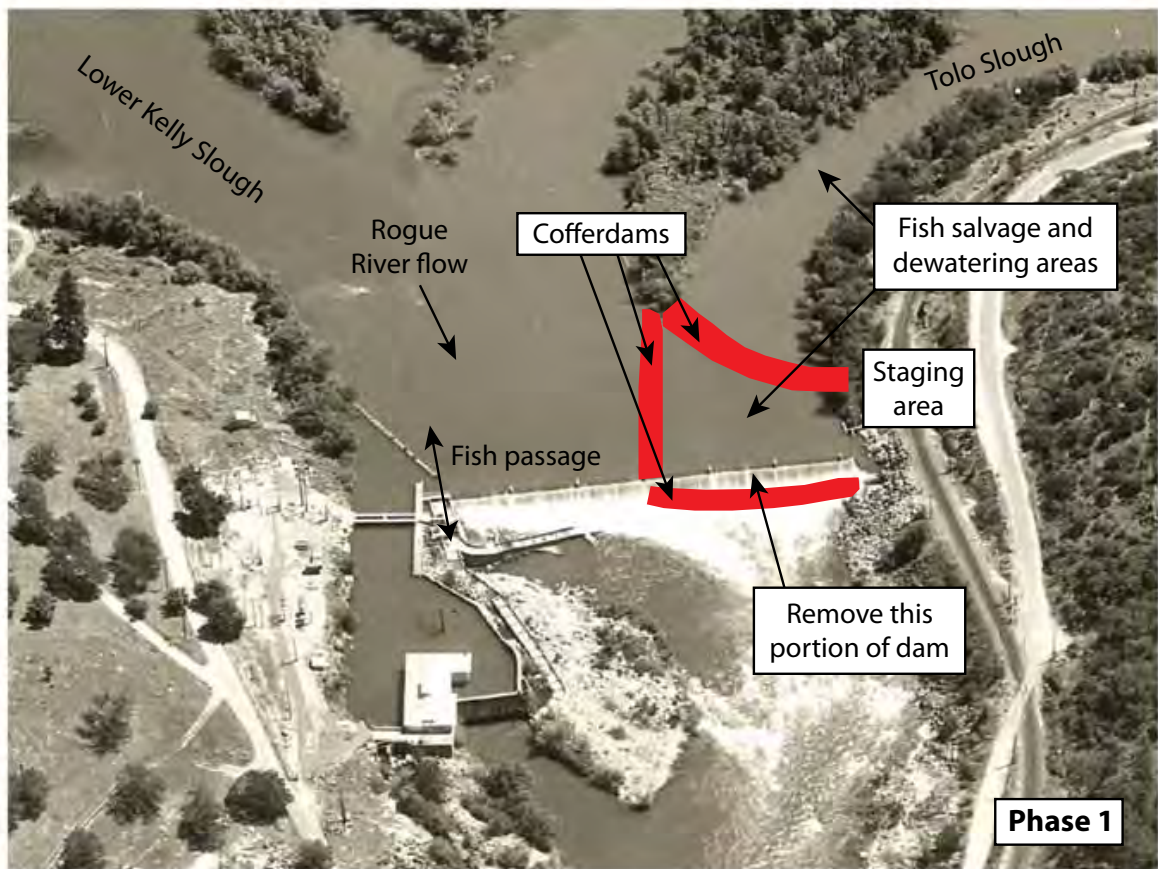
During Phase 1, an additional cofferdam would be constructed downstream of and parallel to the dam to serve as a work platform and isolate the area from river flows to allow for removal activities. Fish would also be salvaged from this cofferdam according to the Fish Salvage Plan. In addition, a floating silt curtain would be suspended downstream of the dam to control sediment that may be washed downstream of the work area. Silt curtains are impermeable barriers constructed of a flexible reinforced material with a float on the top and a weight on the bottom to hold the curtain in place.

Once the areas are isolated and fish salvage has occurred, the southern portion of the dam would be removed. The concrete structure consists of piers and concrete slabs that have a maximum thickness of 24 inches. Because of the relatively small thickness of the concrete, standard hydraulic track hoes mounted with hydraulic rams and shears will be able to break and remove the concrete. The concrete and reinforcing steel will be removed down to the existing bedrock. The existing log crib dam will also be removed. It is anticipated that the log crib structure can be removed with the on-site track hoes by pulling the piling and log structure apart.

Following removal of the southern portion of the dam, the cofferdam would be incrementally removed to allow water in the reservoir behind the dam to be drawn down gradually. Once the cofferdam is removed, the river would flow along the south bank, unimpeded, through the area formerly occupied by the southern half of the dam. This reopened section of the river would provide for fish passage through the project work area for the remainder of the dam removal process. As noted above, during the transition from Phase 1 to Phase 2 there would be a short period (about 3 to 5 days) where no fish passage through the fish ladder or the new channel would be available.

For Phase 2, a cofferdam that provides temporary access to the dam would be constructed from the north shore to mid-channel, upstream of the log crib dam. This temporary cofferdam would allow machinery access across the reservoir deposits and along the historic log crib dam for removal. There should be no flowing water in this area as the river will be diverted to the south through the removed portion of the dam. A cofferdam of bulk bags and rock aggregate would be installed at the downstream side of the concrete dam to the north shoreline to isolate the work area from backwater conditions from river flows. The remaining dam structure (northern half) would be removed in the same manner as previously described for removal of the southern half of the dam. Following dam removal, the removal of the power

² Cofferdams are temporary structures built to enclose an underwater area. Water is pumped out of the enclosed area to create a relatively dry area and enable construction work.



Dam Removal Schematic
FIGURE 4

canal, concrete fish ladder, and powerhouse would be completed. Equipment would access the area from the north shoreline outside of active water flow.

Demolished concrete and rock would be hauled from the Gold Ray Dam site to fill the abandoned Gold Hill power canal several miles downstream of the Gold Ray Dam area in an upland area, or placed in appropriate upland sites in the project area as part of site restoration. The disposed concrete and rock would be topped with native river alluvium and fine sediment to create safe slopes and natural conditions. The fill area would be dressed with salvaged soils and planted with native grasses, shrubs, and trees as detailed in the site restoration plan.

The existing ODFW fish counting station, a portion of the original log crib dam, and other historic elements would be salvaged for research and historic preservation purposes.

2.1.1.2 Site Restoration

To reduce the potential for erosion of fine sediments and support existing wetlands and land uses, restoration of the riverbanks at the mouth of Lower Kelly Slough, Tolo Slough, and Bear Creek would be undertaken. The restoration would consist of a combination of large wood, boulder ballast rocks, and soil bioengineering for vegetation establishment and long term stability (e.g., plantings, soil mats). Reestablishing a connection between the north channel and the Rogue River was considered as a restoration alternative but has been determined to not be feasible at this time.

Following removal of the dam and appurtenant structures, areas disturbed during construction would be restored to reestablish preconstruction contours and establish native vegetation to the extent practicable. Soil used for temporary access in dam removal would be distributed on the north side of the riverbank to create topography similar to historic conditions. Haul routes would be scarified and decompacted to encourage soil fertility and plant growth. The exposed areas around the former dam site would be planted with native vegetation that is ecologically appropriate for the riparian area. Establishment of herbaceous vegetation will occur first to retain site soils. Tree and shrub plantings will be scheduled for the winter following construction to ensure adequate precipitation and growing conditions. These plantings will include white-oak, grass savannah, and mixed-pine forest in upland areas. Riparian areas will be planted with bigleaf maple, willow species, vine maple, dogwood, and alder.

2.1.1.3 Cost Estimate

The estimated construction cost, including engineering and contingency, of Alternative 1 is approximately \$5.6 million.

2.1.2 Dam/Fish Ladder Rehabilitation/Reconstruction (Alternative 2)

Alternative 2 involves rehabilitating the Gold Ray Dam complex to meet current dam, fish ladder, and fish screening design standards, thus addressing the issues of liability and substandard fish passage facilities posed by the existing dam. This alternative also considers rehabilitation to reestablish hydropower generation at Gold Ray Dam. Jackson County's comprehensive study examining the requirements for rehabilitating the dam and reestablishing electric power generation was completed in February 2010 (HDR, 2010a, Appendix D). Alternative 2 would address substandard fish passage and migratory conditions for native fish but it would not improve native fish habitat. In addition, there are substantial regulatory and legal challenges associated with its implementation. However, Alternative 2 was a subject of stakeholder interest raised during scoping (see Appendix A). The proposed elements of dam rehabilitation are described below.

2.1.2.1 Dam Rehabilitation

The design of Gold Ray Dam is known as a slab and buttress design, consisting of an inclined upstream slab supported between downstream buttresses (Figure 5). The majority of dam and water control structures are in a deteriorated state. There is evidence of significant concrete deterioration, cracking, and displacement throughout the site (HDR, 2010a).

Rehabilitation of Gold Ray Dam to meet current dam safety standards would be most efficiently accomplished by converting the existing slab and buttress design into a gravity dam. This would be accomplished by filling the voids beneath the slabs with concrete and tying the existing structure into the new interior concrete with dowels and reinforcing. To meet the required factors of safety for dam stability to prevent the structure from moving during an earthquake or severe flood, the new filled-in, solid portion of the dam would be secured into the bedrock with high-strength ground anchors. Figure 5 illustrates the dam rehabilitation elements.

Rehabilitation would also include reconstruction of the forebay retaining walls.

Work areas for rehabilitation of the dam would be isolated through the use of cofferdams, similar to what was described above for Alternative 1.

2.1.2.2 Fish Passage Improvement

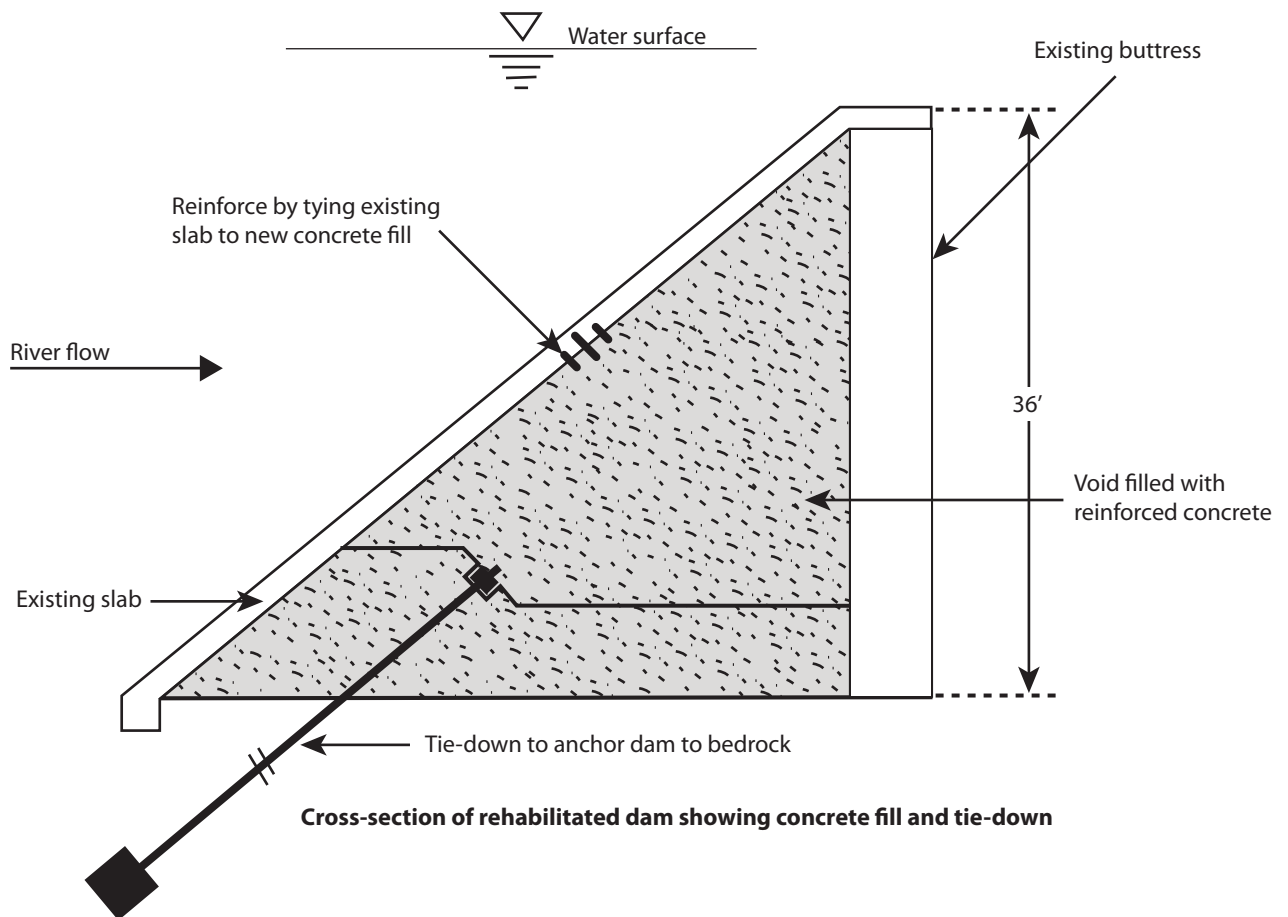
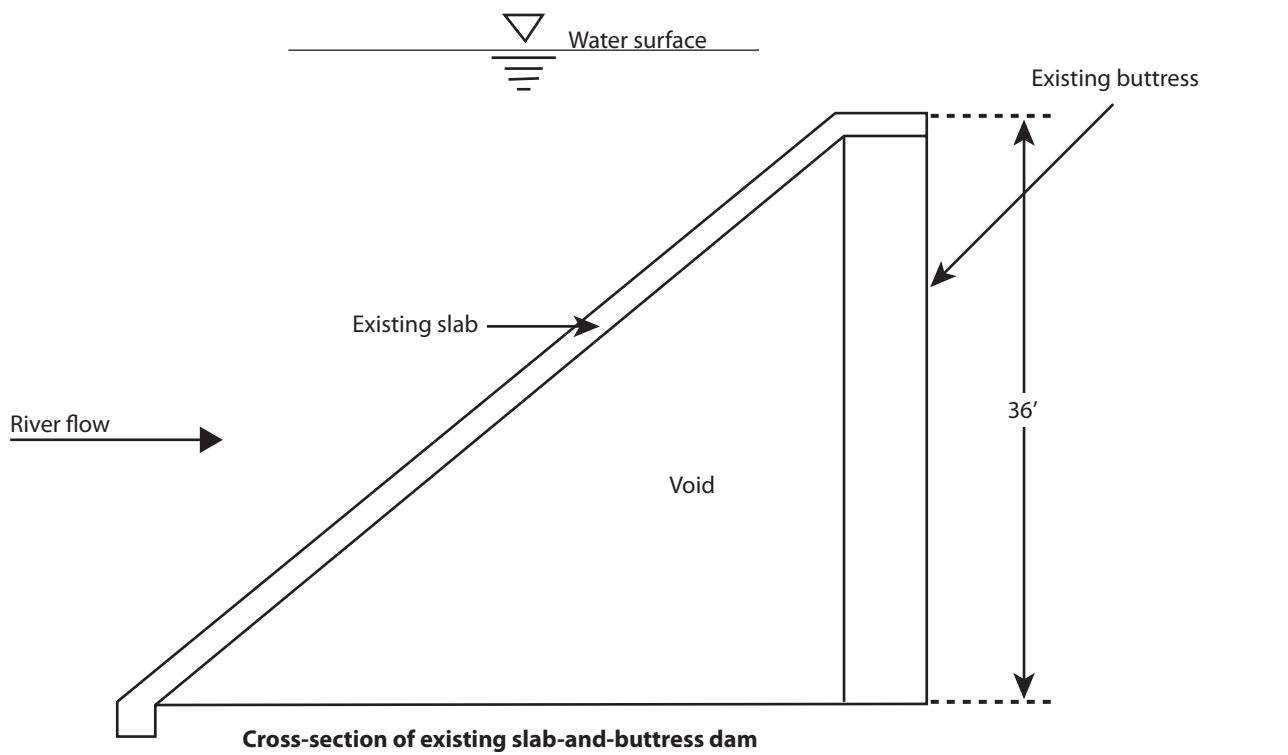
The Gold Ray Dam fish passage improvement would meet ODFW and NMFS' juvenile and adult fish passage criteria (ODFW, 2004; NMFS, 2008a). A conceptual design for a pool-and-weir fish ladder was developed based on current fish passage criteria; the fish ladder consists of individual pools that are 12 feet long, 10 feet wide, and 10 feet deep with incremental steps of 6 inches. Five larger entrance pools located at the downstream end of the ladder would be plumbed with an auxiliary water system to meet attraction flow requirements (i.e., providing sufficient flow to attract fish into the ladder) (RDG, 2010a) (Appendix D).

2.1.2.3 Fish Screen

Fish screens are necessary for hydropower facilities to prevent fish from entering turbines and being injured or killed (known as "fish entrainment"). The existing fish screens and coarse trash racks, intended to prevent fish and debris from entering the forebay area, do not meet NMFS design criteria. These would have to be removed and replaced with screens and trash racks that meet the design criteria both at the upstream end of the power canal and downstream of the tailrace.

2.1.2.4 Power Generation

The requirements for retrofitting the dam facility to generate power again were evaluated in 1982 (Tudor, 1982). As part of Jackson County's dam rehabilitation study (HDR, 2010a, Appendix D) the findings of that study were reviewed and updated to assess including power generation as part of a dam rehabilitation alternative. The 1982 power generation study recommended modifying the forebay, reconstructing the powerhouse and generation facilities, modifying the tailrace, and installing a substation and power lines to link into the regional electrical power distribution system. The estimated construction cost (assuming the project would be bid in 1984) was approximately \$12.9 million. The updated study concluded that, from an engineering perspective, while there have been some advances in hydropower turbine technology since the 1980s, application of newer technologies would have only a limited influence on the construction cost of upgrading the power generation system. Similarly, the energy production calculated in the 1982 study (31 million kilowatts per hour per year) is reasonable for a rehabilitation alternative. There have been improvements in turbine efficiency since the 1980s, but they are relatively minimal (likely one to two percent increased efficiencies over what was assumed in the 1982 study) (HDR, 2010a).



Dam Rehabilitation Elements
FIGURE 5

Restoring power generation would require Jackson County to acquire a new license from the Federal Energy Regulatory Commission (FERC). The FERC licensing procedure can be long and costly (generally taking five years or longer; licensing costs for other similarly sized facilities are approximately \$2 million to \$3 million). On the Rogue River, licensing and reestablishing hydroelectric power generation is complicated by a number of factors, including the presence of coho salmon, which is listed as a threatened species under the Endangered Species Act and Oregon water law that prohibits water withdrawals from the Rogue River for power generation (ORS 528.270).

Power generation would provide revenue for the County and this would, over time, offset some of the construction costs. Annual generation of 31 million kilowatts per hour per year would produce annual revenue of \$1.8 million (in 2009 dollars). Estimated annual operation and maintenance costs would be approximately \$300,000. Assuming a discount rate of 4.5 percent and a 40 year facility life, the present value of the revenue stream is approximately \$25 million, which is significantly less than the construction costs estimated for rehabilitation (see Section 2.1.2.5)(HDR, 2010a).

2.1.2.5 Cost Estimate

Table 2 presents a summary of the estimated construction costs, including engineering and contingencies, for Alternative 2. The ARRA funds available for Alternative 1 would not be available for the components of the alternative that are not related to improving fish passage.

Table 2: Summary of Estimated Rehabilitation Costs – Gold Ray Dam

Component	Estimated Construction Cost
Dam Rehabilitation	\$11.9 M
Fish Passage Improvements	\$4.0M
Fish Screening	\$24.8M
Power Generation	\$29.0M
Total Estimated Cost	\$69.7M

2.2 No Action Alternative

The No Action Alternative would involve taking no action to improve fish passage and habitat or reduce Jackson County's cost and safety liabilities associated with ownership of Gold Ray Dam. Existing facilities would continue to be substandard with regard to fish passage and structural and seismic stability. The County would continue to maintain the facilities, including periodic removal of snagged logs. County concerns with safety for river users as well as with people climbing on the dam or entering the power house would continue.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Geology and Soils

3.1.1 Affected Environment

The valleys of the Rogue River and Bear Creek, in the central part of Jackson County, are characterized by moderate relief. They consist of floodplains, terraces, alluvial fans, and hills, which formed through erosion and the extensive deposition of alluvial outwash following the uplift of the surrounding mountains (NRCS, 1969).

The National Resources Conservation Service (NRCS) Soil Survey of Jackson County characterizes project area soils as: Camas-Newberg-Evans complex, 0 to 3 percent slopes on the land between the mainstem of the Rogue River and the old river channel to the north and the spit of land along Tolo Slough; Evans loam, 0 to 3 percent slopes along the left bank of Bear Creek; Tallowbox gravelly sandy loam, 35 to 70 percent slopes in the area south of the Gold Ray Dam; and Tallowbox gravelly sandy loam, 20 to 35 percent slopes in the area north of the Gold Ray Dam. The soils are characterized as well to excessively drained (NRCS, 1969).

Immediately downstream of the Gold Ray Dam, the banks of the Rogue River consist of large outcrops of weathered bedrock.

Up to 400,000 cubic yards of sediment have accumulated in the inundated areas of the Gold Ray Dam impoundment (HDR, 2009a). Based on sediment core samples taken behind the dam, 80 percent of the total sediment was sand and gravel and 20 percent is silt and clay (HDR, 2009a). Note that sediment quality is addressed in more detail in Section 3.3 on water quality.

3.1.2 Environmental Consequences

3.1.2.1 No Action

The No Action Alternative would not result in any change to the existing geologic or soil conditions. Sediment would continue to accumulate behind Gold Ray Dam. This may result in continued erosion of shoreline soil and disturbance or resuspension of sediments.

3.1.2.2 Dam Removal

Removal of Gold Ray Dam would result in temporary disturbance of both upland soils and sediments in the immediate area of construction activities. Drawdown of the impoundment during dam removal would cause release of accumulated sediments from behind the dam. During construction, a floating silt curtain would be suspended in the Rogue River downstream of the dam to contain some suspended sediments near the construction area and minimize sediment that may be washed downstream of the work area.

To reduce the potential for erosion of fine sediments, the dam removal contractor would restore the riverbanks at the mouths of Lower Kelly Slough, Tolo Slough, and Bear Creek. The restoration would use a combination of large wood, boulder ballast, and soil bioengineering for stability.

Following removal of the dam and appurtenant structures, disturbed areas would be regraded and revegetated to reestablish the original site topography and vegetation. Soil used for temporary access in dam removal would be distributed on the north side of the river bank to create topography similar to historic conditions. Haul routes would be scarified and decompacted to encourage soil fertility and plant growth.

The contractor would submit an Erosion and Sedimentation Control Plan (ESCP). This contractor-prepared plan would be specific to the construction techniques to be employed.

Removal of Gold Ray Dam would restore more natural processes of sediment transport to the Rogue River. Once the dam is removed, the sediment accumulated behind the dam over the last 100 years would be washed downstream over a relatively short time frame and flowing water would resuspend and transport the sediments. The river would begin incising through the sediment deposits behind the dam until a stable slope is reached upstream from the dam site. Finer sediments would suspend and be transported more quickly than coarser sediments. The amount of sediment in water flowing downstream from the dam would increase for a short duration immediately following dam removal. Hydraulic and sediment transport modeling indicates that the majority of the sediment accumulated behind the dam would be transported downstream within the first few years following dam removal (HDR 2010c). As the reservoir sediments are transported downstream, the concentration levels would gradually diminish with distance and would not be discernable from naturally occurring sediment beyond the area immediately downstream of the dam. Eventually the amount of sediment in river water would reach a stable condition with normal flows. The first flood following dam removal would likely flush additional sediment from the formerly impounded area to the downstream river channel. Each subsequent flood would likely have decreasing sediment concentrations.

3.1.2.3 Dam Rehabilitation

Rehabilitation of the Gold Ray Dam would result in temporary disturbance of both upland soils and sediments in the immediate area of construction activities. Construction could result in the release of some of the accumulated sediments behind the dam; however, in the long term, the accumulated sediments would remain in place. Dam rehabilitation would have no long-term effects to geology and soils in the project area.

3.2 Land Use and Recreation

3.2.1 Affected Environment

3.2.1.1 Existing Land Use and Land Use Planning

Prior to settlement and development, the project area primarily consisted of a combination of oak savanna and open prairie wetland areas, surrounded by adjacent upland prairie areas.

Historic land use activities in the Rogue River basin included mining, agriculture and forestry, power generation (including Gold Ray Dam), and fish harvesting. At least 44 mines were historically present in the Rogue River basin upstream of Gold Ray Dam in Jackson County. Most mining activities ceased in the 1940s. The Rogue River basin has been used for agriculture since settlement began in the region starting around 1850. Important agriculture products include fruit orchards, cropland, pastureland, forest products and fish harvesting.

Gravel mining, fruit orchards, cropland, pastureland, forestry and fish harvesting are still performed within the basin today, including areas adjacent to the project area. Current land use in the project area includes local and state roadways, the Central Oregon and Pacific Railroad and managed and unmanaged grassland. Just beyond the western boundary of the project area are a few rural residential homes (Gold Ray Estates) and agricultural land.

Land immediately adjacent to Gold Ray Dam is currently owned by Jackson County. The land surrounding the dam was previously owned by Pacific Power and its predecessors; ownership was transferred to Jackson County in 1972. The county property is zoned Open Space Reserve (OSR). The

majority of the land in the project area is owned by Jackson County and the State; the remainder of the land is privately owned.

Lands around the reservoir above Gold Ray Dam are designated in the County's Comprehensive Plan as agriculture, forestry, and aggregate, and zoned as OSR and Exclusive Farm Use (EFU). Downstream of the Gold Ray Dam, land is zoned as Rural Residential (RR), Woodland Resource (WR), Aggregate Removal (AR), and EFU (Jackson County, 2009b).

Wild and Scenic Rivers

The Rogue River from the confluence of the Applegate River (RM 95) just west of Grants Pass to Lobster Creek Bridge (RM 11), 88 miles downstream, is designated a Wild and Scenic River under provisions of the Wild and Scenic Rivers Act of 1968. There are two rivers in the headwaters of the Rogue upstream of the project area (headwaters to RM 173) and a section of the Illinois River (a major tributary of the Rogue River) which are designated Oregon State Scenic Waterways. The Rogue River within the project area is not designated as a Wild and Scenic River or Oregon State Scenic Waterway.

3.2.1.2 Recreation

Recreation Facilities

Gold Nugget Rapids, a Wayside/Recreation Site managed by the Bureau of Land Management (BLM), is located at the western extent of the project area. Activities available at this site include river access for rafting, as well as wading, fishing, hiking, and picnicking.

Jackson County is in the process of developing the Rogue River Greenway, a regional trail along the Rogue River, which would be located adjacent to Gold Ray Road. The development of the greenway would provide an accessible trail in the project area for hiking along the Rogue River with a potential connection to the Bear Creek Greenway (Vial, 2010).

Boating/Canoeing

White water rafting is a very popular activity on the Rogue River and is an important part of the tourism economy for both Jackson and Josephine counties during the summer months. There are over 20 rafting companies in Jackson and Josephine counties. Gold Ray Dam is an impediment to those rafting the river and, due to the dam and limited river access in its vicinity, rafting is limited to areas below the Gold Ray Dam and above Touvelle Park. Below Gold Ray Dam, the river can be accessed via Upper River Road. There are numerous locations where rafts can put in and parking is available for trailers. The reach of river between Gold Ray Dam and the City of Gold Hill provides numerous moderately sized rapids that can be accessed easily, with most trips on this reach lasting a half day (HDR, 2009b).

Most raft trips above Gold Ray Dam start near the City of Shady Cove and end upstream of Touvelle Park. The duration of these trips also is usually a half day. There are no guided rafting trips below Touvelle Park down to Gold Ray Dam, both due to the lack of public boat ramps and the lack of significant rapids.

The reach between Gold Ray Dam and the City of Gold Hill is characterized by exposed bedrock and narrow channel widths, providing increased velocities. The reach between Gold Ray Dam and Gold Hill is popular with white water kayakers. The Nugget Whitewater Rodeo is held at Nugget Falls in this reach every October. Also, there is a standing wave created at the base of Gold Ray Dam on the south side of

the river near the exit of the fish ladder, which is popular with kayakers. Legal river access is available from the south side of the river (HDR, 2009b).

There is no white water kayaking immediately upstream of Gold Ray Dam.

The backwater behind Gold Ray Dam is used for canoeing and kayaking. With few power boats using the area and opportunities for wildlife viewing, blackberry harvesting, and quiet and solitude in a natural setting, the area is a desirable location for canoeing. In particular, the old river channel, north of the mainstem of the Rogue River, can be accessed from Lower Kelly Slough near the dam or from the Rogue River upstream of the mouth of Bear Creek. Several sections of the old river channel are not navigable by canoe due to sedimentation, vegetation growth, and downed trees. These barriers require portages around the blocked segments of the channel. There are also canoeing opportunities in the sloughs within the impoundment, including Lower Kelly Slough and Tolo Slough. Additionally, Upper Kelly Slough, immediately upstream of the impoundment south of the mainstem, is often used for canoeing (HDR, 2009b).

There is at least one private boat ramp located within the impoundment, but access to the ramp must be granted by the landowner. The area upstream of Gold Ray Dam is currently used for jet boating. Jet boats are the only reliable means for accessing the river by boat between Touvelle Park and Gold Ray Dam without access to a private boat ramp. Jet boats can navigate the shallow waters and return back upriver to Touvelle Park.

Fishing/Hunting

There are a variety of native fisheries on the Rogue River near Gold Ray Dam, including two runs of Chinook salmon (fall and spring), two runs of steelhead (winter and summer), coho salmon, and rainbow and cutthroat trout. The impoundment behind the dam also provides excellent fishing for nonnative warm water species, including crappie and smallmouth and largemouth bass. Fishing on the Rogue River is regulated by ODFW.

Fishing from drift boats and power boats is popular on the river below the dam where putting in is easy using one of the ramps along Upper River Road. Gold Nugget Rapids wayside downstream of Gold Ray Dam is a popular fishing location. Above the dam, drift boats are uncommon below Touvelle Park as there are no public boat ramps between Touvelle Park and Gold Ray Dam. Bank fishing is perhaps the most common means of accessing the river for fishing above the dam. The proximity of Upper River Road makes fishing below Gold Ray Dam easily accessible. Upstream of the dam, bank access is difficult, but with limited boat access, the reach between Touvelle Park and the dam is popular for those able to access the banks of the river.

Guided fishing on the Rogue River is an important component of the local economy. Guided fishing businesses based on the Rogue River have developed with Gold Ray Dam in place. For many, the presence of the dam has created a more valuable commodity due to the difficulty in accessing the river between the dam and a boat ramp upstream. Many of the guide companies have negotiated private access to the river above the dam (HDR, 2009b).

Gigging (or frog collection) and waterfowl hunting also occur within the flat water area upstream of Gold Ray Dam.

Hiking/Bird Watching/Nature Study

There are limited opportunities for trail hiking in the area of Gold Ray Dam. Lower Table Rock is located near the dam, but there is no trail access between the two locations. Downstream of the dam, the land on the north side of the river is privately owned and Upper River Road follows the river on the south side.

Habitat conditions created by Gold Ray Dam have made this large riparian area popular among the birding community both for the large numbers of birds and the numbers of different bird species. The area is also appreciated for the ecological diversity present. This makes it an ideal location for educational investigations of natural history, including ecology, zoology, and geology. Access for these activities is usually by canoe.

3.2.2 Environmental Consequences

3.2.2.1 No Action

The No Action Alternative would not directly or indirectly impact existing land uses or recreation. This alternative is compatible with local land uses and zoning. Land use would likely remain the same or similar to existing conditions for the foreseeable future.

3.2.2.2 Dam Removal

The removal of Gold Ray Dam is consistent with the Jackson County Comprehensive Plan and zoning designations for the project area.

Wild and Scenic Rivers

Temporary increases in turbidity could be expected during dam removal as summarized under Section 3.3.2.2. Sediment would be transported downstream during high flow and flood periods. Hydraulic and sediment transport modeling estimates that virtually all accumulated sediment would be transported out of the existing reservoir during high flow events within the first several years following dam removal. The increased turbidity that would occur during these events would be similar to the turbidity experienced in pre-removal high flow events and is not anticipated to negatively affect the Wild and Scenic segment of the Rogue River.

Recreation Facilities

Gold Nugget Rapids Wayside/Recreation Site and Rogue River Greenway would not be affected by the removal of the Gold Ray Dam.

Boating/Canoeing

With the removal of Gold Ray Dam, the Rogue River would be free-flowing from Lost Creek Dam to the mouth, allowing rafting to occur uninterrupted throughout the entire reach. Gold Nugget Rapids would not be affected by the removal of Gold Ray Dam.

Dam removal would result in flowing water through this reach of river with the potential for low rapids and swift water attractive to rafters and some canoers. This would provide potential for full-day guided raft trips.

The changes for white water kayaking opportunities with removal of Gold Ray Dam would depend on the gradient of the river channel that is exposed after the sediment in the impounded area has moved. The standing wave at the base of the dam would disappear if the dam is removed.

Dam removal would have temporary and long-term effects on canoeing and kayaking. Construction activities would temporarily (June through October) disturb the quiet setting and flow conditions that attract canoers and kayakers to the area. The Oregon State Marine Board (OSMB) has recommended measures that would reduce the risks to boaters on the Rogue River during construction; Jackson County will implement these measures during construction (see Section 3.13.2.2). The OSMB also recommended monitoring Fishers Ferry for potential sedimentation. Over the long-term, flat water boating opportunities would be substantially reduced with the removal of Gold Ray Dam and the restoration of free-flowing conditions. The condition of Upper Kelly Slough may not change much with the removal of the dam because the slough is situated upstream at the upper end of the impoundment; this area may continue to provide flat water boating opportunities. Canoeing and kayaking activities in Lower Kelly Slough and Tolo Slough would be substantially reduced, as the waterbodies may only intermittently contain enough water for flat water boating.

The removal of Gold Ray Dam would allow jet boats that launch from Touvelle Park to proceed farther downstream past the former dam site. With dam removal, jet boats would have unimpeded access from Lost Creek Dam to the river mouth. By expanding the reach of river available to jet boats and other water craft, conflicts among users may rise. However, much of the Rogue River is available to both jet boats and rafters with little conflict. Also, use of jet boats downstream of the dam where they typically are not currently used could result in increased boats and noise levels throughout this reach of the river.

Fishing/Hunting

Dam removal would have temporary adverse effects on fishing activities during removal. Construction activities would result in temporary increases in sediment that would potentially adversely affect fishing. Removal of Gold Ray Dam would likely lead to changes in how ODFW manages the river. Because there would no longer be a dam with a ladder affecting salmonids during upstream migration, the regulation limiting fishing to “all angling from Gold Ray Dam downstream to markers located downstream from lowest fishway entrance (river mile 126)” (ODFW, 2010) would likely not be necessary. For fishing upstream of the dam, the references to the impoundment would no longer be needed. ODFW would have the opportunity to manage the river as an open reach from the mouth up to the Lost Creek Dam. Construction activities would have no direct effect on hunting, as construction will occur outside of the designated hunting seasons (ODFW, 2009)

Drift boating opportunities would be increased for those who did not previously have access to the private boat ramp within the impoundment. Drift boats could put in at Touvelle Park and utilize the entire reach of the river. Enhanced access to the area for drift boat fishing would generally be a benefit to private drift boater and guide services.

Bank fishing between the site of Gold Ray Dam and Touvelle Park would be negatively impacted by an increase in drift boat and raft traffic, as the boat traffic may startle fish. The removal of the dam would return the impounded area to a natural gradient and thus provide approximately 1-1/2 miles of new river to fish. It would also provide for access to the river upstream of the dam for bank fishing. However, this would be limited to walking upstream from the current location of the dam.

With the impounded water no longer present, the warm water fishing would likely be limited to the remaining slough waters. This would result in a decrease in available fishing opportunities for nonnative, warm water fishes (e.g., largemouth bass and smallmouth bass) at this location of the Rogue River.

ODFW will oversee fish salvage and relocation. Some non-native game fish (such as largemouth bass) may be relocated to nearby ponds and lakes.

The removal of the dam would substantially decrease the available flat water area, reducing areas available for gigging (or frog collection) and waterfowl hunting.

Hiking/Bird Watching/Nature Study

The removal of Gold Ray Dam would not directly provide new hiking opportunities in the area.

The type of wetlands and riparian vegetation within the impounded area would change as a result of the drop in water level (effects on wetlands and floodplains as a result of the water level drop are discussed in detail in Section 3.4.2.2). The changes to the ecology in the impounded area would temporarily affect opportunities to explore the ecological diversity in the area. As the previously inundated riparian area becomes vegetated, bird watching and nature study opportunities would improve; however, bird watching opportunities specifically related to the open, flat water conditions would be substantially reduced.

3.2.2.3 Dam Rehabilitation

The Dam Rehabilitation Alternative would not impact existing land uses or recreation directly or indirectly. This alternative would be compatible with local land uses and zoning, because it would allow for the existing conditions and proposed future land uses to remain as they currently are.

3.3 Water Quality and Resources

3.3.1 Affected Environment

3.3.1.1 Water Quality

Water quality in the Rogue River mainstem and in its tributaries has been degraded by historic and current land uses in the river basin. Under Section 303(d) of the Federal Clean Water Act (CWA), the Oregon DEQ prepared a list of stream segments that do not meet water quality standards, referred to as the “303(d) list.” The mainstem Rogue River near Gold Ray Dam does not meet water quality standards for the following criteria: alkalinity, ammonia, chlorophyll a, dissolved oxygen, E. coli, fecal coliform, pH, phosphorus, and water temperature. Most important to fish habitat, warm water temperatures and low dissolved oxygen concentrations can adversely affect all life stages of anadromous fish present in the mainstem.

The Conservation Biology Institute (2003) concluded that water quality degradation is one of the primary threats to aquatic integrity in the Rogue River basin. The Conservation Biology Institute also indicates the mainstem of the Rogue River between Grants Pass and Medford appears to be only moderately impacted by water quality degradation, despite heavily populated centers along the I-5 corridor.

Tolo Slough and Kelly Slough are formed by impounded water above Gold Ray Dam. These areas have little surface flow connection to the main channel and water temperatures in these side channels often exceed suitable conditions for native cold water fish. In the summer of 2003, Watershed Sciences conducted thermal infrared imaging of the area near Gold Ray Dam and found that water temperatures in Kelly Slough (19.8°C) and Tolo Slough (20.4°C) were significantly higher than the mainstem Rogue River (16.7°C). Warm water temperatures are not conducive to native fish habitat; due to these high water temperatures, nonnative warm water fish species displace native fish in the sloughs as native fish seek cooler water habitat.

3.3.1.2 Sediment Quality

Sediment sampling conducted by Southern Oregon University in the reservoir above Gold Ray Dam in 2007 found metallic contaminants deposited in the reservoir from upstream sources associated with urban development in the Medford metropolitan area, including contributions from leaded gasoline, industrial activities, and abandoned ore deposits (Carrington and Elliott, 2007). However, the concentrations of these contaminants were below the screening levels set to protect aquatic organisms and human health. The USACE Portland District Project Review Group assessed the quality of sediments from behind Gold Ray Dam and determined the sediments met the USACE's Sediment Evaluation Framework guidelines for unconfined disposal and did not present contamination concerns. (USACE, 2009)

3.3.1.3 Hydrology

General hydrologic patterns for the Rogue River are driven by rainfall and groundwater inflow. Peak flows normally occur in November through May in response to abundant rainfall, snow melt, and runoff as soils are often fully saturated through the rainy season. Flow in the Rogue River is heavily controlled by Lost Creek Dam to reduce peak flows during high flow events.

Water withdrawals from the Rogue River for irrigation and city water supply generally reduce stream flow, affect water temperature and water quality, reduce or eliminate fish spawning and rearing habitat, and interfere with fish migration. According to the Rogue Basin Coordinating Council (2006) most tributary streams to the upper Rogue River downstream from Lost Creek Dam experience reduced water quantity during the summer months due to water withdrawals. The mainstem flows, however, are augmented by water releases from the Lost Creek Dam to support fisheries (USFWS, 2005).

3.3.1.4 Groundwater

Almost all of the water for domestic, industry, agriculture, and other uses in Jackson County comes from surface water sources; however, many rural residents rely on groundwater supplies for domestic uses. Groundwater is typically not used for irrigation or large scale agriculture due to its limited supply. Demands for groundwater are not expected to increase dramatically in the near future because projections for population growth for people dependent on wells is anticipated to grow less than 1% through the year 2050 (Ryan and Dittmer, 2002).

Also, as urban areas expand, there is a tendency to replace domestic wells with municipal surface water supplies.

According to the county watermaster and Oregon Water Resources Department's online well log query (available at http://apps2.wrd.state.or.us/apps/gw/well_log/Default.aspx) there are 14 wells used for domestic water supply within 0.25 mile of Gold Ray Dam. Of these, 8 are located on land upstream of Gold Ray Dam, and 6 are downstream. Of the upstream wells, 6 are located adjacent to Tolo Slough close to Gold Ray Dam and have static water levels (the level that water came to rest following completion of the well's construction) that range from 8 feet to 12 feet below the ground surface. Wells in the project area draw water from either alluvial or fractured bedrock aquifers.

3.3.1.5 Water Rights

Oregon Water Resources Department (OWRD) water rights records (OWRD, 2006) indicate that there are four surface water points of diversion (PODs) from the Rogue River within the project area upstream of Gold Ray Dam. The uses for the water rights associated with these diversions are domestic, irrigation, fire protection, and supporting aquatic life. In addition, there are 30 surface water PODs on the Rogue River downstream of Gold Ray Dam within the project area. Uses for the water rights associated with downstream diversions include domestic (for Gold Ray Estates), irrigation, fish culture, fire protection,

livestock, recreation, and temperature control. Figure 6 shows the location of wells and PODs as recorded by OWRD.

3.3.2 Environmental Consequences

3.3.2.1 No Action

The No Action Alternative would result in the persistence of current conditions for water quality, water quantity, sediment transport, and groundwater. Side channels created by the impounded water would continue to reach elevated water temperatures unsuitable for native coldwater fish. Sediment transport and the habitat values for native fish would continue to be reduced in this reach of the river.

3.3.2.2 Dam Removal

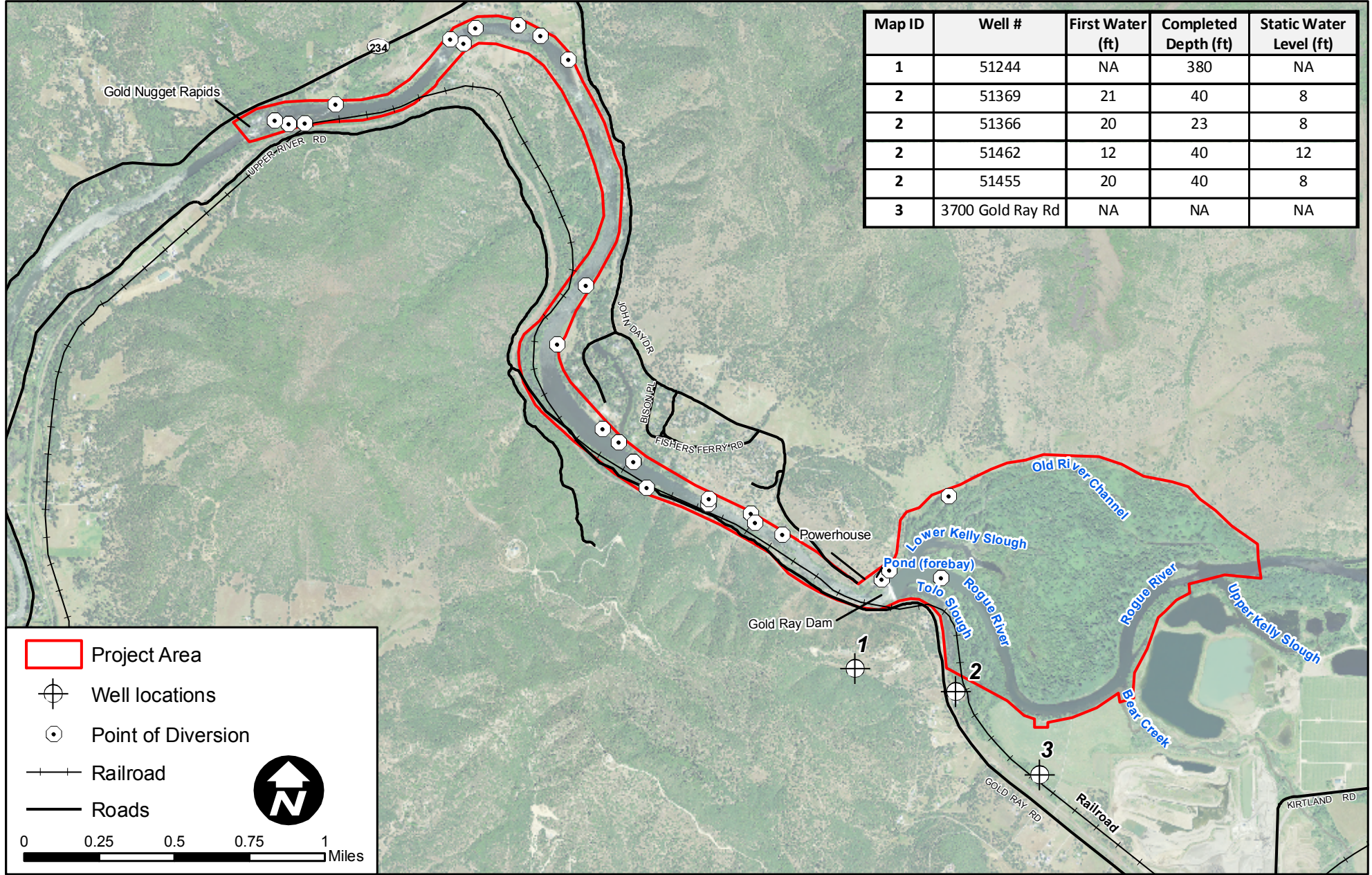
Water quality would be reduced slightly during construction due to increased turbidity. Contractors would be required to comply with applicable state, local, and federal permit requirements (see Section 1.5.2, specifically permits required in accordance with the Clean Water Act sections 401 and 404), which would provide adequate minimization and mitigation of normal construction impacts. This would include the use of Best Management Practices (BMPs) to minimize the impacts of construction to water quality.

Increased turbidity would continue at intervals during high flow periods until the accumulated sediments behind Gold Ray Dam are moved downstream. Nearly all of the accumulated sediment (about 400,000 cubic yards) would be transported downstream. Finer silt and clay would remain in suspension in the lower river; however, because of the large volume of water, this would not significantly increase turbidity beyond the immediate project site. Sand-sized particles would move more slowly, partially filling the pools and other lower velocity areas. Hydraulic and sediment transport modeling indicates that nearly all accumulated sediment would be transported out of the existing reservoir area during high flow events within the first several years following dam removal (HDR, 2010c). The increased turbidity that would occur during these events would be insignificant compared to the amount of turbidity already in the river.

The change in water levels in the Rogue River following dam removal would be dependent on flows in the river. The removal of the dam would lower the water surface elevation in the Rogue River by 4 to 22 feet behind the dam and by 0 to 7 feet upstream of the river's confluence with Bear Creek for a 100-year storm event and flows of 2,500 cubic feet per second (cfs)³, respectively. The lowering of the water surface elevation of the Rogue River would expose fine sediments at the downstream end of Lower Kelly and Tolo sloughs. The exposed sediment in these side channels could erode over time from high flows, possibly resulting in a long-term source of sedimentation. But this source of sediment could be significantly reduced by establishment of vegetation in the side channels due to the absence of standing water. If this erosion does occur, turbidity caused by this erosion would be limited to the area near the exposed sediments and turbidity impacts should be less downstream as sediments would dilute in the main river channel.

Following temporary increases in turbidity, dam removal would restore more natural hydrologic and sediment transport processes. The Gold Ray Dam does not regulate flow; therefore, the flows at the former dam site would be similar to current conditions. Areas impounded with water, such as Lower Kelly Slough and Tolo Slough, would likely revert to narrow ephemeral stream channels. There may be a slight benefit to water quality as areas of backwater ponds with high summer water temperatures would be reduced.

³ The 100-year storm flow represents an extremely high flow event and 2,500 cfs represents a typical flow in the Rogue River.



SOURCE: OWRD GIS 5/9/2006 - NOTE: Aerial Photo Taken June 2009

Oregon Water Resources Department Recognized Wells and Points of Diversion

FIGURE 6

Like surface hydrology, the dam removal would restore more natural groundwater processes. In general, the Rogue River in the project area is a groundwater discharge area; this indicates that a change in surface water levels may cause a corresponding decrease in groundwater levels. If adjacent upstream wells are shallow, groundwater levels may drop below pump settings, causing an interruption in water supply (OWRD, 2010).

Construction activities for the dam removal may result in inadvertent spills of hazardous materials that, if not attended to, could contaminate the shallow groundwater system. Project construction could result in inadvertent spills of hazardous materials used in standard construction practices. Construction would require the transport and use of potentially hazardous materials, such as gasoline, diesel fuel, industrial chemicals, and other hazardous chemicals. However, risk associated with accidentally spills would be minimized by compliance with erosion and pollution control plans prepared by the contractor.

Dam removal would not change flow in the Rogue River. As such, water available for upstream and downstream surface water PODs would not change. However, upstream water intakes may be affected by the change in water level following dam removal. Following dam removal, Jackson County will monitor the effects of changing upstream water levels on intakes for PODs. If changing water levels cause existing intakes to no longer reach Rogue River flows, Jackson County will negotiate with water users to extend the intakes. Dam removal would have temporary effects on downstream PODs from turbidity increases during construction and from sediment transport in the years immediately following the dam removal. It is unlikely in the long-term that existing downstream PODs would be adversely impacted by sediment as most sediment would be transported through the reach downstream of Gold Ray Dam. For the first few years after the dam is removed, some sediment would settle in areas immediately downstream of the dam and may affect PODs if sediment accumulates around the water intakes, potentially causing an interruption in the ability to withdraw water at the PODs.

For upstream wells, Jackson County will perform tests on legal wells to determine the wells' water level and production. The flow tests will be completed during late June through early July (to help eliminate the influence, if any, from spring runoff). The wells will be tested again following dam removal to determine if there is a change in the water level or production. If Jackson County determines that there has been an impact to permitted and legal wells due to removal of the dam that affects the well owners' access to water, they will work with each well owner to mitigate the impact. Jackson County will consult with OWRD to ensure that the County completes all mitigation that they are legally required to by Oregon water law.

For the downstream water intakes, prior to dam removal Jackson County will complete an assessment of each individual pump location for permitted PODs. For each POD information collected will include: the location of the intake pump; the size of the size of the pump; characteristics and conditions of the intake location; and the typical regular maintenance required for the pump and intake. Following dam removal, Jackson County will inspect intake and pump sites at the request of landowners. If adverse effects to intakes occur as a result of dam removal, Jackson County will coordinate with landowners to determine the appropriate solution on a site-by-site basis, with the understanding that the landowners will be responsible for maintenance associated with baseline conditions (i.e., prior to dam removal). Jackson County will complete all mitigation that they are required to by law.

The long term monitoring program to be coordinated by Jackson County will also include monitoring of sediment transport and flow conditions, and this will be shared with adjacent property owners.

3.3.2.3 Dam Rehabilitation

The dam rehabilitation alternative would result in the persistence of current conditions for water quality, water quantity, groundwater and the ability to divert surface water and access ground water.

3.4 Wetlands and Floodplains

3.4.1 Affected Environment

3.4.1.1 Wetlands

Wetlands are regulated under federal and state laws, including Section 404 of the Federal Clean Water Act and Oregon's Removal-Fill law. Existing wetlands within the project area fall under jurisdiction of both the USACE and Oregon Department of State Lands. A wetlands study area (a subset of the project area) was determined based on the likely effects of the proposed action. Wetlands are present in the project area and were determined using a combination of aerial photography-based vegetation mapping and field investigations of the study area (Figure 7). A review of historical aerial photos shows that wetlands upstream of the dam are gradually transitioning to upland from siltation coupled with changing hydrology and land uses. Approximately 16% of the 528-acre study area is wetland. These wetlands were categorized as four types based on dominant vegetation and are described below: ash forest, willow forest-shrub, grass-sedge marsh, and aquatic vegetation (HDR, 2009c). Because access to the areas is limited, these wetlands are relatively undisturbed.

Ash Forest Wetlands

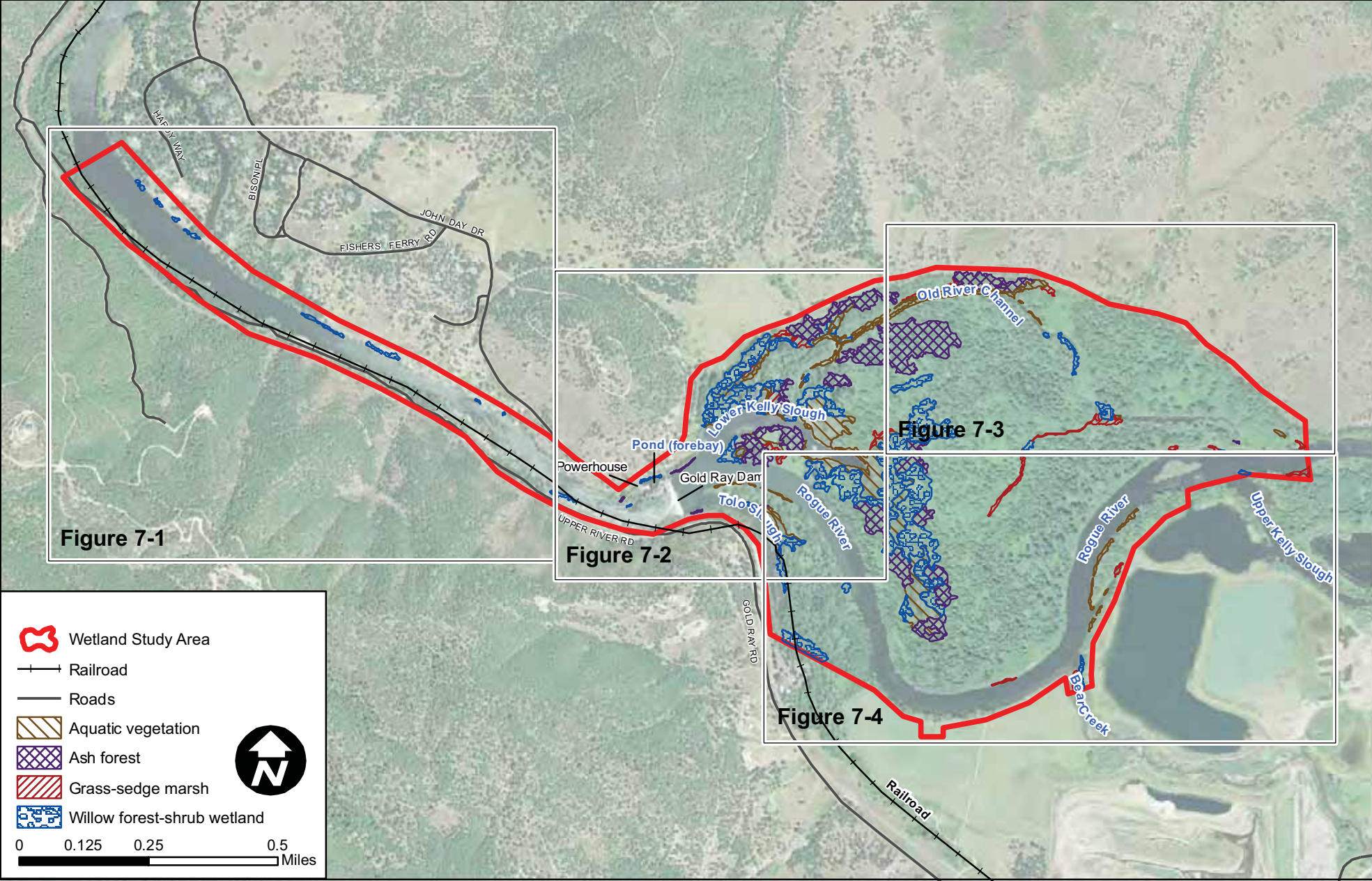
This wetland type is found upstream of the Gold Ray Dam in the floodplain and riparian areas adjacent to the Rogue River and sloughs (5% of study area). The tree canopy varies from open to closed but is dominated by Oregon ash (*Fraxinus latifolia*) with an understory of red osier dogwood (*Cornus sericea*), cluster rose (*Rosa pisocarpa*), and invasive reed canarygrass (*Phalaris arundinacea*). These wetlands are associated with the high water table associated with the river and sloughs.

Willow Forest-Shrub Wetlands

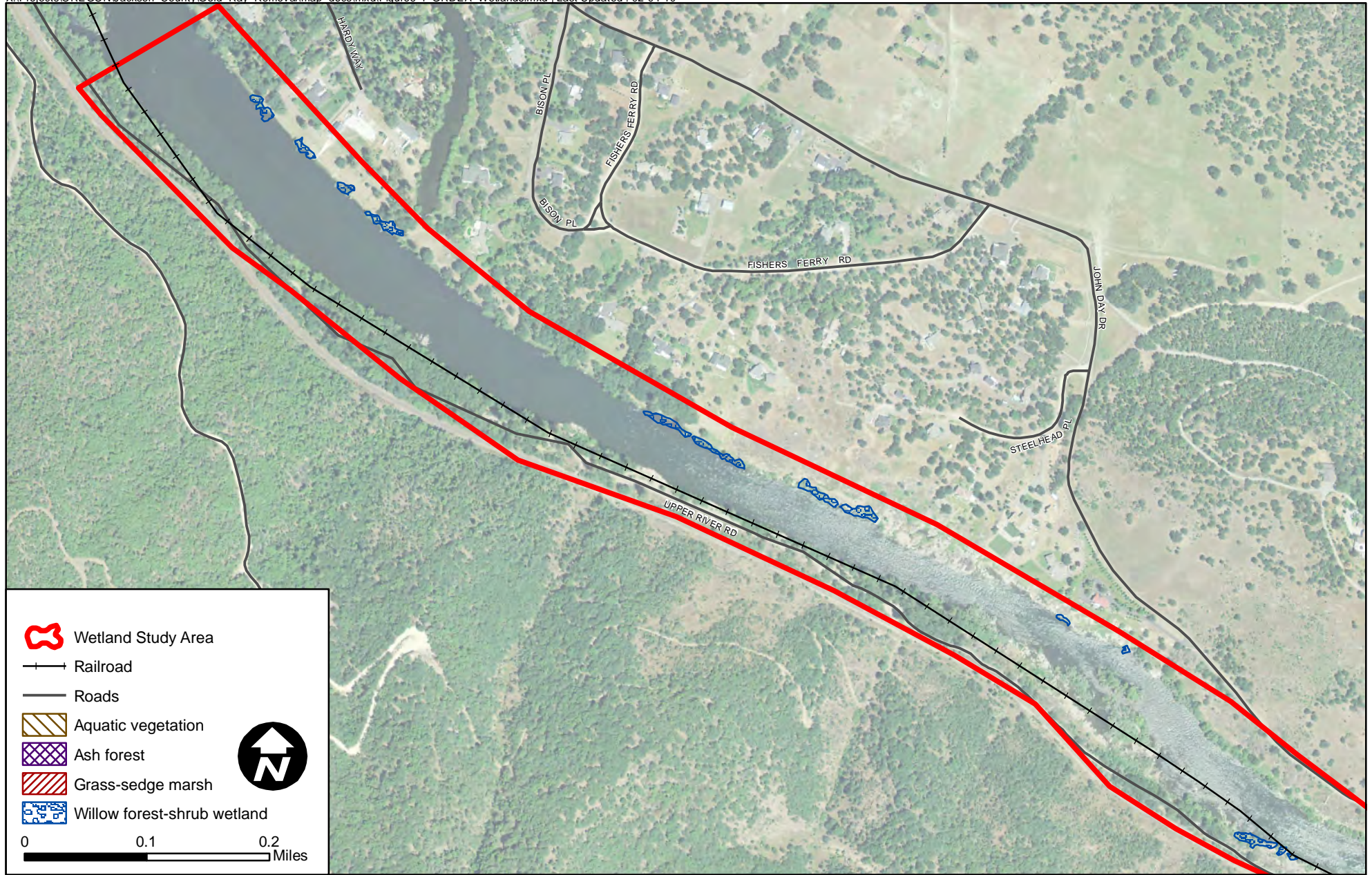
This wetland type is common throughout the study area and is the primary wetland type downstream of the Gold Ray Dam (6% of study area). These wetlands are generally located within the ordinary high water level (OHW) of the Rogue River and its tributaries. The dominant willow is coyote willow (*Salix exigua*) with Pacific willow (*Salix lasiandra*), Scouler's willow (*Salix scouleriana*), and northwest sandbar willow (*Salix sessilifolia*) present in drier areas. Understory vegetation varies but is dominated by reed canarygrass in drier areas and sedges (*Carex* sp.), rushes (*Juncus* sp.), flatsedges (*Cyperus* sp.) and yellow flag iris (*Iris pseudacorus*) in wetter areas. Soils in this community are typically loamy sand to sandy soils and these wetlands are associated with the high water table associated with the river and sloughs.

Grass-Sedge Marsh Wetland

This wetland community is found along the margins of the Rogue River and its tributaries below OHW (2% of study area). These areas are dominated by reed canarygrass, cattails (*Typha latifolia*), European burr-reed (*Sparganium emersum*), sedges, rushes, and flatsedges. Along the mainstem of the Rogue River and Old River Channel these wetlands are dominated by reed canarygrass and are typically narrow (4-8 feet across). Within Lower Kelly Slough, these areas are broad areas with up to 6 inches of surface water inundation.

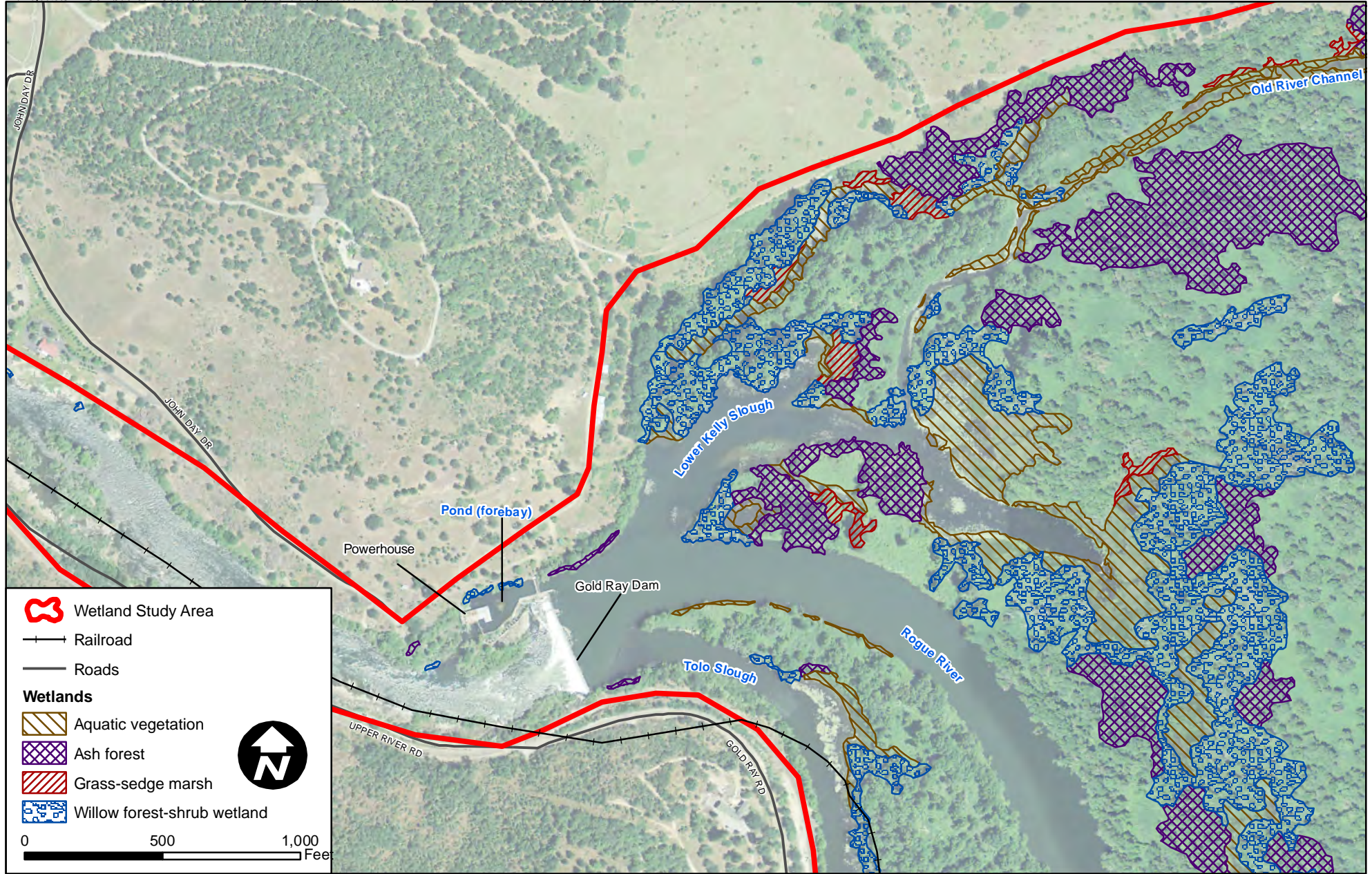


Wetlands Index
FIGURE 7



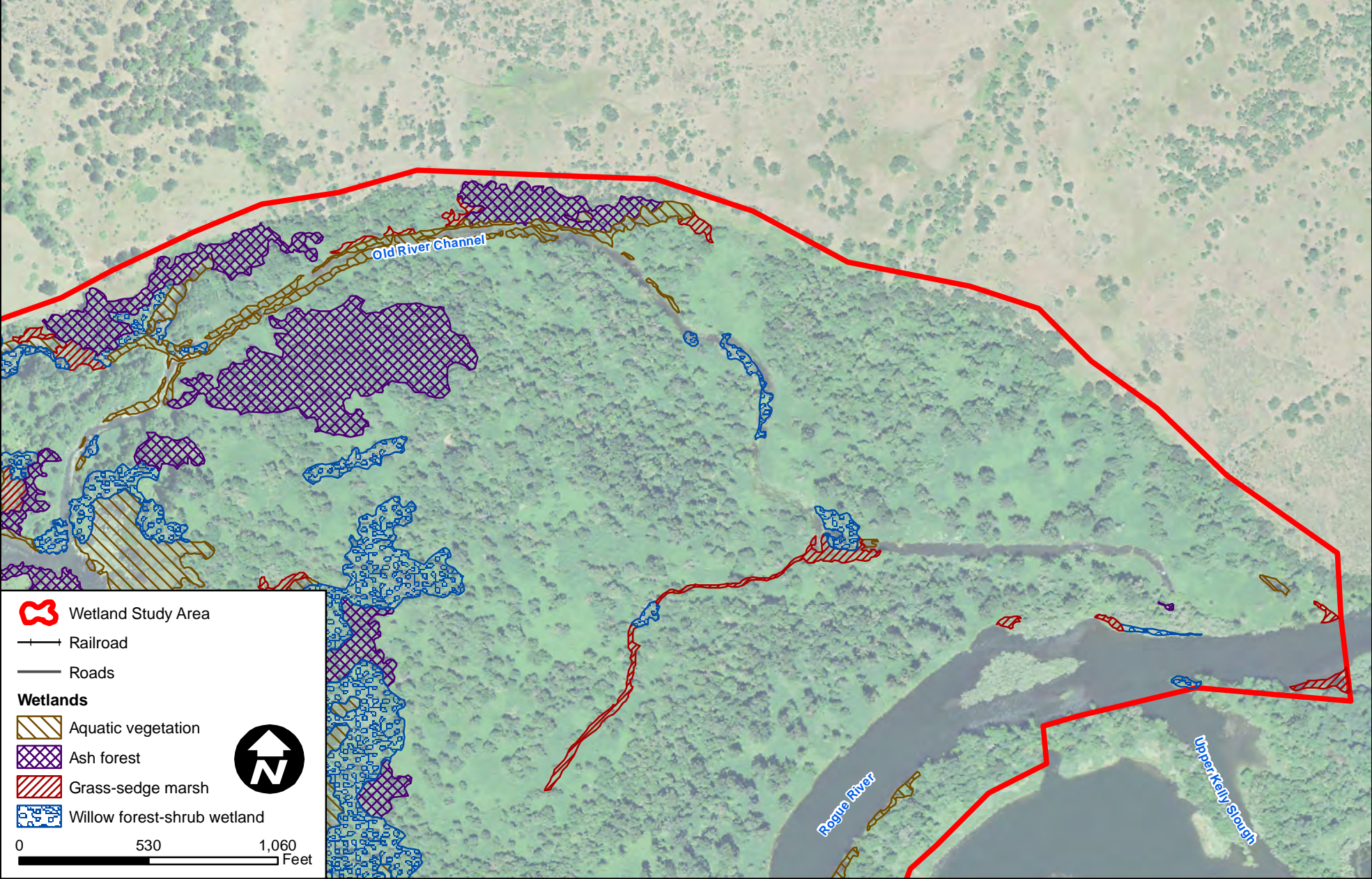
NOTE: Aerial Photo Taken June 2009

Wetlands
FIGURE 7-1



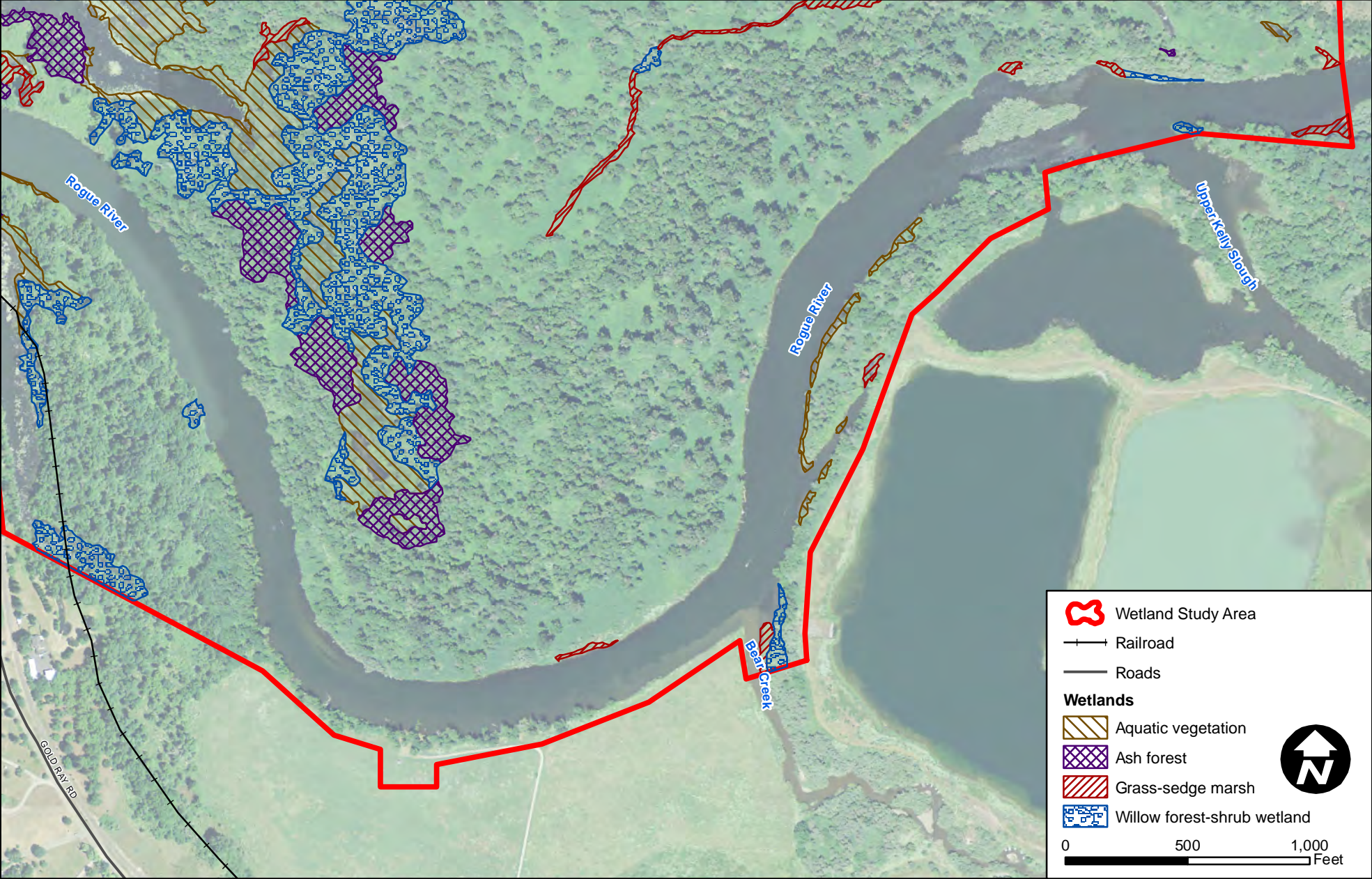
NOTE: Aerial Photo Taken June 2009

Wetlands
FIGURE 7-2



NOTE: Aerial Photo Taken June 2009

Wetlands
FIGURE 7-3



NOTE: Aerial Photo Taken June 2009

Wetlands
FIGURE 7-4

Reed canarygrass is less dominant in these areas. Soils in this community are typically loamy sand to sandy soils and these wetlands are associated with the high water table associated with the river and sloughs.

Aquatic Vegetation Wetlands

This wetland community is found along the margins of the Rogue River and its tributaries below OHW with wide expanses located within Lower Kelly Slough (3% of study area). These areas include species that grow below or at the surface of the water, including Canadian pondweed (*Elodea canadensis*) and swamp smartweed (*Polygonum hydropiperoides*) with European burr-reed (*Sparganium emersum*) in the shallow areas. As these communities were under water, soils were not investigated. These wetlands are associated with the water level in the river and sloughs.

3.4.1.2 Floodplains

Executive Order 11988 (Floodplain Management) directs federal agencies to identify and evaluate the potential effects of actions they may take in areas that are subject to a one percent or greater chance of flooding in any given year. Such areas are defined as the 100-year floodplain.

Floodplains in the project area have been mapped by Federal Emergency Management Agency (FEMA, 2010) (Figure 8). The 100-year floodplain occupies all of the study area for the project and extends the approximate width of the river channel downstream of the dam. Upstream, the 100-year floodplain extends from the base of the slope north of the Old River Channel to nearly Kirtland Road to the south.

3.4.2 Environmental Consequences

3.4.2.1 No Action

Wetlands

Under the No Action Alternative, wetlands in the area would persist under current hydrologic conditions. Wetlands upstream of the dam are gradually transitioning to uplands due to siltation and changing hydrology and land uses that will continue under the No Action Alternative.

Floodplains

The 100-year floodplain would continue to be affected as it has in the past with periodic inundation from flood events.

3.4.2.2 Dam Removal

Wetlands

Wetlands would be directly and indirectly affected as a result of dam removal and restoration efforts. Permits from the USACE and DSL will be required for direct impacts to wetlands. During dam removal, cofferdams would be used to access the dam structure as well as isolate parts of the river. The cofferdams would temporarily impact wetlands by placement of fill material within the wetlands (see Figure 7). Construction of staging areas, temporary access roads, and cofferdams would require vegetation removal and could lead to erosion and increased sedimentation to wetlands resulting in temporarily decreased water quality and reduced habitat availability. Accidental fuel and oil tank leaks and improperly disposed stormwater could enter wetlands and impair water quality and damage wetland plants and wildlife. Implementing BMPs would eliminate or minimize these effects.

Construction effects to wetlands would be temporary and would result in a short term loss of wetland functions. No long-term effects to wetlands in the construction zone are expected. Wetlands temporarily impacted during construction would be restored to their pre-existing conditions following the completion of work and it is anticipated that they would return to a fully functioning state within a few years. No permanent loss or gain of wetlands due to construction is expected.

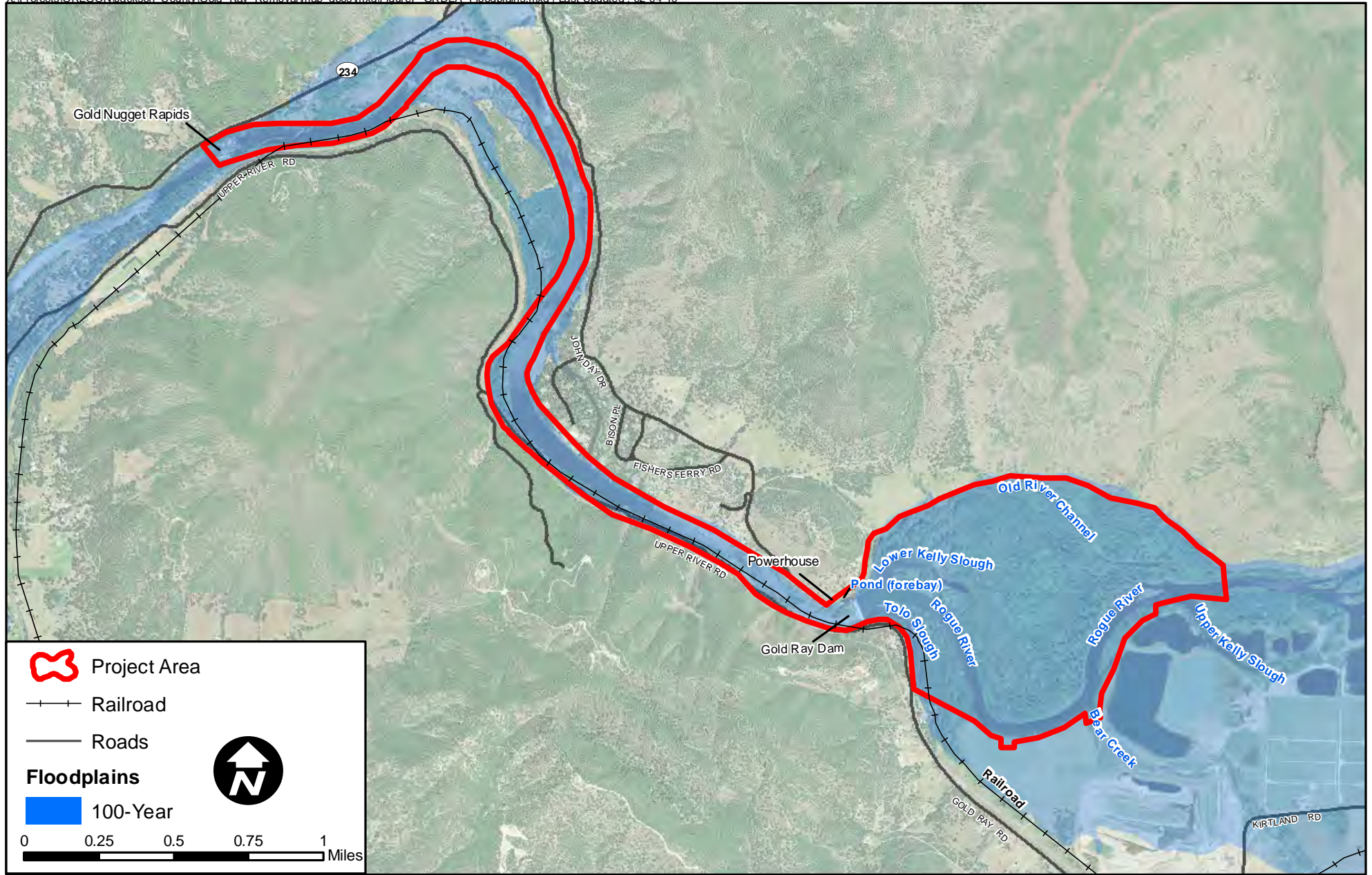
The removal of the dam would lower the water surface elevation in the Rogue River by 4 to 22 feet immediately upstream of the dam and by 0 to 7 feet upstream of the river's confluence with Bear Creek (based on a 100-year storm event and 2,500 cfs flows). As river levels drop, areas that are currently under water would be exposed. The riverbanks at Lower Kelly Slough, Tolo Slough, and Bear Creek may need to be stabilized to avoid severe erosion as a result of this exposure. The stabilization efforts would involve placement of grade control structures at or below OHW. Wetlands located in these areas would be temporarily and permanently affected by the installation of the stabilization structures.

Immediately upstream of the former dam site, the lowered river level would change the hydrologic conditions of existing wetland areas and expose new areas to hydrologic conditions that could support formation of new wetlands. At first, grasses, sedges, and rushes would populate these newly exposed areas. Depending on water levels and the amount of flooding that occurs, shrubs such as willows are anticipated to begin to populate many of these areas as an early succession species, ultimately transforming them into willow-dominated wetlands.

Alterations to the surface water would result in changes to drainage patterns as well as fluctuations in inundation frequency, depth, and duration that can result in vegetative composition changes. The existing wetlands are expected to become drier with the drop in river levels. Although groundwater discharge in some areas, especially the Old River Channel, could maintain hydrology, most wetland areas would be exposed to drier conditions and would transition to either willow or ash forest wetlands or become uplands. This is expected to occur in Lower Kelly Slough and Tolo Slough. Overall, it is expected that the loss of wetlands upstream of the dam would be offset by the creation of new wetlands after river levels change.

No long term data for hydrology related to groundwater and river levels in the wetlands is available. There are indications based on topography and observations in summer months (when river levels are low) that groundwater discharges occur near the Old River Channel and possibly in other areas upstream of the dam. Groundwater is expected to be of sufficient quantity along the Old River Channel to continue to support wetlands after dam removal. As river levels equalize near Bear Creek, fringe wetlands would remain unchanged.

Based on information from hydraulic and sediment modeling and site conditions, it is estimated that dam removal would result in the loss of approximately 12.4 acres of wetlands upstream of the former dam site. This would be offset by the estimated addition of approximately 18.7 acres of wetlands that would form in the newly exposed areas of the river channel and as a result of restoration efforts. Overall, the removal of the dam to restore the Rogue River to a natural condition would result in a net gain in wetlands. These wetlands would be of different types in terms of vegetation and hydrology but would still remain riverine wetlands. Long term monitoring (funded by NOAA and coordinated by Jackson County) of the river and associated riparian areas will occur after construction. If, during the monitoring, unanticipated loss of wetlands is evident, then additional restoration measures will be identified and implemented in accordance with the USACE permit.



Rogue River 100-year Floodplain
FIGURE 8

Downstream of the former dam site, water level changes are anticipated to be minimal. With water levels and sedimentation rates similar before and after dam removal, no changes to existing wetlands and no formation of new wetlands downstream of the former dam site are expected. No permanent loss or gain of wetlands is expected downstream of the former dam site.

Restoration efforts immediately following the removal of the dam will include restoring temporarily affected areas to preconstruction contours, as feasible, and establishing native vegetation. Establishment of herbaceous vegetation will occur first to retain site soils. Tree and shrub plantings will be scheduled for the winter following construction to ensure adequate precipitation and growing conditions. Wetland plantings will include white alder, Oregon ash, red-osier dogwood, willows, tufted hairgrass and American sloughgrass.

Floodplains

During construction, no equipment or supplies would be stored on site between work periods and all disturbed areas would be stabilized following construction. Construction is also expected to occur during low flows in the summer; therefore, construction-related effects during flood events are not expected.

Removal of the dam would result in changes in water levels upstream of the former dam site and sediment transport and deposition downstream. Stream flows downstream of the dam site would be similar to existing flows through this reach, which are generally not conducive to sediment deposition. Hydraulic and sediment transport modeling of dam removal indicate that there would be some sediment deposited in areas downstream of the dam following dam removal, resulting in minimal increase in the water surface elevation. These deposited sediments would be transported further downstream (and ultimately to the Pacific Ocean) during high-flow events, such as a 100-year flood. Based on results of the hydraulic and sediment transport analysis and from review of historical documents, it is anticipated that there will be no significant long term reduction in flood carrying capacity and no long-term impact to the existing base flood elevation or floodway resulting from dam removal. Coupled with minimal changes to river water levels, the FEMA-mapped floodplains downstream are expected to change very little and effects to floodplains would be minimal. FEMA has indicated that its policy for projects like dam removal, which remove built structures from floodplains and restore more natural sediment transport processes, is to not treat the projects as encroachments and that a minimal rise in water surface elevation from sediment transport is acceptable (RDG, 2010b).

Although river water levels upstream would drop as a result of the dam removal, the FEMA-mapped 100-year floodplain upstream is defined by the topography and surrounding drainage basin more so than the presence of the dam. Therefore, effects to the floodplain upstream of the dam would be minimal.

3.4.2.3 Dam Rehabilitation

Wetlands

Construction of staging areas, temporary access roads, and cofferdams would require vegetation removal and could lead to erosion and increased sedimentation to wetlands resulting in temporarily decreased water quality and reduced habitat availability. Accidental fuel and oil tank leaks and improperly disposed stormwater could enter wetlands and impair water quality and damage wetland plants and wildlife. Implementing BMPs will eliminate or minimize these effects. Construction noise and increased human activity would temporarily disrupt wildlife associated with the wetlands.

Most construction effects to wetlands would be temporary but would result in a short term loss of wetland functions. Wetlands temporarily impacted during construction would be restored to their pre-existing

conditions following the completion of work and it is anticipated that they would return to a functioning state within a few years. No long-term effects to wetlands in the construction zone are expected.

The upgrades necessary for dam rehabilitation would avoid permanent impacts to all wetlands except for a small wetland located near the powerhouse. This wetland derives hydrology from the small stream that flows through it as a result of a leak in the powerhouse forebay. Dam rehabilitation would repair that leak. The changes to drainage patterns as well as fluctuations in inundation frequency, depth, and duration would result in vegetative composition changes within the wetland. It is unknown if other sources, such as groundwater, supply hydrology to this wetland. It is possible that with the repair of the leak, the area may no longer support hydrology sufficient to create wetland conditions. As this wetland is an artificial condition of the dam leak, no restoration is proposed. Siltation as a result of slack water created by the dam has likely contributed to historical wetland loss upstream of the dam. This siltation process coupled with changing hydrology and land uses would gradually transition wetlands to uplands.

Floodplains

All facility upgrades would take place within the FEMA-designated 100-year floodplain. There are no practical alternatives to locate the upgrades outside of the floodplain. All construction would occur during the driest portion of the year when flooding is not anticipated. No equipment or supplies would be stored on site between work periods and all disturbed areas would be stabilized; therefore, construction-related effects during flood events are not expected. The following measures have been incorporated into the alternative to avoid, minimize, or offset potential adverse effects to floodplains:

- ◆ Implement an erosion and sediment control plan.
- ◆ Limit the profile of in-stream structures to affect the least surface area within the floodplain.

3.5 Aquatic Biology

3.5.1 Affected Environment

3.5.1.1 Aquatic Species

About 20 species of game and nongame fish inhabit the Rogue River, including the largest runs of wild anadromous salmonids in Oregon outside of the Columbia River (ODFW, 1988). These strong runs support recreational and commercial fisheries along the Rogue River and contribute significantly to the local economy each year. The native species most likely to occur in the project area include Chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*), steelhead (*O. mykiss*), cutthroat trout (*O. clarki*), Klamath small scale sucker (*Catostomus rimiculus*), speckled dace (*Rhinichthys osculus*), sculpin (*Cottus spp.*), Pacific lamprey (*Lampetra tridentate*) and stickleback (*Gasterosteus aculeatus*). The slack water habitat in the impoundment also supports nonnative warm water fish species, such as largemouth bass (*Micropterus salmoides*), smallmouth bass (*M. dolomieu*), pumpkin seed (*Lepomis gibbosus*), black crappie (*Pomoxis nigromaculatus*), bluegill (*L. macrochirus*), brown bullhead (*Ameiurus nebulosus*), yellow perch (*Perca flavescens*), and carp (*Cyprinus carpio*).

Salmon and steelhead principally use the project area as migration corridor and must pass over Gold Ray Dam as they move between the ocean and spawning and rearing areas in headwater tributaries. Resident fish may reside year-round in the reservoir or stream habitats downstream of the dam. Gold Ray Dam isolates some populations of resident fish because poor swimming species (e.g., lamprey) are unable to pass the outdated fish ladder. Like other mainstem dams, Gold Ray Dam creates unsuitable habitat conditions for native fish. For example, the reservoir creates slow water habitats that support invasive species that prey on native fish. Potential spawning habitat is lost due to water impoundment upstream of

the dam. Fish moving upstream must navigate an inadequate fish ladder to pass the dam, causing delays or injury. Fish moving downstream that are washed over the dam could be injured by turbulence or disorientated and are more susceptible to predation. USFWS considered these factors, among others, at the former Savage Rapids Dam, and estimated about 22 percent of the total run of coho perished each year because of the dam. While a similar study is not available for Gold Ray Dam, it is likely that some portion of the salmon and steelhead populations are injured or killed each year attempting to pass Gold Ray Dam.

Chinook salmon, coho salmon, and steelhead populations are augmented by the Cole Rivers Hatchery located at Lost Creek Dam. The hatchery program successfully provides additional opportunities for anglers. Hatchery fish return to the Cole Rivers Hatchery as adults and must pass Gold Ray Dam as they migrate. These species are discussed in more detail below. Among the fish species found in the project area, they are most important due to their popularity as recreational fisheries and the focus by state and federal agencies to recover their populations.

Chinook Salmon

The Chinook salmon population in the Rogue River is composed of distinct spring and fall runs. Adult spring Chinook enter the Rogue River from the ocean from late winter through early summer and migrate upstream past Gold Ray Dam. Spring Chinook then hold in deep pools on the mainstem for up to 5 months before spawning in the mainstem or tributaries in September through October. Before spawning, adult Chinook hold in pools, preferring deep pools with cool water, abundant large wood, and undercut banks for cover. Spawning typically occurs in riffles, high dissolved oxygen levels, and clean gravels and cobbles. Fall Chinook have been observed spawning approximately 1.5 miles downstream of the Gold Ray Dam; however ODFW has not identified significant spawning areas in the project area (ODFW, 2010). Juveniles emerge during the winter and spring, rear in tributaries until the summer, when they migrate towards the ocean as smolts. Abundance of spring Chinook in the Rogue River has declined owing to limited spawning habitat, variable ocean conditions, and changes in water temperature due to the operations of the Lost Creek Dam (ODFW, 2007). As a result, ODFW developed a conservation plan to specifically address Rogue River spring Chinook (ODFW, 2007). The conservation plan describes the desired status of spring Chinook salmon and the strategies and actions that will be taken to move the population toward desired status. Removal of Gold Ray Dam is consistent with the recovery goals stated in the conservation plan.

Fall Chinook salmon return to freshwater between August and November and spawn in the mainstem and lower portions of Rogue River tributaries from late October and early November. Unlike spring Chinook, there is abundant spawning of fall Chinook in the lower river below Gold Ray Dam. Populations of fall Chinook have generally increased over the past decade.

Coho Salmon

Coho salmon are the salmonid species most linked to the complex riverine habitats that were once prevalent in Rogue River tributaries. Adult coho salmon spawn primarily in small streams with stable gravel substrates and mainstem spawning is mostly limited to hatchery fish spawning immediately downstream of Cole M. River Hatchery (ODFW, 1991). Juveniles rear primarily in small streams during the summer months within pools, side channels, and other slow velocity areas with overhead cover. They spend the winter months in low gradient braided channel areas, where side channels, sloughs, and beaver ponds are present, before migrating to the ocean. In general, they depend on smaller streams that have wide riparian areas with marshes and side channels and pools in off-channel areas, alcoves along the edges of streams and rivers and beaver dams for summer and winter freshwater habitat. These fish must remain in freshwater habitat, generally tributary streams, for one year before migrating downstream to the

ocean. Urbanization, agriculture, water withdrawals, warm water temperatures, and loss of stream/floodplain connectivity in the greater Rogue River basin inhibit the recovery of coho salmon (DEQ, 2008).

Steelhead

Steelhead are rainbow trout that migrate to the ocean. There are distinct summer and winter runs of steelhead that exhibit various life histories adapted to conditions of the Rogue River. Adult summer steelhead spawn primarily in small tributary streams (Everest, 1973), while adult winter steelhead primarily spawn in larger tributary streams. Steelhead do not typically spawn in the mainstem such as the area near Gold Ray Dam. Juvenile steelhead reside in small and large tributary streams, as well as in the mainstem of the Rogue River. Unlike the salmon, which prefer pools and glides, juvenile steelhead are able to rear in fast-moving water. This trait and their variable stay in freshwater from 1 to 4 years, make them very adaptive to changing habitat conditions. They can compensate somewhat for elevated stream temperatures by seeking turbulent water with more oxygen. Many of the small streams preferred by steelhead for spawning dry up in the summer, and steelhead fry produced in these ephemeral streams migrate downstream into larger streams as flows decrease (Everest, 1973). In addition to high water temperatures, numerous other factors, including habitat loss, fish passage barriers, over harvesting, have limited steelhead production in the Rogue River basin (ODFW, 1992; ODFW, 1994).

3.5.1.2 Threatened and Endangered Species

NMFS listed the Southern Oregon-Northern California Coast (SONCC) coho salmon Evolutionarily Significant Unit, (ESU), which includes Rogue River coho, as threatened under the Endangered Species Act (ESA) in 1997 and reaffirmed its status in 2005 (62 FR 24588 and 70 FR 37160). Population declines of native coho throughout its range resulted from numerous human-caused factors, including habitat degradation, pollution, over-fishing, and introductions of hatchery stocks (Nehlsen et al., 1991). NMFS is in the process of preparing a recovery plan that will provide recommendations to guide the recovery of coho in its historic range (NMFS, 2008b).

In 1999, NMFS considered the listing of Rogue River Chinook as part of the SONCC Chinook ESU but concluded that the listing was not warranted given the large returns of Chinook to the Rogue River (64 FR 50394). The status of Rogue River steelhead was similarly reviewed for listing in 2001 but the listing was also found to not be warranted at that time (66 FR 17845).

Separate from the federal ESA, ODFW reviewed the status of major populations of native fish in Oregon (ODFW, 2005). ODFW concluded that the population of Rogue River spring Chinook was at risk of population declines and hampered recovery in the near term due to lack of reproductive isolation as a result of intensive hatchery production. Other Rogue River fish, including Rogue winter steelhead, Rogue summer steelhead, Rogue fall Chinook salmon, and southern Oregon coastal cutthroat, were determined not to be at risk at that time of review (ODFW, 2005).

3.5.2 Environmental Consequences

3.5.2.1 No Action

For the No Action Alternative, Gold Ray Dam would remain as an impediment to fish passage for both migratory and resident fish species. Gold Ray Dam would interfere with migration timing and adversely affect migrating fish each year.

3.5.2.2 Dam Removal

During dam removal there would be short term adverse impacts to aquatic habitat and fish. Demolition would include construction of cofferdams in the river channel, removal of riparian vegetation, release of sediments stored behind the dam, and temporary fish passage blockage for up to 5 days. These construction impacts could harm fish that are present near the work areas. However, most activities performed in the river channel would be completed during ODFW's recommended in-water work period (June 15 to August 31) when salmon and steelhead are less likely to be present in the project area. ODFW has also approved an extension to the in-water work timeframe for the final stages of dam removal through October 15. Adult summer steelhead, fall Chinook, and coho may be present in the project area during this extended in-water work time frame. But during that stage of the demolition process the river would be restored to its historic channel and there would be limited impacts on fish from in-water work. Potential impacts include localized turbidity near work areas, underwater noise disturbances, and construction activities that cause fish to avoid the project area. No blockage to fish passage or fish handling is expected during the in-water work extension. This extension is a result of working with ODFW and NMFS to minimize disturbance of upstream adult fish passage and extend the opportunity for counting fish at the counting station. Plus, the extension would allow the contractor to complete the entire dam removal in one construction season.

Construction of cofferdams could trap fish in isolated areas and expose them to unsuitable water conditions. To mitigate the likelihood of entrapment, fish inadvertently trapped inside the cofferdams would be captured and released immediately after the cofferdams were installed. Fish salvage would be accomplished using a combination of seining and electrofishing and would be supervised by ODFW fish biologist following the methods described in the fish salvage plan (Appendix C). Fish salvage efforts would also occur in Lower Kelly Slough where fish could be stranded as the reservoir is drained.

Section 3.4.2.2 describes the potential impact to riparian vegetation during construction. The indirect effects from riparian vegetation loss on aquatic species would be minor. Exposed shorelines after dam removal are expected to naturally revegetate to provide stream shading and streambank stability over time. There could be a minor increase in large woody debris contributed to the river channel if hydrology changes result in the loss to mature riparian trees that could fall into the river. Portions of the former reservoir would be replanted to encourage growth of native vegetation and reestablishment of the riparian vegetation.

Short-term increases in sedimentation would occur during the initial dam removal phase, and would continue during high flows following dam removal as stored sediments are washed downstream over time. Increased suspended sediment can cause lethal, sublethal, and behavioral effects in juvenile and adult salmonids (Newcombe and Jensen, 1996). The effects would be most acute directly below the dam and would decrease with distance downstream as suspended sediment settles out of the water column. Salmon species, such as coho, tend to avoid highly turbid waters (Bisson and Bilby, 1982) and fish near the project area may move laterally or downstream to avoid suspended sediments (Lloyd 1987). While effects to fish may occur, the release of stored sediments is expected to be similar to annual high water events when the Rogue River is typically laden with suspended sediments. While the stream channel immediately downstream of the dam is composed of bedrock and large boulders, there are pockets of suitable spawning gravels likely used by Chinook. These spawning areas could be affected by deposition of fine sediment or change in hydrology as a result of dam removal. Sediment deposition in spawning areas may impact fall Chinook, however deposition of fine sediment would be likely to occur during construction when fall Chinook are less likely to be present; therefore these impacts would be limited in extent and magnitude. Dam removal would likely create new spawning habitat in the area that was previously inundated by the reservoir. The overall restoration of the natural river channel and sediment transport processes would be a substantial benefit to Rogue River fisheries despite the temporary increases in suspended sediment caused by dam removal.

Upstream fish passage would be provided through the existing fish ladder or the newly open channel during the dam removal process, except for the period when the reservoir is drained and the cofferdams are removed. During the transition from Phase 1 to Phase 2, there would be up to a 5 day period when fish passage would be completely blocked as the fish ladders on the north side of the dam are dewatered when the river is diverted from the north side of the channel to the newly opened south side channel. Based on the current demolition plans, this period is anticipated to occur in the first half of August. During this part of the demolition process it is not possible to provide upstream passage because the difference in water surface elevation above and below the cofferdam would be about 30 feet. The cofferdam would be incrementally lowered to a point where fish passage would be restored through the newly open channel. The migration of adult fall Chinook and summer steelhead attempting to pass Gold Ray Dam during this time would be delayed resulting in decreased reproductive success for those individual fish. Overall this impact is expected to be minor when considering the populations as whole. Juvenile downstream passage should be unaffected.

The proposed action would remove the last mainstem dam on the Rogue River from the ocean to Lost Creek Dam near the headwaters; providing unimpeded upstream and downstream movement for anadromous and resident fish. Removal of Gold Ray Dam would restore the natural river functions for habitat creation and hydrology and provide an overall benefit for fish. Slack water habitat currently created by the dam would change to riverine habitat. This habitat shift toward increased riverine habitat would benefit native species that prefer swifter moving water and lower water temperature. Several introduced species, such as large mouth bass, are locally abundant at the reservoir because of the artificial lake-like conditions created by the dam. Populations of these nonnative species are expected to decline after dam removal due to the reduction of warm water habitat.

Dam removal would remove the ODFW fish counting station at the Gold Ray Dam fish ladder. ODFW is developing alternative fish monitoring methods, and would apply these methods if the fish counting station is removed. If dam removal is selected, ODFW plans to replace the dam count for spring Chinook with carcass counts after the fish have spawned. Carcass counts were conducted in the 1970s and 1980s, and resumed in 2004. ODFW also operates a seining station at Huntley Park on the lower Rogue River. This long term data collection station provides the primary data ODFW uses to monitor trends in abundance for coho salmon, fall Chinook salmon, and late run summer steelhead. Additional spawning and juvenile surveys are conducted by ODFW for summer and winter steelhead and coho salmon, and will continue to be conducted (ODFW 2010).

The in-water work and fish handling required for dam removal may expose SONCC coho to direct impacts. NMFS has prepared a Biological Assessment (BA) in accordance with the ESA. The BA documents that the project would result in *a may affect, likely to adversely affect* determination for SONCC coho due to short term impacts. However, dam removal would result in a long term benefit for the species and would likely be consistent with future recovery plan goals for SONCC coho prepared by NMFS (NMFS 2010). NMFS Northwest Region has determined that the proposed action is covered under the USACE Standard Local Operating Procedures for Endangered Species Programmatic Biological Opinion regarding the effect on SONCC coho.

3.5.2.3 Dam Rehabilitation

Temporary effects associated with dam removal (turbidity, removal of riparian vegetation, fish handling) would be similar for dam rehabilitation because this alternative would include in-water work. The dam rehabilitation alternative would improve the fish passage by modifying the existing ladder to comply with ODFW's fish passage guidelines; however, fish would still have to navigate through an artificial structure instead of a natural, unobstructed stream channel. The dam would continue to create unfavorable habitat conditions for native fish by maintaining slackwater habitat with water temperatures that exceed suitable

conditions for native fish, but which support invasive warmwater fish that prey upon juvenile salmon and steelhead.

Hydropower facilities like the one considered for Gold Ray Dam can trap downstream migratory fish in their turbines, which can cause mortality or injury. The new hydropower facilities would have screening devices to reduce the likelihood of turbine entrainment, but the chance of fish injury remains, regardless of screening.

3.6 Terrestrial and Avian Wildlife

3.6.1 Affected Environment

The study area is largely undeveloped open space with multiple types of wildlife habitat and corridors. A park located downstream of the dam on the south side of the river is vegetated with an oak savannah community and includes several pull-offs and informal boat launches, but the riparian vegetation is generally intact, allowing wildlife movement between the Rogue River and the open space to the south and west of the park. On the north side of the river, downstream of the dam, is the Gold Rey Estates residential development. These homes are located well outside the 100-year floodplain and the shorelines are generally vegetated. As with the park, the riparian vegetation is largely intact allowing for movement of wildlife along the Rogue River. There are several narrow, vegetated corridors that wildlife can use to migrate between the Rogue River and adjacent undeveloped uplands north of Gold Rey Estates. Wildlife that use the downstream study area include species that habituate well to human disturbance and include black bear (*Ursus americanus*), black tailed deer (*Odocoileus hemionus*), elk (*Cervus canadensis*), waterfowl, raptors, and other bird and small mammal species.

Within the study area upstream of the Gold Ray Dam, the river and surrounding uplands are not easily accessed by humans. Adjacent property is privately owned and roads are very limited. There is a private boat launch located on the south side of the river that locals are able to use for river access with approval of the land owner. The limited access reduces the potential for human disturbance of wildlife in the riparian areas and the large peninsula located between the old river channel and the Rogue River. This area is used by a multitude of wildlife for shelter, foraging, breeding, and migration. Discussions with local residents indicate that elk, black tailed deer, black bear, common gray fox (*Urocyon cinereoargenteus*), American beaver (*Castor canadensis*), raccoon (*Procyon lotor*), and Northern river otter (*Lontra canadensis*) frequent the area (Friddle, 2009). A multitude of passerine and migratory bird species, waterfowl, and raptors such as red tailed hawks (*Buteo jamaicensis*), Northern harrier (*Circus cyaneus*), osprey (*Pandion haliaetus*), mallards (*Anas platyrhynchos*), double crested cormorants (*Phalacrocorax auritus*), American robin (*Turdus migratorius*), Northern flicker (*Colaptes auratus*), winter wren (*Troglodytes troglodytes*), and black capped chickadee (*Poecile atricapillus*) are also present in the area. The Oregon Natural Heritage Information Center (ORNHIC) data search (ORNHIC, 2009) also noted Northern Pacific pond turtle (*Actinemys marmorata*) within the Gold Ray impoundment and in Lower Kelly Slough. Townsend's big eared bat (*Corynorhinus townsendii*), Lewis' woodpecker (*Melanerpes lewis*), common kingsnake (*Lampropeltis getula*), and California mountain kingsnake (*Lampropeltis zonata*) have been observed in the study area (ORNHIC, 2009).

Bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) are protected under the Gold and Bald Eagle Protection Act. Protection of eagles has included definition of zones around nest trees that are guidelines for disturbance. The primary zone extends 330 feet from the nest tree, and land clearing or construction in this zone is discouraged year-round with human disturbance minimized during the spring and summer nesting season. A secondary zone ranges to a distance of 660 feet from the nest, and human disturbance in this zone is minimized during the breeding season, but construction may be possible outside the nesting season. A third zone extends up to ¼ or ½ mile from the nest, depending on

topography and line of sight to the nest. Most activities are permitted in this zone, such as construction blasting, outside the breeding season. The nearest bald eagle nest site is located within 2 miles of the study area but more than ½ mile from the Gold Ray Dam construction site (ORNHIC, 2009). This nest site has been unoccupied for several years, but bald eagles are known to use this area. No golden eagle nest sites are known to be present within 2 miles of the study area.

3.6.2 Environmental Consequences

3.6.2.1 No Action

Under the No Action Alternative, no new construction would occur and no wildlife habitat would be removed. Any changes in the wildlife community would likely occur over a long period of time, in response to natural changes in vegetation.

3.6.2.2 Dam Removal

Construction activities would have a temporary effect on terrestrial wildlife during dam removal. Construction effects on resident wildlife would be caused by noise associated with construction activities (e.g., clearing and grading, excavation) and noise associated with construction equipment moving to and from the project site. Construction traffic may result in wildlife mortality from vehicle impact, however construction vehicles will be traveling at a relatively low speed to the project site (due to road conditions and topography). Sound level increases would be minimal, and the animals would either avoid the area or adapt to the increased noise levels. Animals that are mobile (such as deer and birds) would likely avoid the immediate area temporarily, while localized species that are less mobile (such as snakes and mice) would experience adverse effects (possible injury or mortality) as a result of clearing, grading, excavation, and disposal of excavated materials. The sound produced by conventional construction equipment ranges from about 80 to 90 decibels (dB). Sound from a point source attenuates by about 7.5 dB as distance doubles, where vegetation is present to absorb noise (WSDOT, 2007). Atmospheric conditions and topography also strongly influence attenuation. The zone of effect is considered to extend from the source of the noise to the point at which the noise attenuates to ambient levels. Ambient noise levels at the project site are unknown. Conditions are likely noisier than a typical rural area, which would have an ambient noise level of 35 to 40 dB (WSDOT, 2007), because of the background noise contributed by the location in this reach of Rogue River. Ambient noise would also include regular intrusions from traffic on the Gold Hill Road and railroad. Based on the formula above for attenuation over distance, a bulldozer operating at the dam site could be heard above ambient noise as much as 0.5 mile away; however, the actual extent of disturbance around the site would likely be much smaller, because it would be significantly contained by steep hillsides to the west and east.

Wildlife displaced during construction would likely make use of the project area again upon completion of the project, as vegetation is reestablished on disturbed soils. Habitat types in the project area would remain the same after dam removal but the total acreage for each habitat, particularly wetland types, would change after removal of the dam. Overall net acreage of habitat above the dam would remain the same after restoration efforts. Decrease in open water would reduce the presence of waterfowl and their habitat.

The nearest bald eagle nest is located more than ½ mile away from the dam and has been unoccupied for several years; elevated noise levels should not affect this nest site. No documented roost sites are within 2 miles of the project site. No large-diameter live ponderosa pine, cottonwood, or Douglas-fir trees or snags, that could be preferred eagle nest or roosting sites, would be removed during construction.

Use of security lighting at night during construction may disturb wildlife feeding and movement, particularly nocturnal birds and mammals. Impacts from these activities would be contained within

established staging and construction limits, and would be limited to the areas immediately adjacent to the dam site. No long-term impacts are expected.

The following mitigation measures have been incorporated in the proposed action to avoid, minimize, or offset potential adverse effects on wildlife:

- ◆ Trees felled to clear areas for construction will be placed along the margins of the site to provide cover for birds, reptiles, and small mammals.
- ◆ Several additional mitigation measures will be implemented prior to or during construction to prevent or minimize project effects on vegetation and wildlife. These measures are described below.
 - Minimize the areas of disturbance to only those that are necessary.
 - Dispose of excavated invasive and noxious weeds in a manner that prevents reestablishment.
 - Minimize the area of soils exposed at any one time to reduce dust that can bury native plants.
 - Stockpile felled trees on site.
 - Maintain clean work areas with proper litter control and sanitation to prevent wildlife attraction.
 - Dispose of human refuse in containers that can be sealed and protected from wildlife.
 - Replant temporarily disturbed areas with native vegetation and manage them to minimize reestablishment of noxious weeds. All disturbed areas will be permanently restored with a combination of herbaceous and woody species, including grasses, shrubs, and trees. Restoration will focus on restoring or enhancing functions provided by vegetation including, but not limited to, permanent stabilization and erosion control, water quality improvement, and sensitive area buffering.

3.6.2.3 Dam Rehabilitation

Dam rehabilitation would involve construction activities and would have direct, temporary impacts similar to those described for dam removal.

3.7 Vegetation

3.7.1 Affected Environment

A vegetation study area (a subset of the project area) was established based on the likely effects of the proposed action. The following vegetation communities are within the vegetation study area:

Uplands

- ◆ Oak savannah
- ◆ Cottonwood-ash forest
- ◆ Willow forest-shrub uplands
- ◆ Himalayan blackberry-grape
- ◆ Bedrock
- ◆ Roads-structures
- ◆ Maintained herbaceous

Wetlands

- ◆ Ash forest
- ◆ Willow forest-shrub wetlands
- ◆ Grass-sedge marsh
- ◆ Aquatic vegetation

These communities were categorized based on dominant vegetation and are described below (HDR, 2009):

3.7.1.1 Uplands

Oak Savannah

This upland type is common within the study area outside the floodplain of the Rogue River. Tree canopy varies from scattered trees (<10% canopy) to small stands (50-80% canopy). The dominant tree is Oregon white oak (*Quercus garryanna*) but occasionally ponderosa pine (*Pinus ponderosa*) or Douglas fir (*Pseudotsuga menziesii*) are present in the denser stands. Understory vegetation varies with canopy coverage. In denser tree stands, the understory consists of snowberry (*Symphoricarpos albus*) and cluster rose (*Rosa pisocarpa*) with small patches of grasses and forbs. In open areas, grasses dominate the landscape.

Cottonwood-ash Forest

This upland type is found primarily upstream of the Gold Ray Dam in the riparian and floodplain areas of the Rogue River and its tributaries. Tree canopy varies from open to closed, and is primarily Oregon ash (*Fraxinus latifolia*), but cottonwoods (*Populus balsamifera*) dominate in some areas. In the small peninsula that creates Tolo Slough, the understory is dominated by poison hemlock (*Conium maculatum*), cluster rose, forbs, and small patches of Himalayan blackberry (*Rubus armeniacus*). For the remaining areas, the understory is dominated by red osier dogwood (*Cornus sericea*), cluster rose, and Himalayan blackberry. Herbaceous vegetation, when present, is dominated by reed canarygrass (*Phalaris arundinacea*).

Willow Forest-shrub Uplands

This upland type is found throughout the project area. The dominant willow is Pacific willow (*Salix lasiandra*), Scouler's willow (*Salix scouleriana*), coyote willow (*Salix exigua*) and northwest sandbar willow (*Salix sessilifolia*). Understory vegetation varies but is dominated by reed canarygrass. Several of these communities are found below the ordinary high water level of the Rogue River but appear to be located on bedrock bases that infringe with groundwater interactions. They are also topographically higher than average river levels.

Himalayan Blackberry-grape

This upland type is prevalent on the large peninsula that lies between the old river channel and mainstem of the Rogue River upstream of the Gold Ray Dam. These areas are dominated solely by 6- to-10-foot-high Himalayan blackberry vines. In addition, the western end of the large peninsula near Lower Kelly Slough is dominated by grape vines (*Vitis sp.*).

Maintained Herbaceous

Maintained herbaceous includes yards associated with homes within the study area. The only homes and yards within the study area are located at Gold Rey Estates downstream of the Gold Ray Dam.

3.7.1.2 Wetlands

Wetland vegetation types include ash forest wetlands, willow forest-shrub wetlands, grass-sedge marsh, and aquatic vegetation. The wetland vegetation types are described in Section 3.4.1.1.

3.7.1.3 Noxious Weeds

The Oregon Department of Agriculture (ODA) Noxious Weed Control Program maintains a list of plant species considered to be noxious (ODA, 2010). Noxious weeds are nonnative, invasive species that contribute to the loss of agricultural production and ecological diversity.

Noxious weeds in the project area include Himalayan blackberry, poison hemlock (*Conium maculatum*), and St John's Wort (*Hypericum perforatum*). Noxious weeds comprise a small fraction of the overall vegetation downstream. Upstream, noxious weeds, particularly Himalayan blackberry, are very common and are dominant over about 20% of the vegetated areas.

3.7.2 Environmental Consequences

3.7.2.1 No Action

Under the No Action alternative, no new construction would occur and no vegetation would be removed. Changes in vegetation would occur over time, as a result of natural succession or events such as floods or wildfire. Invasive weeds would likely continue to spread.

3.7.2.2 Dam Removal

Construction of staging areas, temporary access roads, and cofferdams would require vegetation removal and could lead to erosion and increased sedimentation, resulting in temporarily reduced habitat availability. Accidental fuel and oil tank leaks and improperly disposed stormwater could enter vegetated areas and damage plants and wildlife. Implementing BMPs would eliminate or minimize these effects. Vegetation is expected to be removed for construction. Existing native vegetation removed during construction would be replanted and affected areas would be restored. Some noxious weeds may be eradicated through vegetation and seed bank removal. Newly disturbed areas will be replanted and managed to minimize reestablishment of noxious weeds. Conversely, there is an opportunity to introduce additional noxious and invasive species. This could occur through movement of seeds on construction equipment or vehicles. This would be minimized with BMP's established for the project.

Temporarily disturbed areas will be replanted with native vegetation and managed to minimize reestablishment of noxious weeds. All disturbed areas will be permanently restored with a combination of herbaceous and woody species, including grasses, shrubs, and trees. Restoration will focus on restoring or enhancing functions provided by vegetation, including permanent stabilization and erosion control, water quality improvement, and sensitive area buffering. High flows from the Rogue River may affect newly planted vegetation by uprooting plants or removing topsoil. Restoration efforts will include long-term monitoring coordinated by Jackson County to track vegetation establishment and effects of high flows on vegetation. New plantings or other measures will be proposed if high flows damage revegetated areas.

Once the dam is removed, the river level is expected to drop between 4 and 22 feet behind the dam and 0 to 7 feet upriver near Bear Creek, depending on river flow, and to equalize to current levels upstream near the mouth of Bear Creek. Downstream water levels are not expected to change. Alterations to the

upstream surface water levels would result in changes to drainage patterns as well as fluctuations in inundation frequency, depth, and duration that can result in vegetative composition changes. Vegetation types associated with wetlands may transition to upland types. Newly exposed areas would, over time, vegetate with herbaceous vegetation and, depending on location and hydrologic regime, transition to shrub and forest systems. Downstream of the dam, changes in vegetation are not expected to occur.

3.7.2.3 Dam Rehabilitation

Construction of staging areas, temporary access roads, and cofferdams would require vegetation removal and could lead to erosion and increased sedimentation, resulting in temporarily decreased water quality in surface waters and reduced habitat availability. Accidental fuel and oil tank leaks and improperly disposed stormwater could enter vegetated areas and damage plants and wildlife. Implementing BMPs will eliminate or minimize these effects. Vegetation is expected to be removed for construction. No vegetation is proposed for permanent removal.

There is the potential to eradicate some of the noxious weeds through vegetation and seed bank removal. Newly disturbed areas will be replanted and could be managed to minimize reestablishment of noxious weeds. Conversely, there is an opportunity to introduce additional noxious and invasive species. This could occur through movement of seeds on construction equipment or vehicles. This will be minimized with BMP's established for the project.

Temporarily disturbed areas would be replanted with native vegetation and managed to minimize reestablishment of noxious weeds. All disturbed areas will be permanently restored with a combination of herbaceous and woody species, including grasses, shrubs, and trees. Restoration will focus on restoring or enhancing functions provided by vegetation including, but not limited to, permanent stabilization and erosion control, water quality improvement, and sensitive area buffering.

3.8 Cultural and Historic Resources

3.8.1 Affected Environment

Cultural and historic resources within the project area include historic buildings and archaeological resources. The area of potential effects (APE) for historic buildings is a tax lot that includes the dam and related structures (including foundations of buildings no longer standing); the APE for archaeological resources includes the tax lot associated with the dam as well as the upstream reach of the impoundment behind Gold Ray Dam.

3.8.1.1 Historic Buildings

The Gold Ray Dam and associated structures were the first large-scale hydroelectric development in southern Oregon. The dam's construction marked the start of a regional utility in this area, replacing a smaller municipal steam plant in Medford and providing the first electric power to several other communities, including Gold Hill, Jacksonville, and Central Point. Built between 1903 and 1904 and continuously operated until 1972, the dam and its functional components remain a largely intact example of early efforts at electrification in Oregon. With its unusual rope-driven generators, original turbines, and switching equipment, the powerhouse effectively documents its original design, construction, and operation. The concrete dam, built in 1941, retains high integrity to its original design. Other elements of the project, including minor buildings, water-control and fish passage features, in addition to scattered stone and concrete remnants of the hydroelectric project's development, convey the scale of both the original development and the continued operation of the site by both the California Oregon Power Company and, after 1961, Pacific Power and Light (Jackson County, 2009a).

The Gold Ray Dam and associated structures (including 11 identified built features), all located on their original sites on the 26.02 acre parcel identified on Jackson County Assessor Map 362W18 as tax lot 300,

are considered eligible for listing on the National Register of Historic Places under the Secretary of Interior's eligibility criterion "A," for their association with the early development of electric power in southern Oregon. Certain features, particularly the Gold Ray powerhouse, may be additionally significant under criterion "C" as examples of early electric generation equipment and design, rare surviving examples of early 20th century technology. The conditions of the dam, powerhouse, and associated structures have deteriorated over the years. The powerhouse contains components of the electrical generation operations, such as switches and control boards, but its deteriorated condition makes it unsafe for human occupation. The Oregon State Historic Preservation Office has concurred with the determination that the dam and associated structures are eligible for listing on the National Register of Historic Places.

3.8.1.2 Archaeology

Research of State Historic Preservation Officer (SHPO) records and archaeological site investigations indicate that there are no Native American cultural sites or prehistoric archaeological sites in the APE. NMFS coordinated with federally-recognized tribes with treaty rights in the project area (Confederated Tribes of the Grande Ronde, Confederated Tribes of the Siletz and Cow Creek Band of the Umpqua Tribe of Indians); the tribes requested and were provided the report documenting the findings of the archaeological site investigations. The archaeological resources identified in the areas surveyed were related to the development and operation of the Gold Ray Dam hydroelectric project. As such, the site is also likely to be considered eligible under the Secretary of Interior's eligibility Criterion "D," for the data potential of the archaeological resources identified across the site (Rose et al., 2010).

3.8.2 Environmental Consequences

3.8.2.1 No Action

The No Action Alternative would not directly affect existing cultural or historic resources. However, the condition of the dam, powerhouse, and associated structures would continue to deteriorate over time as Jackson County does not have the resources to maintain or restore the facilities.

3.8.2.2 Dam Removal

Historic Buildings

Removal of Gold Ray Dam and associated structures would be an adverse effect on the historic property. The adverse effect would be mitigated by salvage of components of the dam and appurtenances, including a section of the original log crib dam and the ODFW fish counting station, as well as creation of interpretive displays for the site. Before the structure is removed it will be documented thoroughly according to guidance provided by the Oregon SHPO. As part of the review and implementation of the project and in accordance with Section 106 of the National Historic Preservation Act, NMFS is consulting with the Oregon SHPO regarding the adverse effect finding and the proposed mitigation measures. NMFS is also coordinating with local historical societies. NMFS has completed consultation with the Oregon SHPO and is in the process of entering into a Memorandum of Agreement. The MOA will be in place before the dam removal begins. The MOA will include the specific steps that Jackson County will take to mitigate the adverse effect on the historic property (Gold Ray Dam). Mitigation will include salvaging and documenting key components of the dam and powerhouse, though it is not feasible to preserve the powerhouse completely.

Archaeology

The removal of Gold Ray Dam and related structures would have an adverse effect on the archaeological resources associated with those structures. Because the archaeological resources' significance is related to

history of the dam, adverse effects would be mitigated through measures similar to those proposed for the historic buildings. During construction, identified resources would be avoided to the extent practicable. As with historic building described above, as part of the review and implementation of the project, NMFS consulted with the Oregon SHPO and interested federally recognized tribes. NMFS will enter into a Memorandum of Agreement with the Oregon State Historic Preservation Office that will include the specific steps that Jackson County will take to avoid existing archaeological resources that contribute to the significance of the site.

In the event that any archaeological sites, human remains, funerary items, or associated artifacts are discovered during restoration and removal of fill, activities will cease immediately and a qualified archaeologist will be consulted. The SHPO, tribal officials, and other relevant officials will be notified. Additional mitigation efforts may be needed. Following dam removal, Jackson County will coordinate a reconnaissance-level archaeological survey of the formerly submerged areas upstream of the dam to determine if any significant archaeological sites are located there; a management plan for cultural resources will be developed based on the findings of the survey.

3.8.2.3 Dam Rehabilitation

Historic Buildings

Dam rehabilitation would affect the structures that contribute to the eligibility of the Gold Ray Dam. While the rehabilitation would not remove the dam, it would alter the facilities that contribute to the dam's eligibility for the National Register of Historic Places (i.e., as examples of early electric generation equipment and design, rare surviving examples of early 20th century technology). Adverse effects on the historic character of the dam could be lessened by retaining the existing facilities and/or recreating the architectural themes with any new components. Measures taken to mitigate adverse effects, if necessary, will be coordinated with Oregon SHPO.

Archaeology

Construction activities associated with rehabilitation of the dam and associated structures would potentially disturb archaeological resources associated with the site. During construction, identified resources would be avoided to the extent practicable. In the event that any archaeological sites, human remains, funerary items, or associated artifacts are discovered during restoration and removal of fill, activities would cease immediately. The SHPO and other relevant officials would be notified and, if necessary, interested federally recognized tribes would be notified. Additional mitigation efforts may be needed.

3.9 Visual Quality and Aesthetics

3.9.1 Affected Environment

The project area has a mix of human-made and natural elements. The dam and associated structures are notable visual features and have shaped the visual character of the surroundings, essentially creating the large backwater area upstream of the dam, which includes Tolo Slough and Lower Kelly Slough. The area north of the Rogue River and upstream of the dam is a large, vegetated area that is notable for its wildlife and attracts visitors for hiking and nature study. Lower Table Rock is visible to the northeast of the dam. Large gravel extraction ponds are located south of the Rogue River east of Gold Ray Dam.

The dam, powerhouse, and associated structures present a built element on the landscape that conveys the historic use of the area (see Section 3.8). Though the powerhouse is in a relatively deteriorated condition, it adds to the visual interest of the built elements of the site. Downstream of the dam, the Rogue River runs through a scenic valley. The presence of the dam and powerhouse detracts from the natural scenic

aesthetics of this river reach. Gold Ray Road and the Central Oregon and Pacific Railroad (CORP) run along the south shore of the river and the Gold Rey Estates housing development is on the north shore immediately downstream of the dam.

Overall, the project area has a high aesthetic quality that is valued by local residents (Appendix A). Figure 9 shows a representative view of the area upstream of Gold Ray Dam.

3.9.2 Environmental Consequences

3.9.2.1 No Action

The No Action Alternative would not change the visual quality and aesthetics of the project area.

3.9.2.2 Dam Removal

This alternative would result in a direct, short term adverse effect on visual quality and aesthetics in the project area during construction. The presence of construction equipment, staged material, and the construction activities would detract from the existing visual quality of the site. Immediately following dam removal, relatively large areas that are presently submerged would be exposed. These areas would, over time, appear more like the existing downstream reach of the river. Proposed site restoration would help establish plantings and materials that would provide an appearance of a free-flowing river, similar to downstream of the dam.

Removal of the dam and associated structures would eliminate an element of visual interest to some viewers. However, the natural scenic aesthetics of this river reach would be restored. The open water conditions of the upstream area would transition to a free-flowing river system and the aesthetic features associated with the existing upstream condition would change.

3.9.2.3 Dam Rehabilitation

Dam rehabilitation would not change the overall visual quality of the project area. The replacement or substantial rehabilitation of the powerhouse and power canal facilities would change the appearance of these features. Also, power transmission lines and facilities would detract from the scenic quality of the area.

3.10 Transportation

3.10.1 Affected Environment

The CORP runs along the south side of the river. The CORP is a Class II railroad that provides 303 miles of freight service from a connection with the Union Pacific Railroad at Eugene, Oregon, to Black Butte, California. Traffic on the CORP is approximately 27,000 cars carrying commodities of lumber, logs, and plywood (RailAmerica, 2010).

Gold Ray Road (accessed via Blackwell Road/Highway 99) is also located on the south side of the river. The road crosses to the inside of the railroad tracks approximately 250 feet downstream of the Gold Ray Dam. Gold Ray Road becomes Upper River Road approximately 1.3 miles downstream of the Gold Ray Dam and extends north by northwest to the town of Gold Hill. Traffic on Upper River Road is moderate and mostly used by those accessing the river for recreation purposes (fishers, picnicking, and rafting).

John Day Drive (accessed via Sams Valley Highway/Highway 234) is located on the north side of the river and ends near the powerhouse. This road has very limited traffic and is almost exclusively used by residents of the Gold Rey Estates, ODFW, Jackson County, and a few other private land owners. There is limited access to the river from John Day Drive and it has very little recreational use, if any at all.



**Representative Views of the Rogue River Upstream and
Downstream of Gold Ray Dam**
FIGURE 9

3.10.2 Environmental Consequences

3.10.2.1 No Action

The No Action Alternative would not impact the existing transportation network directly or indirectly. This alternative would be compatible with transportation plans and programs, and would allow for the existing conditions to remain as they currently are.

3.10.2.2 Dam Removal

The CORP would participate in the removal of the Gold Ray Dam by transporting materials necessary for its removal. The dam abutment on the south bank of the river would be left in place as part of dam removal; this would provide continued stability to the bank adjacent to the railroad and road. During construction, there may be intermittent periods when Gold Ray Road near the dam site would be closed to those accessing the river from Blackwell Road/Highway 99. However, river access is available from Gold Hill via Upper River Road, west of the project area. Long-term transportation effects may include an increase in traffic along Gold Ray Road due to the increase in available recreation opportunities. To preserve the CORP rail line, the existing abutments on the south side of the river will remain in place.

During construction, those using John Day Drive would experience an increase in traffic volume and may have intermittent traffic delays as construction equipment is transported to and from the construction site. Cautionary signage and flaggers will be present, as needed, during construction to minimize transportation impacts. In addition, Jackson County will require the contractor to limit work to daylight hours, provide notice to adjacent landowners regarding planned activities, and establish a communication protocol to respond to public inquiries and comments. Public access to John Day Drive would remain open throughout construction. The removal of the dam would increase the amount of accessible riverbank and, as a result, recreation-related traffic may increase in the long term.

3.10.2.3 Dam Rehabilitation

Construction impacts associated with dam rehabilitation would be similar to those described above for dam removal. In the long term, traffic on Gold Ray Road and John Day Drive would likely remain unchanged from the current volume.

3.11 Air Quality

3.11.1 Affected Environment

The Rogue Valley area has had a history of not meeting national air quality standards and has been deemed a “nonattainment area” for particulate matter. With the help of the Medford-Ashland Particulate Matter Maintenance Plan, the area is now considered an “attainment” area by the Environmental Protection Agency (EPA), and meets air quality standards.

3.11.2 Environmental Consequences

3.11.2.1 No Action

The No Action Alternative would not result in any change to air quality.

3.11.2.2 Dam Removal

Dam removal would result in temporary air quality effects associated with construction activity and the removal of the dam and associated structures. These effects would be controlled by compliance with applicable state requirements and local ordinances.

There would be no permanent air quality effects resulting from the removal of the dam and associated structures.

3.11.2.3 Dam Rehabilitation

Dam rehabilitation would result in temporary air quality effects associated with construction activities. These effects would be controlled by compliance with applicable state permit requirements and local ordinances.

There would be no permanent air quality effects resulting from the rehabilitation of the dam and associated structures.

3.12 Noise

3.12.1 Affected Environment

The Gold Ray Dam is located in a rural setting. Existing noise contributions include occasional vehicular traffic, trains, boat motors, and the sound of the Rogue River cascading over the Gold Ray Dam. The existing noise contributions result in a relatively low ambient noise level.

3.12.2 Environmental Consequences

3.12.2.1 No Action

The No Action Alternative would not result in any noise changes.

3.12.2.2 Dam Removal

Construction activities associated with the removal of the Gold Ray Dam and associated structures would result in an increased noise level during the construction period. Construction noise could result from increased truck traffic and operation of construction equipment. Jackson County will require the contractor to limit construction activities to daylight hours, provide notice to adjacent landowners regarding planned activities, and establish a communication protocol to respond to public inquiries and comments.

It is anticipated that the ambient noise level within the immediate vicinity of the Gold Ray Dam would decrease slightly once the dam removal was complete, as water would no longer be cascading over the dam. However, there would be intermittent periods of increased noise in this reach of river if there is an increase in power boat use.

3.12.2.3 Dam Rehabilitation

Construction activities associated with rehabilitation of the Gold Ray Dam and associated structures would result in an increased noise level during the construction period. In the long term, power generating pumps would add to the noise level in the general vicinity.

3.13 Human Health and Safety

3.13.1 Affected Environment

Gold Ray Dam and its associated structures present a public safety hazard. There are minimal security measures at the dam site to limit trespassing and vandalism. The dam is often the site of illegal activities, such as poaching (Oregon State Police, 2008). The dam is a barrier for recreational boaters and boaters in the reservoir risk impingement on the dam.

The aging dam and facilities are functionally obsolete and unsafe from both a dam safety and public safety perspective. The particular design of Gold Ray Dam is no longer used in the United States due to the design's susceptibility for deterioration of the upstream slabs: they are relatively thin and have minimal reinforcement. A cursory inspection of the site by dam engineers revealed evidence of significant concrete deterioration, cracking and displacement throughout the site (HDR, 2010a). The long-term performance of the dam may be limited due to its deteriorated condition. The dam would likely require substantial upgrades to guarantee its long term stability and reduce public safety hazards.

A site inspection conducted in December 2009 indicated the potential for environmental contamination at several areas within the dam area due to the long-term use of the dam for power generation.

Contamination from polychlorinated biphenyls (PCBs) may be present at the former location of transformers in the project area, including in the forebay just upstream of the powerhouse (HDR, 2009d). Follow up assessment of sediments in the forebay indicated levels of PCBs below detection limits (HDR, 2010b). Investigations of possible contaminants within the sediments stored behind the dam found traces of heavy metals from upstream industrial sources but the level of contamination was well below the threshold for impacts to human health (USACE, 2009).

3.13.2 Environmental Consequences

3.13.2.1 No Action

If no action is taken, Gold Ray Dam would remain as a safety hazard and liability risk for Jackson County.

3.13.2.2 Dam Removal

Dam removal would eliminate the public safety hazards and liability risk for Jackson County associated with the current condition of the dam. Demolition activities could pose a short-term risk to public safety. These safety concerns would be addressed in a site-specific Health and Safety Plan prepared by the construction contractor in accordance with 20 CFR 1910.120 and applicable state and local regulations governing worker's protection and health and safety. The Health and Safety Plan would identify known or suspected hazards associated with contamination and working conditions. The plan would include guidance for excavation, spill prevention, confined space entry, hearing and respiratory protection, and emergency response.

The project design incorporates measures to limit sedimentation and impacts to water quality. The sediments behind the dam are not known to contain hazardous substances and their release downstream would not affect human health. Sediments in the forebay have been analyzed and determined to have PCB concentrations below detectable limits (HDR 2010). Construction debris will be handled and disposed of in accordance with applicable regulations.

To protect public safety, the Oregon State Marine Board (OSMB) initially requested that, during the construction phase, an area one mile upstream of the dam and one-half mile downstream of the dam be closed to recreational boater access, and that the temporary river closure remain in effect until the channel conditions have stabilized at the former dam site and affected reaches downstream. Jackson County has consulted with OSMB and both parties agreed that closing the river for one mile upstream and one-half mile downstream would have large impacts to recreational users of the river. Jackson County proposed closing the river approximately 1000 feet upstream and approximately 500 feet downstream of the dam. OSMB agreed that this lesser distance was sufficient to protect public safety. In addition Jackson County will implement the following requested conditions to protect public safety during construction:

- Provide written notice to the OSMB, Jackson County Sheriff Marine Unit, and other requested state agencies 30 days prior to restricting public access to the Rogue River within the project site. Jackson County will work cooperatively to engage these agencies to develop effective methods of public notice and warnings of channel closure.
- Develop and post warning and information signs and waterway markers at access points, at boat ramps and the upstream and downstream ends of the work site for a period of at least two weeks before any activity or closure to alert boaters and other waterway users of the location and nature of the navigational changes made to the river. Jackson County will maintain these signs for the length of the project.

Signs would be posted at these upstream and downstream project boundaries instructing boats of the hazards and to keep out of the project area. Signs would be posted at nearby boat launches to inform river users of the closed areas. Dam removal would open a new stretch of the Rogue River to boating and rafting; the newly-opened stretch would have limited access for emergency services to respond to incidents involving boaters. Jackson County will work with emergency responders to develop response plans for this section of the river.

Removal of Gold Ray Dam, the powerhouse, and forebay/tailrace structures would largely remove the safety hazards at the site. The dam and buildings would no longer present a public safety risk. Similarly, the risk of the dam to boaters would be removed. The long-term risk of dam failure would also be abated.

3.13.2.3 Dam Rehabilitation

Dam rehabilitation would alleviate some safety concerns because the dam structure would be reinforced to decrease the likelihood of failure. Retrofitting of the dam for power generation would mean that Gold Ray Dam would need to comply with FERC's stringent dam safety measures. Acquiring certification from FERC is a lengthy process and would delay any safety improvements currently proposed under this alternative. Even if the dam is rehabilitated, it would still pose a hazard to boaters and potential trespassers.

3.14 Socioeconomic and Environmental Justice

3.14.1 Affected Environment

The estimated 2008 population of Jackson County is 210,138. Medford (estimated 2006 population 71,168) is the largest city in Jackson County and is located about 6 miles southwest of Gold Ray Dam. The project area is rural and sparsely populated. The 2007 estimated median household income in Jackson County is \$44,344; approximately 13.4 percent of persons in Jackson County are considered to be living in households below the poverty level. Jackson County's estimated 2007 population is 94.3 percent white and 5.7 percent nonwhite. (U.S. Census, 2010)

As noted in Section 3.2, there are multiple fishing and rafting guide services that use the project area and adjacent stretches of the Rogue River; these businesses contribute to the local and regional economy. In addition, there are gravel mining operations immediately adjacent to the Rogue River upstream of Gold Ray Dam and surrounding agricultural uses that also generate regional economic activity.

3.14.2 Environmental Consequences

3.14.2.1 No Action

The No Action Alternative would not affect the existing socioeconomic conditions. No changes to the population, income, or ethnic makeup of Jackson County would occur. Guide services would experience the same conditions in the project area as currently exist.

3.14.2.2 Dam Removal

Dam removal would result in a short term increase in economic activity in Jackson County. Construction activities would increase the demand for materials and services in Jackson County during construction. Dam removal would temporarily affect guide services that use this portion of the Rogue River, making the area unavailable for boating and fishing during construction. Similarly, construction may affect the Rogue River downstream of Gold Ray Dam by increasing turbidity, which could affect fishing downstream of Gold Ray Dam and adversely affect fishing guide services during construction.

The removal of Gold Ray Dam would change the Rogue River to a more natural, free-flowing condition and change some of the recreational uses of this reach of the river (see Section 3.5.2.2). These changes would be beneficial for fishing guides that focus on native fishes, and would have adverse effects on guides that focus on the existing warm water fishery upstream of the dam. The removal of Gold Ray Dam would have a beneficial long term effect on rafting guide services as it would open a larger stretch of the Rogue River to a free-flowing condition. Dam removal with proposed restoration would not adversely affect existing gravel mining operations.

Property owners immediately downstream of the dam, including Gold Rey Estates residents, could experience temporary impacts from changes in the river and the movement of sediment following dam removal. Effects could include clogged irrigation intakes and associated interruption of water use, which in turn could have cost impacts (such as utilizing temporary water sources or damage to landscaping from lack of irrigation). Jackson County will inventory privately owned water intakes prior to dam removal, assess current maintenance, and develop plans to address potential impacts to individual water intakes.

As described above in Section 3.3.2.2, dam removal would lower surface water levels upstream of the dam. If adjacent upstream wells are shallow and influenced by surface water, groundwater levels may drop below pump settings, causing an interruption in water supply (OWRD, 2010). As a result, well owners upstream of the dam may experience an interruption in water supply and incur costs due to loss of water use.

Dam removal would not change the population or demographic composition of Jackson County, nor would it have a disproportionate effect (negative or positive) on low-income or minority populations within Jackson County.

3.14.2.3 Dam Rehabilitation

Dam rehabilitation would result in a short term increase in economic activity in Jackson County during construction of the dam improvements. Construction activities would increase the demand for materials and services in Jackson County during construction. Construction activities would temporarily affect guide services that use this portion of the Rogue River, making use of the area unavailable for rafting and fishing during construction. Construction may also affect the Rogue River downstream of Gold Ray Dam by increasing turbidity, which could affect fishing downstream of Gold Ray Dam. Long-term turbidity increases are not likely to occur once construction activities are completed.

Dam rehabilitation, and specifically the rehabilitation of power generation at the dam, would not be cost effective (see Section 2.1.2.4) and would not provide an economic benefit for Jackson County.

Dam rehabilitation would not change the population or demographic composition of Jackson County. It would not have a disproportionate effect (negative or positive) on low-income or minority populations in Jackson County.

3.15 Cumulative Impacts

Cumulative impacts result from the incremental impacts of an alternative when added to other past, present, or reasonably foreseeable future actions, regardless of what agency, federal or nonfederal, or person undertakes those other actions.

Past activities have shaped the environmental conditions of the project area. Most notably, the development of the Gold Ray Dam has created the current fish passage conditions and changed the natural conditions upstream of the dam by impounding water. The impact of historic activities and development patterns is reflected in the affected environment as described in the preceding sections of this EA.

For the Gold Ray Dam project, other actions considered in the cumulative impact analysis are:

- ◆ The development and operation of Gold Ray Dam for hydroelectric power and the subsequent ceasing of electric power generation (past action).
- ◆ The development of other dams on the Rogue River (past action).
- ◆ Mining and mineral extraction and agricultural and urban development (past, ongoing and future actions).
- ◆ The removal of other dams on the Rogue River, specifically Gold Hill Dam and Savage Rapids Dam (past actions).
- ◆ The continued operation of Lost Creek Dam upstream of Gold Ray Dam (ongoing and future action).

3.15.1 No Action

The No Action Alternative would have no cumulative environmental impacts. The existing conditions in the project area would remain unchanged.

3.15.2 Dam Removal

Dam removal would have a beneficial cumulative effect on native fish and fish habitat by removing the barriers to fish migration and therefore providing an additional 31 miles of open river habitat, resulting in a total of 153 miles of the Rogue River (from Lost Creek Dam to the mouth) free of human-made barriers. The removal or modification of other dams on the Rogue River cumulatively resulted in this effect. Cumulative improvements in river and habitat conditions could benefit recreational fishing and fishing guides whose primary interest is in native fish. While removal of Gold Ray Dam would not have cumulative effects on project area geology or soils, reestablishment of a continuous stretch of free-flowing river would have the cumulative effect of restoring a more natural sediment transport dynamic in the Rogue River.

Dam removal would largely eliminate the backwater area and the associated fishing and canoeing opportunities that exist in the project area. At the same time, it would create new opportunities, such as providing connectivity of a free-flowing river system for recreational rafting and canoeing. Removal of

other dams on the Rogue River has eliminated other similar areas within the Rogue River system, having a cumulative adverse effect by reducing the opportunities for this type of recreation.

3.15.3 Dam Rehabilitation

Dam rehabilitation would have a cumulative benefit to fish passage by providing a fish ladder in compliance with ODFW and NMFS fish passage criteria. Dam rehabilitation would not have cumulative benefits to native fish habitat in the Rogue River, as the existing backwater conditions would remain in place.

3.16 Irreversible and Irretrievable Use of Resources

3.16.1 No Action

Under the No Action Alternative there would be no commitment of resources and thus no irreversible or irretrievable use of resources.

3.16.2 Dam Removal

Implementation of the Dam Removal Alternative involves a commitment of a range of natural, physical, human and fiscal resources. Fossil fuels and labor would be expended to remove the dam, appurtenant structures, restoration and stabilization; which are generally not retrievable. However, they are not in short supply and their use would not have an adverse impact upon continued availability of these resources. Natural resource commitment including the indirect changes to wetlands and existing warm water habitat would be irretrievable once the dam is removed. Formation of new wetlands is expected to offset wetland loss due to changes in hydrology. The removal of the Gold Ray Dam would also require a substantial one-time expenditure of federal funds, which are not retrievable. However, the benefits of the expenditure are expected to outweigh the commitment of these resources. Release of funding resources would not occur until all appropriate environmental permits and findings (e.g., Clean Water Act 404/401, ESA Section 7, SHPO consultation) are appropriately concluded.

3.16.3 Dam Rehabilitation

Implementation of the Dam Rehabilitation Alternative involves a commitment of a range of natural, physical, human and fiscal resources. Fossil fuels, labor, and construction materials such as cement, and aggregate material would be expended to rehabilitate the dam, fish ladder and hydropower facilities. Additionally, labor and natural resources are used in the making of construction materials. These materials are generally not retrievable. However, they are not in short supply and their use would not have an adverse impact upon continued availability of these resources. Any construction would also require a substantial one-time expenditure of funds, which are not retrievable. Power generation would offset, to some degree, the expenditure of funds, but power generation revenues would provide only a partial pay-back of expenditures and would not be cost-effective.

4.0 LIST OF PREPARERS AND AGENCIES CONSULTED

4.1 List of Preparers

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4.2 Agencies and Other Entities Consulted

- ◆ Confederated Tribes of the Grand Ronde
- ◆ Confederated Tribes of the Siletz Indians of Oregon
- ◆ Cow Creek Band of the Umpqua Tribe of Indians
- ◆ U.S. Army Corps of Engineers
- ◆ U.S. Fish and Wildlife Service
- ◆ National Marine Fisheries Service (Northwest Region)
- ◆ Oregon Department of Fish and Wildlife
- ◆ Oregon Department of State Lands
- ◆ Oregon Department of Water Resources
- ◆ Oregon Department of Environmental Quality
- ◆ Oregon State Historic Preservation Office
- ◆ Jackson County
- ◆ Oregon Watershed Enhancement Board
- ◆ Rogue Valley Council of Governments

5.0 ABBREVIATIONS AND ACRONYMS

APE	area of potential affects
AQMA	Air Quality Maintenance Area
AR	Aggregate Removal
ARRA	American Recovery and Reinvestment Act
BA	Biological Assessment
BLM	Bureau of Land Management
BMP	Best Management Practices
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CORP	Central Oregon and Pacific Railroad
CWA	Clean Water Act
dB	decibel
DEQ	Department of Environmental Quality
DSL	Department of State Lands
EA	Environmental Assessment
EFU	Exclusive Farm Use
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESCP	Erosion and Sedimentation Control Plan
ESU	Evolutionarily Significant Unit
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FONSI	Finding of No Significant Impact
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRCS	National Resources Conservation Service
ODA	Oregon Department of Agriculture
ODFW	Oregon Department of Fish and Wildlife
OHW	ordinary high water
ORNHIC	Oregon Natural Heritage Information Center
OSMB	Oregon State Marine Board
OSR	Open Space Reserve
OWEB	Oregon Watershed Enhancement Board
PCB	polychlorinated biphenyls

POD	point of diversion
RDG	River Design Group
RR	Rural Residential
RVCOG	Rogue Valley Council of Governments
SHPO	State Historic Preservation Officer
SONCC	Southern Oregon-Northern California Coast
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
WR	Woodland Resource

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7.0 APPENDICES

Note: Appendices A through D were not revised from what was presented with the Draft EA. These appendices are incorporated in the Final EA by reference. Appendix E presents a summary of public and agency comments with responses. The Draft EA is located on the RVCOG website:

http://www.rvcog.org/mn.asp?pg=NR_Gold_Ray_Dam

Appendix A: Scoping Summary

Appendix B: Project Drawings

Appendix C: DRAFT Fish Salvage Plan

Appendix D: DRAFT Gold Ray Dam Project Rehabilitation Technical Memo

Appendix E: Summary of Comments on Draft EA with NMFS Responses

Appendix A: Scoping Summary

Note: Appendix A has not been revised from what was presented with the Draft EA.

Appendix B: Project Drawings

Note: Appendix B has not been revised from what was presented with the Draft EA.

Appendix C: DRAFT Fish Salvage Plan

Note: Appendix C has not been revised from what was presented with the Draft EA.

Appendix D:
DRAFT Gold Ray Dam Project
Rehabilitation Technical Memo

Note: Appendix D has not been revised from what was presented with the Draft EA.

**Appendix E:
Summary of Comments on Draft EA
with NMFS Responses**

SUMMARY OF PUBLIC AND AGENCY COMMENTS ON THE GOLD RAY DAM PROJECT DRAFT ENVIRONMENTAL ASSESSMENT

The Draft Environmental Assessment (EA) was made available for public review and comment on February 25, 2010. The 30-day public comment period concluded on March 26, 2010. The Rogue Valley Council of Governments (RVCOG) collected public comments on National Marine Fisheries Service's (NMFS) behalf. During the public comment period, NMFS conducted a public meeting in coordination with Jackson County and RVCOG. A total of 939 individuals, organizations, and public agencies submitted comments by e-mail, mail, and fax during the public comment period. Public agencies and organizations that submitted comments are listed below. NMFS has reviewed and considered all comments submitted. Due to the volume of comments, summaries of the individual comments and issues are provided in the following table (organized consistent with the outline of the EA), along with NMFS' response to those comments and whether the Final EA includes revisions from the Draft EA based on the comments. The number in parentheses at the end of each comment summary indicates the number of individual comments that captured in that particular summary.

State and Federal Governmental Agencies

Oregon Department of Fish and Wildlife

Oregon Department of Geology and Mineral
Industries

U.S. Bureau of Land Management

Non-Profits/Other Organizations

Jackson County Farm Bureau

Bear Creek Watershed Council American Rivers

American Whitewater

Rogue Flyfishers

Rogue Riverkeeper / Klamtah-Siskiyou

Wildlands Center

Oregon Wild

FFF Steelhead Committee

Native Fish Society

WaterWatch

Southern Oregon Resource Alliance

Summary of Public and Agency Comments on the Gold Ray Dam Project Draft Environmental Assessment

Comment Summary	Response	Change to EA Y/N
INTRODUCTION (EA Section 1.0)		
Background (1.1) -- No comments		
National Environmental Policy Act (1.2)		
An Environmental Assessment (EA) is the appropriate level of review for the project and an Environmental Impact Statement (EIS) is not necessary as there is no significant adverse environmental impact from dam removal and there is no significant public controversy. The action is well-supported by citizens and natural resources agencies and is in the public interest. (4)	National Marine Fisheries Service (NMFS) acknowledges this comment. NMFS will consider this and all other public comments on the Draft EA in making its decision.	N
An EA is not adequate, an EIS is necessary for this project. Decision is pre-determined because of funding. (1)	<p>The Council on Environmental Quality's (CEQ) regulations implementing National Environmental Policy Act (NEPA) state that agencies shall prepare an EA when necessary under the procedures adopted by individual agencies (40 CFR 1501.3(a)). National Oceanic and Atmospheric Administration's (NOAA) NEPA procedures (NOAA Administrative Order 216-6) indicate that the Gold Ray Dam project is not one that requires preparation of an EIS; rather it is a project that requires an EA. Specifically, NOAA 216-6 Section 6.03c2 notes "Projects that <i>may have</i> significant impacts are required to have an EA unless they meet the criteria of a Categorical Exclusion or the [agency] determines that an EIS will be prepared. Where an EA reveals that significant impacts will or may occur, the Responsible Program Manager must prepare an EIS." (emphasis added)</p> <p>The purpose of an EA is to determine whether an EIS is</p>	N

Summary of Public and Agency Comments on the Gold Ray Dam Project Draft Environmental Assessment

Comment Summary	Response	Change to EA Y/N
	required. The Draft EA made available for public comment presented the results of NMFS' assessment of the environmental effects of the proposed action and alternatives, consistent with the requirements of NEPA, CEQ regulations, and NOAA's NEPA procedures. There has been no final decision regarding the Gold Ray Dam project, regardless of the grant to study and, if appropriate, remove Gold Ray Dam. A decision has not been pre-determined. NMFS will, upon consideration of public comments on the Draft EA, the Final EA, and other information, issue either a Finding of No Significant Impact (FONSI) or Notice of Intent to prepare an EIS.	
The EA lacks a discussion on any irreversible and irretrievable commitments of resources involved in the proposed action. (1)	Resources committed for the project would include those required for study of the effects of the proposed action and alternatives documented in the EA. If Alternative 1 is selected, commitments of resources would be those related to dam removal, such as those committed to the removal of the dam and appurtenant structures, restoration and stabilization, and the anticipated transport of sediment through the Rogue River. Natural resources commitment includes the indirect changes to the wetlands and existing warm water habitat. If Alternative 2 were selected, commitment of resources would be those needed for the rehabilitation of the dam and potentially the restoration of hydropower generation.	Y
Proposed Action (1.3) – no comments		

Summary of Public and Agency Comments on the Gold Ray Dam Project Draft Environmental Assessment

Comment Summary	Response	Change to EA Y/N
Purpose and Need for Proposed Action (1.4)		
<p>Safety benefits of dam removal are exaggerated. Oregon Water Resources Department's hazard rating for the dam is low, which "indicates that if the dam fails there is little plausibility for loss of life, and human infrastructure that could be affected by inundation downstream is minor or non-existent" (OAR 690-020-0100). (4)</p>	<p>The Oregon Water Resources Department has not inspected Gold Ray Dam in more than 15 years. Recent engineering inspection showed the dam to be in a state of deterioration and appears unsafe from both public safety and dam safety perspectives (see Appendix D). Safety hazards associated with the existing dam go beyond those associated with risks of dam failure and associated loss of life and human infrastructure. Gold Ray Dam does not provide storage, so risks of downstream inundation if the dam fails are not nearly as great as if the Gold Ray Dam were a storage dam. Safety risks associated with the dam also include boater safety and risks to human health and safety posed to individuals that may venture onto the dam or into the powerhouse, as documented in Section 1.4 of the Draft EA. Safety is also addressed in Section 3.13 of the Final EA.</p>	N
<p>The EA should describe the structural stability of the dam. (1)</p>	<p>Section 2.1.2.1 of the Draft EA notes that there is evidence of concrete deterioration, cracking, and displacement throughout the [dam] site. Further detail on the condition of the dam is presented in Appendix D of the Draft EA, Sections 2.3.1 and 2.4. In addition to the deteriorated condition of the dam, the dam's design makes it susceptible to deterioration due to the relative thinness and minimal reinforcing. In addition, according to the Federal Emergency Management Agency, dams like Gold Ray Dam are particularly vulnerable to motions</p>	N

Summary of Public and Agency Comments on the Gold Ray Dam Project Draft Environmental Assessment

Comment Summary	Response	Change to EA Y/N
	that can result in the tipping of the buttresses and loss of support for the concrete slabs that comprise the dam. As such, the dam presents concerns regarding both hydraulic and seismic stability.	
There is no economic benefit from the dam and restoring hydropower is not economically feasible or environmentally sound. (5)	NMFS acknowledges this comment.	N
Regulatory Requirements and Coordination (1.5)		
There was a lack of advance public notice about the public meeting. Concern about format of the public meeting, specifically the lack of public debate. (3)	CEQ regulations state that environmental documents, like the Draft EA for this project, be available to the public to "...inform those persons and agencies that may be interested and affected" (40 CFR 1506.6(b)). NOAA's NEPA procedures (NOAA Administrative Order 216-6) further suggests that the Draft EA be circulated to allow for greater public participation. There is no requirement in CEQ regulations or in NOAA's NEPA procedures (NOAA Administrative Order 216-6) for a specific format for public meetings or for public testimony to be gathered. NMFS recognized the high level of public interest in this project and held both a public scoping meeting (November 2009) and a public meeting following release of the Draft EA (March 2010). The meetings were announced about 10 days in advance of the meeting date through e-mail distributions, local media, and on the Rogue Valley Council of Governments' website. At each meeting, there was an informational presentation and information stations where meeting participants could ask questions and provide comments directly to the team preparing the	N

Summary of Public and Agency Comments on the Gold Ray Dam Project Draft Environmental Assessment

Comment Summary	Response	Change to EA Y/N
	EA. NMFS was able to gather input, both from oral comments provided directly to NMFS and other project staff and written comments submitted at the meeting and via mail and e-mail. Both the public scoping meeting and the public meeting following release of the Draft EA were attended by more than 100 people, and more than 900 written comments from individuals and agencies were submitted on the Draft EA. Public outreach and involvement allowed NMFS to hear and consider the wide range of concerns and issues held by the public regarding the Gold Ray Dam project.	
DESCRIPTION OF PROPOSED ACTION AND NO ACTION ALTERNATIVE (2.0)		
Action Alternatives (2.1)		
The county should consider mobilizing the Navy Seals to use explosives to blow up the dam. Use of “shaped charges” could detonate portions of the dam for a gradual drawdown. Concrete debris should be left in the channel as to create a rapid. This alternative would breach the dam at no cost to the county. (1)	NMFS acknowledges this comment. At this time, the use of explosives for dam removal is not being considered by NMFS due to environmental concerns.	N
Dam Removal (Alternative 1) (2.1.1)		
Support of dam removal, including concurrence with the stated purpose and need for the proposed action. (830)	NMFS acknowledged this comment.	N
The statement in section 2.1.1 that dam removal will restore “near natural flows” does not accurately describe the Rogue River given the flow regulation at Lost Creek Dam.(1)	NMFS acknowledges the comment. Dam removal would establish flows nearer to natural conditions, but river flows would still be regulated by Lost Creek Dam.	Y
Dam/Fish Ladder Rehabilitation/Reconstruction (Alternative 2)(2.1.2)		
Support of dam rehabilitation and hydroelectric development (36)	NMFS acknowledges this comment. NMFS has reviewed the assessment of rehabilitation of the dam and reestablishment of hydropower and acknowledges that	N

Summary of Public and Agency Comments on the Gold Ray Dam Project Draft Environmental Assessment

Comment Summary	Response	Change to EA Y/N
	it is not cost-effective and would not fully meet the purpose and need. NMFS notes that its involvement in the Gold Ray Dam project is providing funding for improvements to fish passage and native fish habitat. While the reconstruction of fish ladders would improve fish passage, partially addressing the project purpose, it would do so at significantly higher cost than the dam removal alternative.	
No Action Alternative (2.2)		
The EA states that the no action alternative would maintain the status quo but does not consider the potential of future dam maintenance; especially since section 3.13.1 notes the evidence of significant concrete deterioration, cracking, and displacement. (1)	NMFS acknowledges this comment. Section 2.2 of the Draft EA documented the no action alternative to be essentially continuation of the status quo, and acknowledges that the environmental and infrastructure trends noted in the comment would likely continue.	N
Support of retaining the dam - no action alternative. (44)	NMFS acknowledges this comment. NMFS will consider the alternatives and public comments on the Draft EA in making its decision.	N
Money designated for dam removal should be used for other county needs. (12)	NOAA made American Recovery and Reinvestment Act funds available for the purpose of improving fish passage and native fish habitat.. If, following the NEPA process, NMFS does not decide to remove the dam, the funds would no longer be available to the County for purposes other than fish passage and habitat improvements. Similarly, if the County decides against dam removal, money would be reallocated by NMFS to other federal programs.	N
AFFECT ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES (3.0)		
Geology and Soils (3.1)		

Summary of Public and Agency Comments on the Gold Ray Dam Project Draft Environmental Assessment

Comment Summary	Response	Change to EA Y/N
<p>The 1997 New Years Day channel avulsion into the Kendell Bar pond on ODOT property caused a base level lowering of 10-12 feet, which proceeded to migrate upstream. This recent, location specific, analog of a headcutting event should be used as a predictive tool for the Gold Ray Dam removal. (9)</p>	<p>NMFS reviewed the 2006 Rogue River Stakeholders Monitoring Report to understand the impacts of the 1997 pond capture upstream of the dam. Surveyed cross-sections showed no significant changes at the downstream end of the pond capture area over a two-year period. The Kendell Bar pond capture is not a good analog for the dam removal because the pond capture created a significant headcut (due to the instantaneous effect of the pond breach and significant river bed elevation difference). In addition, the Kendell Bar area has a connected floodplain with a very wide channel section whereas the reservoir area has a confined channel with no floodplain connectivity. The pond capture provides useful information but is not a good predictive tool for Gold Ray Dam removal. NMFS used hydraulic and sediment models to determine potential impacts of dam removal in the reservoir area. The restoration plan will include measures to address the long-term stability of the areas upstream of Gold Ray Dam under a dam removal scenario.</p>	<p>N</p>
<p>The EA does not provide design basis or hydraulic calculations to support the proposed stabilization structures. A 25-year event should be the design standard. (3)</p>	<p>The purpose of the EA is to discuss specific environmental impacts and not provide detailed designs. A detailed hydraulic model and sediment management report is available from Jackson County that describes predicted results from dam removal.</p>	<p>N</p>
<p>Land Use and Recreation (3.2)</p>		
<p>The EA refers to whitewater boating experience at a Class IV level, although Class IV rapids are not a prerequisite for a whitewater</p>	<p>NMFS acknowledges this comment. The Final EA explains that dam removal would provide potential for</p>	<p>Y</p>

Summary of Public and Agency Comments on the Gold Ray Dam Project Draft Environmental Assessment

Comment Summary	Response	Change to EA Y/N
boating experience. Also, most whitewater outfitters do not offer trips with Class IV rapids. Removing the dam will allow the option to extend the current half day trip from Gold Ray to Gold Hill to a full day. While flat water boating areas will decrease there would be increased opportunity for moving water canoeing. (1)	full-day guided raft trips, without specifying the class of the rapids (Section 3.2.2.2).	
Kayakers use the surfing wave currently below Gold Ray Dam, which would be lost if the dam is removed. They request consideration of creating a surfing wave as part of dam removal. (6)	NMFS acknowledges this comment. Section 3.2.1.2 acknowledges the presence of the standing (surfing) wave below Gold Ray Dam. The addition of a surfing wave as part of dam removal is not included in the current restoration plan.	N
The dam presently blocks boat passage. Dam removal will open up more of the Rogue River for boating and access to public lands. (12)	NMFS acknowledges this comment.	N
Dam removal will improve fishing opportunities.(4)	NMFS acknowledges this comment.	N
The artificial reservoir created by the dam has limited access; given a few people direct access to sections of the river. (3)	As noted in the Draft EA, the upstream area, while lacking direct public access to the water, is used for a variety of recreation and nature study activities and is well used for those purposes.	N
The river above Gold Ray Dam is already available to jet boats, which launch at Touvelle Park, so dam removal will not necessarily increase jet boat traffic as suggested in Section 3.2.2.2 of the EA. The EA should consider the interaction between jet boats and drift boats. (2)	NMFS acknowledges this comment. While dam removal would not necessarily increase jet boat traffic, it would lengthen the reach available for jet boat use. Existing use of the river above the dam by jet boats is discussed in Section 3.2.1.2. Section 3.2.2.2 includes discussion of the interaction of jet boats and other water craft.	Y
The loss of wetlands from dam removal may conflict with Jackson County's Comprehensive Plan. (2)	The Natural and Historic Resources section of the Comprehensive Plan acknowledges that backwater areas behind Gold Ray Dam are Natural Areas. The removal of the dam would change the wetlands behind the dam but wetland loss is expected to be offset by	N

Summary of Public and Agency Comments on the Gold Ray Dam Project Draft Environmental Assessment

Comment Summary	Response	Change to EA Y/N
	wetland gains from restoration and establishment of a more natural flow condition (see Section 3.4.2.2). In addition, this area will remain a natural area and improve with restoration efforts, and will continue to be consistent with the Comprehensive Plan.	
Currently Gold Ray Dam serves at the boundary for an “artificial flies and lures only” fish zone designated by ODFW. The EA should indicate if this designation would change with the loss of the dam. (1)	A portion of the southern-most abutment of the dam will remain and this will denote the boundary. The description in the fishing regulations may change (see Section 3.2.2.2), but ODFW has no plans to change the boundary (ODFW 2010).	N
Dam removal would result in loss of bass fish opportunities. The project should consider transporting salvaged warm water fish to local lakes to mitigate lost fishing opportunities. (4)	NMFS acknowledges this comment and Section 3.2.2.2 acknowledges the loss of fishing opportunities for largemouth and smallmouth bass. Oregon Department of Fish and Wildlife (ODFW) will oversee fish salvage and relocation. Some non-native game fish (such as largemouth bass) may be relocated to nearby ponds and lakes.	Y
Water Quality and Resources (3.3)		
The EA should consider the impacts to domestic wells upstream of the dam in more detail and certainty. (9)	The analysis presented in the Draft EA was based on review and assessment of available information on wells in the project area and consultation with the Jackson County Watermaster and Oregon Water Resources Department. The relationship between Rogue River water levels and groundwater levels is complex and interrelated (that is, groundwater feeds the river and vice versa).	Y

Summary of Public and Agency Comments on the Gold Ray Dam Project Draft Environmental Assessment

Comment Summary	Response	Change to EA Y/N
	Jackson County is conducting further evaluation of downstream water intakes and upstream wells to establish more detailed existing conditions regarding the water sources and costs of operations. If Alternative 1 is selected, Jackson County will, in coordination with property owners, develop a management plan to assess downstream intakes and upstream wells and establish procedures to address project related adverse effects, if any.	
Removal of Gold Ray Dam would impact residential and irrigation water intakes downstream (including the Savage Rapids intakes). (6)	The Final EA includes 3.3.2.2 information about downstream water intakes and anticipated effects from the project alternatives.	Y
Sediments released from dam removal would not cause water quality concerns downstream. (1)	Sediments would cause temporary increase in turbidity during dam removal. Water quality impacts would be controlled to the extent practicable by construction best management practices (see EA section 3.3.2.2).	Y
Existing reservoir water conditions violate state law for water quality; specifically OAR 340-041-0028. (1)	Water quality conditions in the Rogue River are documented in Section 3.3.1.1, which notes that the Rogue River near Gold Ray Dam does not meet water quality standards for several criteria.	N
Would discharge from Medford's sewage treatment plant affect water quality differently if dam were removed (i.e., since there would be a reduction in water volume; no reservoir to dilute)? (1)	Effluent leaving the Medford wastewater treatment plant meets Oregon Department of Environmental Quality's permits limits for the receiving water. Changes in flow of the receiving waters would not affect water quality.	N
Wetlands and Floodplains (3.4)		
The EA does not describe in detail the location of the wetlands that	As stated in Section 3.4.1.1, field investigation and aerial	Y

Summary of Public and Agency Comments on the Gold Ray Dam Project Draft Environmental Assessment

Comment Summary	Response	Change to EA Y/N
are anticipated to be affected. Suggest further collection of data on wetland and preparation of an EIS. The process of aerial photography assessment underestimated the amount of wetlands present above the dam. The acres and quality of wetlands lost with dam removal should be listed in the EA. (7)	photography were used to classify wetlands. This method was developed in coordination with the Oregon Department of State Lands (DSL) and the U.S. Army Corps of Engineers, the two agencies with regulatory authority over wetlands and waters. Use of aerial photography in conjunction with field investigation is accepted by resource agencies as a method for assessing the extent of wetlands present for an EA. The hydraulic and sediment modeling conducted for the project does not provide quantitative information in sufficient detail to determine the exact amount and location of wetland loss from changes in hydrology. The analysis of affected wetlands based on best available data is presented in Section 3.4.2.2.	
Dam removal would result in the loss of valuable wetlands. (6)	NMFS acknowledges this comment. The EA acknowledges that there would be a reduction in the wetlands present within the project area, but that the reduction would be offset by the creation of new wetlands after river levels change following dam removal (Section 3.4.2.2).	Y
Wetlands upstream of the dam were created by the dam. They are not natural, contain invasive plants, and provide habitat for predators that damage bird populations. Loss of these wetlands is outweighed by ecological benefits of dam removal. (8)	NMFS acknowledges this comment.	N
The EA incorrectly assumes that there would be no effect to existing wetlands under the no action alternative, since sediment would continue to accumulate behind the dam and fill in existing wetlands. Existing wetland could also be lost if the dam should fail or be	Siltation as a result of slack water created by the dam has likely contributed to historical wetland loss upstream of the dam. This siltation process could continue to fill in the existing wetlands and transition	Y

Summary of Public and Agency Comments on the Gold Ray Dam Project Draft Environmental Assessment

Comment Summary	Response	Change to EA Y/N
damaged due to no action. (1)	them to upland under the no action alternative. The timeframe over which this transition would occur is unknown (Section 3.4.1.1).	
The overall ecologic benefit from dam removal outweighs the loss of existing artificial wetlands. (1)	NMFS acknowledges this comment.	N
Aquatic Biology (3.5)		
Fish salvage plan should include lamprey. The fish salvage plan should include specific measures to collect lamprey, including slow draw down allowing lamprey time to emerge from the substrate. Lamprey should be mentioned as a species that would benefit from dam removal. (2)	Section 3.5.2.2 of the EA states that fish salvage will be supervised by ODFW fish biologist following the methods described in the fish salvage plan (Appendix C). Salvage activities would relate to native fish collectively, including lamprey. Appendix C details the fish salvage plan and includes specific measures for salvage of lamprey (Section 5.2.1 of Appendix C).	N
Dam removal will result in the loss of ODFW's fish counting station. Fishing outfitters rely upon current fish passage data for their business. The EA does not explain what fish tracking methods will replace the fish counting station. The project should consider replacing the dam with a weir to count fish. (11)	<p>ODFW is currently developing alternative monitoring methods. ODFW's highest priority is to develop alternatives to the spring Chinook count, since essentially the entire population of spring Chinook in the Rogue River has been counted as it passed Gold Ray Dam. If dam removal is selected, ODFW plans to replace the dam count for spring Chinook with carcass counts after the fish have spawned. Carcass counts were conducted in the 1970s and 1980s, and resumed in 2004.</p> <p>ODFW also operates a seining station at Huntley Park on the lower Rogue River. This long term data collection station provides the primary data ODFW uses to monitor trends in abundance for coho salmon, fall chinook</p>	Y

Summary of Public and Agency Comments on the Gold Ray Dam Project Draft Environmental Assessment

Comment Summary	Response	Change to EA Y/N
	<p>salmon, and late run summer steelhead. Additional spawning and juvenile surveys are conducted for summer and winter steelhead and coho salmon, and will continue to be conducted. (Section 3.5.2.2)</p> <p>NMFS anticipates that ODFW will be able to responsibly manage fisheries using a variety of survey methods. These methods are used to manage fisheries in other Oregon coastal river systems. (ODFW 2010)</p> <p>Replacing the current dam with a weir for the purpose of fish counting is in conflict with the purpose and need of the project to improve fish passage and native fish habitat.</p>	
Dam removal will benefit native fish. (38)	NMFS acknowledges this comment. Anticipated benefits to native fish are consistent with the project's purpose and need.	N
The historic North Channel upstream of the dam should be re-watered, especially the side channel and alcove habitat favored by threatened coho salmon. (1)	The north channel is currently an overflow channel that has water during high flow events in the mainstem. It is expected that similar conditions will continue following dam removal. The possibility of increasing the connectivity of the north channel to the river has been considered and is not feasible at this time. The EA (Section 2.1.1.2) describes restoration activities at the mouth of Kelly and Tolo sloughs (i.e. alcove habitat) that will benefit native fish.	N
The EA should include information that the Gold Ray Dam is on ODFW's list of priority fish passage barriers to be removed. (1)	The purpose and need, Section 1.4, includes a statement that Gold Ray Dam is listed on ODFW's Oregon	N

Summary of Public and Agency Comments on the Gold Ray Dam Project Draft Environmental Assessment

Comment Summary	Response	Change to EA Y/N
	Statewide Fish Passage Priority List	
The dam violates the Endangered Species Act since the dam likely “takes” federally listed SONCC coho, and Jackson County does not have an Incidental Take Permit as required under ESA. (4)	Maintaining the dam as-is does not constitute a “federal action” that requires consideration under Section 7 of the ESA. The no-action alternative assumes that the county would continue under current funding (e.g. non federal funding) and maintenance plans.	N
Hydropower generation associated with the dam rehabilitation alternative could increase the risk to juvenile fish due to turbine entrainment. (1)	NMFS design criteria noted in Section 2.1.2.3 are, in part, intended to prevent turbine entrainment of fish. Fish screens (located upstream and down stream of turbines) are included as part of the dam rehabilitation alternative to avoid fish entrainment and would cost approximately \$24.8 million.	N
Dam removal and deposition of released sediment will reduce existing spawning gravel directly below the dam. (2)	The stream channel below the dam is primarily composed of bedrock and boulders. Pockets of gravel suitable for Chinook spawning below the dam may be affected by dam removal. These spawning areas could be affected by deposition of fine sediment or change in hydrology as a result of dam removal. This text has been added to Section 3.5.2.2 of the EA. However, dam removal will likely result in the creation of spawning habitat that was previously inundated by the reservoir.	Y
Terrestrial Wildlife (3.6)		
Dam removal will results in loss of wildlife habitat above the dam. (5)	Habitats types would remain the same after dam removal but the total acreage for each habitat, particularly wetland types, would change after removal of the dam. Overall net acreage of habitat above the dam would remain the same after restoration efforts.	Y

Summary of Public and Agency Comments on the Gold Ray Dam Project Draft Environmental Assessment

Comment Summary	Response	Change to EA Y/N
Vegetation (3.7)		
In addition to dam removal, the project should consider additional restoration including removal of blackberry, trash and other debris from nearby tributaries. (1)	NMFS acknowledges this comment. NMFS will continue to work with Jackson County and RVCOG on the long-term restoration and monitoring, which may include removal of invasive plants like blackberries.	N
High flows that may occur after dam removal could wash away newly replanted vegetation. (2)	High flows from the Rogue River may affect newly planted vegetation by uprooting plants or removing topsoil. Long term monitoring will track vegetation establishment as part of the restoration efforts, and propose new plantings or other measures if high flows damage planted vegetation (Section 3.7.2.2).	Y
Cultural and Historic Resources (3.8)		
Preserve the powerhouse, if possible, for its historic value. (8)	NMFS will enter into a Memorandum of Agreement with the Oregon State Historic Preservation Office that will include the specific steps that Jackson County will take to mitigate the adverse effect on the historic property (Gold Ray Dam). Mitigation will include salvaging and documenting key components of the dam and powerhouse, though it is not likely feasible to preserve the powerhouse completely due to its deteriorated condition.	N
Release of sediment would affect the sacred fishing hole of the Latgawa tribe. (1)	The EA documents impacts to fish and fishing (Sections 3.2.2.2 and 3.5.2.2). Temporary short-term impacts are anticipated during construction. Overall positive effects on the native fish would result from dam removal and no long-term adverse effects on any fishing locations are anticipated. As part of the development of the EA, NMFS coordinated with the federally recognized Tribes with	N

Summary of Public and Agency Comments on the Gold Ray Dam Project Draft Environmental Assessment

Comment Summary	Response	Change to EA Y/N
	treaty rights in the project area: Confederated Tribes of the Grande Ronde, Confederated Tribes of the Siletz and Cow Creek Band of the Umpqua Tribe of Indians (see Section 1.5.3 of the EA).	
Visual Quality and Aesthetics (3.9)		
The EA fails to address aesthetic impacts such as loss of riverfront property, increased litter, and other impacts from increased access and river recreation, and aesthetic values associated with the loss of upstream wetland. List the number of private property owners that would be affected. (4)	There are individual landowners in the area upstream of Gold Ray Dam that would be affected by the dam removal alternative. The EA acknowledges the aesthetic value of the upstream area and the potential change associated with the dam removal alternative (Section 3.9.2.2). Upstream water levels would change, but private property owners would retain river frontage. The dam removal alternative would not change downstream aesthetics.	N
The existing dam structure and upstream features (wetlands, reservoir, and sloughs) contribute to the aesthetical quality of the site. The EA should consider dam removal as a negative impact to this visual resource. (5)	<p>The EA notes that the reservoir area “is notable for its wildlife and attracts visitors for hiking and nature study”. The aesthetic quality of the site and the value that people place on the aesthetics of the site are described in Section 3.9.1.</p> <p>The removal of the dam and associated structures would change the visual quality of the area, which is subjective to the viewer. Section 3.9.2.2 of the Final EA notes that the removal of the dam would eliminate an element of visual interest to some viewers.</p>	Y
Transportation (3.10)		
Traffic impacts on John Day Drive during construction would include increased traffic, noise, and safety related impacts. The EA should	Section 3.10.2.2 indicates that during construction traffic on John Day Drive would increase. The following	Y

Summary of Public and Agency Comments on the Gold Ray Dam Project Draft Environmental Assessment

Comment Summary	Response	Change to EA Y/N
consider the mitigation for these effects such as: limiting traffic to only authorized vehicles and flagging. (10)	text was added to address public safety concerns on John Day Road: To ensure public safety signs indicating traffic delays and flaggers will be present as needed during construction. If dam removal is selected, Jackson County will require the contractor to limit work to daylight hours, provide notice to adjacent landowners regarding planned activities, and establish a communication protocol to respond to public inquiries and comments.	
Air Quality – (3.11) No comments	NA	
Noise – (3.12)		
Increased traffic during construction will create additional noise. (10)	Section 3.12.2.2 acknowledges that activities associated with construction would result in an increased noise level during the construction period. Specific examples of the types of noise associated with dam removal have been added (Construction noise could result from increased truck traffic, jack hammering, bulldozer, compressor, etc). Construction activities would be limited to daylight hours.	N
Human Health and Safety (3.13)		
For the no action alternative, fencing could reduce risk around dam and limit the county's liability. (2)	The no action alternative assumes that the dam will remain as is, without fencing. Fencing would discourage some people from entering the dam site, but not completely exclude people from entering the site and creating a risk to health and safety.	N
The Oregon State Marine Board (OSMB) has sole authority to close the Rogue River to boat traffic during construction. OSMB suggest that the waterway remain closed to the public until channel conditions	OSMB's recommendations have been incorporated into the Final EA. Jackson County will coordinate with OSMB regarding the implementation of the recommendations.	Y

Summary of Public and Agency Comments on the Gold Ray Dam Project Draft Environmental Assessment

Comment Summary	Response	Change to EA Y/N
have stabilized at the dam site and in the affected downstream reach. The following conditions are necessary to project public safety: (1) provide written notice 30 days prior to river closure to Department of State Lands, OSMB, Jackson County Sheriff Marine Unit, Oregon State Police Fish and Wildlife Division, Department of Fish and Wildlife, and Oregon Parks and Recreation Department; (2) the county should develop plans to effectively provide public notice and warning of the channel closure; (3) the county will post adequate warnings signs; (4) the county will maintain warning and information signage during the channel closure; and (5) the county will monitor sediment accumulation at Fishers Ferry and remove sediments that impact the boat ramp. (1)	To protect public health and safety	
Socioeconomic and Environmental Justice (3.14)		
The EA fails to address the economic losses from dam removal (losses associated with well impacts, compensation for adverse economic impacts, and property value losses). (3)	The Draft EA documents the likely impacts to property owners. The Final EA contains additional details regarding these effects (Section 3.14.2.2).	Y
Dam removal and restoring a free flowing river may increase property values for adjacent landowners. (1)	NMFS acknowledges this comment.	N
Limiting financial liability of the local communities and restoring habitats outweighs concerns of individual landowners regarding impacts to water intakes. (4)	NMFS acknowledges this comment.	N
Dam removal would improve the health of the Rogue River and increase fishing opportunities. The EA should expand the discussion on this economic benefit. (3)	The Draft EA documents the potential for economic benefits from recreational uses of the river.	N
Dam removal could damage water intake structures. As a result downstream landowners could experience economic impacts, specifically loss of irrigation water for landscaping. The contractor or government agency should purchase insurance to reimburse property	Jackson County will coordinate with downstream property owners with existing water intakes on the Rogue River to assess the baseline conditions of intakes in terms of location, equipment and maintenance	Y

Summary of Public and Agency Comments on the Gold Ray Dam Project Draft Environmental Assessment

Comment Summary	Response	Change to EA Y/N
owners for lost landscaping. (4)	requirements. The County will develop a management plan to address impacts, if any, to the existing downstream water intakes (Section 3.3.2.2).	
Include specific analysis of socioeconomic effects to Gold Rey Estates property owners in the Final EA. (5)	The Draft EA documents the likely impacts to property owners. The Final EA contains additional details regarding these effects (Section 3.14.2.2).	Y
Current dam does not offer economic benefit (i.e., no water storage, hydropower, or flood control benefits). (1)	NMFS acknowledges this comment.	N
Cumulative Impacts		
The EA lacks complete discussion of the cumulative effects of mineral extraction. (1)	The EA analysis of cumulative effects includes mineral extraction as one of the past, present and reasonably foreseeable future actions to be considered in assessing the cumulative effects of the proposed action and alternatives. Mineral extraction has been and continues to be an action that affects the environmental conditions of the Gold Ray Dam project area (Section 3.1 of the EA).	N
Who pays for post construction monitoring? (2)	NOAA Open Rivers Initiative provides funding for monitoring over the next three to five years In addition the US Geological Survey is providing funding for water quality monitoring. The Rogue Valley Council of Governments has coordinated (and will continue to coordinate) monitoring programs. If dam removal is selected, the monitoring program will help assess the changes in conditions in the Rogue River.	N
Error on third bullet on page 3-38; Applegate dam has not been removed. (1)	The Final EA includes updated information regarding Applegate Dam.	Y
Error on page 3-38; removal will open access for fish to 330 miles of	The text was revised to focus on the Rogue River and the	Y

Summary of Public and Agency Comments on the Gold Ray Dam Project Draft Environmental Assessment

Comment Summary	Response	Change to EA Y/N
river but these areas are not completely free of man-made barriers as indicated. (1)	area that would be completely free of human-made barriers with the removal of Gold Ray Dam.	