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**DRAFT ENVIRONMENTAL ASSESSMENT
FOR THE PROPOSED ISSUANCE OF A PERMIT TO ALLOW
INCIDENTAL TAKE OF THREATENED AND ENDANGERED
SPECIES**

**GRANTS PASS IRRIGATION DISTRICT
OPERATION OF SAVAGE RAPIDS DAM
JOSEPHINE AND JACKSON COUNTIES, OREGON**

Prepared for:

United States Department of Commerce
National Marine Fisheries Service

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The proposed Habitat Conservation Plan, which is set forth within the Environment as the Proposed Action was prepared by Grants Pass Irrigation District with assistance from S.P. Cramer & Associates, Inc, and with technical assistance from the National Marine Fisheries Service.

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COVER SHEET

Title of Proposed Action: Issuance of a Permit for Incidental Take of Federally-Listed Species associated with the Habitat Conservation Plan for the operation of Savage Rapids Dam, Josephine and Jackson Counties

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1. INTRODUCTION

The Savage Rapids Dam is located on the Rogue River in southwest Oregon at rivermile (RM) 107 about 5 miles east of the city of Grants Pass, Oregon (Figures 1 and 2). Savage Rapids Dam is owned and operated by Grants Pass Irrigation District (GPID). Its sole purpose is to divert water for irrigation. Fish passage at Savage Rapids Dam has been an issue since the dam was constructed in 1921 by GPID. The concrete structure has a structural height of 39 feet, and a fish ladder was constructed on the north side at the time the dam was completed. A ladder was constructed on the southside in 1934. Rotating fish screens were an initial part of the gravity diversion on the south side. Early attempts to screen the pumping diversion on the north side were unsuccessful and the diversion remained unscreened until 1958. Fish passage improvements made in the late 1970's have helped reduce fish deaths, but fish passage problems continue.

The dam is a combination gravity and multiple-arch, concrete structure. The dam has a structural height of 39 feet, a hydraulic height of 30 feet, and an overflow crest with a length of approximately 465 feet. The crest is divided into 16 bays. The first seven at the north end of the dam are of multiple-arch construction with buttresses on 25-foot centers. The rest of the bays are concrete-gravity sections.

Metal stoplogs, installed and removed by a motorized cableway and hoist, control water going over the spillway section. A small, concrete-block structure above the north end of the dam houses the hoist equipment. The stoplogs raise the upstream water surface 11 feet, and are in use during the irrigation season only.

In the center of the dam at bays 10 and 11 are two river outlets controlled by 16-by-7 foot, hydraulically-operated, radial gates, each with a capacity of 3,000 cubic feet per second (cfs). The gates are used to de-water the reservoir to permit access to the crest of the spillway while the stoplogs are being installed and removed.

At the north end of the dam is a concrete structure designed to contain pumping equipment. The pumping facilities allow water to be pumped from the Rogue River into four canals at higher elevations, using hydraulically-powered pumps. One turbine drives a centrifugal pump which supplies water through a 42-inch pipe within the dam to the South Highline Canal and Savage Lateral on the south side of the Rogue River. The other turbine drives two pumps connected in series which supply water to the Tokay Canal and Evans Creek Lateral on the north side of the Rogue River. The two headworks are fed by the turbine and pump system on the north bank that diverts up to a total of 800 cfs from the river, 660 cfs of which drives two turbines, providing the energy for three pumps to lift

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about 90 cfs up to the canals. The water that drives the turbines returns directly to the tailrace of the dam.

The remaining diversion from the dam is the gravity diversion into the Gravity Canal (also known as the South Canal) at the south end of the dam. Flow is regulated by two four-foot by four-foot, hand-operated, slide gates in a headworks at the upstream face of the dam. GPID facilities also includes nearly 160 miles of canals and four relift pumping plants (BOR 1995).

There are fish ladders located at both the north and south sides of the dam to provide for upstream and downstream fish migration. The north fish ladder is a rectangular, concrete structure containing pools 8 feet long and 9 feet wide. The south fish ladder is a concrete structure approximately 100 feet long and divided into 10 pools. Extending from the bottom of the south ladder to the river are a series of fish resting pools and attraction channels.

GPID currently serves approximately 8,000 patrons owning a total of 7,700 acres in Jackson and Josephine counties. Savage Rapids Dam provides GPID with its primary water supply via canals in the greater Grants Pass area. The water provided by GPID is not treated and thus is not used for human consumption. Of the 8,000 patrons, about 300 own more than 5 acres and the remaining 7,700 own less than 5 acres. The patrons with more than 5 acres represent a variety of agricultural interests (e.g., wine grapes, sugar beets, fruit orchards, etc.), but some industrial interests are also included in this group (e.g., lumber mills, a golf course, etc). Of the 7,700 patrons owning less than 5 acres, most use GPID water for small hayfields and/or personal vegetable gardens. Many of these patrons own less than 1/4 of an acre and use GPID water on their lawns (BOR 1995). Many GPID patrons have an alternative water source because they are served by municipal water from the city of Grants Pass, but this water is more expensive than GPID water. However, most GPID patrons, especially those with more than 5 acres, are outside the city of Grants Pass and do not have an alternative water source.

GPID is seeking to remove Savage Rapids Dam and to replace the existing diversion facilities with new, electrically-powered pumping plants. Dam removal and construction of new diversion points is expected to proceed in accordance with federal legislation introduced on October 23, 2000, as S. 3227 (106th Congress, 2nd Session). The District is committed to continuing support of this legislation. However, the funding is uncertain at this time, and GPID would like to continue operation of the current facility to provide water to its patrons.

GPID has prepared a Habitat Conservation Plan (HCP) that describes the Proposed Action at Savage Rapids Dam for one year, beginning with the irrigation season of 2001. GPID prepared the HCP to fulfill the requirements of section 10(a)(1)(B) of the Endangered Species Act (ESA) as part of an application to receive an Incidental Take Permit for listed Southern Oregon/Northern California (SONC) coho salmon. The SONC coho salmon are listed as threatened under the ESA. The HCP

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also considers the impacts of continued operation of the facility on Klamath Mountains Province (KMP) steelhead, a species that is proposed for listing. GPID proposes to continue current operations based on modifications developed during 1998-2000, with further modifications based on the timing of fish runs for the irrigation. During implementation of the HCP, GPID will also pursue federal funding for the removal of Savage Rapids Dam. By the end of the 2001 irrigation season, funding for dam removal should be secure, and a new proposed action can be identified.

This Environmental Assessment (EA) will determine whether significant environmental impacts could result from a proposed action, thus fulfilling the requirements of the National Environmental Policy Act (NEPA). This document presents a description and analysis of alternatives, and evaluates the impacts of the alternatives for the 2001 irrigation season.

2. PURPOSE OF AND NEED FOR ACTION

The purpose of the action is to issue a permit so that GPID can continue to supply water to their patrons and simultaneously pursue funding for removing the dam. GPID has prepared an HCP and wishes to receive an incidental take permit for SONC coho salmon (incidental take is not prohibited for KMP steelhead). Without this take permit, continued operations at Savage Rapids Dam would be subject to continued litigation for violation of the Endangered Species Act. The economic impact to the patrons of not receiving water during this period depends on what they use the water for, the existence and cost of alternative water sources, and the weather.

3. DESCRIPTION OF THE AFFECTED ENVIRONMENT

The description of the affected environment provided here represents baseline conditions of the watershed. Savage Rapids Dam and the GPID service area are within the lower part of the middle Rogue River basin which includes most of Josephine County and a large part of Jackson County (Figure 1). The middle Rogue River is surrounded by mountains, and most of the basin is forested. The headwaters of the Rogue River originate in the Cascade Range near Crater Lake and flows over 215 miles to its confluence with the Pacific Ocean at Gold Beach, Oregon. The total basin area encompasses over 5,000 square mile (USFWS 1995). Two major tributaries, the Illinois and the Applegate Rivers, head in the Siskiyou Mountains and flow north, entering the Rogue at RM 27 and 95, respectively.

The Rogue River is a designated wild and scenic waterway from its junction with the Applegate River just west of Grants Pass downstream to 10 miles upstream from the mouth at the Pacific Ocean. Savage Rapids Dam is located at RM 107 on the Rogue River, upstream of the wild and scenic reach.

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3.1 Climate, Soils and Geology

The area has mild, wet winters and hot, dry summers. The city of Grants Pass receives about 30 inches of precipitation annually, most of which falls during October through May. On average, only 2 inches of precipitation fall during June through September. Snow accumulates at high elevations during the winter and early spring and is the principal source of streamflow during late spring and summer.

In 1998, McLaren/Hart conducted a study to characterize the sediment behind the impoundment at Savage Rapids Dam (McLaren/Hart 1998). Generally, the sediment is sand with gravel on the north bank, and sand with silt on the south bank. The organic content of the soil is low. The sediment contains measurable concentrations of naturally inorganic elements, but virtually no man-made organic chemicals such as pesticides or other organic chemicals (i.e., PAHs).

3.2 Water Resources

The flow of the Rogue River at Grants Pass has ranged from 500 cfs to as high as 152,000 cfs (BOR 1995). Two-year return flows are approximately 35,000 cfs. Completion of Lost Creek Dam in 1977 provided significant regulation of flows in the middle reach of the Rogue River. About 10 to 20 percent of the total Rogue River flow originates upstream of Lost Creek Dam.

The Rogue River is the principal source for municipal, industrial, and irrigation water as well as for water-based recreation in the Grants Pass area. Under currently designated water rights and instream flow requirements, the Rogue River at Grants Pass has no additional streamflow available for diversion during most of the year (OWRD 1991). The major water user in the area is GPID which has rights to divert water for irrigation and an instream nonconsumptive water right for operation of its hydraulic turbines. The out-of-stream diversion at Savage Rapids Dam historically averaged 180 cfs, and the nonconsumptive use to power the pump turbines is 800 cfs. With implementation of a water conservation plan, out-of-stream diversion by GPID is 150 cfs.

In addition, the Fort Vannoy Irrigation District and the Apple-Rogue District Improvement Company have minor irrigation water rights. The ODFW has a water right to divert water from the Rogue River to enhance flows in tributaries, and this water, when requested, is carried by GPID facilities. The cities of Grants Pass and Rogue River divert water for municipal and industrial purposes.

Water quality of the Rogue River is generally good. Hot, dry periods in the summer can produce undesirable high water temperatures. The reach of the Rogue River between Applegate River and Evans Creek is listed on the Oregon Department of Environmental Quality (ODEQ) 303(d) List of Water Quality Limited Water Bodies for not meeting the temperature and bacteria criteria. Bacteria

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counts exceed the fecal coliform standards 12% of the times measured. Water temperatures exceed established rearing temperatures throughout the summer. Although logging, and urban and agricultural development have had a detrimental effect in some areas, the overall quality of the aquatic system is good (BOR 1995).

3.3 Vegetation

Land cover type in the project area is native forest with a mixed shrub and herbaceous understory. Native forest is oak/madrone deciduous woods and pine/Douglas fir mixed conifer forest. The shoreline along the seasonal reservoir is highly developed with scattered houses, lawns, gardens, small pastures, parks, and recreational vehicle campgrounds. In some areas, deciduous trees and shrubs form dense riparian vegetation. Alder, ash, cottonwood, willow, snowberry, sumac and backberry are common along the shoreline. When the reservoir is lowered at the end of the irrigation season, some persistent grasses are evident, but most land between the reservoir high waterline and the natural high waterline of the river is rocky or gravelly and bare of vegetation.

3.4 Fisheries Habitat and Resources

The Rogue River supports a large population of anadromous salmonids including spring and fall chinook salmon, coho salmon, summer and winter steelhead, and sea-run cutthroat trout. Of these, steelhead and chinook salmon are the most abundant and the most widely distributed. There are also four species of resident trout, six species of warm-water game fish, two species of sturgeon, and shad, which have overlapping or coinciding distributions. An ODFW administrative rule for wild fish management (OAR 635-07-525) contains a Policy giving protection and enhancement of wild stocks first and highest consideration. Wild fish make up more than 90 percent of the fall chinook and winter steelhead, and account for about 50 percent of the spring chinook, coho and summer steelhead that return to the Rogue River (USFWS 1995). The production of hatchery fish in the basin is done to mitigate the loss of habitat upstream of Lost Creek and Applegate Dams, both part of the Corps of Engineers Rogue Basin Project.

Habitat within the confines of the reservoir created by Savage Rapids Dam is poor for salmon and steelhead because flow is slowed and bottom sediments do not contain gravelly conditions favorable for spawning beds. As a result, adults do not generally spawn in the reservoir reach. Juvenile salmonids may be exposed to higher levels of predation from fish and birds as they migrate downstream through the slower moving waters of the reservoir. Seasonal raising and lowering of the impoundment limits the establishment of an aquatic substrate to support a significant resident fish population of trout or other resident fish.

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Rainbow trout are common in the middle and upper Rogue River system. Coastal cutthroat trout are found in headwater tributaries of high elevation tributaries. Brook and brown trout are introduced species found in the North Fork Rogue River between Prospect and Union Creek.

Warm-water game fish are abundant in lakes, reservoirs and ponds, some at harvestable levels. The most prevalent species are black crappie, largemouth bass, bluegill, brown bullheads, and green sunfish. Nongame fish include suckers, carp, roach, sculpins, dace, and red-sided shiners.

3.5 Wildlife

Land use surrounding the reservoir formed by Savage Rapids Dam can be classified as urban and suburban. Interstate 5 borders the reservoir on the north and Highway 99 borders the reservoir on the south. Consequently wildlife present tend to be tolerant of human disturbance. Waterfowl are most common during spring and fall migration periods, although some species are present year-round. Diving ducks such as mergansers, scaup, redheads, and goldeneye are common in the pool upstream of the dam because of the small fish present (USFWS 1995). Migratory song birds use the wooded forest and shrub areas. Fur-bearing mammals such as mink, beaver, river otter, muskrat, nutria and racoon use the area intermittently but are not permanent residents.

Upland species are found in agricultural portions of the basin. These include ring-necked pheasants, California quail, mourning dove, and bandtailed pigeon. Resident brush rabbits and western gray squirrels are present but limited.

3.6 Threatened and Endangered Species

Coho salmon (*Oncorhynchus kisutch*) of the Rogue River basin are within the Southern Oregon/Northern California (SONC) Evolutionarily Significant Unit (ESU). This ESU was listed as threatened under the ESA by the NMFS on May 6, 1997 (62 FR 24588). Biological information on SONC coho salmon may be found in Weitkamp et al. (1995). Critical habitat was designated for the SONC coho salmon on May 5, 1999 (64 FR 24049). Critical habitat for SONC coho salmon consists of all waterways below naturally impassable barriers including the project area. The adjacent riparian zone is also included in the designation. This zone is defined as the area that provides the following functions: Shade, sediment, nutrient or chemical regulation, streambank stability, and input of large woody debris or organic matter. Interim protective regulations for SONC coho were issued under section 4(d) of the ESA on July 18, 1997 (62 FR 38479). Long-term trends suggest that natural populations are not self-sustaining.

Adult coho salmon migrate upstream past Savage Rapids Dam from October through mid-December (BOR 1995). Spawning occurs in smaller tributaries through January. Juvenile coho

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typically rear through one entire year in the area where they were spawned, and then migrate to sea as yearling smolts in the spring. Juveniles migrate downstream from approximately April through June. Although some subyearling coho have been captured at Savage Rapids Dam, evidence suggest that these fish were competitively displaced from the primary rearing areas upstream. It is thought that these subyearling migrants either perish or rear downstream for another year before entering the ocean. Research has demonstrated that coho migrating as subyearling are likely to be smaller than their cohorts that did not migrate, and are poor contributors to adult returns (Solazzi et al. 1990). Small tributary streams that are able to maintain flow are the preferred summer habitat for juveniles (Stein et al. 1972).

The Klamath Mountains Province (KMP) steelhead (*Oncorhynchus mykiss*) occur in the proposed action area. KMP steelhead, including both summer and winter runs, were proposed for listing as a threatened species under the ESA on February 12, 2001 (66 FR 9808). A final agency determination will be promulgated by March 31, 2001.

Both summer and winter steelhead spawn and rear in the Rogue Basin up and downstream of Savage Rapids Dam. Summer steelhead spawn in tributary streams that enter the Rogue River primarily between river miles 65 and 159. Savage Rapids Dam is in the middle of this range at mile 107. Ninety-five percent of summer steelhead first return to the Rogue River as immature “half-pounders” (ODFW 1994), most of which do not migrate above mile 75. Winter steelhead spawn throughout the Rogue Basin, with 13% to 25% of the winter steelhead migrating upstream of Gold Ray Dam.

Summer steelhead adults begin migrating past Savage Rapids Dam in mid-May through December, with peak migration from mid-September through December. Winter steelhead adults migrate upstream from January through mid-May, with peak migration from mid-March through mid-May. Juveniles outmigrate from March through September, with the peak occurring in the spring. Juveniles migrates as fry, parr and smolts.

3.7 Cultural Resources

The Rogue River corridor was used extensively by prehistoric and historic populations. Archeological surveys have not been made of the dam and reservoir area to determine if sites are present.

3.8 Recreation

Within the Rogue River basin, recreation and tourism are important economic activities. Visitors as well as residents use the river and adjacent land for fishing, hunting, camping, backpacking, hiking, boating, jet skiing, picnicking, photography, nature study/viewing, and sightseeing. Water skiing

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is limited to reservoirs. With the exception of hunting, backpacking, and hiking, these activities are present in the Grants Pass/Savage Rapids Dam area.

River running and touring on the Rogue River have become so popular that permits are now required for many downstream reaches in order to regulate the number of trips and people in an effort to limit adverse effects on the river system.

The reservoir is relatively narrow, which limits boat use on the reservoir. The reservoir is not a primary or secondary destination site for any significant number of non-local visitors (BOR 1995). Even local use is limited because of the narrow surface area which contributes to crowding and safety problems.

The quality of fish in the reservoir is considered poor and is an incidental activity. The State formerly stocked the reach from Gold Ray Dam to the upper end of Savage Rapids impoundment with catchable-size trout. Stocking was stopped in 1994 to avoid conflicts with wild fish. Most of the fishing in the general area takes place in the 2,000-foot reach downstream from Savage Rapids Dam to Pierce Riffle because this reach has a higher than average concentration of fish.

Although the area on the south abutment of the dam is not designated or developed for public access, the location is well known and used by local people for fish viewing during spawning runs. Local groups have installed a bench here.

3.9 Socioeconomic Conditions

Most of the Rogue River basin population is within the central valley region. Medford is the largest city in the region and is located 30 miles southeast of Grants Pass. Most of the basin's economic development has also taken place within the central valley and is based on the lumber and wood products industries, agriculture and recreation. Most of the usable land within the valley is well developed and fully utilized within the constraints of climatic conditions and the availability of water, soils, and topographic features. Urban growth has encroached on commercial agricultural land.

Douglas fir is the major commercial tree species and accounts for about 50 percent of the commercial growing stock in Jackson County and two-thirds in Josephine County (BOR 1995). Douglas fir is the primary species used in the production of softwood plywood and lumber.

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3.10 Indian Trust Assets

There are no Indian-owned lands in the vicinity of Savage Rapids Dam. There are no Indian reservations located in the Rogue River basin. No Indian trust assets such as hunting and fishing rights have been identified in the basin.

4. ALTERNATIVES INCLUDING THE PROPOSED ACTION

4.1 Alternative 1 - No Action Alternative

Under this alternative, NMFS would grant a 99-year ITP for an HCP that would require no changes to historic operations (pre-1998), although structural changes to the facility would remain in place. The Savage Rapids Dam would remain in place. No monitoring of impacts to fish would occur, and there would be no triggers for the shut-down of operations. NMFS is required by law to evaluate at no action alternative

4.2 Alternative 2 - Proposed (Preferred) Action

Under the proposed action, NMFS would grant a one-year Incidental Take Permit (ITP) for irrigation operations while GPID pursues authorization and funding for the removal of Savage Rapids Dam. The ITP would be based on a Habitat Conservation Plan (HCP) that describes GPID activities for the 2001 irrigation season. Under the HCP, GPID would continue to divert 150 cfs of water from the Rogue River at Savage Rapids Dam into GPID's distribution system. In addition, the GPID Board will make every effort to promote support for dam removal, and secure legislation to authorize and fund dam removal.

GPID generally begins diverting water in April, with water use increasing throughout the summer months of June, July and August. Historically, diversion rates begin to decline in September and the end of the irrigation season is in October. At the beginning of the irrigation season, usually in late April, the radial gates are opened to lower the reservoir pool, allowing installation of the stoplogs. Three metal stoplogs are placed in each of the 16 bays to raise the reservoir water surface elevation 11 feet above the concrete crest of the dam to an elevation of 964 feet above mean sea level. Once this is done, the radial gates are partially closed to fill the reservoir without completely interrupting riverflow. Approximately 1,000 cfs are allowed to pass until the filling is completed and the fish ladders are functioning.

GPID will continue to seek the advice of its consultants and staff to make reasonably practicable adjustments to improve fish passage at the dam. The District will devote the remaining

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portion of its \$265,000 grant (roughly \$125,000 remains unspent) from the State of Oregon to make improvements at the fish passage facilities that GPID, its consultants, and NMFS deem reasonable.

4.2.1 North Turbine/Pump Intake

GPID will not divert water at the North Turbine/Pump Intake prior to May 7, 2001. After that date, water can be diverted so long as measured impacts on listed salmonids do not exceed the trigger levels identified in the monitoring plan below. As set forth in the monitoring plan, irrigation diversions at the North Turbine/Pump Intake will also be halted when trigger levels of listed coho salmon are present.

GPID will continue to operate and maintain a brush seal at the base of the traveling screens, as well as a screen backwash system. GPID will continue to operate and maintain the seal improvements between the traveling screen panels. GPID will attempt to eliminate gaps bigger than 1.75 mm. GPID will also continue to operate and maintain the other interim measures installed prior to the start of water diversions in 1998-2000, including modifications to the bypass system.

GPID will clear debris from the trash racks in front of the traveling screens on a daily basis. GPID will also inspect and attempt to clean the bypass ports daily.

4.2.2 South Gravity Intake

GPID will operate and maintain the interim measures installed prior to the start of water diversions in 1998-2000, including maintaining the new screen, the motorized screen cleaner, the light at the head gate, the perforated baffle plates behind the juvenile fish screens, and the neoprene seals around the screens. GPID may divert water into the South Gravity Intake at any time, provided GPID does not exceed a 0.4 fps approach at the bar screens.

4.2.3 Fall Operations

GPID will commence pulling stoplogs on October 9, and complete all stoplog removal by November 1, 2001.

4.2.4 Monitoring

The existing traveling screen bypass trap will be operated at the North Turbine-Pump Intake, unless NMFS and GPID agree to some other location. GPID will monitor the bypass trap, and potentially shut down its water diversion, as described below.

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During the first two days of operation, GPID will sample the trap at the traveling screen bypass every three hours, beginning no later than three hours following the initial start of irrigation diversion. GPID will immediately cease diversion activities for 72 hours if a cumulative total of 100 or more Age 1+ juvenile coho are observed in the trap at any time during a 24 hour period. A NMFS representative may be present during this two-day period.

Thereafter, until June 15th, GPID will sample the trap at the traveling screen bypass every 12 hours during water diversion operations, and until July 15th, sample once daily. During this time, GPID will immediately cease diversion activities for 48 hours if 100 or more Age 1+ juvenile coho are counted in the trap at the traveling screen bypass during a 24 hour period. For purposes of these “trigger” calculations, five Age 0+ fish will be considered to be the equivalent of one Age 1+ fish.

GPID will also continue a net-based sampling program on one of the two canals flowing from the Tokay Canal/Evans Creek Lateral headworks to quantify numbers of fish which may be bypassing screens. Monitoring of the net will occur daily during each business day after water diversions begin at the North Turbine-Pump Intake and continue through July 15th.

GPID will sample impingement using a washbasket for at least six daylight hours and at least six nighttime hours per week during facility operations.

Fences have been placed along the fishways to prevent adult fish from jumping out of the ladder during migration. Possible stranding of fish from swimming out of the fishways will be monitored daily if high water occurs. Stranded fish will be rescued and returned to the river.

4.2.5 Funding for Removal of Savage Rapids Dam

During implementation of the HCP, GPID will continue to pursue federal authorization and funding for the removal of Savage Rapids Dam and replacement of the dam with electric pumps for irrigation. GPID will contact Senators Ron Wyden and Gordon Smith and Congressman Greg Walden to re-introduce legislation to provide the funding. GPID will continue to provide funding (\$50,000) for lobbying efforts to promote and secure the dam removal legislation.

4.3 ALTERNATIVE 3 - EXTENSIVE ALTERATIONS TO IRRIGATION

Under this alternative, NMFS would grant a one-year ITP for interim operations with extensive alterations to the irrigation system, thus minimizing the volume of water withdrawn from the Rogue River. GPID would continue to pursue federal authorization and funding for dam removal.

4.4 Alternative 4 - Replacing North Irrigation Facilities

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Under this alternative, NMFS would grant a 99-year ITP for an HCP that would require the replacement of the north irrigation screens with new screens in compliance with NMFS screen criteria. The Savage Rapids Dam and its water-powered turbine pumps would remain in place. No monitoring of impacts to fish would occur, and there would be no triggers for the shutdown of operations.

5. ENVIRONMENTAL CONSEQUENCES

5.1 Alternative 1 - No Action Alternative

Continued loss of fish at Savage Rapids Dam would occur. This alternative is costly and has a high level of uncertainty because it would entail continued litigation pursuant to take of SONC coho salmon and KMP steelhead.

5.2 Alternative 2 - Proposed (Preferred) Action

5.2.1 Climate, Soils and Geology

This alternative would have no effect on climate, soils and geology.

5.2.2 Water Resources

This alternative would have no effect on water resources.

5.2.3 Vegetation

This alternative would have no effect on vegetation or forest resources.

5.2.4 Fisheries Habitat and Resources

The modifications in operational and maintenance procedures of the GPID water diversion activity, as implemented since 1998, have not shown any detectable impacts to the habitat of the forebay area of the Savage Rapids Dam. Improved habitat conditions may be detectable in the tailrace area because of changes in the spill pattern (over the dam crest onto the mid-channel rock abutment) and in the hydraulic profile resulting from the modified stoplog design and placement.

Facility operations will not alter the habitat conditions of the upstream zone affected by the hydraulics of the forebay area (pool) of the Savage Rapids Dam. Conditions will remain as they have since the dam was constructed over 75 years ago. Structural and operational modifications of the dam

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crest, implemented under this alternative, will have a positive impact relative to the hydraulic conditions in the tailrace zone downstream of Savage Rapids Dam by concentrating spill in the deeper portions of the tailrace.

5.2.5 Wildlife

This alternative would have no effect on wildlife habitat or species.

5.2.6 Threatened and Endangered Species

Lethal and non-lethal impacts to coho salmon and steelhead would result from the proposed action. Lethal impacts include mortality of adults and juveniles, and non-lethal impacts could include impacts to habitat and increased energy costs associated with migrating through the dam and reservoir.

Total mortality of juvenile salmonids related to operation of Savage Rapids Dam is estimated based on the overlap in the timing of migration with the period of dam operation, and by the proportion of flow affected by the dam. All fish entrained into the irrigation canals (both on the north and south side) die because there is no return route to the river. The turbines on the north were not designed to be “fish friendly”, therefore approximately 30% of the entrained fish that pass through them are killed or injured. In addition, approximately half of the fish impinged by the screen die, and there is additional mortality associated with the pump. Under current operations, there is very low mortality of juvenile fish passing through the fish bypass or over the spillway.

In a variety of flow conditions, the addition of forebay lighting to attract fish over the spillway appears to dramatically reduce the number of juveniles that are impacted by the dam. A study conducted by GPID in 1998 demonstrated that fish use of the north-side bypass system appeared to drop by 90 % on nights when lighting over the spillway was turned on. There was no increase in fish entrainment on those nights, so the fish have apparently passed over the spillway as intended.

The only observed mortality to adult coho salmon passing Savage Rapids Dam has been from fish that jumped or swam out of the fishway. Fences have been placed along the fishways to prevent fish from jumping out and being stranded. However, the poor design of the fishways likely result in substantial delay and some mortality of adults.

Predation by birds and fish, particularly on juvenile salmonids, likely occurs in the forebay and at the tailrace.

The most notable effects of Savage Rapids Dam on adult fish passage in the past have been on spring chinook and steelhead during periods of high flow. When flow exceeds roughly 10,000 cfs, spill

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occurs over all bays of the dam and the attraction flows into the ladder become difficult for adult fish to locate. This results in delay of upstream migration until flows recede. Some fish may become injured from jumping onto rock or falling back onto rocks. Additionally, some adults become stranded in pools on the rocky outcroppings as flows recede.

5.2.7 Cultural Resources

This alternative would have no effect on cultural resources.

5.2.8 Recreation

This alternative would have no effect on recreation.

5.2.9 Socioeconomic Conditions

This alternative would have no effect on socioeconomic conditions. Monitoring activities and any required alterations to facilities at Savage Rapids Dam would be funded by an existing grant from the state of Oregon.

5.3 Alternative 3 - Extensive Alterations to Irrigation

More extensive alterations to irrigation operations would result in a reduction in the amount of water diverted from the Rogue River into the GPID canal system. This would result in reduced mortality to juvenile salmonids due to entrainment and impingement. There would also be reduced mortality at the pumps.

Mortality of juvenile salmonids associated with predation in the tailrace and forebay (pool) would remain the same. Mortality at the turbine and bypass systems would also remain. For adult salmonids, the mortality and increased metabolic energy cost associated with migrating past the dam structure and fish ladders and through the reservoir would remain.

GPID considers further alterations to irrigation operations would be economically impractical since further restrictions would undermine GPID's ability to deliver water to its patrons.

5.4 Alternative 4 - Replacing North Irrigation Screens

Replacing the north irrigation screens would reduce pumping-related juvenile mortality at the dam site. Other sources of mortality and harm would remain.

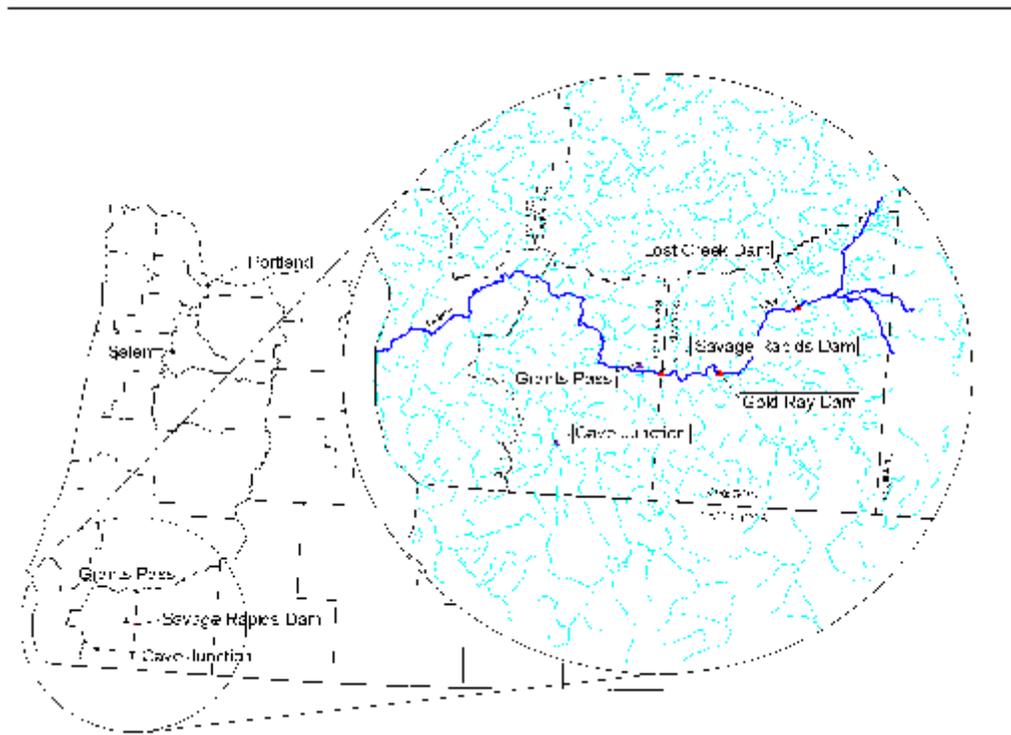
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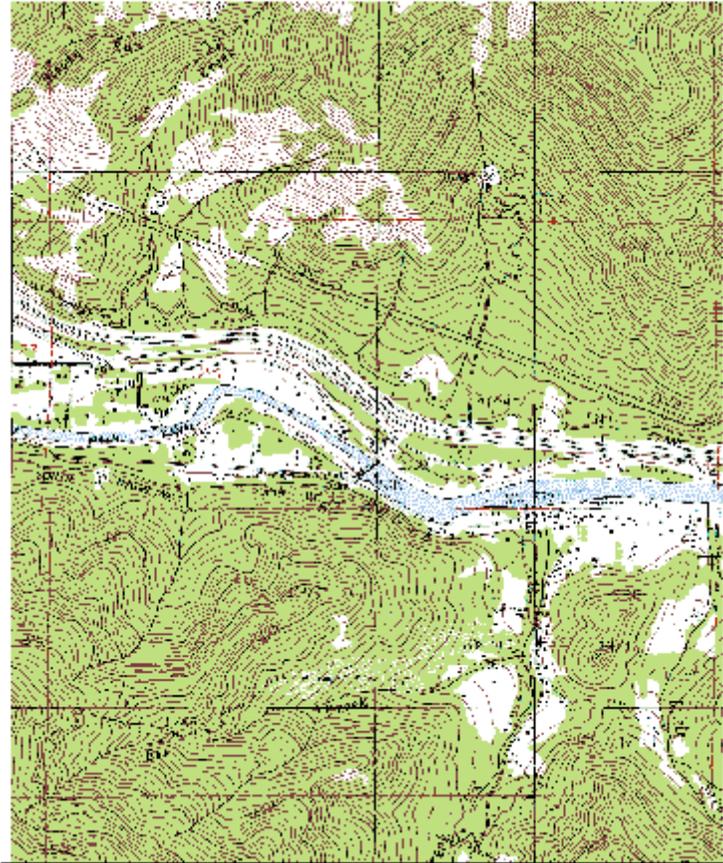
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Figure 1. Vicinity map.



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Figure 2. Location of Savage Rapids Dam.



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APPENDIX A

List of Preparers

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APPENDIX B

List of Agencies, Organizations, and Person to whom copies of the Environmental Assessment are Sent

U.S. Congressional Delegation

Honorable Ron Wyden U.S. Senate, Washington D.C.,
Honorable Gordon Smith, U.S. Senate, Washington, D.C.,
Honorable Greg Walden, U.S. House of Representatives, Washington, D.C.,

State Delegation

Honorable John Kitzhaber, Governor, State of Oregon, Salem, OR

Honorable Bill Fisher, Oregon State Senate, District 23, OR
Honorable Jason Atkinson, Oregon State Senate, District 25, OR
Honorable Lenn Hannon, Oregon State Senate, District 26, OR
Honorable Susan Morgan, Oregon House of Representatives, District 46, Oregon
Honorable Carl Wilson, Oregon House of Representatives, District 49, Oregon
Honorable Rob Patridge, Oregon House of Representatives, District 50, Oregon
Honorable Cherryl Walker, Oregon House of Representatives, District 51, Oregon

Federal Agencies

Natural Resources Conservation Service
U.S. Fish and Wildlife Services
U.S. Bureau of Reclamation

Indian, State, and Other Agencies

Oregon Department of Fish and Wildlife
Oregon Water Resources Department

Local Entities

Jackson County
Josephine County
City of Grants Pass
City of Rogue River
Rogue Valley Council of Governments

Libraries

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Medford Headquarters Library
Rogue River Regional Library
Josephine County Library Services

Organizations and Individuals

American Fisheries Society
American Rivers, Washington D.C.
Rogue River Flyfishers
Izaak Walton League
WaterWatch of Oregon Inc.
Earthjustice Legal Defense Fund
Curry Guides Association