RECLAMATION

Managing Water in the West

Draft Environmental Assessment
Fish Passage Improvements
Savage Rapids Dam
Grants Pass Project, Oregon

U.S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region

August 2005

U.S. Department of the Interior

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian tribes and our commitments to island communities.

Mission of the Bureau of Reclamation

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

Acronyms and Abbreviations

BMP	best management practices
CAR	Coordination Act Report
cfs	cubic feet per second
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
EA	Environmental Assessment
EIS	Environmental Impact Statement
EFH	Essential fish habitat
ESA	Endangered Species Act
ESU	Evolutionarily significant unit
fps	feet per second
GPID	Grants Pass Irrigation District
LAET	Lowest apparent effect threshold
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NHPA	National Historic Preservation Act
NOAA Fisheries	National Oceanic and Atmospheric Administration (formerly NMFS – National Marine Fisheries Service)
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
ODSL	Oregon Department of State Lands
PR/FES	Planning Report/Final Environmental Statement
Reclamation	U.S. Bureau of Reclamation
RM	river mile
ROD	Record of Decision
SHPO	State Historic Preservation Officer
SONCC	Southern Oregon/Northern California Coast
SVOC	Semi-volatile organic compounds
TMDLs	Total maximum daily loads
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
VOC	Volatile organic compounds

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Chapter 1 PURPOSE AND NEED

1.1 Purpose and Need for Action

The purpose for this action is to improve fish passage while maintaining a water diversion for the Grants Pass Irrigation District (GPID). The need for this action is because of inadequate fish passage at Savage Rapids Dam.

A 1995 Planning Report/Final Environmental Statement (PR/FES) prepared by the Bureau of Reclamation (Reclamation) proposed dam removal and construction of pumping facilities but the action was never implemented due to a lack of local consensus. In August 2001, a Consent Decree (Decree) was issued to settle a pending Federal court case against GPID under the Endangered Species Act (ESA) and a water right cancellation case pending in the Supreme Court of the State of Oregon. The Decree provided that the GPID should seek authorization and funding for implementing the Pumping/Dam Removal Plan as identified in the 1995 PR/FES. The Decree further stipulated that GPID must cease operating the Dam as its diversion facility by November 1, 2005, with an extension to November 1, 2006, at the judge's discretion. Section 220 of the fiscal year 2004 Energy and Water Appropriations Bill (Public Law 108-137) authorized the Secretary of the Interior to construct pumping facilities and remove Savage Rapids Dam. Although not a party to the lawsuit, Reclamation did provide technical support to the team negotiating the Decree.

A revised preferred alternative is presented in this Environmental Assessment (EA). While it is very similar to the 1995 PR/FES Preferred Alternative, it differs in that some of the dam infrastructure will be retained; a single, large pumping plant will be constructed on only the left (south) side of the river; and a pipe bridge would be constructed to convey water to the right (north) side of the river. Because of these changes, and because of the age of the PR/FES, Reclamation is preparing this EA to determine if the proposed changes associated with the revised Preferred Alternative, or changes in the affected environment that have occurred since the 1995 PR/FES, would result in significant impacts not previously addressed. If this EA indicates that such impacts are likely, Reclamation intends to prepare a supplemental Environmental Impact Statement (EIS).

This EA is tiered to the 1995 PR/FES and the information in that document is incorporated by reference into this EA[1]. This EA presents additional information about existing conditions and additional analysis of impacts that was not discussed in the 1995 PR/FES. It generally will not repeat analysis of impacts to specific resources unless changes have occurred. Tables 2.1 and 2.2 in chapter 2 summarize the changes between the 1995 PR/FES and the 2005 EA.

1.2 Background

Fish passage at Savage Rapids Dam has been an issue since the dam was constructed in 1921 by the GPID. Built to divert water for irrigation from the Rogue River, the concrete structure, including installed stoplogs, has a height of 39 feet. A fish ladder was constructed on the right side at the time the dam was built and a fish ladder on the left side was added in 1934. Rotating fish screens were an initial part of the gravity diversion. Early attempts to screen the pumping diversion were unsuccessful, and it remained essentially unscreened until 1958. Fish passage improvements made in the late 1970s helped reduce losses, but fish passage problems continue. The existing fish screen at the pump intake does not meet current criteria of the National Oceanic and Atmospheric Administration (NOAA Fisheries).

1.3 Decisions Required

Reclamation must decide if a supplemental EIS is needed.

1.4 Existing Project and Facilities Description

The GPID, organized in 1916, serves lands in Josephine and Jackson Counties (Figure 1-1). Savage Rapids Dam is located on the Rogue River in southwestern Oregon, about 5 miles east of the city of Grants Pass. The privately-owned dam is the primary irrigation diversion facility of the GPID. Major facilities comprising Savage Rapids Dam include a main pumping plant consisting of two hydraulic turbines directly connected to pumps located on the right abutment, approximately 160 miles of canals, and four relift pumping plants. The main canals and laterals are South Highline Canal, Savage Lateral, Gravity Canal, Tokay Canal, and Evans Creek Lateral. Savage Lateral and Evans Creek Lateral carry water generally east into Jackson County, and the other canals carry water generally west into

[1] A copy of the 1995 PR/FES can be obtained online at http://www.usbr.gov/pn/programs/ea/oregon/savage/index.html

Josephine County (Figure 1-2). Gravity Canal serves the lowlands along the left side of the river.

The district diverts about 980 cubic feet per second (cfs) of water from the forebay formed by Savage Rapids Dam. About 800 cfs flows through the turbines and back into the river next to the north fish ladder. About 150 cfs is pumped to the upper canals with the remaining 60 cfs supply diverted to the Gravity Canal through headworks located on the left abutment of the dam.

Savage Rapids Dam is a combination gravity and multiple arch concrete dam with a crest length of 465 feet and a maximum height of 39 feet, including stoplogs. The river outlet for the dam consists of two 7- by-16-foot radial gates with a combined capacity of approximately 6,000 cfs. The reservoir is relatively narrow, only two to three times wider than the river. The annual mean flow of the Rogue River is 3,372 cfs. The total drainage area above the dam is slightly less than 2,459 square miles. Fish ladders are present on both ends of the structure, with the north ladder located on the right abutment of the dam and the south ladder located on the left, adjacent to the headworks for the Gravity Canal.

1.5 Issues and Concerns

The existing traveling fish screens at the pump intake do not meet current NOAA Fisheries screening criteria. In 1997, the National Marine Fisheries Service (now NOAA Fisheries) listed the Southern Oregon/Northern California Coast (SONCC) coho salmon as threatened.

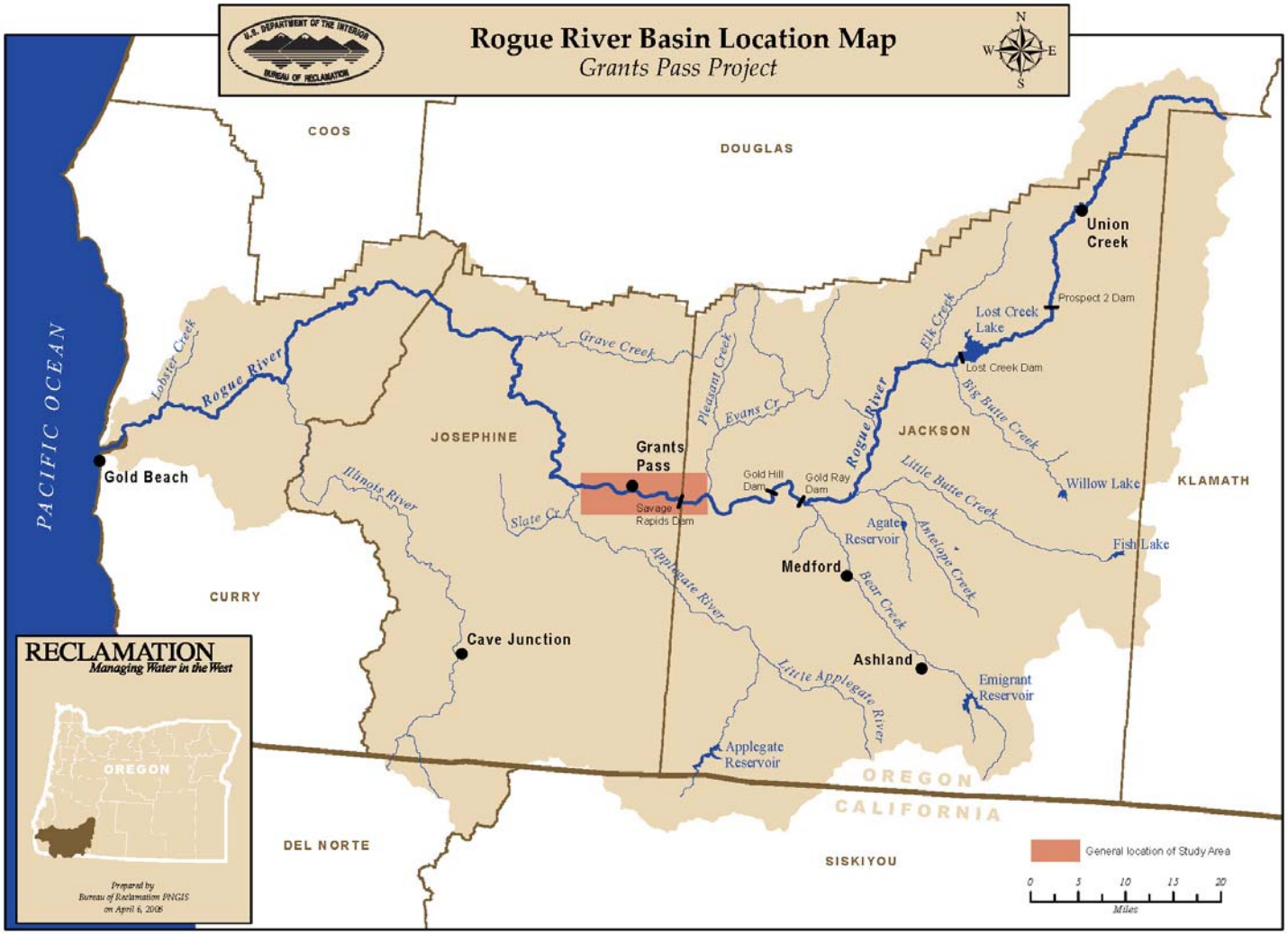

Figure 1-1. Rogue River Basin Location Map - Grants Pass Project

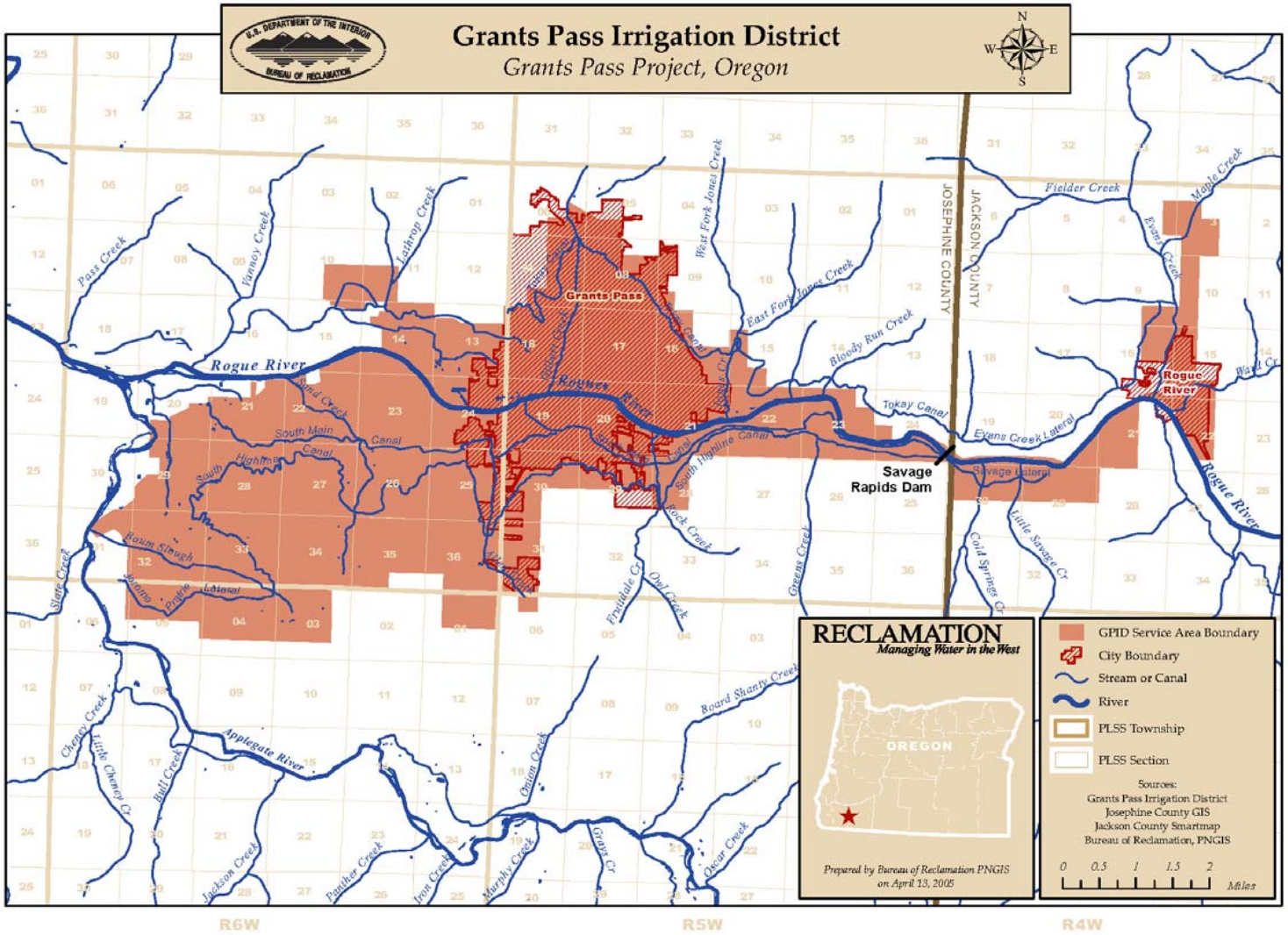

Figure 1-2. Grants Pass Irrigation District

Chapter 2 DESCRIPTIONS OF ALTERNATIVES

Reclamation considered a number of options to address the fish passage issue at Savage Rapids Dam in an effort to fine tune the dam removal/pumping plant construction action proposed as the Preferred Alternative in the 1995 PR/FES. Several of the options were eliminated from further study early in the process for various reasons, primarily engineering concerns. Three options were studied in greater detail; two were ultimately eliminated from further study as discussed under Section 2.4 – Alternatives Considered but Eliminated from Further Study. The remaining one is presented as the 2005 Preferred Alternative. Reclamation did not consider any options not involving dam removal/pumping plant construction for this EA because of the direction given in the Consent Decree and Public Law 108-137.

The following alternatives are evaluated in this EA:

- Alternative A – 1995 PR/FES Preferred Alternative (Two pumping plants, complete dam removal)
- Alternative B – 2005 Preferred Alternative (A single pumping plant on the left side [south] of the river with a pre-engineered bridge supporting a pipeline to convey water to the right side [north] of the river, partial dam removal)

The 2005 Preferred Alternative (Alternative B) is being compared to the 1995 Preferred Alternative (Alternative A) to determine if additional significant impacts occur that were not discussed in that document. If changes to the existing environment for a specific resource have occurred, additional analysis of the 1995 Preferred Alternative will be done for that resource.

Additional analysis of the No Action Alternative as discussed in the 1995 PR/FES will not be done in this EA. The No Action Alternative remains unchanged from the 1995 PR/FES with the exception of the 2001 Consent Decree requiring GPID to cease operating Savage Rapids Dam as its diversion facility by November 1, 2005, with a potential extension to November 2006. Therefore, the No Action Alternative is not a viable alternative.

2.1 Summary of Changes

In addition to the 1995 Preferred Alternative (Alternative A), a revised preferred alternative (Alternative B) is being evaluated. The purpose of this EA is to determine if additional significant impacts not addressed in the 1995 PR/FES would occur so that Reclamation can

determine if a supplemental EIS needs to be prepared. The 1995 PR/FES is incorporated by reference in this EA.

Table 2-1 below provides a comparison of the physical feature changes made between Alternative A and Alternative B. Table 2-2 provides a summary of analysis for the affected environment and environmental effects on resources between the 1995 PR/FES and the 2005 EA and whether additional information is available, or significant modifications of the alternatives have occurred that result in impacts not discussed in the 1995 PR/FES.

Table 2-1. Physical Feature Changes Between the 1995 PR/FES and the 2005 Preferred Alternative [1]

Physical Feature	Alternative A – 1995 PR/FES Preferred Alternative	Alternative B – 2005 Preferred Alternative
Pumping Plants	One on right side (north), 3 pumps, capacity 32 cfs. One on left side, 6 pumps, 118 cfs. Both placed above 100-year flood elevation.	Single plant, 12 pumps, on the same location as described for left plant in 1995 (total capacity 150 cfs). Pumping plant, motors, and electrical equipment placed above 100-year flood elevation.
Intake Structures	Right intake located downstream of north fish ladder. Left intake located just downstream of the south fish ladder.	Single intake located on the same location as discussed in the 1995 PR/FES (immediately downstream of the south fish ladder).
Pumping Units	Vertical turbine pumping units operating in wet sump with noise abatement berms.	Vertical turbine pumping units operating from sumps. Abatement of noise generated by the motors is accomplished by housing the motors inside an insulated building. Noise generated by the pumps is attenuated because the pumps are completely submerged in water.
Power	Supplied from an existing 12.8 kV transmission line. A small transformer located in the service yard next to the left pumping plant. Transmission line across	A substation designed to tap into the existing Pacific Power 69 kV transmission line adjacent to the left pumping plant.[2]

[1] The No Action Alternative remains the same from 1995 to 2005. The Dam Retention Alternative was not carried forward to the 2005 EA.

[2] Currently there is exists one power pole with two separate transmission lines, 12.8 kV and 69 kV.

Table 2-1. Physical Feature Changes Between the 1995 PR/FES and the 2005 Preferred Alternative [1]

Physical Feature	Alternative A – 1995 PR/FES Preferred Alternative	Alternative B – 2005 Preferred Alternative
	the river to supply power to right pumping plant.	
Dam Structures Remaining	None	Right and left abutments (including the existing pumping plant), gravity canal channel and headworks, north and south fish ladders, apron, and small portion of left side (south) of the dam remain.
Dam Demolition and Removal	Dam and appurtenant structures completely removed.	Reservoir drawn down and cofferdams constructed to isolate construction areas from the river and provide water flow through the south fish ladder. Right side of the dam removed down to apron. Pilot channel cut through cofferdams to allow river to move to the right; cofferdam constructed around the left side of the dam. A portion of the left side of dam removed.

Table 2-2. Summary of the Affected Environment/Effects Analysis on Listed Resources Between the 1995 PR/FES and the 2005 EA

Resource	Alternative A – 1995 PR/FES Preferred Alternative	Alternative B – 2005 Preferred Alternative
Water Use	Current instream right to power hydraulic turbines forfeited as pumping power provided by electric motors. Other water rights unaffected.	No change from 1995 PR/FES.
Water Quality	Increases in turbidity during construction and dam removal.	More information available on sediment quantity and composition. Overall no change from the 1995 PR/FES.
Groundwater	Elimination of the reservoir will not affect groundwater.	No change from 1995 PR/FES.

Table 2-2. Summary of the Affected Environment/Effects Analysis on Listed Resources Between the 1995 PR/FES and the 2005 EA

Resource	Alternative A – 1995 PR/FES Preferred Alternative	Alternative B – 2005 Preferred Alternative
Wild & Scenic Rivers	Temporary but insignificant increase in turbidity during construction.	No change from 1995 PR/FES.
Land Use	110 acres of part-year flat water changed to riverine. One to 1.5 acres near existing dam converted to pumping plants and appurtenant facilities.	No change from 1995 PR/FES.
Aquatic Habitat	Reservoir converted to free flowing river.	No change from 1995 PR/FES.
Anadromous Fish	Salmon and steelhead escapement to increase about 22 percent due to elimination of passage barrier.	Potential short-term fish passage delays during cofferdam construction and dam removal. Overall impacts and benefits the same as described in 1995 PR/FES – elimination of passage barrier.
Resident Fish	Habitat for resident fish improves in reservoir reach.	No change from 1995 PR/FES.
Wildlife	Construction activities result in temporary disturbance. Waterfowl using reservoir replaced by riverine species.	No change from 1995 PR/FES.
Vegetation	About 3 acres affected. Area to be revegetated.	No change from 1995 PR/FES.
Threatened & Endangered (T&E) Species	T&E species included bald eagle and northern spotted owl. SONCC coho salmon and Klamath Mountains Province steelhead were proposed for listing. Alternative was determined to have no measurable effect on listed species.	SONCC coho salmon listed as Threatened. More recent data available for coho. Overall impacts and benefit (elimination of passage barrier) same as described in 1995 PR/FES.
Plants	No plant species listed at time of original analysis. Impacts of this	Gentner mission bells and Cook's lomatium added to T&E list. Not

Table 2-2. Summary of the Affected Environment/Effects Analysis on Listed Resources Between the 1995 PR/FES and the 2005 EA

Resource	Alternative A – 1995 PR/FES Preferred Alternative	Alternative B – 2005 Preferred Alternative
	alternative today would be the same as for Alternative B.	present in project area.
Candidate Species	Candidate species included Pacific Western big-eared bat, northern pond turtle, and northern red-legged frog. No impacts identified.	In 2005, candidate species changed to include only Pacific fisher and Streaked horned lark. No impacts identified.
Species of Special Concern	None designated at time of original analysis. Impacts of this alternative today would be the same as under Alternative B.	Thirty-seven species added to Species of Special Concern list. Most species not present in the project area.
Recreation	Heavy concentration of fish and fishermen between dam and Pierce Riffle eliminated. Fish viewing at dam eliminated. Type of recreation activities will change; overall recreational use will not change. Public access to this river reach to remain problematic since access limited primarily to Savage Rapids Park.	No change from 1995 PR/FES.
Aesthetics	Construction of pumping plants and dam removal short-term effects. Reservoir change similar to seasonal drawdown. Design measures would make facilities less obtrusive than existing dam.	May be less aesthetically pleasing than under Alternative A, because right and left dam abutments will remain in river and there will be a pipe bridge across the river.
Cultural Resources	Unlikely to affect.	No change from 1995 PR/FES.
Indian Trust Assets	None in project area.	No change from 1995 PR/FES.
Social Well Being	Part-year lakeside residents will become permanent riverside residents. Docks will become unusable. Tourism may increase as visits to “new” reach of river becomes available.	No change from 1995 PR/FES.

Table 2-2. Summary of the Affected Environment/Effects Analysis on Listed Resources Between the 1995 PR/FES and the 2005 EA

Resource	Alternative A – 1995 PR/FES Preferred Alternative	Alternative B – 2005 Preferred Alternative
Economics	Increase in annual benefits due to increased annual harvest of salmon and steelhead and increased commercial and sport fishing harvest. Effects on the regional economy would be short-term steming from construction.	No change from 1995 PR/FES.
Energy Requirements	Increase in annual power consumption by about 5,675,800 kWh.	No change from 1995 PR/FES.
Air Quality and Noise	Temporary, short-term effects due to construction. No significant increase in long-term noise.	No change for air quality. Noise may be lower because pumping plant is inside a metal building.
Environmental Justice	No adverse effects on minorities or low-income populations and communities.	No change from 1995 PR/FES.
Unavoidable Adverse Effects	None.	No change from 1995 PR/FES.
Irreversible and Irretrievable Commitment of Resources	None.	No change from 1995 PR/FES.

2.2 Alternative A – 1995 PR/FES Preferred Alternative

This alternative has not changed from its description in the 1995 PR/FES. In summary, the 1995 Preferred Alternative consists of constructing two pumping plants, one on the right bank and one on the left bank, and complete removal of the dam. The right pumping plant would have three pumps with a combined capacity of 32 cfs. The left pumping plant would have six pumps with a combined capacity of 118 cfs (total project capacity would be 150 cfs). The

motors and electrical equipment for both facilities would be located above the 100-year flood elevation.

The right intake structure would be located downstream of the north fish ladder and the left intake structure would be located downstream of the south fish ladder. Vertical turbine pumping units would operate in a wet sump with noise abatement berms to reduce the overall noise level in the immediate vicinity.

Power for the pumps would be supplied by an existing 12.8-kV powerline located next to State Highway 99 on the left side of the river. A pad-mounted transformer would provide the needed voltage adjustment for the pump motors. A transmission line would be constructed across the river to supply power to the right pumping plant.

All existing structures would be demolished and removed from the site, including the dam, pumping plant and related facilities, hoist house and cable works, north and south fish ladders, and a portion of the Gravity Canal.

2.3 Alternative B – 2005 Preferred Alternative

Alternative B was selected as the 2005 Preferred Alternative primarily because of the cost savings of constructing and maintaining only one pumping plant. Alternative B consists of a single pumping plant with a pipeline across the river and partial dam removal. The structures on the right side (turbine and pump structures, intake, and north fish ladder) and on the left side (Gravity Canal channel, headworks, and south fish ladder) of the dam would be retained along with a portion of the left side of the dam. The portion of the dam between the existing pumping plant and the radial gates would be removed down to the level of the existing apron (bays 1 through 9).

This alternative consists of constructing a single pumping plant and intake/fish screen structure housing 12 pumps on the left side of the Rogue River immediately downstream of the left abutment of the existing dam. This plant would pump 59 cfs to the Highline Canal/Savage Lateral System, 59 cfs to the Gravity Canal System, and 32 cfs to the Tokay Canal/Evans Creek Lateral System (total of 150 cfs). The intake/fish screen structure would be designed to be inundated during flood events, while the pumping plant and associated features would be designed to be above the 100-year flood level. Refer to Figure 2-1 and 2.2 at the end of this chapter for a site plan and a cross section through the pumping plant and intake structure. Table 2-3 shows Alternative B pumping plant data.

The pumping plant uses vertical turbine pumping units that operate out of sumps. This arrangement places the pump below the water surface, substantially reducing the noise generated by the pump, while the motor is placed above the 100-year flood level in a building that attenuates the noise generated by the motor.

The exact location of the intake will require additional consideration during final design. The primary concerns during this phase of planning are assuring adequate flows past the intake structure; protecting the intake structure from the large volume of sediments that will be released following dam removal; and protecting the structure from large debris during peak runoff and flood events.

The intake and fish screen structure are sized to meet the maximum capacities required for the pumping plant and the fish screening criteria developed by NOAA Fisheries and the Oregon Department of Fish and Wildlife (ODFW). The fish screen approach velocity used in the sizing of the fish screens will not exceed 0.4 feet per second (fps) and the sweeping velocity will be greater than 0.8 fps. The intake is designed to be inundated during floods.

Table 2-3. Alternative B Pumping Plant Data

Item	Left Pumping Plant		
	Tokay Canal/Evans Creek Lateral	Highline Canal/ Savage Lateral	Gravity Canal
Number of pumps	4 – (2 small pumps and 2 large pumps)	4 – (2 small pumps and 2 large pumps)	4 – (2 small pumps and 2 large pumps)
Pumping Capacity (cfs)	32	59	59
Small Pumps			
Flow (cfs)	5.33	9.83	9.83
Flow (gallons per minute)	2,394	4,414	4,414
Total dynamic head (feet)	187	121	29
Motor size (horsepower)	175	200	50
Large Pumps			
Flow (cfs)	10.67	19.67	19.67
Flow (gallons per minute)	4,788	8,827	8,827
Total dynamic head (feet)	187	121	29
Motor size (horsepower)	350	400	100

Power for the pumping plant would be provided from an existing 69 kV transmission line located next to State Highway 99 on the left (south) side of the Rogue River. A new 69 kV substation will be constructed in the existing parking lot on the left side of the river.

The discharge pipelines from the new pumping plant would follow the general alignment of the existing pipelines. The pipeline supplying water to the Tokay Canal/Evans Creek Lateral system will cross the river via a pre-engineered pipe support bridge. Once across the river the

new pipeline would convey water from the right abutment of the existing dam to Interstate 5 where it connects to the existing pipe buried beneath the interstate. From the freeway, the new pipeline follows the alignment of the existing pipeline and conveys water from Interstate Highway 5 to the Tokay Canal/Evans Creek Lateral headworks. The two new left pipelines would convey water to the headworks for the Gravity Canal and the Highline Canal/Savage Lateral. The diameters and lengths of the pipelines are summarized in Table 2-4.

Table 2-4. Alternative B Left Pipeline Dimensions

Location	Diameter (Inches)	Length (Feet)
Plant to Tokay Canal/Evans Creek Lateral System	30	2,225
Plant to Highline Canal/ Savage Lateral System	42	605
Plant to Gravity Canal	42	60

2.4 Alternatives Eliminated from Further Study

Two other alternatives discussed early in the evaluation process were eliminated from further study.

One alternative was the construction of a single pumping facility housing 9 pumps on the right bank immediately upstream of the existing dam. Two pipelines supported by a pre-engineered bridge, would cross the river to serve the Highline Canal/Savage Lateral and Gravity Canal systems. The pumps would be vertical turbines pumping out of a wet sump. A single pumping plant and intake/fish screen structure would be constructed on the right side of the river immediately upstream of the right abutment of the existing dam.

Disadvantages of this alternative that resulted in its elimination from further study are as follows:

- Requires channel to be excavated through reservoir sediments from the left river channel to the intake until the dam has been breached
- Initially relies on the existing sluiceways beneath the right abutment to get water to flow past the fish screens which have become plugged, requiring added cost to unplug them plus the risk of loss of service while the cleaning is occurring.
- Access on the right side of the river is complicated by the need for a right-of-way across a railroad line and past several homes.

The other alternative was a modified version of the 1995 PR/FES Preferred Alternative consisting of constructing two pumping plants on the right and left sides of the river, combined with partial dam removal. Three new pumps would be constructed and installed in the right abutment structure of the existing dam to serve the Tokay Canal/Evans Creek Lateral. The left plant would have 6 new pumps installed downstream of the left abutment of the existing dam adjacent to the south fish ladder. Partial dam removal would retain the turbine and pump structures, intake, and north fish ladder on the right side; the Gravity Canal channel, headworks, and south fish ladder on the left side of the dam.

Disadvantages of this alternative that resulted in its elimination from further study include:

- Operation and maintenance on two pumping plants on opposite sides of the river will increase costs
- Use of the existing right abutment structure presents uncertainties that may extend construction time past the irrigation season adding potentially significant pump rental and power costs

Figure 2-1. Site plan of 2005 Preferred Alternative

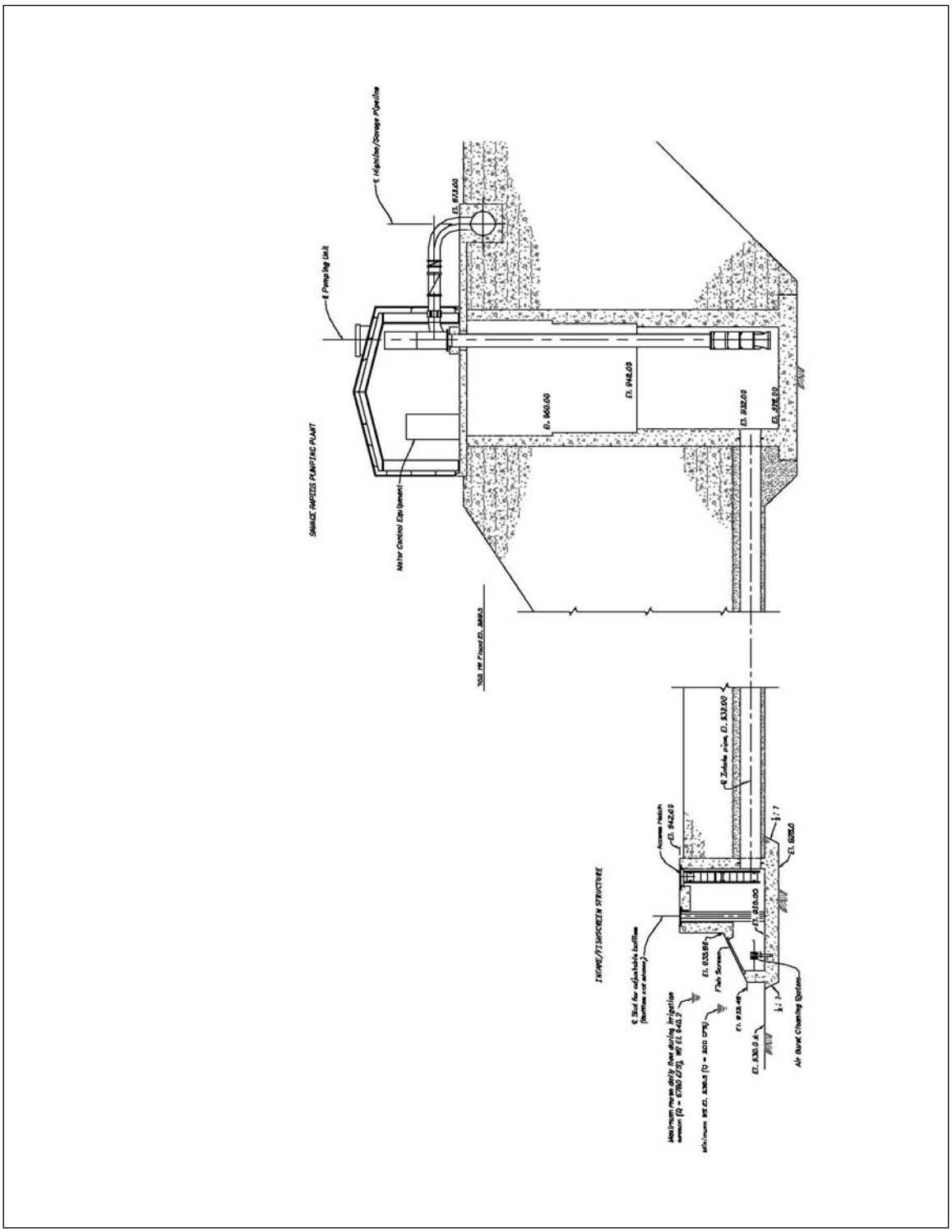

Figure 2-2. Cross section through pumping plant & intake structure of 2005 Preferred Alternative

Chapter 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

The discussions of the affected environment and environmental impacts presented in the 1995 PR/FES are incorporated by reference in this chapter. This chapter presents additional information about the existing conditions that has become available since publication of the 1995 document. To aid in understanding the comparison of the 1995 Preferred Alternative with the 2005 Preferred Alternative, a brief summary of the major points from the 1995 PR/FES is included for each resource. In addition, if new information on existing conditions result in new or different impacts under Alternative A than were previously discussed, they are also identified.

The purpose of this chapter is to compare the impacts of the 1995 PR/FES Preferred Alternative (Alternative A) to the 2005 Preferred Alternative (Alternative B) and determine if additional significant impacts occur. Additional analysis of the No Action Alternative will not be done in this EA.

3.2 Water Quality

3.2.1 Affected Environment

Water Use

The Rogue River is the principal source for municipal, industrial, and irrigation water and for water-based recreation in the Grants Pass area. The major water user in the area is GPID which has rights to divert about 149 cfs for irrigation and an instream nonconsumptive water right of 800 cfs for operating the hydraulic turbines at Savage Rapids Dam. Future out-of-stream diversion at Savage Rapids Dam by GPID are expected to range from 117 to 145 cfs as GPID implements its conservation plan. The cities of Grants Pass and Rogue River divert water for municipal and industrial purposes.

Groundwater

The Oregon Groundwater Quality Protection Act of 1989 has instituted well monitoring and groundwater quality assessments (ODEQ 2003). Thirty wells were sampled in Jackson County resulting in a groundwater quality rating of 1 (<10 percent of the wells had a contaminant level over the drinking water standard). Nineteen wells were sampled in the North Bear Creek Valley (tributary of the Rogue) resulting in a groundwater quality rating of 3 [10 to 25 percent of wells had a contaminant level over the drinking water standard – in this case nitrates, pesticides, and volatile organic compounds (VOC)]. Overall, most of the concern lies with impacts to groundwater quality resulting from increased urbanization, agricultural, and industrial growth in the Medford and Grants Pass areas. Little concern has been expressed about the quantity of groundwater available for consumption.

Site specific information from the 1995 PR/FES indicates that the reservoir behind Savage Rapids Dam does not significantly affect ground-water levels except in close vicinity of the reservoir. Under current operations the surface of the reservoir is lowered at the time that ground-water levels could be expected to be near their lowest.

Water Quality

One of the major concerns about removing Savage Rapids Dam is the effect on water quality in the Rogue River when dam removal releases large quantities of sediment stored behind the dam. The first sampling and testing of sediment behind the dam was conducted by McLaren and Hart in 1998 and was funded by Sportfish Heritage. McLaren and Hart tested sediments collected from the exposed area on the margins of Savage Rapids Reservoir for the presence of toxic metals and VOC. The Environmental Protection Agency (EPA) reviewed the McLaren and Hart report and concluded the data indicated that release of the sediments would present minimal ecological risk from VOC or heavy metals contamination.

An evaluation of the proximity of Savage Rapids Dam to known sources of contamination indicated that a substantial amount of mining was done upstream from the dam during the early 1900s. Since the McLaren and Hart report focused only on sediments along the margins of the reservoir, the chemical composition of the sediments from the deeper parts of the reservoir was unknown. The potential for water quality impacts due to dam removal prompted Reclamation (USBR 2001) to conduct the Savage Rapids Dam Sediment Evaluation Study (*Sediment Evaluation Study*). Testing of reservoir sediments for chemicals-of-concern related to mining indicated no contaminants with concentrations significantly higher than naturally occurring background levels. The chemical composition of reservoir sediment would not pose any hazard to water quality, fish and wildlife, or human uses if released downstream.

The *Sediment Evaluation Study* also included a bathymetric survey of the reservoir as well as the river downstream of the dam; along with the use of a river hydraulics model, HEC-RAS, and a sediment transport model, HEC-6t. Reclamation also developed a 2-dimensional model (2D Study) to predict after-dam removal water surface elevation, inundation area, water depth, channel location, and velocity of discharges (USBR 2003).

Savage Rapids Dam creates a backwater pool that extends ½-mile upstream during the non-irrigation season (November through April) and 2-½ miles upstream during the irrigation season (May through October). The *Sediment Evaluation Study* and the 2D Study indicate that the volume of deposited reservoir sediment upstream of the dam is approximately 200,000 cubic yards (not 516,000 as estimated in 1995), located in the ½-mile reach just upstream from the dam. This represents approximately 2 to 2-½ years of the average annual sediment load transported by the Rogue River at nearby Grants Pass. The reservoir sediment is substantially the same as the substrate along the river channel bed downstream from the dam. The reservoir sediment is composed of 2 percent fines (silt and clay-sized particles), 71 percent sand, and 27 percent gravel overall. Cobbles from 3 to 5 inches in diameter compose up to 20 percent of the deposit found on the right (north) shore of the reservoir. A finer-grained bar deposit is present on the left (south) side of the reservoir, but is less than 10 percent of the total sediment volume. A majority of the reservoir sediment is trapped in the right side of the reservoir. The left side is partially flushed using the existing radial gates during reservoir drawdown at the beginning and end of each irrigation season.

Since the publication of the 1995 PR/FES, information about water quality in the Rogue River and its tributaries has increased dramatically. The Oregon Department of Environmental Quality (ODEQ) is required by the Federal Clean Water Act (CWA) to maintain a list of stream segments that do not meet water quality standards, referred to as the 303(d) list. ODEQ's 2002 303(d) list was approved on March 24, 2003 by the EPA. (http://www.deq.state.or.us/wq/303dlist/303dpage.htm). Table 3-1 summarizes sections of the Rogue River from the 303(d) list that do not meet water quality standards by river mile, parameter, and season. Table 3-2 summarizes the number of tributaries and the corresponding parameter.

ODEQ has targeted 2005 to develop Total Maximum Daily Loads (TMDLs) for streams on the 303(d) list for the Upper, Middle, and Lower Rogue River subbasins (ODEQ 2004). TMDLs describe the amount of each pollutant a water body can receive and still not violate water quality standards. Establishing TMDLs for a stream is the first step in the process for developing a plan to improve water quality.

Table 3-1. 303(d) List Sections of the Rogue River

River Mile	Parameter	Season
0 – 27.2	Temperature	Summer
68.3 – 94.9	Fecal coliform pH Temperature	Summer Winter/Spring/Fall Summer
94.9 – 110.7*	Fecal coliform Temperature	Summer Summer
110.7 – 132.2	Fecal coliform	Winter/Spring/Fall
*Savage Rapids Dam is located at RM 107		

Table 3-2. Rogue River Tributaries on 303(d) List

Subbasin	Number of Streams on 303(d) List	Parameter
Lower Rogue	19	Temperature
Middle Rogue	12 25 6 2 1	Fecal coliform Temperature Dissolved oxygen pH Sedimentation
Upper Rogue	17 8 5 1 1	E. coli Dissolved oxygen Sedimentation Chlorophyll A pH

Section 305(b) of the Federal CWA requires each state to prepare a water quality assessment report every 2 years. ODEQ summarized data from first, second, and third order streams, which make up the vast majority of stream miles in a given region. First through third order streams are critically important in determining the condition of larger streams and rivers, especially from the effects of land use activities. ODEQ found that the Rogue River basin

showed relatively unimpaired biotic conditions compared to other basins in western Oregon, with 23 percent of the macroinvertebrate community and 10 percent of the vertebrate community in poor condition. Water quality was the most significant stressor (36 percent in poor or fair condition) along with fine sediment (27 percent in fair or poor condition). Excessive fine sediment in streams affects spawning and survival of many stream organisms. Fine sediment in this case is defined as particles with a diameter of 2 mm or less.

Overall, since 1995, more information from monitoring programs has become available about water quality in the Rogue River basin. This additional data indicates that the water quality has been degraded from historic conditions. The Conservation Biology Institute (2003) has 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 that the most heavily populated watersheds along the I-5 corridor and the mainstem of the Rogue River between Grants Pass and Medford appear to be only moderately impacted by water quality degradation.

3.2.2 Environmental Consequences

Alternative A – 1995 PR/FES Preferred Alternative

The following discussion is summarized from the 1995 PR/FES.

Water Use

The current instream right to power the hydraulic turbines would be forfeited as pumping power would be provided by electric pumps. Other water rights would be unaffected.

Groundwater

Elimination of the reservoir would not have a significant effect on ground-water levels. Shallow wells near the reservoir edge that pump directly from the river, would be affected over the entire year to much the same extent as they are now affected for 7 months when the reservoir is lowered.

Water Quality

Water quality would be reduced slightly during construction due to increased turbidity. Contractors will be required to comply with various State, local, and Federal permit processes, which would provide adequate mitigation of normal construction impacts. Increased turbidity would continue at intervals during flood periods until the accumulated sediments behind Savage Rapids Dam are moved downstream. Nearly all of the accumulated sediment (estimated in 1995 to be about 516,000 cubic yards; currently estimated to be 200,000 cubic yards) would be transported downstream. Finer silt and clay would remain in

suspension in the lower river until reaching the ocean; however, because of the large volume of water, this would not significantly increase turbidity. Sand-sized particles would move more slowly, partially filling the pools as well as the interstitial spaces among gravel and cobbles in lower velocity areas. Virtually all sediment would be transported out of the existing reservoir area within 5 to 10 years during flood events. The increased turbidity that would occur during these events would be insignificant compared to the amount of turbidity already in the river.

Alternative B – 2005 Preferred Alternative

Water Use

Same as Alternative A.

Groundwater

Same as Alternative A.

Water Quality

The environmental impacts to water quality are described below.

Dam Removal Impacts

The narrow reservoir backed up by Savage Rapids Dam is only two to three times wider than the natural river channel in this reach. Before the dam was constructed, the river channel passed through the right side of the existing reservoir in the vicinity of the dam. Once the dam is removed, the river will follow in the approximate location as the original channel. Nearly all of the sediments trapped behind the dam will be eroded. After removal of the right side of the dam and the formation of the initial flushing channel, a large portion of the reservoir sediment would be quickly eroded (depending upon flow in the river). This flushing occurs because, as the dam is removed, the river would seek a lower base level and begin incising through the deposits behind the dam. The remaining reservoir sediment would be eroded by the river during higher winter flows. As the reservoir sediment is transported downstream, sediment deposition would occur in pools and eddies downstream of the dam during low-flow periods as it does now.

Seventy-one percent of the reservoir sediment is sand, and 27 percent is gravel; the remainder is fines with some scattered cobbles. Gravel-sized sediment is transported along the river bed as bed load. Sand-sized sediment can be transported either as bed load or in suspension (suspended load). If the dam is removed during a low flow period, the majority of sand will likely be transported as bed load; however, during higher flows a portion of the sand could be suspended into the water column, particularly in high gradient reaches. Gravel and sand-sized

sediment that is transported through the reservoir is predicted to deposit in downstream pools during low-flow periods, and be subsequently eroded and transported further downstream during floods. The amount of deposition in downstream river pools would vary by location and time depending on the frequency and magnitude of floods.

Maximum deposition is estimated to range from 1 to 8 feet in river pools (water surface elevation would not be affected). These sediments would be scoured out and transported downstream during high-flow periods. Sediment concentrations would initially be high, but of short duration. Concentrations would also increase during high flows, but the levels would decrease with each subsequent high flow. The sediment would be transported past the Applegate River confluence within a 1 to 10-year period, depending on the frequency and magnitude of high flow events following dam removal. Eventually the majority of reservoir sediment would be eroded and reach the ocean.

Short-term Construction-related Impacts

Cofferdams will be constructed to isolate the river from construction areas for the pumping plant, intake, and dam removal, preventing the contamination of the river from concrete, silt, welding slag, sandblasting abrasive, or other contaminants. Contaminated water behind cofferdams would be pumped from cofferdams and treated to avoid pollutants from entering the waterway. A short-duration increase in sedimentation may result during the installation of the cofferdams as sheet piles are driven into the substrate. Conversely, some short-term increases in turbidity will also occur as sheet piles are pulled when cofferdams are no longer needed. Overall however, the cofferdams will serve to protect water quality by isolating activities from the river.

In conclusion, the *Sediment Evaluation Study* estimated 200,000 cubic yards of sediment to be stored behind the dam, which is much smaller than the original estimate of 516,000 cubic yards of sediment in the 1995 PR/FES. Therefore, overall impacts will be smaller than that predicted for the 1995 Preferred Alternative (Alternative A). Short-term increases in sedimentation will occur during the initial dam removal phase, and increased sedimentation will occur during high water flows. Because the sediments stored behind the dam are essentially the same as sediments existing in the river channel below the dam, and are not contaminated by mine wastes or pesticides, there will be no further degradation of the mainstem Rogue River reaches currently appearing on the 303(d) list. The overall water quality assessment (Section 305 B requirements) of the Rogue River basin will not be affected by removal of the Savage Rapids Dam. The most significant sources of water quality impairment will continue to stem from increased urbanization, agricultural, and industrial activities.

Grants Pass City Water Treatment Plant Intake

Sand deposition at the water treatment plant intake would increase the cost of water treatment. Based on recent river survey data, there are approximately 8 pools between Savage Rapids

Dam and the City of Grants Pass intake that have depths greater than 10 feet during low flow periods (900 cfs). If the dam is removed in the fall during a low flow period, it is expected that the majority of sand and gravel-sized sediment would deposit in eddies along the channel margins and these deep pools just downstream from the dam until the next high flow. During subsequent high flows, the sediment would be remobilized downstream and may cause higher suspended sediment concentrations than normal. However, any increase in suspended sediment concentration during high flows past the City's intake will lessen the impact because the treatment plant is operated at a slower pumping rate and for fewer hours per day. Velocity measurements of the river obtained in April 2002 (2,800 cfs), indicate that velocities are highest on the right side of the river at the intake location, and any sediment deposition would be most likely to occur on the left side away from the intake structure. Some sediment deposition in small, isolated eddies along the right bank is possible. The City of Grants Pass has requested that Reclamation inform them of the reservoir drawdown and dam removal schedules so that they can adjust intake operations. Reclamation will continue to coordinate with the City and its consultant who is doing the design work to modify the intake.

Mitigation

No long-term adverse impacts to water quality will occur. However, there will be short-term adverse impacts. Reclamation would use best management practices (BMP) (as outlined in Appendix A – Proposed Mitigation Measures) to minimize environmental consequences caused by construction activities. All standard and reasonable precautions would be taken to reduce erosion and limit sedimentation during and after construction. As much as possible construction will be done within the In-water Work Period (June 15 through August 31).

3.3 Wild and Scenic Rivers

3.3.1 Affected Environment

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. Since publication of the 1995 PR/FEIS, there has been no change in the wild and scenic river status of the Rogue River. However, because the Federal wild and scenic section of the Rogue River is downstream of the Savage Rapids Dam (RM 107), there is continuing concern about the potential effects of dam removal on the water quality of this section of the Rogue River.

3.3.2 Environmental Consequences

Alternative A – 1995 PR/FES Preferred Alternative

Temporary but insignificant increases in turbidity could be expected during dam removal as summarized under Section 3.2.2 - Water Quality Environmental Consequences. Sediment would be transported downstream during high flow and flood periods over a period of time from 1 to 10 years, depending on the frequency and magnitude of those high flow events. Turbidity during these high flows due to project construction activities would be insignificant compared with the turbidity already existing in the river during these events.

Alternative B – 2005 Preferred Alternative

The *Sediment Evaluation Study* conducted in 2001 resulted in reducing the estimated size of the sediments accumulated behind the Savage Rapids Dam from 516,000 cubic yards to 200,000 yards. When compared against the 1995 Preferred Alternative, the amount of sediment being transported down the river following dam removal will be reduced by nearly 40 percent; therefore, there would be less downstream effects than indicated in the 1995 PR/FES. Additionally, that study also found that the sediments stored behind the dam were the same as sediments found in the river channel downstream of the dam, composed mostly of sand, gravel, and cobble. Testing found no contamination of the sediments from mining or agricultural activities.

Mitigation

No adverse impacts have been identified; therefore, no mitigation is needed.

3.4 Land Use

3.4.1 Affected Environment

Since the publication of the 1995 PR/FES, there has been no change in, nor additional information available for the affected environment discussion.

3.4.2 Environmental Consequences

Alternative A – 1995 PR/FES Preferred Alternative

The impacts of this alternative would be the same as that previously discussed in the 1995 PR/FES.

Alternative B – 2005 Preferred Alternative

The impacts of this alternative would be the same as that previously described under Alternative A – 1995 PR/FES Preferred Alternative.

Mitigation

No adverse impacts have been identified; therefore, no mitigation is needed.

3.5 Fish

3.5.1 Anadromous Fish

The most significant change since publication of the 1995 PR/FES is the listing of coho salmon as threatened. Critical habitat for the coho was designated in 1999. The discussion of this species and its critical habitat is in Section 3.8 – Endangered Species Act Threatened and Endangered Species. Additionally, Essential Fish Habitat (EFH) was designated in the Rogue River for coho and Chinook salmon pursuant to the passage of the Magnuson-Stevens Fishery Conservation and Management Act of 1996. Environmental consequences to EFH are discussed in this section and environmental consequences to SONCC coho critical habitat are discussed in Section 3.8 – Endangered Species Act Threatened and Endangered Species. Implementation of the Oregon Plan for Salmon and Watersheds (Jacobs et al. 2002) has increased monitoring of salmon and their habitats in the Rogue River as well as other Oregon coastal salmon stocks. Fish counts at Gold Ray Dam located 23 miles upstream of Savage Rapids Dam provide good estimates of Savage Rapids Dam passage numbers for spring Chinook and coho, and a good indicator of fall Chinook and steelhead passage numbers. Run timing has been refined based on the additional data acquired since 1995. Recent status reviews of salmon stocks have resulted in classifying the fall and spring Chinook present in the Rogue River as part of the SONCC Chinook Evolutionary Significant Unit (ESU).

Affected Environment

Steelhead (Oncorhynchus mykiss)

For the 10-year period from 1995 to 2004, counts of adult winter and summer steelhead at Gold Ray Dam ranged from 11,081 in 1995 to 51,583 in 2002. The 10-year average is 26,334. The 10-year average passage figure used in the 1995 PR/FES for steelhead was 61,300. Winter steelhead adults pass Gold Ray Dam from early January through mid-May with the peak occurring in late March. Summer steelhead pass Gold Ray Dam from early June through mid-December, with the peak occurring in mid-July and again in late October. The 1995 PR/FES indicated that summer steelhead passage occurred from January 1st through

mid-May with the peak occurring from mid-March through mid-May. Summer steelhead passage began in mid-May continuing through December with the peak occurring from mid-September through December. Additional discussion of the coastal rainbow/steelhead occurs in the Section 3.5.2 – Resident Fish.

An anadromous form of the coastal cutthroat trout occurs in the Rogue River with adult migration occurring summer and fall. Additional discussion of the coastal cutthroat trout occurs in Section 3.5.2 – Resident Fish.

Spring Chinook (Oncorhynchus tshawytscha)

For the 10-year period from 1995 to 2004, counts of adult spring Chinook at Gold Ray Dam have ranged from 15,957 in 1998, to 81,957 in 1995. The 10-year average is 38,971. The 10-year average passage figure used in the 1995 PR/FES for spring Chinook was 43,584. Adults pass Gold Ray Dam from mid-April through mid-August with peak passage occurring from mid- to late-May. The 1995 PR/FES indicated that spring Chinook passage occurred from April 1st through mid-August with peak passage occurring from mid-June through mid-August.

The spring Chinook is included in the SONCC Chinook ESU. This ESU was proposed for listing in 1998 (Federal Register 1998); however, listing was found not to be warranted. The bulk of Chinook production occurs in the Rogue River basin. While long-term trends in this ESU are mixed, fall Chinook trends are positive. However, concerns remain over small spring Chinook populations and negative trends for spring Chinook in the Rogue River (NOAA Fisheries 1999).

Fall Chinook (Oncorhynchus tshawytscha)

For the 10-year period from 1995 to 2004, counts of fall Chinook at Gold Ray Dam ranged from 3,540 in 1999 to 24,857 in 2003. The 10-year average is 12,267. The 10-year average passage figure used in the 1995 PR/FES for fall Chinook was 7,532. Fall Chinook adults pass Gold Ray Dam from mid-August through late November, the same as indicated in the 1995 PR/FES. Fall Chinook are included in the SONCC Chinook ESU (NOAA Fisheries 1999).

Essential Fish Habitat for the Southern Oregon/Northern California Chinook ESU and the Southern Oregon/Northern California Coast Coho ESU

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) mandates Federal action agencies which fund, permit, or carry out activities that may adversely impact the essential fish habitat (EFH) of federally-managed fish species to consult with the National Marine Fisheries Service (NMFS currently NOAA Fisheries) about the potential adverse effects of their actions on EFH (Section 305(b)(2)).

The geographic extent of freshwater EFH for the Pacific salmon fishery is defined as the waters currently or historically accessible to salmon within specific U.S. Geological Survey hydrologic units (PFMC 1999). The Pacific Fisheries Management Council (PFMC 1999), under Appendix A of Amendment 14 to the Pacific Coast Salmon Plan on fishery management, identified and described EFH for the SONCC Chinook salmon (which includes both fall and spring Chinook) as well as the SONCC coho in the Middle Rogue River Hydrologic Unit. This hydrologic unit encompasses the mainstem Rogue River through the action area. The mainstem Rogue River in the Middle Rogue River Hydrologic Unit in the action area provides spawning and rearing habitat for fall Chinook; migratory habitat for spring Chinook and migratory habitat for SONCC coho (ODFW 2004b).

EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. For the purposes of interpreting the definition of EFH, "waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means habitat required to support a sustainable fishery and a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle.

EFH for SONCC Chinook and SONCC coho consists of four major components: (1) spawning and incubation; (2) juvenile rearing; (3) juvenile migration corridors; and (4) adult migration corridors and adult holding habitat. Important features of EFH for spawning, rearing, and migration include adequate (1) substrate composition; (2) water quality (e.g., dissolved oxygen, nutrients, and temperature); (3) water quantity, depth, and velocity; (4) channel gradient and stability; (5) food; (6) cover and habitat complexity (e.g., large woody debris, pools, channel complexity, aquatic vegetation); (7) space; (8) access and passage; and (9) flood plain and habitat connectivity (PFMC 1999).

Environmental Consequences

Alternative A – 1995 PR/FES Preferred Alternative

The following discussion is summarized from the 1995 PR/FES. This alternative would improve habitat in the 3.5-mile reach upstream of the dam, changing it from a seasonal impoundment to a riverine environment. Restoration of this reach would provide additional habitat for fall Chinook spawning. Release of accumulated sediment from the reservoir would not have a significant effect on water quality or fish.

Fish passage problems at Savage Rapids Dam would be eliminated resulting in an increase in the escapement of salmon and steelhead at this site of about 22 percent.

Alternative B – 2005 Preferred Alternative

Short-term Construction-related Impacts.

Additional design work since the publication of the 1995 PR/FES provides details on the construction of the pumping plant and associated intake structure and dam removal for the 2005 Preferred Alternative. This information is useful in considering short-term construction-related impacts to anadromous fish. Table 3-3 summarizes construction activities, anadromous fish run timing for adults and juveniles and potential short-term effects for the dam removal and pumping plant construction activities at Savage Rapids Dam. While the discussion is more detailed due to more comprehensive information, impacts under both Alternative A and B would be similar.

Fish Passage

Potential delays to upstream adult migration may occur during two periods of time during the construction process. The first occurs during mid-April of 2008 when the radial gates are opened to drain the reservoir to allow construction of cofferdams. The drawdown process will take about 3 days. The reservoir will remain drawn down through April. Fish passage may be impaired during this time as the only avenue of passage is through the radial gates. Flow velocities greater than 10 fps can cause a velocity barrier to migrating adult salmon. Initial modeling indicates that water velocities will be less than 8 fps during river levels likely to occur during this period (<2,000 cfs). A temporary delay may occur if river flows are higher than 2,000 cfs. The reservoir would remain drawn down up to 3 weeks to facilitate cofferdam construction on the right side of the dam. As can be seen from Table 3-3, spring Chinook and winter steelhead adults are in the river in the project area during this time. Some adults may be delayed; however, the peak run timing for spring Chinook occurs from mid- to late-May and for winter steelhead mid- to late-March, thus the bulk of these adult runs will not be affected. The radial gates would be closed during the first week of May, filling the reservoir, and re-establishing fish passage through the south fish ladder.

The second period of potential delay occurs during early September after the right side of the dam has been removed (behind the cofferdams). The reservoir will once again be drawn down through the radial gates to allow removal of the cofferdams. Water velocity through the radial gates during September should not exceed 10 fps as this is usually a low-flow period. A pilot channel will be excavated through the sediments to guide the river to the right side of the channel. A short-term velocity barrier may be created when the river first flows through the new pilot channel. This will subside rapidly as the channel erodes and widens. A temporary delay in upstream migration may occur from 1 to 5 days, depending on river flows. Fall Chinook and summer steelhead adults are in the river during this time of year and may experience temporary delays in migration.

Table 3-3. Construction Schedule, Timing of Anadromous Fish Runs, and Construction Activities That May Affect Anadromous Fish

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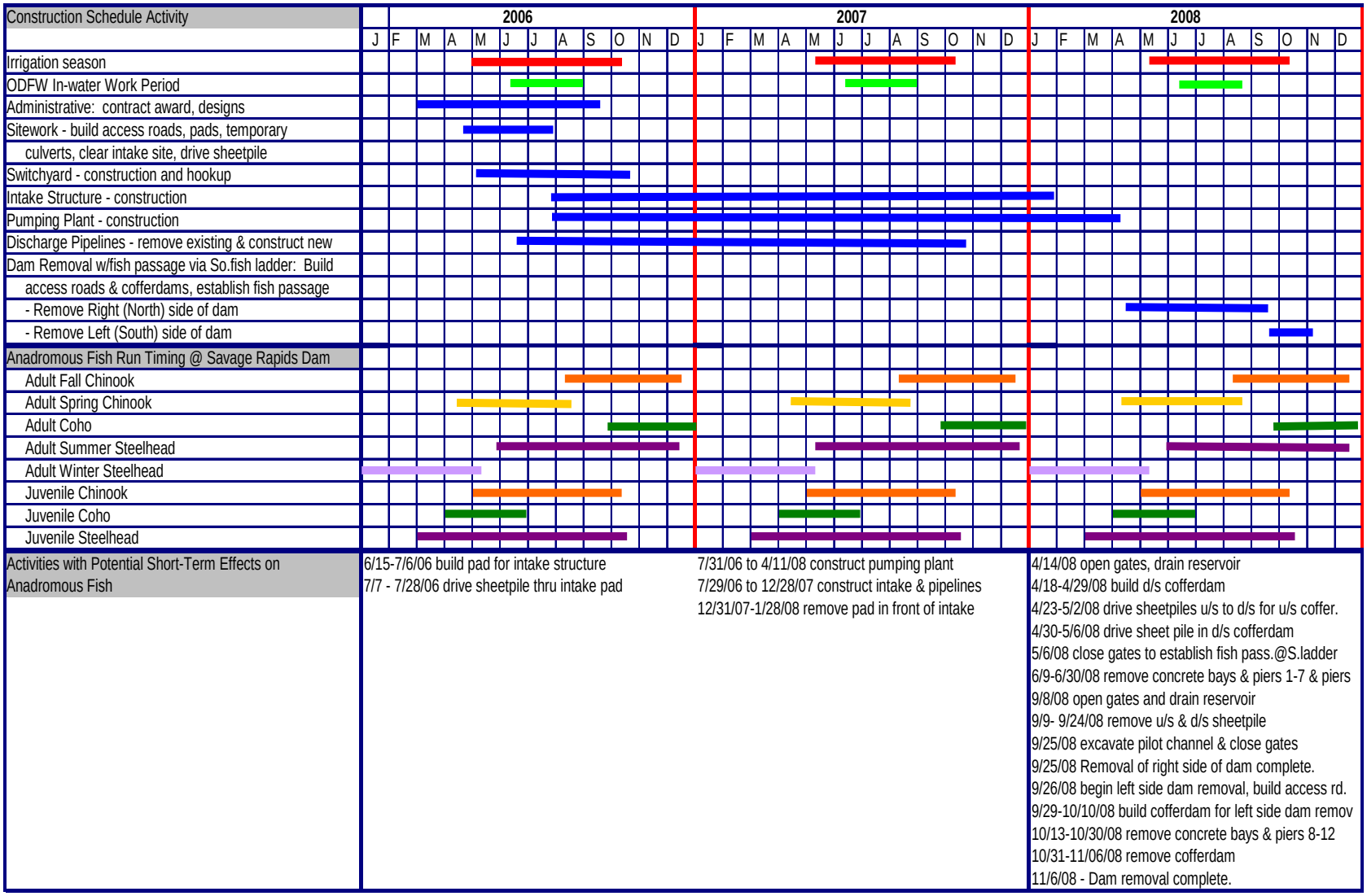

Cofferdams

The purpose of the cofferdams is isolate work areas from the river and prevent contamination from construction-related materials; prevent physical harm to aquatic life; and to allow construction to proceed in the dry. There are, however, three potential impacts that can occur during installation of the cofferdams: (1) entrapment of juvenile outmigrating smolts behind the cofferdam; (2) injury from shock waves generated when driving sheet piles into the river substrate; and (3) turbidity created when either cofferdam material is placed in the river or sheet piles are driven in and subsequently removed after construction is complete.

The first period of time that may potentially affect migrating anadromous fish occurs during July 2006 when the pad for the intake is constructed and sheet piles are driven in. Driving sheet piles into the river substrate can generate intense sound pressure waves that can injure or kill fish. The type of sheet pile material and the method the sheet pile is driven in (impact hammers or vibratory hammers) determine the intensity of sound waves generated. At this point in the design process, the type of sheet pile material and method has yet to be determined. Installing the sheet piles for the intake pad will occur during the In-water Work Period established by the ODFW (2000). These guidelines are based on ODFW district fish biologists' recommendations. For the Rogue River in the project area this period is from June 15 through August 31. This time period was established to avoid the vulnerable life stages, including migration, spawning, and rearing of anadromous fish and other species. Spring Chinook and summer steelhead adults are in the river in the area during this period of time. Chinook and steelhead juveniles are outmigrating during this period of time.

The second period of time that may potentially affect migrating anadromous fish occurs during mid- to late-April 2008 when sheet piles are installed for cofferdams to allow the removal of the right side of the dam. This work would occur outside of the In-water Work Period based on the recommendations of NOAA Fisheries, U.S. Fish and Wildlife Service (USFWS), and ODFW. This exception to the In-water Work Period would allow dam removal to be completed by November of 2008, which would allow fall Chinook adults to migrate upstream unobstructed. It would also result in completing the construction work a year earlier.

One of the major concerns expressed by the fisheries agencies is the potential to entrap outmigrating juvenile salmon and steelhead behind cofferdams that are constructed in the river (all species are in the river in the project area during mid- to late-April). Potential adverse impacts would be offset by the development of a fish salvage plan in close consultation with NOAA Fisheries and ODFW. All juvenile anadromous fish, as well as resident fish, would immediately be captured from behind newly constructed cofferdams and released downstream.

Sheet piles would be removed from the intake pad during January 2008. Sheet piles on cofferdams on the right side of the river would be removed during September 2008 and left side sheet piles would be removed in late October – early November. Both installing and

removing sheet piles would result in temporary turbidity that would be confined to the area close to the operation.

Long-term Impacts.

Removing Savage Rapids Dam permanently eliminates a major source of anadromous fish mortality in the Rogue River by allowing unimpeded movement of anadromous fish both upstream and downstream in the Rogue River. Salmon and steelhead escapement at Savage Rapids Dam is estimated to increase about 22 percent (USBR 1995).

Essential Fish Habitat

Impacts to water quality have been discussed above under Alternative B – 2005 Preferred Alternative. Construction activities are confined to removing the dam and installing intake screens and a pumping plant. Processes that generate large woody debris will not be affected. Channel complexity overall will not be affected except that a free flowing channel will be restored through the dam. Riverine habitat will be restored in the 2-½ miles of reservoir habitat backed up seasonally by the dam. Pools immediately below the dam will temporarily be filled with sediments stored behind the dam from 1 to 8 feet deep. Sediments flushed from behind Savage Rapids Dam would be transported downstream. The estimated rate of sediment transport ranged from 1 to 10 years to reach the Applegate River confluence depending on the frequency and magnitude of flood events. It is likely that some temporary adverse effects will occur to fall Chinook spawning habitat during the initial scouring of the sediments upon dam removal. No changes to water quantity will occur as a result of implementing Alternative B as the new pumping plant will deliver the same amount of water to the canals as is currently delivered by the existing diversions and pumps at Savage Rapids Dam.

It is also likely that adverse impacts to fall Chinook spawning habitat will occur immediately downstream from Savage Rapids Dam. Much of the gravel bar that lies immediately downstream from the dam will need to be removed to allow construction of the intake pipes and screens. Fall Chinook have been observed to spawn on this gravel bar (Van Dyke 2005). Essentially a small area of spawning habitat would be exchanged to remove a long-standing passage barrier.

No temporary passage barriers will be created during any of the construction tasks for outmigrating juvenile salmonids. There will be a slight risk of entrapment behind cofferdams. A fish salvage plan approved by NOAA Fisheries and ODFW will be implemented to salvage all fish. A temporary upstream passage delay of up to 3 weeks may occur during April 2008 when the reservoir is drawn down to install cofferdams on the right side of the river. Another temporary upstream passage delay may occur during September 2008 when the reservoir is drawn down to remove the cofferdams. However, the long-term benefit is the permanent removal of a significant passage barrier.

Mitigation

Reclamation would use BMPs (as outlined in Appendix A – Proposed Mitigation Measures) to minimize environmental consequences caused by dam removal and construction of the pumping facility and intake screens, as well as the construction of access roads and staging areas. All standard and reasonable precautions would be taken to reduce erosion and limit sedimentation during and after construction. As much as possible construction would take place during the In-water Work Period (June 15 through August 31). However, cofferdam installation on the right side of the dam would be done in April at the fisheries agencies request to minimize impacts to anadromous fish. NOAA Fisheries, USFWS, and ODFW recommended that construction start in April, outside of the In-water Work Period. This exception to the In-water Work Period would allow dam removal to be completed by November 2008, thereby allowing fall Chinook adults to migrate upstream unobstructed. Moving the construction schedule up to April also allows the project to be completed in 2008 rather than extending it to 2009, thereby reducing adverse impacts.

A fish salvage plan would be implemented to remove all fish inadvertently entrapped behind cofferdams as specified in the CAR (USFWS 2005).

3.5.2 Resident Fish

Affected Environment

Additional information on resident species from that presented in the 1995 PR/FES is provided to assist in understanding the effects of the alternatives.

Coastal Rainbow/Steelhead (*Oncorhynchus mykiss irideus*)

The coastal rainbow/steelhead subspecies found in the Rogue River has both a resident form (rainbow trout) and anadromous form (steelhead). This genetically complex subspecies has at least 15 different life history traits (ODFW 1995). This subspecies is divided into genetic groups: the South Coast/Lower Rogue Group which consists of winter steelhead and rainbow trout, and an upper Rogue River Group which has winter and summer steelhead and rainbow trout. In both groups, resident rainbows are found only in the tributaries and not in the mainstem Rogue River. The upper Rogue River group has unique genetic traits including a non-spawning run referred to as the half-pounder run. This trait is also present in the Klamath River, but is absent in the lower Rogue and Illinois rivers and other Oregon coastal streams. Lost Creek Dam created a naturally impassable barrier on the upper mainstem Rogue and steelhead populations were eliminated above the dam, but rainbow populations persist. Hatchery rainbow trout have been released in the mainstem Rogue River below Lost Creek Dam, but the effect to the native subspecies is unknown.

Coastal Cutthroat Trout (*Oncorhynchus clarki clarki*)

The coastal cutthroat trout exist in the Rogue River in both the resident and anadromous forms. An anadromous run exists in the Rogue River between the Illinois River to Gold Ray Dam with adult migration occurring summer and fall. There is also a fluvial population which are fish that migrate between small spawning tributaries and main river sections downstream (ODFW 1995). The resident form of cutthroat appears to be relatively abundant even in streams where the abundance of the anadromous form has sharply declined. This indicates that habitat problems are occurring along migration corridors, in estuaries, or in near-shore marine environments. The State of Oregon has placed this subspecies on the Oregon Sensitive Species List in the "vulnerable" category. NOAA Fisheries (Johnson et al. 1999) conducted a status review of the coastal cutthroat trout and determined that the fish present in the Rogue River were part of the SONCC ESU. The review concluded that this ESU is not presently in danger of extinction; however, severe habitat degradation has occurred due to agriculture, flood control, logging, and road construction. Large water withdrawals have reduced the quantity and quality of the remaining riverine and estuarine environments. The coastal cutthroat trout was proposed for listing in 1999, but this proposal was overturned in 2002.

White sturgeon (*Acipenser transmontanus*)

White sturgeon breed in the Rogue River and are present in the mainstem up to Savage Rapids Dam. Sport catch numbers from the Rogue River indicate that white sturgeon population appear to be stable with evidence of recruitment.[1] In other river systems such as the Columbia and Snake, dams have adversely impacted white sturgeon populations by fragmenting and isolating populations. Reproductive success is low in many populations and past overharvest has reduced populations to low levels. The effect of Rogue River dams on white sturgeon is unknown, but it is likely that adverse impacts have occurred as seen in other river systems.

Green sturgeon (*Acipenser medirosris*)

Green sturgeon that are found in Oregon only reproduce in the Rogue River. The size of the Rogue population is unknown, but probably varies with movement of fish in and out of the system. Green sturgeon populations are considered to be doing well in Oregon (ODFW 1995).

[1] The amount of fish added to a stock each year through reproduction, growth, and migration into the fishing area. Can also refer to the number of fish entering the spawning stock, or the number of fish from a year class reaching a certain age (National Fisheries Institute 2005)

Adult Pacific lamprey (*Lampetra tridentata*)

Adult Pacific lamprey migrate up Oregon Coast rivers between April and June, with migrations continuing as long as September. Adults are thought to overwinter and spawn the following year anywhere between February through May. Pacific lamprey populations have declined range-wide (throughout Canada, and the Pacific states). In the Rogue River, counts at Gold Ray Dam have ranged from 155 to 2,370 since 1993, but abundance is believed to be far below historical numbers (Kostow 2002). Poor passage through dams which has limited access to historical spawning locations has contributed to their decline. Lampreys are also vulnerable to habitat losses due to reduced river flows, water diversions, dredge, streambed scouring, channelization, riparian vegetation loss, and the introduction of exotic fish predators such as smallmouth bass. This species is on the Oregon Sensitive Species List under the "vulnerable" category.

Other Native Species

Klamath smallscale sucker (*Catostomus rimiculus*), speckled dace (*Rhinichthys osculus*), three-spine stickleback (*Gasterosteus aculeatus*), reticulate sculpin (*Cottus perplexus*), riffle sculpin (*C. gulosus*), Coast Range sculpin (*C. aleuticus*), and western brook lamprey (*L. richardsoni*) are native fish species present in the Rogue River.

Introduced Species

Largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), green sunfish (*Lepomis cyanellus*), bluegill (*Lepomis macrochirus*) black crappie (*Pomoxis nigromaculatus*), brown bullhead (*Ictalurus nebulosus*), pumpkinseed (*Lepomis gibbosus*), brook trout (*Salvelinus fontinalis*), redside shiner (*Richardsonius balteatus*), and Umpqua pike minnow (*Ptychocheilus umpquae*) have been introduced into the Rogue River either as a direct result of legal stocking, illegal stocking by individuals, or through washouts of stocked ponds and lakes during high flows.

Environmental Consequences

Alternative A – 1995 PR/FES Preferred Alternative

Alternative A would benefit resident fish which could more easily move up and down the river to find a suitable habitat as flow conditions change. No estimate of increased resident fish populations was made.

Alternative B – 2005 Preferred Alternative

Short-term Construction Impacts.

Resident native rainbow trout are present only in tributaries of the Rogue River (ODFW 1995) and therefore, would not be affected by short-term construction impacts.

The anadromous form of coastal cutthroat trout migrates as adults during summer and fall through the Savage Rapids Dam area. Some adults may be delayed during early September after the right side of the dam has been removed. The reservoir will be drawn down through the radial gates to allow removal of the cofferdams which is estimated to take about 2-1/2 weeks. Water velocity through the radial gates during September should not exceed 8 fps as this is usually a low-flow period. Adults may experience a 1 to 5 day delay as a short-term velocity barrier is created when the river initially flows through the pilot channel cut through the sediments to guide the river to the right side of the channel. The coastal cutthroat trout also has resident fluvial populations in the project area which migrate between small spawning tributaries and the main river sections downstream. It is possible that adult resident cutthroats may be delayed during the April 2008 reservoir drawdown. Juvenile outmigrants may be entrained behind the cofferdams when they are constructed in April of 2008. A fish salvage plan will be implemented in which all fish entrained behind the newly constructed cofferdams will be immediately captured and released downstream.

Adult Pacific lamprey migrating through the project area may be delayed temporarily during reservoir drawdown in April 2008. Sediment effects from driving in sheet piles would be temporary and confined to the area immediately around the cofferdams. While some sediment will be scoured out of the pilot channel in September of 2008, the bulk of the sediment will be mobilized during the winter and spring peak flood flows. It is unlikely that spawning gravels in riffles would be adversely affected, nor would the silty pools used by rearing juvenile lampreys (ammocoetes) be adversely affected.

Other native and introduced fish may be present in the project area. The most likely impact would be the potential for entrainment in cofferdams. A fish salvage plan will be implemented in which all fish, both native and introduced, resident and anadromous, would be netted and placed in the river downstream of the cofferdams to prevent mortalities.

Long-term Impacts.

Removal of Savage Rapids Dam eliminates a passage barrier that has been the source of migration delays as well as mortalities for decades to both resident and anadromous fish species. The restoration of an unimpeded migration corridor will benefit resident rainbow trout and cutthroat trout by allowing unobstructed movement between spawning tributaries and the mainstem Rogue River. This will remove a major source of habitat fragmentation and allow the free flow of genes in these populations. The anadromous forms of the rainbow and

cutthroat trout benefit because passage delays and mortalities are eliminated. Pacific lamprey benefit similarly. Passage through dams is recognized as one of the major sources of mortality for lampreys, which will be eliminated with removal of the dam. White sturgeon are presently blocked by Savage Rapids Dam. Removal of the dam will open up additional habitat for this species.

The change from reservoir habitat to riverine habitat will eliminate a slackwater habitat and may result in reducing some populations of introduced species. Native species will benefit by increased riverine habitat. While surveys have not been conducted, it is possible that the silty habitat created by the reservoir provided suitable habitat for lamprey ammocoetes. While this habitat will be converted to riverine habitat, suitable habitat for ammocoetes is not limited in the Rogue River.

Mitigation

Reclamation would use BMPs (as outlined in Appendix A – Proposed Mitigation Measures) to minimize environmental consequences caused by dam removal and construction of the pumping facility and intake screens, as well as the construction of access roads and staging areas. All standard and reasonable precautions would be taken to reduce erosion and limit sedimentation during and after construction. As much as possible construction would take place during the In-water Work Period (June 15 through August 31). However, cofferdam installation on the right (north) side of the dam would be done in April at the fisheries agencies request to minimize impacts to anadromous fish. Moving the construction schedule up to April also allows the project to be completed in 2008 rather than extending it to 2009, thereby reducing adverse impacts.

A fish salvage plan would be implemented to remove all fish inadvertently entrapped behind cofferdams as specified in the CAR (USFWS 2005).

3.6 Wildlife

Affected Environment

No additional information from that contained in the 1995 PR/FES on wildlife will be added in this section.

Environmental Consequences

Alternative A – 1995 PR/FES Preferred Alternative

Construction would disturb wildlife, causing them to temporarily move out of the area. This would be a short-term impact and would not be significant, particularly since the Savage Rapids Dam is located within an urban setting. Some waterfowl species that currently use the seasonal reservoir would be displaced by wildlife associated with riverine conditions. Human activities that my disrupt wildlife would neither increase or decrease because the existing shoreline is highly developed with homes and a park. Changes in wildlife populations would not be significant.

Alternative B – 2005 Preferred Alternative

The impacts of this alternative would be the same as that previously described under Alternative A – 1995 PR/FES Preferred Alternative.

Mitigation

No significant impacts to wildlife have been identified; therefore, no specific mitigation is required other than the use of BMPs as described for water quality and fish.

3.7 Vegetation

3.7.1 Affected Environment

Since the publication of the 1995 PR/FES, there has been no change in, nor additional information available for the affected environment discussion.

3.7.2 Environmental Consequences

Alternative A – 1995 PR/FES Preferred Alternative

The impacts of this alternative would be the same as that previously discussed in the 1995 PR/FES.

Alternative B – 2005 Preferred Alternative

The impacts of this alternative would be the same as that previously described under Alternative A – 1995 PR/FES Preferred Alternative.

Mitigation

No significant impacts to vegetation have been identified; therefore, no specific mitigation is required other than the use of BMPs as described for water quality and fish.

3.8 Endangered Species Act Threatened and Endangered Species

Reclamation requested an updated list in September 2004 from NOAA Fisheries and the USFWS of T&E plant and animal species that could be present in the proposed work area. The USFWS response indicated that the bald eagle (threatened), northern spotted owl (threatened), SONCC coho salmon (threatened – new since 1997), Gentner mission-bells (endangered – new since 1995), and Cook's lomatium (endangered – new since 1995) could be present in the action area. NOAA Fisheries indicated threatened SONCC ESU are present in the river. New candidate species include the Pacific fisher and streaked horned lark. The Pacific western big-eared bat, northwest pond turtle, and northern red-legged frog discussed in the 1995 PR/FES were removed from the candidate species list.

3.8.1 Bald Eagle

The bald eagle (*Haliaeetus leucocephalus)*, a threatened species, was addressed in the 1995 PR/FES and no additional information will be added. There would be no adverse impacts resulting from implementation of Alternatives A or B.

3.8.2 Northern Spotted Owl

The northern spotted owl (*Strix occidentalis*), a threatened species was addressed in the 1995 PR/FES and no additional information will be added. There would be no adverse impacts resulting from implementation of Alternatives A or B.

3.8.3 Southern Oregon/Northern California Coast Coho Salmon

Affected Environment

The SONCC coho salmon (*Oncorhynchus kisutch*) was listed as threatened on May 6, 1997. Critical habitat was designated on May 5, 1999, and includes all river reaches accessible to the coho between Cape Blanco and Punta Gorda. Excluded areas are above specific dams (e.g., Lost Creek Dam) or above long-standing, naturally impassable barriers. The Rogue River in the action area falls within this designated critical habitat. The critical habitat

designation is based on physical and biological features that are essential to the listed species. Essential features include substrate, water quality, water quantity, water temperature, food, riparian vegetation, access, water velocity, space, and safe passage. The adjacent riparian areas provide shade; sediment, nutrient, or chemical regulation; streambank stability, and input of large woody debris or organic matter. Critical habitat provides the physical and biological features essential to the conservation of the species. These include spawning sites, food resources, water quality and quantity, and riparian vegetation.

Naturally reproducing populations of coho salmon have been extirpated in nearly all Columbia River tributaries and are in decline in numerous coastal streams throughout Washington, Oregon, and California.

Coho are characterized by a relatively simple 3-year life cycle. Adults typically begin their freshwater spawning migration in the late summer and fall, spawn by mid-winter, and then die. The run and spawning times vary between and within populations. Depending on river temperatures, eggs incubate in redds (gravel nests excavated by spawning females) for 1-1/2 to 4 months before hatching as alevins (a larval lifestage dependent on food stored in a yolk sac). Following yolk sac absorption, alevins emerge from the gravel as young juveniles and begin actively feeding. Juveniles rear in freshwater for up to 15 months, then migrate to the ocean as smolts in the spring. Coho salmon typically spend two growing seasons in the ocean before returning to their natal stream to spawn as 3 year olds. Some precocious males, known as jacks, return to spawn after only 6 months in the ocean.

Coho migrate downstream through Savage Rapids Dam as juveniles from April through June with the peak run occurring in late-May to mid-June. Adult coho migrate upstream past the dam as adults between late September and January with the peak run occurring from mid-October through the end of November. The counts at Gold Ray Dam on the mainstem Rogue River at RM 126 provide the best quantitative source of information available on SONCC coho abundance in the Rogue River. Savage Rapids Dam is located at RM 107. Coho in the Rogue River tend to spawn in smaller tributaries below Gold Ray Dam. However, a high percentage (up to 94.4 percent in 1983) of wild coho salmon entering the Rogue River pass Gold Ray Dam upstream of Savage Rapids Dam. The percentage that pass Savage Rapids Dam would be even greater as Evans Creek, a major core area for coho salmon, enters the Rogue River between Savage Rapids Dam and Gold Ray Dam. Counts of adult coho salmon run size at Gold Ray Dam range from a low of 6,044 in 1998 to a high of 34,154 in 2002.

Table 3-4. Gold Ray Fish Counts for 1995 to 2004 for Coho

Year	Fish Counts
1995	13,158
1996	13,599
1997	15,750
1998	6,044
1999	7,722
2000	28,791
2001	32,962
2002	34,154
2003	17,179

Environmental Consequences

Since the publication of the 1995 PR/FES, additional details on the construction of the pumping plant and associated intake structures and dam removal have been developed and are useful in considering short-term construction-related impacts. While discussed in more detail for Alternative B because of more comprehensive design information, the impacts would be similar under either alternative.

A draft construction schedule has been prepared for the 2005 Preferred Alternative which outlines the construction steps and the proposed timing of those steps over a 3-year period from 2006 through 2008. This schedule is a guide and the contractor may change the schedule as necessary as long as appropriate in-water work periods, CWA restrictions, and other contract requirements are observed.

Alternative A – 1995 PR/FES Preferred Alternative

No discussion of SONCC coho was provided since this species was not listed until 1997. However, as noted above, impacts would be similar to those discussed for Alternative B.

Alternative B – 2005 Preferred Alternative.

Short-term Construction-related Impacts

Additional design work since the publication of the 1995 PR/FES provides details on the construction of the pumping plant and associated intake structures and dam removal for the 2005 Preferred Alternative. This information is useful in considering short-term construction-

related impacts to anadromous fish. Table 3-3 (Section 3.5 – Fish) summarizes construction activities, anadromous fish run timing for adults and juveniles and potential short-term effects for the dam removal and pumping plant construction activities at Savage Rapids Dam.

Fish Passage

Adult coho migration may encounter a slight delay when the reservoir is drawn down in early September through the radial gates to allow removal of the cofferdams, estimated to take about 2-1/2 weeks. Water velocity through the radial gates during September should not exceed 8 fps as this is usually a low-flow period. A pilot channel will then be excavated through the sediments to guide the river to the right side of the channel in late September. A short-term velocity barrier may be created during the initial period of river flow through the new pilot channel. This will subside rapidly as the channel erodes and widens. A temporary delay in upstream migration may occur from 1 to 5 days, depending on river flows. Adult coho migration occurs from late September through January with the peak run in the project area occurring from mid-October through November. Therefore, coho would not be affected.

Cofferdams

The purpose of the cofferdams is isolate work areas from the river and prevent contamination from construction-related materials; prevent physical harm from occurring to aquatic life; and to allow construction to proceed in the dry. There are, however, three potential impacts that can occur during installation of the cofferdams: (1) entrapment of juvenile outmigrating smolts behind the cofferdam; (2) injury from shock waves generated when driving sheet piles into the river substrate; and (3) turbidity created when sheet piles are driven in and subsequently removed after construction is complete.

The first cofferdam would be constructed during July 2006 when the pad for the intake is constructed and sheet piles are driven in. However, coho smolts have completed their outmigration by the end of June and would not encounter any obstacles.

The second period of time that may potentially affect outmigrating coho smolts occurs during mid- to late-April 2008 when sheet piles are installed for cofferdams to allow the removal of the right side of the dam. This work would occur outside of the In-water Work Period based on the recommendations of NOAA Fisheries, USFWS, and ODFW. This exception to the In-Water Work Period would allow dam removal to be completed by November of 2008 which would allow fall Chinook adults to migrate upstream unobstructed. It would also result in completing the construction work a year earlier. The peak of the juvenile outmigration occurs from late-May through mid-June, therefore, the bulk of the coho smolt outmigration would not be at risk for entrapment behind the new cofferdams. Those individuals in the river in April that might become entrained behind newly constructed cofferdams would be captured and placed in the river downstream of the cofferdam in accordance to provisions of a fish salvage plan approved by NOAA Fisheries and ODFW.

Sheet piles would be removed from the intake pad during January 2008, sheet piles on cofferdams on the right side of the river would be removed during September 2008, and left side sheet piles would be removed in late October – early November. Both installing and removing sheet piles would result in temporary turbidity that would be confined to the area close to the operation.

The intake for the pumping plant would be screened in accordance to guidance provided by NOAA Fisheries and ODFW.

Sediments

As discussed in Section 3.2 – Water Quality, the 200,000 cubic yards of native sediment material stored behind the dam would be eroded primarily during high flow events after dam removal is completed. Compared against the sediment loads normally carried by the river during high flows, the addition of this material would not be significant.

Environmental Consequences – SONCC Coho Critical Habitat

Both short-term and long-term impacts will occur to the riparian vegetation in the immediate vicinity of the project area. Riparian vegetation will be removed during construction of access roads to both sides of the dam structure, as well as to the construction equipment staging area. These areas will be removed and revegetated upon completion of the project. The existing riparian vegetation area (approximately ¾ acre) will be permanently converted to pumping plant, intake, substation, and related project structures.

The overall impact to the function of the riparian area in the vicinity of the Savage Rapids Dam in providing shade, sediment delivery, nutrient or chemical regulation, streambank stability, and the input of large woody debris is slight. Some riparian function will be temporarily disrupted in a small area in the immediate vicinity of the dam structures, but will be restored when the project is completed and the area is naturally revegetated. A small area, most of which is located above the 100-year flood zone, will be permanently converted to the substation and pumping plant. Additionally, there will be a service yard and access road below the 100-year flood zone to provide access to the intake structure for maintenance purposes.

Long-term Impacts

No long-term impacts will occur to spawning areas, food production areas, and water quality or quantity in the vicinity of or downstream of the project area.

Removing Savage Rapids Dam permanently eliminates a major source of anadromous fish mortality in the Rogue River by allowing unimpeded movement of anadromous fish both upstream and downstream in the Rogue River.

Salmon and steelhead escapement at Savage Rapids Dam is estimated to increase about 22 percent (USBR 1995).

Mitigation

Reclamation would use BMPs (as outlined in Appendix A – Proposed Mitigation Measures) to minimize environmental consequences caused by dam removal and construction of the pumping facility and intake screens, as well as the construction of access roads and staging areas. All standard and reasonable precautions would be taken to reduce erosion and limit sedimentation during and after construction. As much as possible construction would take place during the In-water Work Period (June 15 through August 31). However, cofferdam installation on the right (north) side of the dam would be done in April at the fisheries agencies request to minimize impacts to anadromous fish. Moving the construction schedule up to April also allows the project to be completed in 2008 rather than extending it to 2009, thereby reducing adverse impacts.

A fish salvage plan would be implemented to remove all fish inadvertently entrapped behind cofferdams as specified in the CAR (USFWS 2005).

3.8.4 Gentner Mission-bells

Affected Environment

Gentner mission-bells (*Fritillaria gentneri*), an endangered species, was listed on December 10, 1999. This species occurs predominantly in southwestern Oregon, where it is known from scattered localities in the Rogue and Illinois River drainages in Jackson and Josephine counties. This species is highly localized within about a 30-mile radius of the Jacksonville Cemetery in Jacksonville, Oregon. Approximately 73 percent of the population is found within a 7-mile radius of the cemetery. Other individuals are scattered around western Jackson County. The closest location to the project area is near the town of Medford (USFWS 2003). This species is associated with a wide array of plants associations, but often occupies grassland and chaparral habitats within or on the edges of dry, open mixed-species woodlands below 5,064 feet elevation. Because this species tends to occupy dry open grasslands or woodlands, it is unlikely to be present in the riparian habitats along the edge of the Rogue River in the project area.

Environmental Consequences

This species is unlikely to be present in the project area; therefore, Alternative A or B will not have any effect on this species.

Mitigation

No adverse impacts have been identified as this species is unlikely to be present in the project area; therefore, no mitigation is needed.

3.8.5 Cook's Lomatium

Affected Environment

Cook's lomatium (*Lomatium cookii*) was listed as endangered in 2002. This small perennial plant in the parsley family is found only where soil types have a hard pan or clay pan layer close to the soil surface that create seasonally wet soils and vernal pools. This habitat type is found in the Agate Desert near Medford, Oregon, and in the Illinois Valley in Josephine County, Oregon.

Environmental Consequences

There is no known demonstrated presence of Cook's lomatium in the project area and it is unlikely to be present in the riparian habitat found in the project area. Therefore, Alternative A or B will not have any effect on this species.

Mitigation

No adverse impacts have been identified as this species is unlikely to be present in the project area; therefore, no mitigation is needed.

3.9 Candidate Species

3.9.1 Pacific Fisher

Affected Environment

The west coast population of the Pacific fisher (*Martes pennanti pacifica*) was given Federal candidate status on April 8, 2004. The only remaining populations of fisher in Oregon are found in two separate and genetically isolated populations in southwest Oregon; one in the northern Siskiyou Mountains and one in the southern Cascade Range. It is found primarily in areas of mature and old growth forests. The west coast fisher population is endangered mainly as a result of the loss and fragmentation of habitat due to timber harvest, roads, urban development, recreation, and wildfires.

Environmental Consequences

Because of the highly disturbed nature of the project area, and the lack of mature and old growth forest in the vicinity, it is unlikely that this species is present in the Savage Rapids Dam area. However, it has been documented to be within the Hellgate Recreation Area on the Rogue River downstream of the project area. Neither Alternative A or B will affect this species directly, or adversely impact its habitat.

Mitigation

No adverse impacts have been identified; therefore, no mitigation is needed.

3.9.2 Streak Horned Lark

Affected Environment

The Streak horned lark (*Eremophila alpestris strigata*) was designated a candidate species in October 2001. It was once abundant in the Willamette Valley and east of Medford in Jackson County in the Rogue River Valley. Currently, it is limited to the Basket Slough National Wildlife Refuge and in isolated populations between Tangent, Peoria, and Harrisburg, Oregon.

Environmental Consequences

This species is associated with bare ground or sparsely vegetated habitats and it is unlikely to be present in the action area. Therefore, Alternative A or B will not have any effect on this species.

Mitigation

No adverse impacts have been identified as these species is unlikely to be present in the action area; therefore, no mitigation is needed.

3.10 Recreation

3.10.1 Affected Environment

Since the publication of the 1995 PR/FES, there has been no change in, nor additional information available for the affected environment discussion.

3.10.2 Environmental Consequences

Alternative A – 1995 PR/FES Preferred Alternative

The impacts of this alternative would be the same as that previously discussed in the 1995 PR/FES.

Alternative B – 2005 Preferred Alternative

The impacts of this alternative would be the same as that previously described under Alternative A – 1995 PR/FES Preferred Alternative.

Mitigation

No significant impacts to recreation have been identified; therefore, no specific mitigation is required other than the use of BMPs as described for water quality and fish.

3.11 Aesthetics

3.11.1 Affected Environment

No additional information on aesthetics will be added to this section that was not contained in the 1995 PR/FES.

3.11.2 Environmental Consequences

Alternative A – 1995 PR/FES Preferred Alternative

As described in the 1995 PR/FES, short-term construction impacts would occur. Removal of Savage Rapids Dam would change the scenic view from a small lake to a natural river. As described in the 1995 PR/FES, short-term construction impacts would occur. Removal of Savage Rapids Dam would change the scenic view from a small lake to a natural river. The shoreline around the seasonal reservoir is highly developed consisting of scattered houses, lawns, gardens, small pastures, parks, and recreation. In some areas, deciduous trees and shrubs form dense riparian vegetation composed of alder, ash, cottonwood, willow, snowberry, sumac, and blackberry. The area between the natural high waterline of the Rogue River and the high waterline of the reservoir would gradually fill in with vegetation. Since all of this area is privately owned, landscaping, planting, and maintenance will vary by ownership as well. The pumping plants, pipelines, and power lines would be designed to blend with the natural environment and would be less intrusive than the existing dam.

Alternative B – 2005 Preferred Alternative

As with Alternative A, the overall view would be changed to one of a free flowing river. However, a portion of the old structure will be left in place, and a pipe bridge will be constructed across the river. This would not be as aesthetically pleasing as total dam removal as proposed under Alternative A, but these structures would not be any more intrusive than the existing dam structure.

Mitigation

No significant impacts to aethestics have been identified; therefore, no specific mitigation is required other than the use of BMPs as described for water quality and fish.

3.12 Historic Properties

3.12.1 Affected Environment

Archeological investigations have documented prehistoric use of southwestern Oregon extending back to around 11,500 years before present. Aikens (1986) characterized the population of the Rogue River basin sub-area as "mountain people, relatively few in number and isolated by the ruggedness of their country into scattered bands." Linguistic studies and historical data document that, at the time of Euro-American entry into southwestern Oregon, the Rogue River Valley was occupied by the Upland Takelma, with additional Takelma bands to the north, the Klamath and Shasta to the east and south, and various Athabaskan-speaking bands further north and to the west. Tribes throughout the Rogue River basin followed a seasonal round designed to maximize the harvest of natural resources. Important resources were fish, acorns, camas, and large and small game. People typically wintered in villages located in the valley bottoms near favored fishing locations. In the spring through the summer, people scattered to camps throughout the valleys and uplands, where they harvested plant resources and hunted game. In the fall they returned to the rivers to fish.

GPID completed construction of Savage Rapids Dam in 1921, but the dam has been significantly altered since that time. Between 1953 and 1955, the original spillway gate structures were rebuilt, replacing the original radial gates with stoplogs; cableway towers were erected at either abutment to facilitate placement of the stoplogs; the dam structure was altered to allow for a river outlet and to facilitate debris passage; and eroded concrete on the face of the dam and the sluiceway was replaced. Between 1957 and 1958, and again in 1974, further changes were made to the dam to facilitate fish passage. On May 25, 1990, Reclamation initiated consultations with the Oregon State Historical Preservation Office (SHPO) to determine if Savage Rapids Dam was eligible to the National Register of Historic Places (National Register). Reclamation's assessment was that the dam was not eligible to the

National Register because past modifications had caused a significant loss of integrity of original design, materials, and workmanship. In a letter dated August 1, 1990, the SHPO concurred with Reclamation's assessment that the dam was not eligible to the National Register.

3.12.2 Environmental Consequences

Alternative A – 1995 PR/FES Preferred Alternative

There is no additional analysis to be added under this alternative that was not discussed in the 1995 PR/FES.

Alternative B – 2005 Preferred Alternative

Additional potential impact areas have been identified for the 2005 Preferred Alternative, an archeological survey was completed of all potential impact areas and no significant resources were found. Reclamation is currently awaiting the final report. The survey included construction areas for the pumping plant, substation, and intake/fish screen structure near the left abutment below the dam; the pipeline that will convey the water from the right abutment to the Tokay Canal/Evans Creek Lateral headworks; the pipeline that will convey the water to the Highline Canal/Savage Lateral headworks; the shoreline and lower terrace areas above and below the dam that may potentially be affected by access road construction/improvement; cofferdam installation, water settlement or treatment ponds, that may be used for staging areas; potential waste material disposal sites, if disposal will be at locations other than an existing landfill; and material source locations for the cofferdams, if that material is not obtained from commercial stockpiles or excavated from redeposited instream sediments backed up behind the dam. Reclamation notified the Confederated Tribes of the Siletz Indians of Oregon and the Confederated Tribes of the Grand Ronde Community of Oregon of the proposed action and requested to be informed if they are aware of any sites with traditional or religious value in or near the potential impact area. To date, no response has been received.

Reclamation anticipates that there is very little likelihood that archeological sites or sites of tribal value will be identified within the potential impact areas. The proposed locations for the pumping plant, substation, and intake/fish screen structure have been extensively disturbed by construction of the dam, the fish ladders, the canal, and road, and much of the lower terrace is covered with spoil material from past construction. Much of the pipeline route has been impacted by road construction. Much of the area above the dam that might be used for project purposes has been scoured to bedrock by the river, with most soils that are present deposited by the reservoir.

If archeological sites or properties of tribal traditional value are identified during the surveys and tribal consultations, then Reclamation will seek to avoid those sites during construction. If they cannot be avoided, then Reclamation will complete investigations to determine if they are eligible to the National Register. If National Register eligible sites are present that will be adversely affected by the proposed undertaking, then appropriate actions will be completed to mitigate the adverse effect. Site eligibility, project effect, and treatment will be determined in consultation with the SHPO and interested tribes using processes defined in 36 CFR 800 and documented in a project memorandum of agreement. Consultations and on-site treatment will be completed prior to any ground disturbance in the vicinity of the sites.

Alternative B – 2005 Preferred Alternative

The impacts of this alternative would be the same as that previously described under Alternative A – 1995 PR/FES Preferred Alternative.

Mitigation

No significant impacts to historic properties have been identified; therefore, no specific mitigation is required.

3.13 Indian Sacred Sites

3.13.1 Affected Environment

Executive Order 13007 defines Indian sacred sites as "any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion." None of the lands affected by the proposed action are Federal fee lands or lands where Federal easements or other realty interests pertain. There is no corollary statute in State codes pertaining to Indian sacred sites on non-Federal lands.

3.13.2 Environmental Consequences

No impacts under either alternative would occur under EO 13007 because that authority does not extend to non-Federal lands.

Mitigation

No significant impacts to Indian Sacred Sites have been identified; therefore, no specific mitigation is required.

3.14 Indian Trust Assets

3.14.1 Affected Environment

Since the publication of the 1995 PR/FES, there has been no change in, nor additional information available for the affected environment discussion.

3.14.2 Environmental Consequences

Alternative A – 1995 PR/FES Preferred Alternative

The impacts of this alternative would be the same as that previously discussed in the 1995 PR/FES.

Alternative B – 2005 Preferred Alternative

The impacts of this alternative would be the same as that previously described under Alternative A – 1995 PR/FES Preferred Alternative.

Mitigation

No significant impacts to Indian Trust Assets (ITA) have been identified; therefore, no specific mitigation is required.

3.15 Social Well Being

3.15.1 Affected Environment

Since the publication of the 1995 PR/FES, there has been no change in, nor additional information available for the affected environment discussion.

3.15.2 Environmental Consequences

Alternative A – 1995 PR/FES Preferred Alternative

The impacts of this alternative would be the same as that previously discussed in the 1995 PR/FES.

Alternative B – 2005 Preferred Alternative

The impacts of this alternative would be the same as that previously described under Alternative A – 1995 PR/FES Preferred Alternative.

Mitigation

No significant impacts to social well being have been identified; therefore, no specific mitigation is required.

3.16 Economics

3.16.1 Affected Environment

Since the publication of the 1995 PR/FES, there has been no change in, nor additional information available for the affected environment discussion.

3.16.2 Environmental Consequences

Alternative A – 1995 PR/FES Preferred Alternative

The impacts of this alternative would be the same as that previously discussed in the 1995 PR/FES.

Alternative B – 2005 Preferred Alternative

The impacts of this alternative would be the same as that previously described under Alternative A – 1995 PR/FES Preferred Alternative.

Mitigation

No significant impacts to economics have been identified; therefore, no specific mitigation is required.

3.17 Air Quality and Noise

3.17.1 Affected Environment

No additional information will be added to this section that was not previously discussed in the 1995 PR/FES.

3.17.2 Environmental Consequences

Alternative A – 1995 PR/FES Preferred Alternative

There is no additional analyses to be added under this alternative that was not discussed in the 1995 PR/FES.

Alternative B – 2005 Preferred Alternative

There would be no difference in impacts to air quality. However, noise levels may be lower because of the different pumping plant design. The pumping plant uses vertical submersible pumping units that operate out of sumps. This arrangement places the pump and motor below the water surface, substantially reducing the noise generated by the pumping unit. Therefore, this alternative will have no adverse effect to the noise level in the vicinity.

Mitigation

No significant impacts to Air Quality and Noise have been identified; therefore, no specific mitigation is required.

3.18 Environmental Justice

3.18.1 Affected Environment

Since the publication of the 1995 PR/FES, there has been no change in, nor additional information available for the affected environment discussion.

3.18.2 Environmental Consequences

Alternative A – 1995 PR/FES Preferred Alternative

The impacts of this alternative would be the same as that previously discussed in the 1995 PR/FES.

Alternative B – 2005 Preferred Alternative

The impacts of this alternative would be the same as that previously described under Alternative A – 1995 PR/FES Preferred Alternative.

Mitigation

No significant impacts to environmental justice have been identified; therefore, no specific mitigation is required.

3.19 Unavoidable Adverse Impacts

3.19.1 Affected Environment

Since the publication of the 1995 PR/FES, there has been no change in, nor additional information available for the affected environment discussion.

3.19.2 Environmental Consequences

Alternative A – 1995 PR/FES Preferred Alternative

The impacts of this alternative would be the same as that previously discussed in the 1995 PR/FES.

Alternative B – 2005 Preferred Alternative

The impacts of this alternative would be the same as that previously described under Alternative A – 1995 PR/FES Preferred Alternative.

Mitigation

No significant unavoidable adverse impacts have been identified; therefore, no specific mitigation is required.

3.20 Irreversible and Irretrievable Commitments of Resources

3.20.1 Affected Environment

Since the publication of the 1995 PR/FES, there has been no change in, nor additional information available for the affected environment discussion.

3.20.2 Environmental Consequences

Alternative A – 1995 PR/FES Preferred Alternative

The impacts of this alternative would be the same as that previously discussed in the 1995 PR/FES.

Alternative B – 2005 Preferred Alternative

The impacts of this alternative would be the same as that previously described under Alternative A – 1995 PR/FES Preferred Alternative.

Mitigation

No significant impacts to irreversible and irretrievable commitments of resources have been identified; therefore, no specific mitigation is required.

3.21 Cumulative Effects

Cumulative effects are those environmental effects resulting from the incremental consequences of a proposed action when added to other past, present, and reasonably foreseeable future actions regardless of who undertakes these actions. Cumulative effects can result from individually minor, but collectively significant actions taking place over a period of time.

Between 1990 and 2000, the human population in Jackson County increased by 23.8 percent and in Josephine County the population increased 20.9 percent (U.S. Census Bureau 2004). As the human population in the action area continues to grow, demand for agricultural, commercial, and residential development is likely to grow with the associated increases in water demand, habitat impacts, and water quality impairment. These potentially adverse effects of population growth are offset to some degree by ongoing habitat and water quality programs being implemented at the State, Federal, and local level.

The state of Oregon adopted model watershed restoration efforts for the Grande Ronde basin and Southern Oregon Coast (including the Rogue River basin) to implement up to $5 million of restoration efforts in each basin by July 1995. Under the Oregon Plan for Salmon and Watersheds (Oregon Plan) approximately $52 million was provided by the state legislature during 1997-2005 to accomplish watershed restoration actions throughout Oregon (OWEB 1999, 2001, 2003, 2005). Federal agencies, including the USFWS, NOAA Fisheries, Reclamation, and U.S. Forest Service (USFS) have provided another $100 million for activities supporting the Oregon Plan during the same time period (OWEB 1999, 2001, 2003, 2005). In the 2000-2001 biennium approximately $5.3 million was provided through the

Oregon Plan for restoration activities in southwest Oregon. Under the Northwest Forest Plan, Bureau of Land Management (BLM), and USFS projects in the Southwest Oregon Province, Rogue River basin, included watershed restoration for anadromous fish totaling approximately $1.5 million in 1994. Private sector voluntary funding during this time is estimated at more than $9 million (OWEB 1999). Federal agency contribution to restoration activities in southwest Oregon and the Rogue River basin in particular continues with several million dollars being used to improved fish passage conditions and restore key habitat area.

One of the most notable future non-Federal actions includes the ODEQ TMDL approval and implementation. Oregon Department of Transportation has ongoing programs to build and modify roads and to improve fish passage through culverts and bridges and Oregon State continues to pass legislation to enhance salmon recovery through habitat restoration programs. Continued Federal and State agency funding, coupled with private sector funds, remain available to these restoration efforts and are all comparable in their recognition of the value of high quality habitat in sufficient amounts to produce sustainable population levels of anadromous fish as part of healthy functioning ecosystems (USFWS 2005).

Chapter 4 COORDINATION AND CONSULTATION

This chapter summarizes the public involvement activities and consultation that has occurred since the release of the 1995 PR/FES. Appendix B contains a list of agencies, organizations, and persons receiving a copy of this draft EA.

4.1 Agency Consultation

4.1.1 National Historic Preservation Act of 1966

The National Historic Preservation Act of 1966 (NHPA) (as amended in 1992) requires that Federal agencies consider the effects that their projects have on historic properties. Section 106 of this Act and its implementing regulations (36 CR Part 800) provides procedures that Federal agencies must follow to comply with NHPA on specific undertakings.

To comply with Section 106 of NHPA, Federal agencies must consult with SHPO, Native American tribes with a traditional or culturally-significant religious interest in the study area, and the interested public. Federal agencies must identify historic properties in the area of potential effect for a project. The significance of historic properties must be determined, and the Federal agency must mitigate adverse effects the project may cause on significant resources.

Consultation with SHPO was conducted and concluded for the 1995 PR/FES with SHPO concurring with Reclamation's assessment that the dam was not eligible to the National Register. Reclamation will conduct an archeological survey of all potential impact areas. If archeological sites or properties of tribal traditional value are identified during the surveys, Reclamation will seek to avoid those sites during construction. If they cannot be avoided, Reclamation will complete investigations to determine if they are eligible to the National Register.

4.1.2 Endangered Species Act (1973) Section 7 Consultation

The ESA requires all Federal agencies to ensure that their actions do not jeopardize the continued existence of listed species or destroy or adversely modify their critical habitat. As part of the ESA's Section 7 process, an agency must request a list of species from the USFWS and NOAA Fisheries that identifies T&E species within or near the action area. The

agency then must evaluate impacts to those species. If the action may impact any listed species, the agency must consult with USFWS or NOAA Fisheries.

In September 2004, Reclamation sent letters to USFWS and NOAA Fisheries requesting current lists of listed and proposed species for the project area. Species lists were received in October 2004 (Appendix C). Appendix C also contains relevant correspondence between Reclamation, USFWS, and NOAA Fisheries.

Currently, Reclamation is developing a BA in coordination with NOAA Fisheries and the USFWS. Prior to Reclamation's issuance of a Finding of No Significant Impact (FONSI) or Record of Decision, USFWS and NOAA Fisheries will need to submit a Biological Opinion to Reclamation. Listed below in Table 4-1 are Reclamation's findings of effects for each listed species.

Table 4-1. ESA Species Effects

Species	Alternative A – 1995 PR/FES Preferred Alternative	Alternative B – 2005 Preferred Alternative
Bald eagle	No effect	No effect
Northern spotted owl	No effect	No effect
SONCC Coho Salmon	May affect, not likely to adversely affect	May adversely affect due to short-term construction impacts
Gentner mission-bells	No effect	No effect
Cook's lomatium	No effect	No effect

4.1.3 Fish and Wildlife Coordination Act

This Act provides for equal consideration of wildlife conservation in coordination with other features of water resource development programs. The Act requires that any plans to impound, divert, control, or modify any stream or other body of water must be coordinated with the USFWS and State wildlife agency through consultation directed toward prevention of fish and wildlife losses and development or enhancement of these resources.

Reclamation has worked closely with USFWS, NOAA Fisheries, and ODFW during the final design process in 2004 and 2005 to keep the agencies informed of the details of dam removal, and pumping plant and intake construction. Three onsite meetings were held and

several conference calls were conducted during the design phase with the fisheries agencies in 2004 and 2005. The USFWS provided a Final Supplemental Fish and Wildlife CAR in July 2005. The Final Supplemental CAR included the four recommendations that were in the 1995 CAR. The first three recommendations were relative to supporting and proceeding forward with the removal of Savage Rapids Dam. In addition, a number of new recommendations specific to implementation of Recommendation #4 in the original CAR, which required close coordination of the specifics of in-water work schedules with the USFWS, ODFW, and NOAA Fisheries, were identified. Reclamation will implement the recommendations identified in the CAR as discussed below

As recommended in the CAR, Reclamation will confine in-water construction activities to the standard In-water Work Period (June 15 to August 31). Exceptions to this may occur for the following activities during 2008 as indicated in the CAR in order to expedite dam removal.[1]

- Reservoir drawdown should occur in April through the use of the existing radial gates. Based on information from GPID, reservoir drawdown should take 3 days (April 7 – 10). The reservoir should remain drawn down up to 3 weeks to expedite dam removal activities on the right (north) side of the dam (April 7 – 28). Every measure should be taken to minimize this drawdown period. Actions to ensure meeting this timeframe could include extra work shifts, longer work days.
  - Construct upstream access road and cofferdam on the right (north) side of the dam in the "dry."
  - The downstream cofferdam on the right side of the dam will be constructed in the "wet."
- Radial gates should close on or before April 29 to refill reservoir to facilitate fish passage through lower portion of south fish ladder. Reclamation should take actions to ensure the time period the radial gates are open will be minimized. Actions to ensure meeting this timeframe could include extra work shifts or longer work days.
- From May 1 to September 7 (18 weeks) the following constructions should occur behind the cofferdams:
  - Excavation of reservoir sediments immediately upstream of the dam; and
  - Removal of right side of dam (bays 1 through 7).

[1] Specific dates any vary slightly from the CAR recommendations to accommodate revisions to the construction schedule developed since the CAR was prepared. Actual construction dates will also vary subject to the Contractor's discretion and any permitting requirements. Any work outside of the In-water Work Period, except as identified in the final CAR, must be approved by USFWS, NOAA Fisheries, and ODFW.

- Lower reservoir for up to 3 weeks. September 8 – 28 , 2008.
  - Remove sheet piles from upstream and downstream cofferdams and excavate pilot channel through upstream and downstream cofferdams.

If the in-water work begins on June 16 per Reclamation's original proposal, USFWS, NOAA Fisheries, and ODFW reiterate the recommendation that Reclamation should take actions to ensure the time period the radial gates are open will be minimized. Additionally, the general construction schedule must be truncated to ensure scheduling dam removal activities to allow for optimal upstream fish passage before October 15. Providing fish passage conditions on or before October 15 is considered a priority by resource agencies.

In response to USFWS, NOAA Fisheries, and ODFW's recommendation regarding the proposed construction schedule, Reclamation has expressed interest in finishing work on the left (south) side in the same year as the right side (2008), instead of undertaking removal of the left side of the dam in 2009. This proposal offers both cost savings and a potential reduction in the length of work-related impacts to the environment. Reclamation has proposed the following:

- Build access road and cofferdam on left side of the dam from September 29 to October 31, 2008.
- Dam removal is estimated to take up to 7 weeks to complete (October 14 through December 2008).
  - Removal of left side of dam (bays 8 through 11)
  - Removal of sheet piles and upper portion of cofferdam on left side of dam from December 2 – 9, 2008. The winter flood should remove the remaining portion of the cofferdam.
- Reclamation will implement the following fish capture and release procedures:
  - Before and intermittently during isolation of an in-water work area, fish trapped in the area must be captured using a trap, seine, electrofishing, or other methods as are prudent to minimize risk of injury, then released at a safe release site.
    - Do not use electrofishing if water temperatures exceed 18°C, or are expected to rise above 18°C, unless no other method of capture is available.
    - If electrofishing equipment is used to capture fish, comply with NOAA Fisheries' electrofishing guidelines.
    - Handle coho salmon with extreme care, keeping fish in water to the maximum extent possible during seining and transfer procedures to prevent the added stress of out-of-water handling.

- Ensure water quality conditions are adequate in buckets or tanks used to transport fish by providing circulation of clean, cold water, using aerators to provide dissolved oxygen, and minimizing holding times.
- Release fish into a safe release site as quickly as possible and as near as possible to capture sites.
- Do not transfer coho salmon to anyone except NOAA Fisheries personnel, unless otherwise approved in writing by NOAA Fisheries. Requests for approval should be provided 2 months prior to implementation.
- Obtain all other Federal, State, and local permits necessary to conduct the capture and release activity.
- Allow NOAA Fisheries or its designated representative to accompany the capture team during the capture and release activity, and to inspect the team's capture and release records and facilities.
- Submit a Salvage Report to NOAA Fisheries within 10 calendar days of completion of the salvage operation.

- Concrete rubble from dam removal activities will not be used to fill in the existing radial diversion channel upstream and downstream of the dam axis. Concrete rubble from dam removal activities should be disposed of in an approved upland disposal site.

- Untreated stoplogs will be used to block the high water opening in the south fish ladder.

4.1.4 Clean Water Act of 1977

Section 404 of the Clean Water Act regulates the discharge of dredge and fill material into water of the United States, including wetlands. The U.S. Army Corps of Engineers (Corps) evaluates applications for Section 404 permits. The ODEQ administers Section 401 of the Clean Water Act in Oregon. The ODEQ determines if a proposed project will meet water quality standards for any activities requiring certain Federal permits including Section 404 permits. If the project will not create unacceptable water quality problems, ODEQ issues its 401 Certification.

Reclamation will obtain appropriate CWA and State permits prior to construction activities.

4.1.5 Rivers and Harbors Act of 1899

The Corps regulates Section 10 of the Rivers and Harbors Act and issues permits for the construction of in-water structures and the excavation and fill of material into waters of the United States.

4.1.6 Oregon Fill and Removal Law

The Oregon Fill and Removal Law, administered by the Oregon Department of State Lands (ODSL), requires that any activity that will discharge into, or excavate material from, waters of the State obtain a permit subject to the regulations in ORS 196.795-990. Waters of the State are defined as "natural waterways including all tidal and nontidal bays, intermittent streams, constantly flowing streams, lakes, wetlands, and other bodies of water in this state, navigable and non-navigable, including that portion of the Pacific Ocean that is in the boundaries of this state."

4.2 Tribal Coordination and Consultation

In July 2005, Reclamation sent letters to the Confederated Tribes of the Siletz Indians of Oregon and the Confederated Tribes of the Grand Ronde Community of Oregon notifying them of the proposed action and asking to be informed of any sites with traditional or religious value in or near the potential impact area (Appendix E). To date, no response has been received. Consultation completed in 1995 with Bureau of Indian Affairs for the 1995 PR/FES indicated there were no known ITAs in the Rogue River basin.

4.3 Public Involvement

The following summarizes the contacts made between Reclamation, NOAA Fisheries, USFWS, and others during the development of this EA. In addition to the specific contacts listed, numerous discussions among all the agencies' staff occurred in order to facilitate communication and fine tune development of alternatives.

May 2004	Reclamation filed a Notice of Intent in the Federal Register to prepare a supplemental EA to determine the need for a supplemental EIS. Written comments identifying issues and concerns were to be accepted for 30 days following the publication notice. No comments were received.

August 2004 — Reclamation released a briefing paper and conducted an onsite tour of Savage Rapids Dam to interested participants. The briefing paper summarized progress to date since the 1995 PR/FES analysis was prepared and mailed to the Savage Rapids Dam participants. Participants included:

GPID
NOAA Fisheries
BLM
USFS
ODFW
Corps
Oregon Watershed Enhancement Board
USFWS
ODEQ
ODSL
WaterWatch of Oregon
Central Oregon and Pacific Railroad

September 2004 — Reclamation sent letters to USFWS and NOAA Fisheries requesting current lists of listed and proposed species for the proposed area which may be affected by the preferred alternative. Species lists were received in October 2004.

December 2004 — An interagency meeting was held in Medford, Oregon, to discuss cofferdam design; protective measures for concrete leachates; the participation process of agencies involved in the EA/BA process; and progress on the Fish and Wildlife CAR. Participants included biologists with Reclamation, NOAA Fisheries, ODFW, and USFWS.

February 2005 — An interagency conference call was held to discuss the preferred alternative, inclined screen design, and velocity modeling efforts. Participants included Reclamation, USFWS, ODFW, and NOAA Fisheries.

March 2005 — An onsite meeting was held at Savage Rapids Dam to discuss the preferred alternative and collect additional design data. Participants included Reclamation, GPID, Jackson and Josephine County Roads, Parks, and Planning Services, Pacific Power, ODFW, Oregon Department of

	Transportation, and WaterWatch.
May 2005	An onsite meeting was held at Savage Rapids Dam to discuss the Preferred Alternative, to tour the site, and collect additional design data. Participants included Reclamation, USFWS, ODFW, NOAA Fisheries, and GPID.
August 2005	This draft EA was provided for public review and comment.

Chapter 5 ENVIRONMENTAL COMMITMENTS

Environmental commitments are actions that are included as part of the Federal decision-making process and will become conditions for implementation of the Preferred Alternative.

The following environmental commitments identified in the 1995 PR/FES are carried forward into this EA.

Fisheries

- Final design of fish passage and protective facilities will be coordinated with USFWS, NOAA Fisheries, and ODFW.
- Instream work will be coordinated with the Corps, USFWS, NOAA Fisheries, and ODFW to assure that adverse effects to anadromous fish will be minimized.
- Under the Preferred Alternative, a portion of Savage Rapids Dam would be demolished in a manner that does not block anadromous fish passage and does not cause excessive turbidity or rapid release of trapped sediments.

Water Quality

- Prior to discharging any wastewater or other pollutants, contractors would obtain permits as required under the National Pollutant Discharge Elimination System. Section 404 permits and Section 402 permits would be obtained from the Corps before initiating construction.
- A removal-fill permit would be obtained from the ODSL as applicable. Water quality certification would be requested from the ODEQ.
- Contractors would be required to comply with Federal, State, and local laws and regulations regarding the control and abatement of water pollution. Contraction methods would be used that protect against the entrance of accidental spillage of solid waste, contaminants, debris, etc., into the Rogue River.

Vegetation

- Areas disturbed through construction would be reseeded.
- Under the Preferred Alternative, the river bank area where the dam is removed and the pumping plants constructed would be recontoured to provide a natural aspect.

Air Quality and Noise

- Contractors will comply with Federal, State, and local regulations concerning control of noise levels (e.g., demolition of Savage Rapids Dam).
- Pumping plant will be inside a metal building substantially reducing noise.

Cultural Resources

- Contractors will comply with construction specifications and take appropriate actions and notify the SHPO if cultural resources are found.

Disposal of Waste

- Waste materials from demolition of existing facilities and cleanup after construction will be disposed of in landfill accordance with State, country, and local regulations and ordinances.
- Hazardous waste materials will be disposed of in accordance with applicable Federal and State regulations.

In addition to the Environmental Commitments identified above, the recommendations in the 2005 CAR delineated in Chapter 4, Section 4.1.3, are considered to be environmental commitments; however, specific dates may vary slightly from the final CAR recommendations to accommodate revisions to the construction schedule developed since the CAR was prepared. Actual construction dates may also vary subject to the Contractor's discretion. Any work outside of the In-wate Work Period, except as identified in the final CAR, must be approved by USFWS, NOAA Fisheries, and ODFW.

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