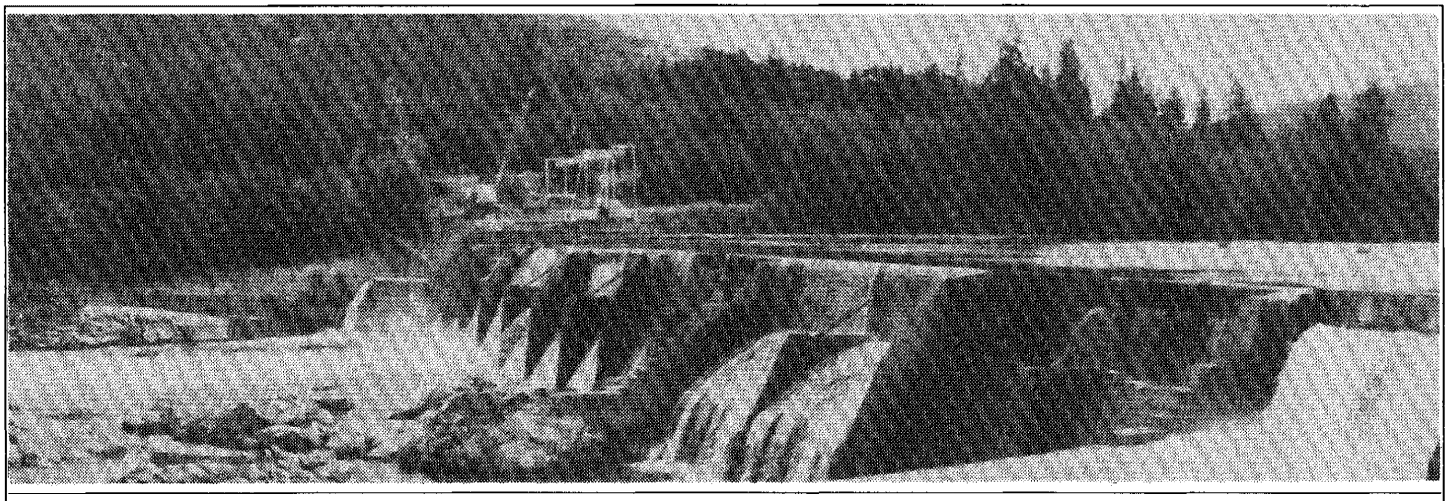
Fish Passage Improvements
Savage Rapids Dam

PLANNING REPORT
AND
FINAL ENVIRONMENTAL STATEMENT



JOSEPHINE COUNTY
WATER MANAGEMENT IMPROVEMENT STUDY, OREGON
Rogue River Basin, Oregon

U.S. DEPARTMENT OF THE INTERIOR
Bruce Babbitt, Secretary

BUREAU OF RECLAMATION
Daniel P. Beard, Commissioner

PRINTING HISTORY

- **The document *Fish Passage Improvements, Savage Rapids Dam, Oregon, Planning Report and Final Environmental Statement* was released in August 1995.**

- **First reprinting — November 1997; 30 copies. This included the same material as the original PR/FES except that the "Record of Decision" (March 1997) and "Amendment to Record of Decision" (April 1997) were added.**

- **Second reprinting — December 2000, 15 copies.**

- **Third reprinting — January 2004; 15 copies.**

AMENDMENT TO THE RECORD OF DECISION

FOR

BUREAU OF RECLAMATION
FINAL ENVIRONMENTAL IMPACT STATEMENT

FISH PASSAGE IMPROVEMENTS
SAVAGE RAPIDS DAM, OREGON

APRIL 1997

The Record of Decision (ROD) signed on March 14, 1997, contains an error pertaining to the Grants Pass Irrigation District's (GPID) position on the Preferred Alternative. The ROD indicates that the GPID appears not to support the Preferred Alternative but instead wishes to pursue other options. GPID has not voted to support any alternative other than the one presented as the Preferred Alternative. In addition, GPID has not requested permission from the Oregon Water Resources Commission to modify its current fish passage plan, which is the same as the Preferred Alternative.

Therefore, on page 4 of the ROD, the last sentence of the first paragraph under VIII. Decision is deleted and replaced with the following sentence: "However, the Preferred Alternative lacks widespread public acceptance."

APPROVED:

Date April 17, 1997

John W. Keys, III
Regional Director
Pacific Northwest Region
Bureau of Reclamation

United States Department of the Interior

BUREAU OF RECLAMATION
Pacific Northwest Region
1150 North Curtis Road
Boise, Idaho 83706-1234

IN REPLY REFER TO:

PN-6519
ENV-6.00

MAR 2 0 1997

Subject: Record of Decision for Fish Passage Improvements at Savage Rapids Dam, Rogue River Basin, Oregon

Ladies and Gentlemen:

Enclosed for your information is a copy of the Record of Decision (ROD) for the subject project. The ROD finalizes Reclamation's study of alternatives to improve salmon and steelhead passage at Savage Rapids Dam.

The ROD identifies the Preferred Alternative, described in the Planning Report/Final Environmental Statement, as the most efficient and environmentally sound alternative for providing safe salmon and steelhead passage at Savage Rapids Dam. As indicated in the ROD, Reclamation will not be pursuing congressional action to authorize or fund the Preferred Alternative because the Grants Pass Irrigation District wishes to pursue a different course of action.

Thank you for your interest in this project. If you have questions about the ROD, please contact Mr. J. Eric Glover, Lower Columbia Area Manager, at (503) 872-2795.

Sincerely,

Kenneth R. Peddle

ACTING FOR John W. Keys, III
Regional Director

Enclosure

RECORD OF DECISION
MARCH 1997

BUREAU OF RECLAMATION
FINAL ENVIRONMENTAL IMPACT STATEMENT

FISH PASSAGE IMPROVEMENTS SAVAGE RAPIDS DAM, OREGON

I. INTRODUCTION

This document constitutes the Record of Decision (ROD) of the Bureau of Reclamation (Reclamation), Pacific Northwest Region, for fish passage improvements at Savage Rapids Dam. The investigation was conducted under authority of Public Law 92-199, enacted December 15, 1971 (85 Stat. 664). Savage Rapids Dam is an irrigation diversion structure constructed by the Grants Pass Irrigation District (GPID) in 1921. It is located on the Rogue River in southwest Oregon.

In 1971, Reclamation was authorized by the Congress to conduct feasibility studies of anadromous fish passage at the dam and improvements to the GPID irrigation system. The anadromous fish of concern are salmon and steelhead. Detailed studies of salmon and steelhead passage were completed in the 1970's and interim fish passage improvements were made between 1977-1981. Studies of irrigation system improvements were deferred at that time because of lack of local support. Additional anadromous fish passage improvements were deferred because of the uncertainty of potential hydropower development at the dam.

In 1988, Reclamation initiated the Josephine County Water Management Improvement Study in response to requests by Josephine County and the GPID. The main objectives of the study were to (1) identify a permanent solution to salmon and steelhead passage problems at Savage Rapids Dam and (2) help resolve conflicts over water uses in Josephine County. The Planning Report/Final Environmental Statement (PR/FES), filed on August 30, 1995, and this ROD focus only on salmon and steelhead passage concerns at the dam and the associated diversion facilities.

II. ALTERNATIVES CONSIDERED

Two action alternatives (Pumping and Dam Retention) and the No Action Alternative were evaluated in the PR/FES. The description of conditions that would exist with the No Action Alternative serves as the baseline for evaluating the effects of the action alternatives.

The Pumping Alternative was identified as the Preferred Alternative in the PR/FES. The Preferred Alternative consists of three parts: (1) replacement of GPID pumping and diversion facilities at the dam with two new pumping plants, one each on the north and south sides of the river; (2) removal of the dam and appurtenant structures and restoration of the site, and (3) forgiveness of the remaining debt to the Federal government amounting to $290,525 as of 1994 (remaining debt as of 1997 is $210,035).

The other action alternative, Dam Retention Alternative, would retain Savage Rapids Dam. Numerous modifications would be made to the dam and control structures to enhance salmon and steelhead passage and protection and operation of the dam and diversion facilities. New fish passage and protective facilities that meet current standards of the National Marine Fisheries Service (NMFS) would be constructed and river channel and dam crest modifications would be made. Existing hydraulic turbines and pumps would be replaced and discharge lines for the irrigation diversion would be replaced or rehabilitated with this alternative.

The No Action Alternative is the best estimate of what would happen in the future if an action alternative is not implemented. For this analysis, Reclamation assumed that GPID would continue to operate the current facilities, making repairs and replacements as needed for up to 20 years. It was further assumed that at some point within this time, the State of Oregon or the Federal government would intervene to mandate fish passage and protective improvements.

III. BASIS FOR FORMULATING AND SELECTING ALTERNATIVES

The action alternatives were formulated on the basis that Reclamation involvement must include (1) improved fish passage for steelhead and salmon and (2) facilities for the GPID diversions. The United States considers anadromous fish to be a national resource and has an interest in the continued operation of the GPID which has remaining debt due to the United States from earlier rehabilitation work by Reclamation.

Under Reclamation policy and Federal rules and regulations, all action alternatives must meet the criteria of completeness, effectiveness, efficiency, and acceptability. In testing whether or not alternatives meet these criteria: (1) monetary benefits to the Nation are compared with monetary costs, (2) economic effects of monetary transfers to the region are compared with transfers out of the region, (3) environmental effects are identified, and (4) other social effects are identified. Two action alternatives—Pumping and Dam Retention—were found to meet the four criteria, but at varying levels of effectiveness, efficiency, and local acceptability.

Reclamation is required to select the action alternative that provides the greatest net economic benefits. Net annual benefits to the Nation with the Pumping Alternative would be about double the net annual benefits with the Dam Retention Alternative. The Pumping Alternative was selected as the Preferred Alternative on the basis that it would be more effective by providing greater fish benefits and would be more efficient by costing less.

IV. ENVIRONMENTALLY PREFERABLE ALTERNATIVE

Reclamation believes that the Preferred Alternative, as presented in the PR/FES, is the environmentally preferable alternative.

V. MAJOR ISSUES

- In 1994, the board of directors for the GPID passed a resolution supporting removal of the dam and construction of pumping plants. The State of Oregon based the extension of a supplemental water permit for GPID in part on implementation of the Preferred Alternative. However, the membership of the board of directors has changed and current members of the board do not actively support removal of Savage Rapids Dam (the Preferred Alternative). The new board members are involved in reassessing the GPID position based on financial and legal considerations.

- During the public review process for the PR/FES, it became clear that some members of the public were highly opposed to removal of the dam. The main opposition was based on maintaining the seasonal lake formed by Savage Rapids Dam. However, there is a widespread misconception that removal of the dam would eliminate irrigation in the area, and there seemed to be widespread skepticism that anadromous fish are killed at the dam.

- After completion of the PR/FES, the Oregon Legislature passed a law directing establishment of a task force to review the findings of the report and to make recommendations. That task force has completed its work and recommends a third action alternative which is similar to the Dam Retention Alternative but would replace the hydraulically powered pumps with electrically driven pumps.

  The alternative identified by the task force has not been evaluated under National Environmental Policy Act (NEPA) requirements. That evaluation would be required before Reclamation could fully compare the task force alternative with the Preferred Alternative identified in the PR/FES. The cost of the task force alternative has been identified and is greater than that of the Preferred Alterative. However, the task force proposes to add other sources of financing so that the Federal cost share for the task force alternative would be less than for the Preferred Alternative. At this time, the task force has not offered a specific proposal in that regard.

  Although benefits of the task force alternative have not been identified, those benefits would be comparable to those identified for the Dam Retention Alternative identified in the PR/FES. As a result, net benefits would be less with the task force alternative than with the Preferred Alternative identified in the PR/FES.

- In March 1995, the NMFS proposed listing a specific stock of coastal steelhead and, in July 1995, proposed listing three evolutionarily significant units of coho salmon on the Pacific coast as threatened under the Endangered Species Act (ESA). Coho salmon and steelhead that pass Savage Rapids Dam belong to fish stocks included in the proposal. In each case, a final decision was to be made within 12 months. However, the proposal on steelhead has been expanded to their entire geographic range along the West Coast. Conflicting data on coho required additional time for study. As a result, final determinations on coho and steelhead listings are scheduled for mid-1997. A final ESA listing determination for either species would require Section 7 consultations with NMFS before implementation of an action alternative at Savage Rapids Dam.

VI. PUBLIC RESPONSE TO FINAL ENVIRONMENTAL STATEMENT

Following the filing of the FES on August 30, 1995, Reclamation received two letters of comment.

- Randy Hinke commented that removal of the Savage Rapids Dam could have some civil defense implications. Reclamation referred the letter to the Federal Emergency Management Agency (FEMA). FEMA responded to Mr. Hinke that there was no policy on national emergency preparedness policy relative to removal or retention of Savage Rapids Dam.

- Lynn and Della Berntson stated in a letter of comment that they were not pleased with any plan to remove Savage Rapids Dam, disagreed with Reclamation's evaluation of the effect of Savage Rapids Dam on salmon and steelhead, and were skeptical of the costs of the two alternatives. They also urged Reclamation to "simply fix the ladder using local contractors." A response was not considered necessary because the comments merely reflected opinion and preference.

VII. ENVIRONMENTAL COMMITMENTS

The environmental commitments, monitoring, and enforcement programs discussed in the PR/FES are neither meaningful nor applicable to Reclamation's decision and are, therefore, not discussed in this ROD.

VIII. DECISION

The Preferred Alternative (Pumping Alternative) is the most efficient and environmentally sound alternative for providing safe salmon and steelhead passage at this irrigation diversion. In addition, the Preferred Alternative would reestablish a free flowing reach of river while extending the useful life of the irrigation diversion facilities and protecting the Federal investment. However, it appears that neither the GPID nor the task force appointed by the Governor support the Preferred Alternative; they wish to pursue other options.

Reclamation considers its study of alternatives to improve salmon and steelhead passage at Savage Rapids Dam and the evaluation of those alternatives under NEPA to be complete. Reclamation will not pursue congressional action to authorize or fund implementation of the Preferred Alternative identified in the PR/FES.

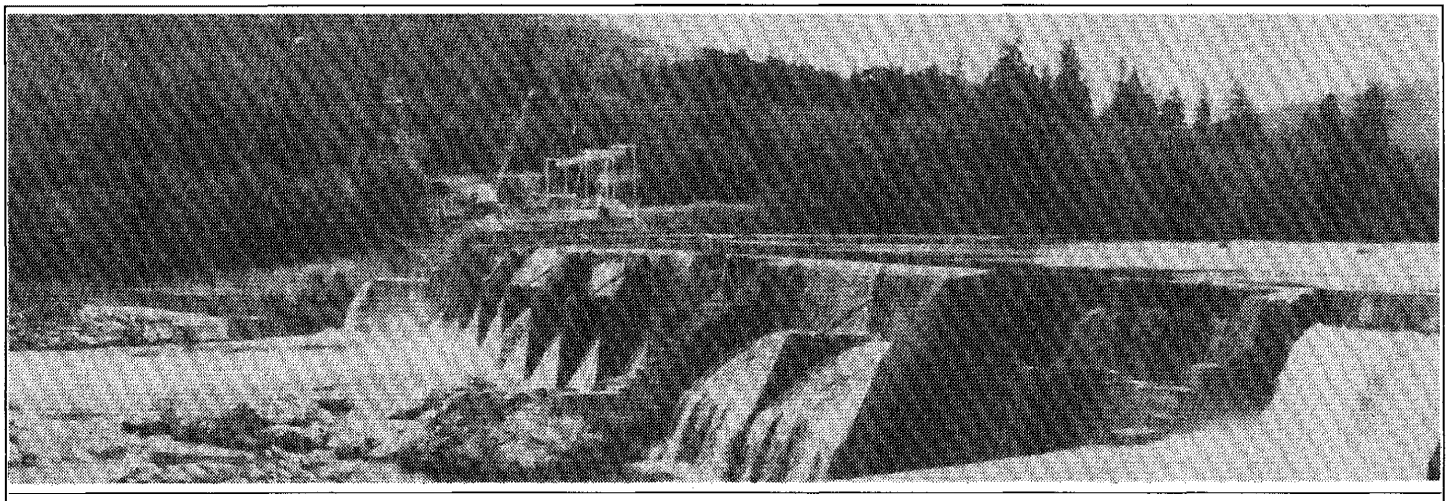
APPROVED:

Date MARCH 14, 1997

John W. Keys, III
Regional Director
Pacific Northwest Region
Bureau of Reclamation

Fish Passage Improvements
Savage Rapids Dam

PLANNING REPORT
AND
FINAL ENVIRONMENTAL STATEMENT



JOSEPHINE COUNTY
WATER MANAGEMENT IMPROVEMENT STUDY, OREGON
Rogue River Basin, Oregon

U.S. DEPARTMENT OF THE INTERIOR
Bruce Babbitt, Secretary

BUREAU OF RECLAMATION
Daniel P. Beard, Commissioner

Planning Report/Final Environmental Statement

Fish Passage Improvement
Savage Rapids Dam

Prepared by:

Pacific Northwest Region
Bureau of Reclamation
Department of the Interior

This is an integrated Planning Report/Final Environmental Statement (PR/FES) on a proposal for the Bureau of Reclamation to significantly enhance the salmon and steelhead populations of the Rogue River in Oregon. This PR/FES presents the results of agency and public review of the Planning Report/Draft Environmental Statement (PR/DES). Revisions were made to correct errors in the PR/DES and to accommodate other comments; however, no changes were made in the facilities of either action alternative or the evaluation of those alternatives.

Development objectives of significantly improving anadromous fish passage and maintaining a water diversion for the Grants Pass Irrigation District located in Jackson and Josephine Counties severely limited the possible alternatives. The federally preferred alternative and the preferred alternative of fish and wildlife agencies is the pumping alternative. Major plan elements include (1) construction of two electric powered pumping plants, one on each side of the river near the site of the existing dam, with a total capacity of 150 cubic feet per second and (2) demolition of the existing dam and related facilities and disposal of the waste. It is also proposed that the existing debt to the Federal government for rehabilitation work on the dam be forgiven as the dam would no longer exist. The other viable alternative is to leave the dam in place and provide new fish passage and protective facilities that would meet current standards of the National Marine Fisheries Service. New hydraulic turbines, pumps, and discharge lines for the irrigation diversion would be installed with this alternative.

The PR/DES was released to the public on December 15, 1994, and a public hearing on the PR/DES was held on February 16, 1995, in Grants Pass, Oregon. A Federal decision on the proposed project will not be made until at least 30 days after the PR/FES is filed with the Environmental Protection Agency and a Notice of Availability" appears in the *Federal Register*.

For further information, please contact Robert J. Hamilton, Bureau of Reclamation, 1150 North Curtis Road, Boise, Idaho 83706-1234, or call (208) 378-5087.

Statement number: **95–34**

Filing date: **August 30, 1995**

MISSION STATEMENTS

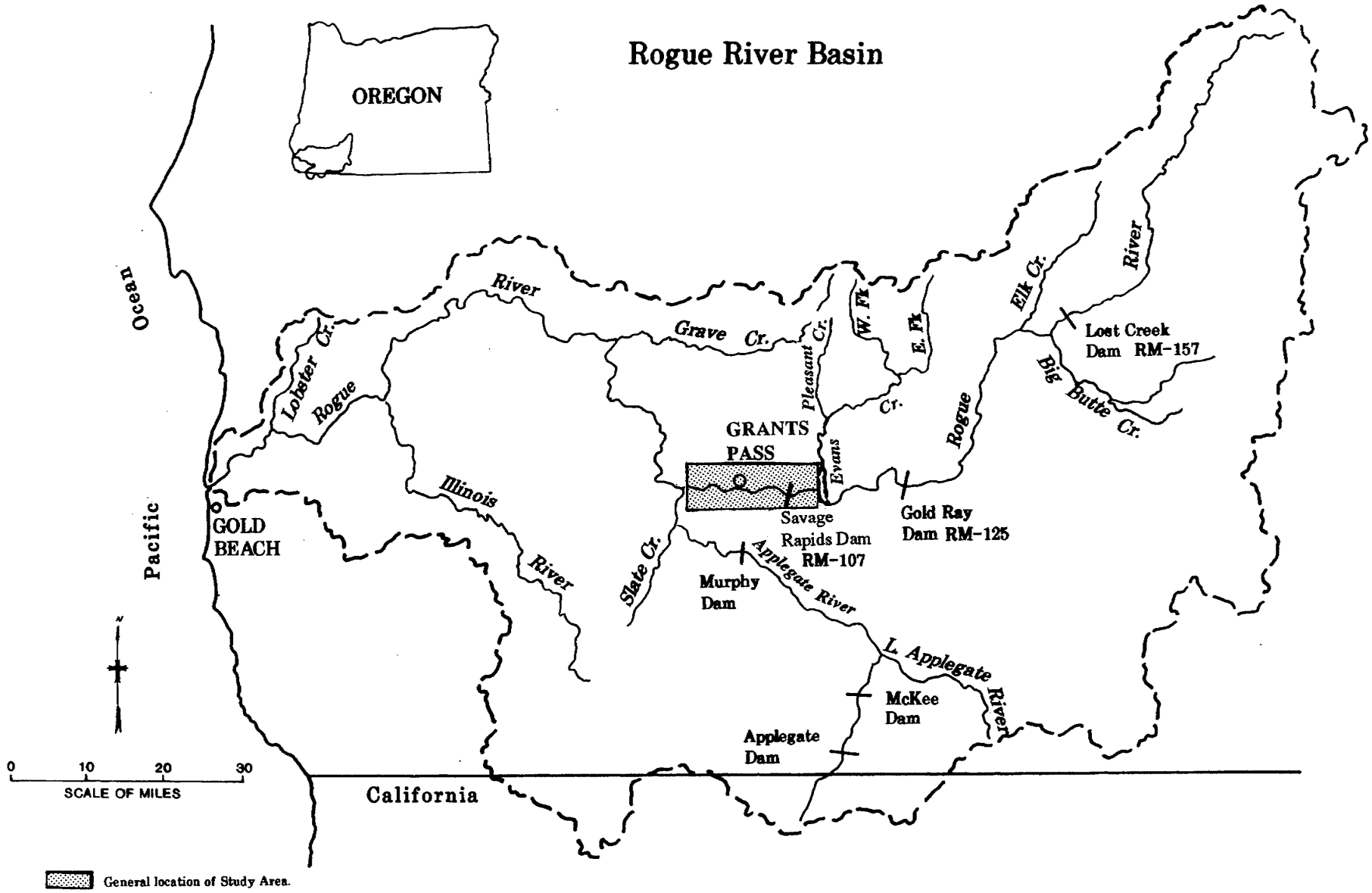
As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. Administration.

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.

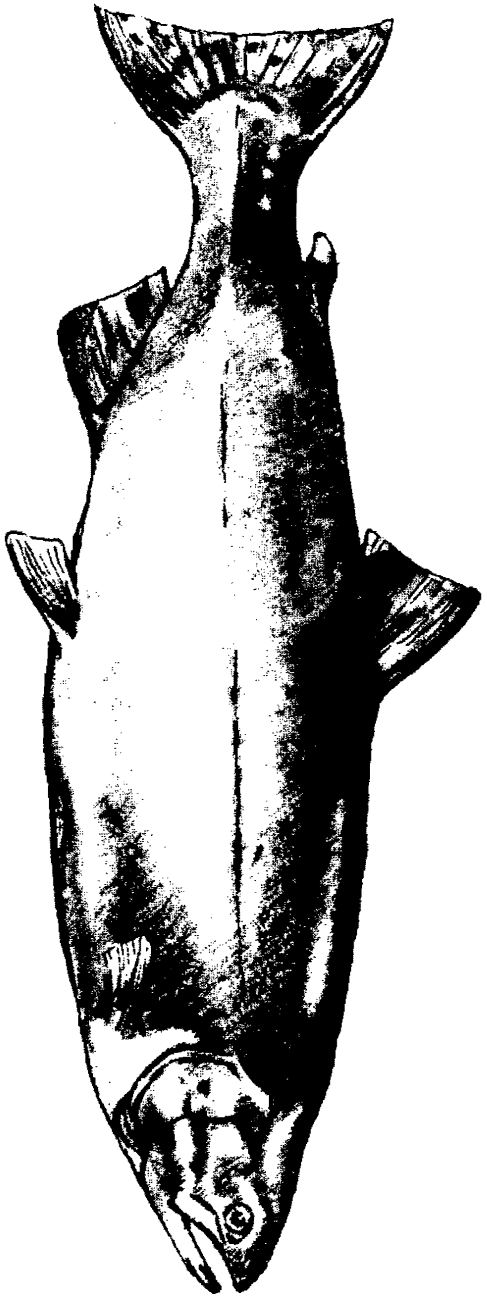
THIS REPORT WAS PREPARED UNDER THE AUTHORITY OF THE FEASIBILITY STUDIES ACT OF DECEMBER 15, 1971 (P.L. 92-199), AND THE NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 (P.L. 91-190, AS AMENDED). PUBLICATION OF THE FINDINGS OF THIS REPORT SHOULD NOT BE CONSTRUED AS REPRESENTING EITHER THE APPROVAL OR DISAPPROVAL OF THE COMMISSIONER OF THE BUREAU OF RECLAMATION OR THE SECRETARY OF THE INTERIOR. THE PURPOSE OF THIS REPORT IS TO PROVIDE INFORMATION AND ALTERNATIVES FOR FURTHER CONSIDERATION BY THE PUBLIC, BUREAU OF RECLAMATION, AND DEPARTMENT OF THE INTERIOR.

Abbreviations and Acronyms

BLM	Bureau of Land Management
cfs	Cubic feet per second
Corps	U.S. Army Corps of Engineers
DNA	David J. Newton Associates, Inc.
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
GPID	Grants Pass Irrigation District
gpm	Gallons per minute
ITA	Indian Trust Asset
JCWMIS	Josephine County Water Management Improvement Study
kW	Kilowatt
kWh	Kilowatt-hours
NED	National Economic Development
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
OMR&P	Operation, management, replacement, and power
OWRD	Oregon Water Resources Department
P.L.	Public Law
P&G	Economic and Environmental Principles and Guidelines for Water and Related Land Resource Implementation Studies
POC	Permit Oversight Committee
PR/ES	Planning report/environmental statement
Reclamation	Bureau of Reclamation
RED	Regional Economic Development
RM	River mile
RV	Recreational vehicle
SHPO	State Historical Preservation Officer
T&E	Threatened and endangered (species)
USFWS	U.S. Fish and Wildlife Service
°F	Degrees Fahrenheit



Location Map



Summary

Purpose, Scope, and Authority

Savage Rapids Dam is located on the Rogue River where the river crosses the Josephine/Jackson County line in southwestern Oregon State. The dam is the primary irrigation diversion facility of the Grants Pass Irrigation District (GPID).

The Bureau of Reclamation (Reclamation) initiated the Josephine County Water Management Improvement study in 1988 in response to requests of Josephine County and the GPID. The main objective of the study was to (1) identify a permanent solution to fish passage problems at Savage Rapids Dam and (2) help resolve conflicts over water uses in Josephine County.

The scope of this report is limited to fish passage concerns at the dam and the associated irrigation diversion facilities. Water management concerns, including improved management of irrigation and other water supplies through facilities improvement and water conservation, are addressed in a separate document prepared by a private consultant for the GPID. That document has been reviewed by the Oregon Water Resources Commission and any implementation of development options will be privately financed and funded. Implementation of those development options would constitute non-Federal cost share as defined by Federal policy.

In 1971, Reclamation was authorized by the Congress to conduct feasibility studies of fish passage and irrigation system improvements. Detailed studies of fish passage were completed in the 1970's, and interim fish passage improvements were made between 1977-1981. Studies of irrigation system improvements were deferred at that time because of costs and lack of interest. Additional fish passage improvements were deferred because of the uncertainty of potential hydropower development at the dam.

Authority to conduct this investigation is provided in Public Law 92-199, enacted December 15, 1971 (85 Stat. 664).

Need for Action

The Rogue River salmon and steelhead trout fisheries in southwest Oregon are nationally renown for diversity and productivity, and the Rogue River supports the largest wild population of these anadromous salmonids in

Oregon. Nonetheless, Pacific Northwest salmon and steelhead fisheries, including those of coastal streams, are severely depressed from historic levels. Some runs of salmon in the Pacific Northwest and California have been listed as threatened or endangered under the Endangered Species Act.

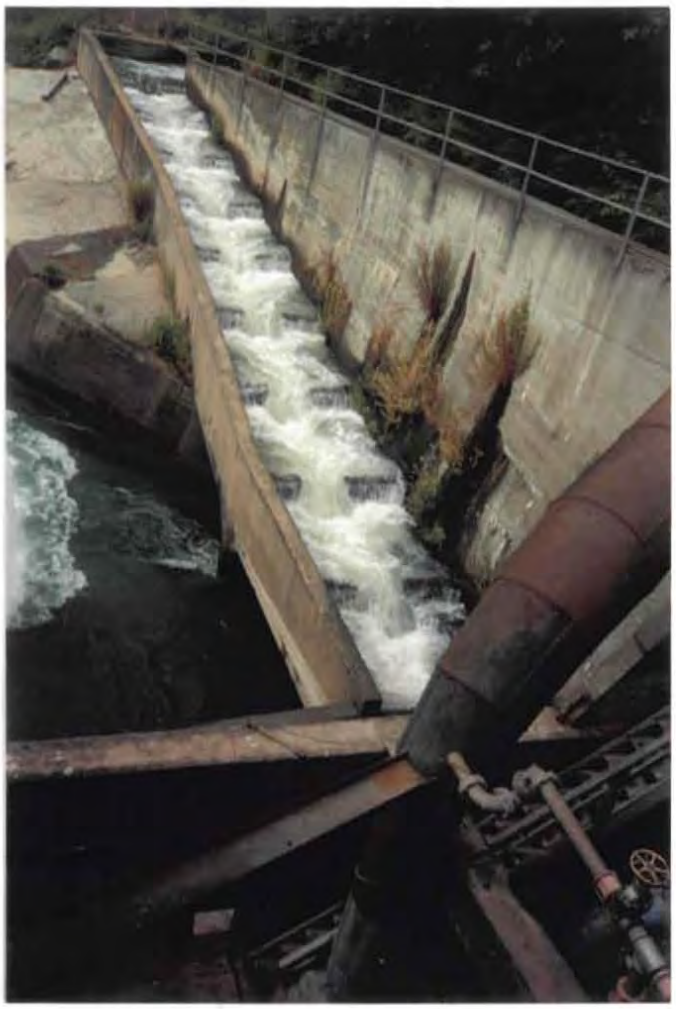
At the time of this writing, none of the anadromous fish in the Rogue River system were listed under the Endangered Species Act (ESA). However, on March 16, 1995, the National Marine Fisheries Service (NMFS) proposed the "Klamath Mountains Province Steelhead" (all steelhead stocks between Cape Blanco, Oregon and Cape Mendocino, California) for listing as threatened under the ESA. This includes the steelhead runs of the Rogue River. On July 19, 1995, NMFS proposed three distinct populations of Coho salmon (from the San Lorenzo River in California to the Columbia River) for listing as threatened under the ESA; this includes the coho run of the Rogue River. In addition, all other anadromous trout species of Oregon, Idaho, Washington, California, and Montana and Pacific salmon (sea-run cutthroat trout and pink, chum, sockeye, and chinook salmon) are currently the subject of comprehensive status reviews which are expected to be completed in 1995 and 1996. Depleted stocks of salmon, especially coho, prompted the Pacific Fishery Management Council to prohibit all ocean fishing for salmon in 1994 along the Washington and northern Oregon coasts and banned all fishing for coho. For 1995, coho fishing is again banned and ocean fishing for other salmon is open but the allowable catch is severely restricted compared to historic levels.

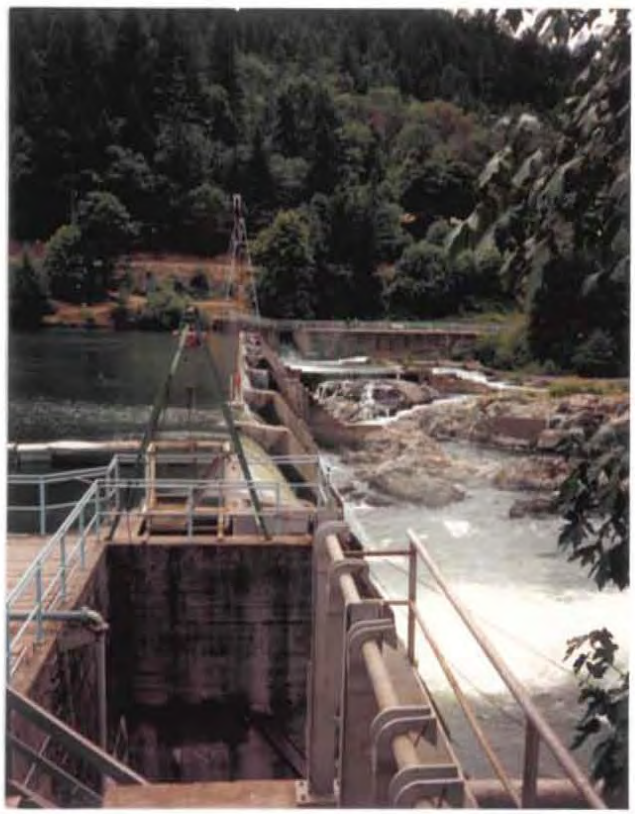
Fish passage at Savage Rapids Dam has been an issue since the dam was constructed in 1921 by the GPID. The concrete structure has a structural height of 39 feet, and a fish ladder was constructed on the north side at the time the dam was completed. A ladder on the south side was completed in 1934. Rotating fish screens were an initial part of the gravity diversion. Early attempts to screen the pumping diversion were unsuccessful, and this diversion remained essentially unscreened until 1958. Fish passage improvements made in the late 1970's have helped reduce losses, but fish passage problems continue. The existing fish screens do not meet current criteria of the NMFS.

Irrigation diversion and fish passage facilities are intimately related, and any change in facilities must consider both fish passage and irrigation diversions. The existing diversion facilities, including the hydraulically driven pumps, are old and nearing the end of their useful lives. These facilities are not capable of operating at the reduced rates expected to be required in the near future and need to be upgraded.

View of Savage Rapids Dam looking north from the left abutment (left).

The north fish ladder (below).





View of Savage Rapids Dam looking south from the right abutment (left).

Alternatives

Two permanent action alternatives were identified in the 1970's studies, and these were reviewed. Public involvement activities and consultation with Federal and State fish and wildlife and other agencies confirm that only two general concepts are viable. These concepts are: (1) construct electric pumping facilities and remove Savage Rapids Dam, and (2) retain Savage Rapids Dam and construct new fish passage and protective facilities to current standards and improve or replace irrigation diversion facilities for the long term. The concerns of most fishery, irrigation, recreation, and other interests are met by one of these alternatives.

Most of the fish and wildlife agencies and interests want the dam removed, and most GPID patrons appear to prefer the least cost alternative (Pumping Alternative). Some recreation and other interests and most residents that own land or businesses located along the shoreline of the seasonal reservoir formed by Savage Rapids Dam want to retain the dam and favor the Dam Retention Alternative.

Preferred Alternative (Pumping Alternative)

Environmental groups, the NMFS, the U.S. Fish and Wildlife Service (USFWS), and the Oregon Department of Fish and Wildlife support removal of Savage Rapids Dam. In January 1994, the GPID Board passed a motion to remove Savage Rapids Dam and replace it with pumping plants[1]. Economic analysis indicates that the pumping alternative has greater net benefits and is, therefore, the federally Preferred Alternative[2].

On October 28, 1994, the Oregon Water Resources Commission, completed a review of the water conservation and fish passage plans recommended by GPID and accepted those plans. The Commission granted an extension of the temporary water permit until October 15, 1999. This permit is necessary to continue full service to GPID lands and the

[1]The motion included several conditions, many relating to funding and financing the project (see Attachment E).

[2]The Water Resource Council's *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies* requires Federal water agencies to select the plan with the ". . . greatest net economic benefits compatible with protecting the Nation's environment . . ." as the preferred alternative.

extension is contingent on implementing the plan to resolve fish passage including removal of Savage Rapids Dam.

The Preferred Alternative would eliminate all salmon and steelhead fish passage problems at Savage Rapids Dam and would increase salmon and steelhead escapement at the site by about 22 percent. (Escapement is the number of adults that return to spawn.) This 22 percent increase amounts to 26,700 spawners[1] which would result in a harvest increase estimated at 87,900 fish (sport and commercial fisheries) with an annual monetary value of $4,998,600. New electric pumping facilities would extend the life of GPID diversion facilities; however, a monetary irrigation benefit was not identified.

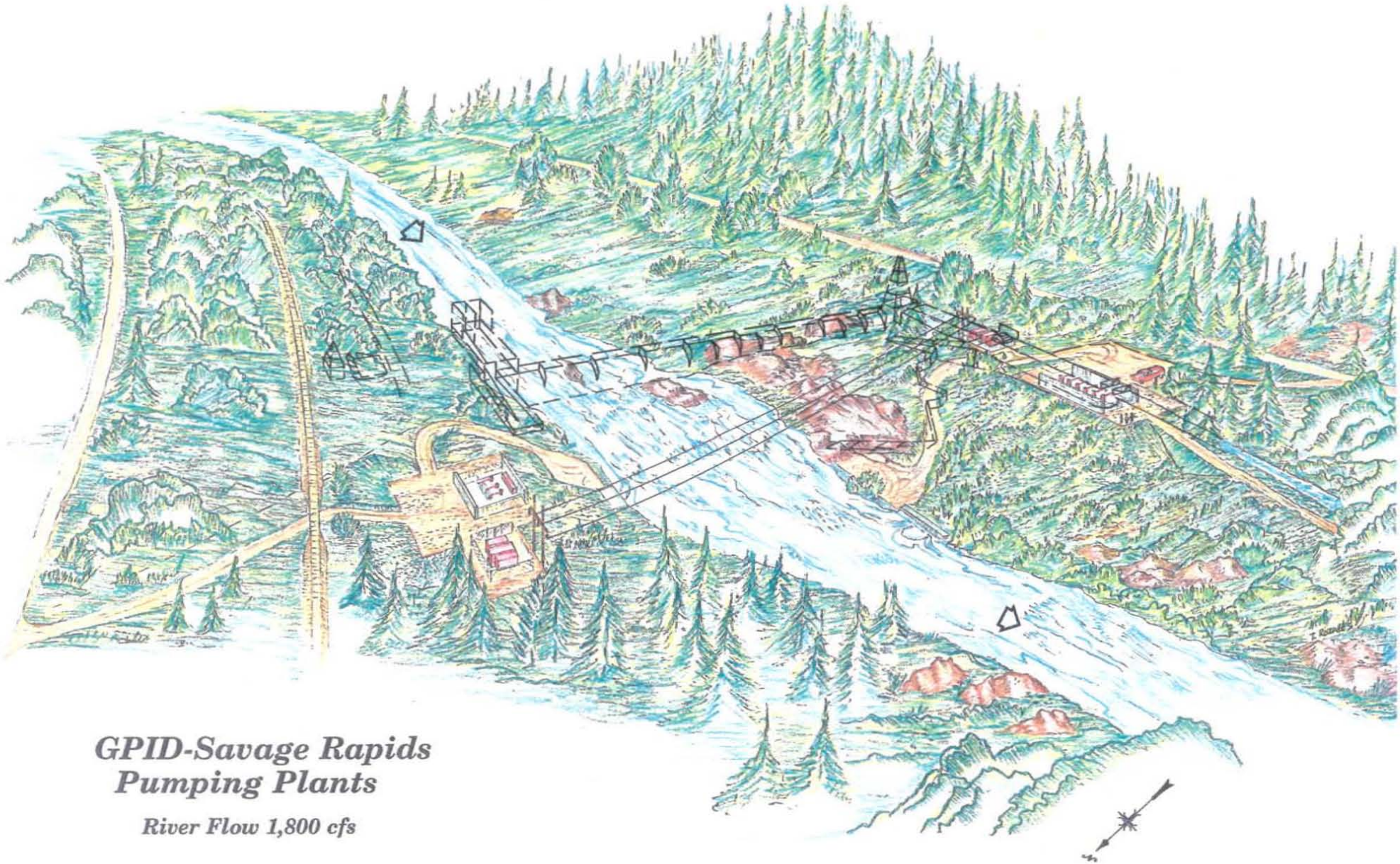
An electric powered pumping plant would be constructed on each bank just downstream from Savage Rapids Dam. Savage Rapids Dam and associated instream facilities would be removed (see artists conception - GPID Savage Rapids Pumping Plants). In addition, the remaining debt owed to the Federal Government for past construction on Savage Rapids Dam would be forgiven.

The north pumping plant would have a capacity of 32 cubic feet per second (cfs) and pump water to the existing Tokay Canal and Evans Creek Lateral. The south pumping plant would have a capacity of 118 cfs and pump water to the existing Savage Lateral, South Highline Canal, and Gravity Canal. Total diversion capacity of the pumping plants would be 150 cfs.

The outdoor type pumping plants would have vertical turbine pumps which operate in a wet sump. Noise abatement walls would surround the units and focus noise upward to reduce the noise level at the site and to help obscure the pumping plants from view. Electric power would be supplied to the plants from an existing 12-kilovolt distribution line on the south side of the river; an overhead powerline would extend from the south plant across the river to the north plant. Annual consumption of power is estimated at 5,675,800 kilowatt-hours (kWh).

Concrete box culverts that extend horizontally from the pumping plants to the river would carry water from the river to the pumping plant sumps. The box culverts at the river openings would be covered by vertical fish screens that meet current criteria; the screens would be protected by

[1]The Oregon Department of Fish and Wildlife has recently estimated the escapement increase at 7,600-29,400 fish.



GPID-Savage Rapids Pumping Plants

River Flow 1,800 cfs

— — Facilities to be removed

Artist concept does not show nearby residences.

trashracks. The vertical screens, which would be oriented essentially parallel to the riverflow, would be 4 feet high and 22 feet long for the north plant and 75 feet long for the south plant.

New discharge pipelines from the pumping plants to existing facilities would be buried and follow the alignment of existing pipelines to the extent possible.

Construction of the Preferred Alternative would take about 5 years. Actual construction would begin with the pumping plants and end with removal of Savage Rapids Dam. Instream construction would be timed and coordinated with Federal and State fish and wildlife agencies to have the minimum effect on salmon and steelhead migration.

Construction of the Preferred Alternative is estimated at $11,205,000 based on January 1993 prices. The estimated project cost, which includes interest during construction (8 percent interest over a 5-year construction period) is estimated at $13,255,000. Annual operating costs are estimated at $233,700 and include $192,600 for electric power. In addition, the debt associated with earlier modifications to Savage Rapids Dam (amounting to $290,525 in 1994) would be forgiven.

The Preferred Alternative would eliminate the existing seasonal reservoir and change the environment of the river from the site of Savage Rapids Dam to the upper end of the reservoir (about 3.5 miles upstream). This reach would become a free-flowing river with the loss of 110 acres of seasonal flatwater and associated flatwater recreation. Landowners along the reservoir reach (essentially all of the land is privately owned) could be expected to extend their developments further toward the new high waterline. The seasonal view of a reservoir and recreation associated with the seasonal reservoir would be eliminated. Lost recreation opportunities associated with flatwater would be offset by increased opportunities associated with a stable riverine environment. It is not expected that the Preferred Alternative would have significant or measurable effects on the quantity of long-term recreation opportunities, land values, land use, or water quality.

For this analysis, all costs of the Preferred Alternative were assigned to an anadromous fishery function since (1) all of the identified monetary benefits[1] are associated with the anadromous fishery function and (2)

[1]Although replacing old irrigation facilities with new facilities would have benefits, monetary irrigation benefits accruing with a 20-year period of analysis would be difficult to identify and would be minor.

removal of the dam would require replacement of irrigation diversion facilities lost due to removal of the dam. It was assumed that, in accordance with past practices, all costs for the anadromous fishery function would be nonreimbursable (to be borne by the Federal Government).

Dam Retention Alternative

With the Dam Retention Alternative, Savage Rapids Dam would be retained but modifications would be made to the structure, equipment, and the river channel. Existing pumping facilities would be replaced with new facilities, including discharge lines, new fish ladders would replace the current north and south side facilities, and new fish screens would be provided at the pumping plant intake and at Gravity Canal.

This alternative was formulated because landowners along the seasonal reservoir and some long-time residents, business interests, and other interests prefer to retain, rather than remove, Savage Rapids Dam. This alternative was also formulated to test the relative economic and environmental impacts of retaining Savage Rapids Dam while improving fish passage. The Dam Retention Alternative, however, has higher construction costs than the Preferred Alternative, and GPID patrons appear unwilling to pay the additional cost of the Dam Retention Alternative.

The Dam Retention Alternative would eliminate most of the salmon and steelhead passage problems and increase salmon and steelhead fish escapement at the site by about 17 percent. The increased escapement of 20,700 spawners[1] would result in an increased sport and commercial fishery harvest of 69,100 fish with an annual monetary value of $3,870,900. New pumping facilities would extend the life of GPID diversion facilities, but provide no monetary irrigation benefits.

The Dam Retention Alternative includes numerous modifications to Savage Rapids Dam, replacement of associated facilities and equipment, and changes to the river channel. The north and south fish ladders, fish screens, diversion turbines and pumps, discharge lines, and the radial gates and gate controls would be replaced. Bays 8 and 9 at the center of the dam would be modified to direct flows to a new plunge pool, and the river channel on the south side below the dam would be reshaped. A juvenile

[1]The Oregon Department of Fish and Wildlife have recently provided new estimates that range from 5,400 to 29,400. They indicate that the 29,400 estimate is highly optimistic.

fish counting facility would be constructed and public access to the south fish ladder would be improved. In addition, numerous operation and maintenance deficiencies would be corrected.

The new fish ladders would be fully functional over the anticipated range of riverflows at full pool elevation and at the lowered pool elevation that is maintained between irrigation seasons. Fish ladder designs provide for improved attraction flows which, along with improvements to the river channel, would attract adult fish through the range of anticipated flows.

Vertical fish screens for the pumping diversion would consist of four units 8 feet wide by 32 feet high. Fish screens for the gravity diversion would consist of five rotary drum screens. New fish screens would have 1/8-inch clear openings and would be angled to provide an approach flow (right angle to screen) velocity of less than 0.4 feet per second. Sweeping flow (parallel to the screen surface) velocity would be twice that of the approach flow velocity.

Single-runner turbine units and single stage double-suction pumps would replace existing units and would supply a maximum of 32 cfs to the Tokay Canal and 59 cfs to the Highline Canal. New discharge pipelines, with the exception of the pipeline embedded in the dam, would be buried; the embedded pipeline would be rehabilitated.

Construction of the Dam Retention Alternative would take about 6 years. Actual construction would begin with the staged removal and replacement of the existing fish ladders so that one ladder would always be operational. Instream construction would be timed and coordinated with Federal and State fish and wildlife agencies to have the minimum effect on salmon and steelhead migration.

Construction of the Dam Retention Alternative is estimated at $17,634,000 based on January 1993 prices. The project cost, assuming 8 percent interest over a 6-year construction period, is estimated at $21,343,000. Annual operating costs are estimated at $104,800.

For this analysis, all of the costs associated with fish passage, protection facilities, counting, and viewing were assigned to the anadromous fishery function and the remaining costs were assigned to the irrigation function. Capital costs assigned to the fishery function are $14,786,000, and costs assigned to irrigation are $2,848,000. It was assumed that all anadromous

fishery costs would be nonreimbursable, to be borne by the Federal Government. It was further assumed that irrigation costs would be privately financed by GPID without cost to the Federal government.

No Action Alternative

The No Action Alternative is the best estimate of what would happen in the future if an action alternative is not implemented. The description of conditions that would exist with the No Action Alternative serves as the baseline for evaluating the effects of the action alternatives.

Due to uncertainties, several reasonable scenarios could be constructed. For this analysis, Reclamation assumed that GPID would continue to operate the current facilities, making repairs and replacements as needed and that salmon and steelhead losses at Savage Rapids Dam would continue at current or near current levels for up to 20 years. It is unlikely that these conditions would continue beyond a period of 20 years. At some time, the State or Federal government would intervene to mandate fish passage and protective improvements. The effect at that time on GPID and the community could be dramatic depending on the solution implemented. Because of these uncertainties, Reclamation's analysis of effects is based on a 20-year period instead of the 100-year project life normally used in Reclamation analyses.

Evaluation

Features, accomplishments, and monetary and other effects are summarized in the Summary Table. There are major differences in costs and monetary benefits between the two action alternatives:

- Costs: The construction cost of the Preferred Alternative is significantly less (about two-thirds) than that of the Dam Retention Alternative; $11,205,000 compared to $17,634,000. Comparisons of project costs and annual equivalent costs for the two alternatives are similar in that those for the Preferred Alternative are significantly less than those for the Dam Retention Alternative.

- Fishery Benefits: The annual benefits (after a 5-year period of build up) of the Preferred Alternative are significantly greater (1.29 times) than that of the Dam Retention Alternative; $4,998,600 compared to $3,870,900.

The benefit/cost ratio (annual equivalent benefits and costs using a discount rate of 8 percent over a 20-year period) of the Preferred Alternative is significantly greater than that of the Dam Retention Alternative; 3.2 to 1 compared to 1.7 to 1.

There is a significant difference between the two alternatives in financing and funding of the construction costs:

- Preferred Alternative: All construction costs would be nonreimbursable, i.e., financed and funded by the Federal Government.

- Dam Retention Alternative: In addition to construction costs financed and funded by the Federal Government, there would be $2,848,000 of construction costs to be financed and funded by the GPID.

The action alternatives have significant environmental effects and differences in only two areas:

- Fish: The estimated increase in salmon and steelhead escapement is significantly greater for the Preferred Alternative; a 22 percent increase compared to a 17 percent increase for the Dam Retention Alternative.

- Seasonal Reservoir: The existing seasonal reservoir of 110 acres and associated flatwater recreation would be eliminated with the Preferred Alternative. This river reach would revert to a free flowing status with that visual aspect, and the area between the old high waterline and the new high waterline would slowly revegetate. It is anticipated that increased stream recreation would offset losses of flatwater recreation. With the Dam Retention Alternative, the seasonal operation of the reservoir would remain unchanged.

Based on the analysis of environmental impacts, there do not appear to be any other significant long-term environmental effects of either action alternative. Short-term environmental effects would be associated with the

construction period but are not considered significant. The lack of significant environmental impacts is in part due to the fact that Savage Rapids Dam and the seasonal reservoir are located in an urban/suburban setting with highways along each side and a railroad along one side. All of the shoreline lands are privately owned, with many ownerships highly developed. As a result, human disturbance in the area is common at all times.

There are no Indian Trust Assets that would be affected by either action alternative. Neither of the action alternatives would have any effect on any river reach within the national Wild and Scenic River system. Neither of the action alternatives would have an adverse impact on minorities or low-income populations and communities.

Neither of the action alternatives are likely to adversely affect currently listed endangered or threatened species. However, there is potential for the listing of one or more Rogue River salmon or steelhead runs in the future. Both of the action alternatives would have a beneficial effect on salmon and steelhead through improved fish passage as described above and in the Summary Table.

The only irreversible and irretrievable commitment of resources is loss of 110 acres of seasonal flatwater and an annual electric power consumption of 5,675,800 kWh with the Preferred Alternative.

Features, accomplishments, costs and benefits, environmental effects, and other evaluations are summarized in the Summary Table on the following pages.

Summary Table

Item	Preferred Alternative	Dam Retention Alternative
Features		
Fishery	Remove Savage Rapids Dam.	Replace existing fish ladders and screens and radial gates. Modify dam crest, excavate new plunge pool, and reshape portions of the river channel. Construct fish counting facility and improve public access for viewing fish and improve safety.
Irrigation	Construct two electric pumping plants to replace those removed with the dam. Construct new supply lines from the pumping plants to the existing canals.[1]	Replace existing turbines and pumps. Replace existing pipelines from pumps to canals; rehabilitate line through the dam. Correct existing operation and maintenance deficiencies.
Accomplishments		
Fishery	22 percent increase in salmon and steelhead escapement (26,700 fish) with increased harvest of 87,900 fish.	17 percent increase in salmon and steelhead escapement (20,700 fish) with increased harvest of 69,100 fish.
Irrigation	Increased life of diversion facilities	Increased life of diversion facilities
Costs and Benefits		
Construction cost (January 1993 price level)	$11,205,000	$17,634,000
Federal investment (project cost)[2]	$13,255,000	$21,343,000
Annual equivalent project cost[3]	$1,350,000	$2,173,800
Annual operating costs	$233,700	$104,800
Total annual equivalent costs	$1,583,700	$2,278,600
Annual equivalent benefits[4]	$4,998,600	$3,870,900
National economic development effects		
Benefit/cost ratio	3.2 to 1	1.7 to 1
Net annual benefits	$3,414,900	$1,592,300
Regional development effects		
Net short-term regional benefits	$15,200,000	$23,900,000
Net short-term employment	120 jobs	190 jobs
GPID construction cost	$0	$2,848,000

[1]Irrigation is not considered a function of this alternative as the pumping plants are a replacement for facilities removed for fish passage. [2]Includes construction cost and interest during construction at 8 percent. [3]Based on a discount rate of 8 percent over a 20-year period. [4] Fishery benefits only; based on a discount rate of 8 percent, a 20-year period, and a 5-year build-up of benefits.

Summary Table

Item	Preferred Alternative	Dam Retention Alternative
Environmental effects		
Ecological components	Major positive effect on salmon and steelhead. Loss of 110 acres of flatwater, replaced by a stable riverine aspect. Positive effect on aquatic insects and overall productivity and riparian vegetation of 3.5-mile reach of Rogue River upstream of Savage Rapids Dam. No measurable effect on wildlife.	Major positive effect on salmon and steelhead.
Physical components	Slight negative effect on air quality and water quality during construction. Increased noise levels during construction and small increase during operation.	Slight negative effect on air quality and water quality during construction. Increased noise level during construction.
Cultural components	No effect	No effect
Recreational components	Loss of 110 acres of flatwater recreation. Replaced with free flowing river recreation.	No effect.
Social well-being effects		
Community	Short term employment increase. Major improvement in salmon and steelhead sport fishery. Riverside landowners will lose a seasonal lake and gain a stable river environment.	Short term employment increase. Major improvement in salmon and steelhead sport fishery.
Health and safety	Eliminates flatwater boating hazards, increases whitewater boating hazards. Traffic hazards increased during construction.	Traffic hazards increased during construction.
Displacements	Changes in recreation and some businesses. Riverside property owners would lose seasonal lake recreation.	None
Energy	Increased energy usage (equivalent to needs of 380 households); not considered significant	None
Indian Trust Assets	None	None
Wild and Scenic Rivers	None	None

Conclusions

It is concluded that:

1. Fish passage and protective facilities at Savage Rapids Dam are inadequate and cause a large loss of salmon and steelhead production.

2. A Preferred Alternative (Pumping Alternative) which includes removal of the existing dam has been developed. In accordance with the Water Resource Council's Principles and Guidelines, this alternative provides the greatest net economic benefits consistent with protecting the Nation's environment. This alternative would eliminate all fish passage problems and provide optimum salmon and steelhead passage at the site.

3. The Preferred Alternative is fully compatible with the recommendations of the U.S. Fish and Wildlife Service and the Oregon Department of Fish and Wildlife.

4. A Dam Retention Alternative has been developed. This alternative would provide substantial improvement in fish passage and eliminate most loss of salmon and steelhead at the site.

5. The Preferred Alternative and the Dam Retention Alternative would have no adverse long-term effects. Neither of these alternatives would adversely affect Indian Trust Assets or affect any river reach included in the national system of Wild and Scenic Rivers.

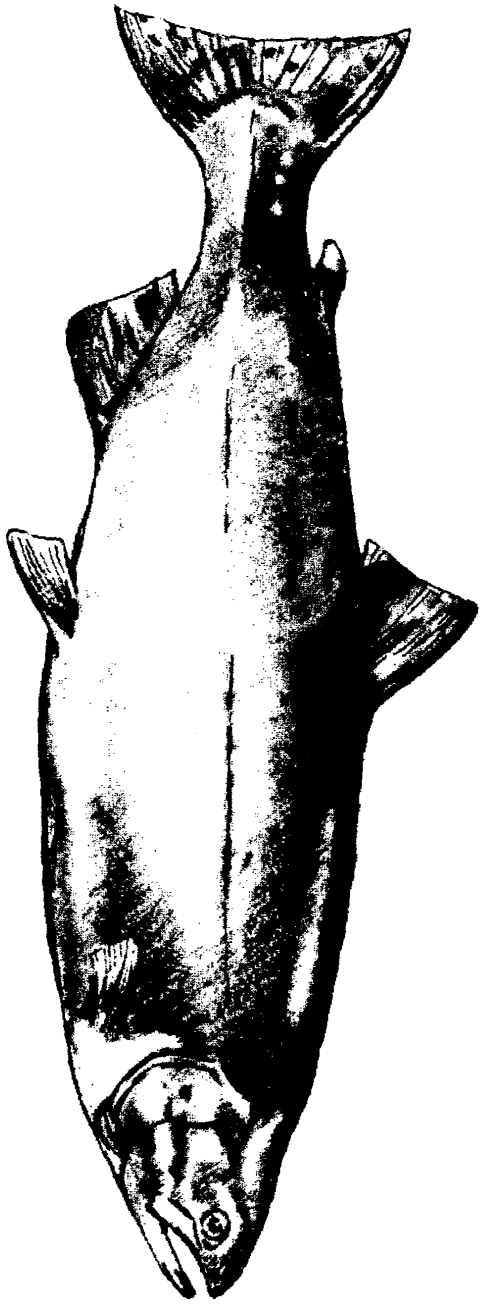
Recommendations

Pending completion of ongoing State initiatives concerning Savage Rapids Dam, it is recommended that:

1. The Preferred Alternative be authorized under the provisions of the Federal Reclamation laws for construction by the Secretary of the Interior substantially in accordance with the plans of this report, with such modifications or additions as the Secretary may find necessary and desirable to carry out the purposes of the plan.

2. Construction costs of the Preferred Alternative be nonreimbursable; the purpose of the alternative is to benefit anadromous fish and irrigation facilities included in the plan are merely replacement for facilities lost through removal of the dam.

3. The Federal Government forgive the remaining debt owed to the United States by the Grants Pass Irrigation District for rehabilitation of facilities, recognizing that removal of the dam also removes the facilities associated with that debt.



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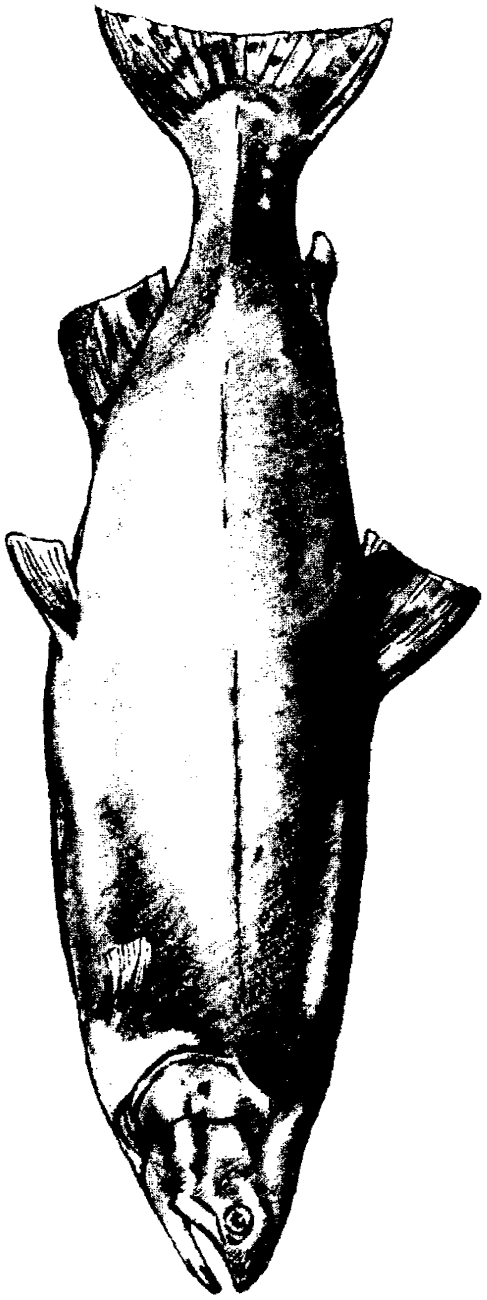


Chapter I— Introduction

LOCATION

This planning report/environmental statement focuses on Savage Rapids Dam, located at river mile (RM) 107 on the Rogue River where it crosses the Josephine/Jackson County line about 5 miles east of the city of Grants Pass in southwest Oregon (see Location Map).

PURPOSE, SCOPE, AND OBJECTIVE

The Bureau of Reclamation (Reclamation) initiated the Josephine County Water Management Improvement Study (JCWMIS) in 1989 to (1) identify a permanent solution to fish passage problems at Savage Rapids Dam and (2) help resolve conflicting water issues in Josephine County, of which Grants Pass Irrigation District (GPID) is a major water user. These two issues are intimately related, especially where Savage Rapids Dam is concerned. However, it has been the intent throughout this study, to maintain a two pronged approach so that study delays in one area would not hold up study and report findings in the other area. This report addresses fish passage concerns only; irrigation diversion facilities are addressed to the extent that those facilities are related to fish passage facilities.

The JCWMIS developed and evaluated data at an appropriate level of detail to support a decision on future actions. This document summarizes the findings by presenting a description and analysis of alternatives which could permanently correct fish passage problems at Savage Rapids Dam and by evaluating the environmental impacts of those alternatives in accordance with the requirements of the National Environmental Policy Act (NEPA). This document may serve as the vehicle to request congressional authorization to implement a preferred fish passage plan.

AUTHORITY

Authority to conduct this investigation is provided in Public Law (P.L.) 92-199, 85 Statute 664 enacted December 15, 1971.

PREVIOUS INVESTIGATIONS

Prior to 1971, Reclamation's involvement with Savage Rapids Dam and the GPID was limited to congressionally authorized emergency repairs and various modifications to the dam in 1953-54 and in 1957-58.

In December 1971, Congress passed P.L. 92-199 which authorized the Secretary of the Interior to conduct a feasibility study of the Grants Pass Division, Rogue River Basin Project, Oregon. The Senate Committee report indicated that the study should include (1) a study of the fish passage at Savage Rapids Dam and (2) a study of the need to replace the existing distribution system of GPID.

Reclamation and the Bureau of Sport Fisheries and Wildlife (now the U.S. Fish and Wildlife Service (USFWS)) undertook the first phase of the study. Because of the immediate need to improve fish passage, the intent was to develop an interim solution to fish passage in the first phase and to consider all water related problems and integrate solutions with a permanent solution to fish passage problems in the second phase. The results of the first phase of the study were published in a special report in 1974. Congress authorized the measures proposed in the report and appropriated funds for construction in P.L. 93-493. The *Final Environmental Statement, Anadromous Fish Passage Improvements, Savage Rapids Dam, Rogue River Basin Project, Grants Pass Division-Oregon (INT-FES 76-26)* (Reclamation 1976) was completed and made available to the public on May 18, 1976.

Not all of the interim measures identified in the report were implemented. Some work was done on the south fish ladder, but a solicitation for bids to replace the north fish ladder received only one response and that bid exceeded available funds. In November 1979, it was decided to use the remaining funds to replace the north side fish screens, deferring further work on the fish ladders until a permanent resolution of the fish passage issue could be achieved.

A formulation working document (Reclamation 1979) provided some information on the second phase of the study. Following public review, it was concluded that prospects were poor for a Federal project to improve irrigation and that part of the study should be dropped. The fisheries part of the study, however, was continued until 1984 when further work was deferred because of uncertainty regarding potential development of hydropower at the dam. The State had passed a law in 1967 that did not

allow further diversion of water for hydropower generation on the Rogue River from river mile (RM) 157 to the mouth. However, there were efforts to amend the law to allow hydropower development at Savage Rapids Dam. A pending Federal Energy Regulatory Commission (FERC) application to develop a hydroelectric generating plant at the dam led fish passage planners to assume that the applicant would have to correct the fish passage problems within the requirements of the FERC license. Eventually it became clear that the State of Oregon would not amend existing legislation to allow hydropower development at the dam. This stopped the FERC application and provided impetus to proceed with finding a permanent solution to fish passage problems.

In early March and April of 1987, Josephine County, GPID, and the city of Grants Pass solicited the Commissioner of Reclamation and the Oregon congressional delegation to provide funds for Reclamation to reopen investigations authorized by P.L. 92-199. The Congress provided funding in fiscal year 1989 for the current investigation which was initiated at that time.

JOSEPHINE COUNTY WATER MANAGEMENT IMPROVEMENT STUDY (JCWMIS)

Two purposes were identified for the JCWMIS (1) resolution of fish passage problems at Savage Rapids Dam and (2) provide assistance in the development of a master water plan for Josephine County including GPID. Two events shifted the focus of the water management activities primarily to GPID facilities and water use. After a final proof survey reduced GPID water rights by about half and after a period of negotiation, the State of Oregon granted a temporary supplemental water right permit to GPID in 1990 (see attachment B). This permit required GPID to study and report on a wide range of water management options that nearly duplicated the water management focus of the JCWMIS. At the same time, budget problems caused Josephine County to limit participation in the study. A decision was made to report separately on the water management activities and the fish passage activities. Reclamation prepared and distributed a progress report on the fishery portion in May 1992 and a report on the water management portion in December 1992.

Early in the study GPID hired a consultant, David J. Newton Associates, Inc. (DNA), to help with the water management aspects of the study. As the JCWMIS progressed, the separation of the fish passage and water

management portions of the study became more distinct. Although Reclamation has provided technical help in both fish passage and water management efforts, GPID and DNA eventually became the focus for directing and reporting on the water management activities.

On January 5, 1994, the GPID Board voted to remove Savage Rapids Dam if certain conditions, mainly funding, could be met (see Attachment E). In March 1994, GPID and its consultant, DNA, submitted a water management plan (Newton 1994) to the Oregon Water Resources Commission which addresses each of the stipulations of its temporary permit, including proposed implementation of conservation measures. That report has been reviewed by the Oregon Water Resources Commission. It is anticipated that any water conservation/management options would be privately financed. Accordingly, Reclamation does not intend to prepare a report on water management options for consideration by Congress.

As a result, this document focuses exclusively on fish passage and the required facilities to maintain irrigation diversions and those study activities related to formulation and evaluation of the fish passage alternatives.

RELATED ACTIVITIES

There are serious concerns regarding the declining numbers of salmon and steelhead along the Pacific coast. Some runs of salmon are now listed as threatened or endangered under the Endangered Species Act (ESA). Most notable are the salmon runs in the Snake and Sacramento River systems. The potential exists for similar listings in the Rogue and other coastal rivers and for listing steelhead throughout its range.

Increasing concerns are being expressed by government agencies and environmental interests for preserving wild stocks in the Rogue River system. This has led to more stringent management of fishing opportunities including reductions and limitations on ocean harvest. As these activities increase and as concerns mount, the issue of fish passage at Savage Rapids Dam becomes more intense.

Federal

The U.S. Army Corps of Engineers (Corps) completed two dams and reservoirs on the Rogue River system, Lost Creek Dam (1977) and Applegate Dam (1980). A third structure, Elk Creek Dam, is

approximately 50 percent complete and underwent a court-ordered review to determine its future. This review was accomplished through a formal environmental impact analysis (Corps 1991). In a February 6, 1992, Record of Decision (Corps 1992), the Corps declared its decision to complete the dam and operate it strictly for flood control purposes under the "no conservation pool alternative," described in the supplemental Environmental Impact Statement (EIS). Court actions are still in progress and construction to complete the structure has not proceeded.

The completed Corps dams provide significant flood control in the Rogue River system, and Lost Creek Dam provides significant flow control of the Rogue River past Savage Rapids Dam.

State

State actions have a significant bearing on all future water management activities in the Rogue River basin.

Diack v. City of Portland

A 1988 State court ruling in Diack v. City of Portland proclaimed that no actions can be taken which affect the instream flow of those sections of Oregon's waterways which have been designated as wild and scenic. The Rogue River from its confluence with the Applegate River, just west of the city of Grants Pass, to Lobster Creek Bridge, 88 miles downstream, was included as a component of the national wild and scenic rivers system in 1968. In addition, the State has placed this reach within the State system of wild and scenic rivers. In response to the Diack decision, the State set standards of acceptable instream flows for the lower Rogue River (OWRD 1991b).

GPID Proof Survey

In 1982, the State completed a final proof survey of the water right permit issued to GPID. This is a process in perfecting a water right and is preparatory to issuing a water right certificate. Because GPID is now irrigating less than half the land claimed in its water right permit, the State issued a water right certificate for about 50 percent of GPID's historic diversion. GPID appealed, and in response, a temporary supplemental

water right permit was granted in April 1990 which allows additional diversion diversions until October 1, 1994. This permit was extended to October 15, 1999 (see attachment G).

This temporary permit carried several stipulations (see Attachment B). One of the stipulations was the formation of an oversight committee to advise and help the district comply with the other terms of the permit. The permit oversight committee (POC) consisted of representatives of GPID's board, non-voting GPID members, the city of Grants Pass, Josephine County, Oregon Water Resources Department (OWRD), the Oregon Department of Fish and Wildlife (ODFW), the Oregon Water Resources Commission, Natural Resources Conservation Service (NRCS)[1], Reclamation, and WaterWatch of Oregon.

Reclamation was asked by both GPID and the State to provide technical assistance in evaluating options for complying with the water permit requirement for improving fish passage at Savage Rapids Dam. Through this permit, Oregon has officially recognized Reclamation as a major participant in the effort to resolve fish passage problems at Savage Rapids Dam.

Flow Measurement

Effective December 31, 1991, OWRD no longer jointly funds the U.S. Geological Survey to measure riverflows and levels at 92 stations. This amounts to more than one-third of the approximately 250 measuring stations throughout the State. Responsibility for collecting data from these stations has now shifted to local water user entities including GPID.

Ballot Measure 5

On November 6, 1990, Oregon voters passed a property tax cutting plan known as "Ballot Measure 5." The effects of the measure are widespread as it effectively limits funding of State and local taxing entities. The measure has seriously affected irrigation districts by changing the rules and costs for "buy outs." Maintaining the financial integrity of such districts was previously accomplished by granting the districts the legal authority to prevent water users who had access to district water from buying out, or withdrawing, from the district. Under Measure 5, anyone can buy out of

[1]Renamed from the former Soil Conservation Service

an irrigation district, and this introduces uncertainty into district management and budget processes. Since passage of the measure, over 200 patrons of GPID have bought out of the district.

County

The Josephine County Water Master's Office and GPID are cooperating in a surface water measurement study. Reclamation has supplied flow meters, measuring flumes, and water level recorders, while the district provides measurement flumes and has provided the staff for installation and monitoring within the general GPID service area. The Watermaster has helped with calibration of flow measurement devices.

Specific goals and policies of the county, which include zoning regulations to preserve agricultural land and the rural character of the county are outlined in the Josephine County Comprehensive Plan.

The Josephine County Water Resources Department sponsored a jointly funded study with the city of Grants Pass and Reclamation to " . . . clarify groundwater resources in the Grants Pass area . . . ." Findings of a review were reported in 1991 (Haskett 1991), and on December 18, 1992, a contractor for the city and the county published the results of the investigation (Newton 1992).

Local

The city of Grants Pass is studying ways to rehabilitate streams passing through the city. The primary focus of its efforts has been Gilbert Creek, which receives supplemental flows from the GPID irrigation system. Restrictive zoning within the stream corridor and restoration of the streambank are activities now underway.

Grants Pass contracted with Brown & Caldwell, a consulting engineering firm, to provide a facilities plan for the city. Current emphasis is on the city's sewer treatment facilities with plans to upgrade and enlarge them within the next few years.

The city of Grants Pass and Josephine County have developed flood control plans which use GPID's distribution system to intercept and carry storm runoff. Most storms with the potential to cause flooding occur between irrigation seasons.

To enhance fish habitat, GPID and local interests have constructed flumes where the South Highline Canal crosses Fruitdale Creek, Allens Creek, and Sand Creek. The flumes were constructed over the creeks to separate canal flows from creek flows while providing an opportunity to release canal water into the creeks to enhance instream flow.

STUDY CONDUCT

Initial scoping for the JCWMIS began in 1988 and continued into 1989. A multidisciplinary planning team, appointed by Reclamation, met throughout 1989 with State, County, GPID and others in scoping activities and helping to identify tasks and roles. Because of changes in study participation and direction, the study was rescoped and some study roles changed in 1990.

Public involvement activities have been largely a local responsibility overseen by Reclamation. Initially, Josephine County developed an overall community involvement process in 1989 for use in developing the County master water plan. This formed the basis for public involvement, but most activities after 1990 were managed by GPID and its contractor, DNA.

The following, listed in alphabetical order, made significant contributions to the JCWMIS:

City of Grants Pass
Grants Pass Irrigation District
Jackson County (Parks Department)
Josephine County (Planning, Water Resources, and Parks Departments)
National Marine Fisheries Service
Oregon Department of Fish and Wildlife
Oregon Water Resources Department
Natural Resources Conservation Service
U.S. Fish and Wildlife Service
WaterWatch of Oregon

In addition to the entities listed above, environmental interests, citizens, and businesses of Josephine and Jackson Counties provided valuable assistance in the study. Additional information on public involvement is in Chapter VIII.

GPID OVERVIEW

Area

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. The middle Rogue is surrounded by mountains, and more than three-fourths of the basin is forest or timberland. The Rogue River is a designated wild and scenic waterway from its junction with the Applegate River just west of Grants Pass downstream to Lobster Creek Bridge about 10 miles upstream from the mouth at the Pacific Ocean.

Nearly one-half of the total basin area and most of the basin population is contained in the central valley region. Medford, Oregon, the largest city in the region, is located about 30 miles southeast of Grants Pass. Because of this population concentration, 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 limits imposed by climatic conditions, soils, topographic features, and availability of water. Urban growth has significantly encroached on commercial agricultural land.

Climate

The area has generally mild, wet winters and hot, dry summers. The city of Grants Pass, located in the central valley, receives about 30 inches of precipitation annually, most of which falls during October through May. On the average only 2 inches of precipitation fall during June through September.

GPID Facilities[1]

The GPID, organized in 1916, serves lands in Josephine and Jackson Counties (see Grants Pass Irrigation District map). The original projected service area included about 18,400 acres along Evans Creek and both sides of the Rogue River from the town of Rogue River to west of the city of Grants Pass. In the 1930's, the service area was cut to about 12,600 acres because the higher elevation lands were not economical to serve. Since that time, the service area has gradually declined to about 7,400 acres, largely because of residential and commercial encroachment. Under Reclamation's current land classification criteria, most of the service area, although arable, would now be classed as nonagricultural due to increased per unit service costs associated with many smaller land parcels.

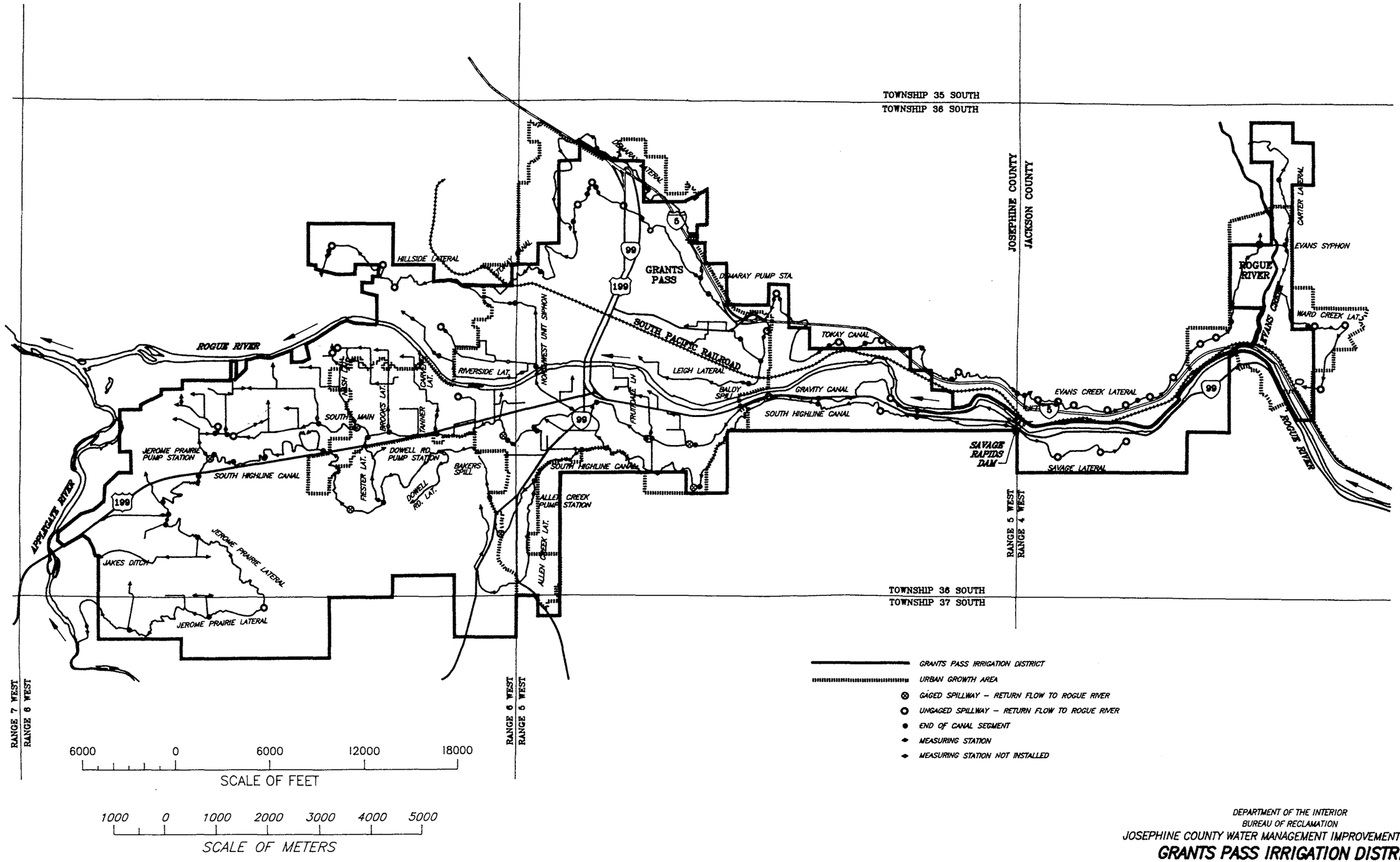
All of GPID's original facilities were privately constructed. Major facilities consist of Savage Rapids Dam, a main pumping plant consisting of three hydraulically-driven pumps located on the right abutment, nearly 160 miles of canals and four relift pumping plants. The district diverts about 180 cubic feet per second (cfs) of water from the forebay formed by the Savage Rapids Dam. About two-thirds of GPID's water supply is pumped from the Rogue River at Savage Rapids Dam into gravity canals using hydraulically powered pumps (GPID has a nonconsumptive right for about 800 cfs to power its turbine pumps). The remaining water supply is diverted to the Gravity Canal through headworks located on the left abutment of the dam.

In 1949, GPID enlisted Federal assistance for modifications to the dam and existing fish screens and for constructing a siphon under the Rogue River. The siphon was completed in 1950 and repair and rehabilitation work on the dam was completed in 1955. Fish passage improvements were made in the late 1970's. In 1990, GPID spent $50,000 to repair the cableway. More repairs are likely in the near future.

Savage Rapids Dam

Savage Rapids Dam, completed in 1921, is a concrete structure 464 feet long, with a maximum height of 39 feet (see photo I-1). Features consist of the north fish ladder, a pumping plant, a 16-bay overflow spillway

[1]Several conventions are used in describing facilities. Left and right always assume the observer is looking downstream. The downstream end of a fishway (fish ladder) is the entrance (where adult fish enter) and the upstream end is the exit (where adult fish exit).



DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
JOSEPHINE COUNTY WATER MANAGEMENT IMPROVEMENT – OREGON

GRANTS PASS IRRIGATION DISTRICT

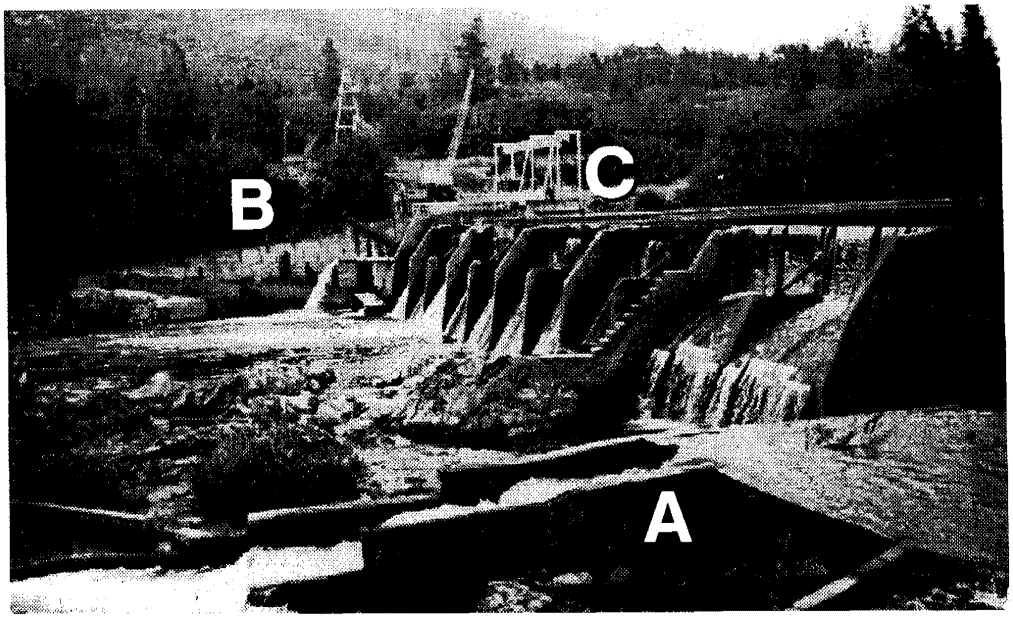
BOISE, IDAHO MAY 1992 **712-100-65**
(CADD FILENAME GPX65)

Used with permission of David J. Newton Associates Inc.

section, two radial gates at bays 10 and 11, the south fish ladder, and the Gravity Canal headworks.

The two existing 16-foot by 7-foot radial gates have a combined capacity of about 6,000 cfs. The radial gates are operated by hydraulic cylinders controlled remotely from the hoist house of the cableway. The radial gate bay structures have concrete flow shields over them to protect the gates from debris that might flow over the dam. These gates were rehabilitated in the 1950's and designed to last about 30 years. The radial gates are normally closed but are opened to lower the reservoir surface level.

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.



A - South fish ladder
B - North fish ladder
C - Support structure for bulkhead gates and fish screens of the pumping plant

Photo I-1--Savage Rapids Dam

The radial gates generally remain closed during the irrigation season and are opened in the fall to remove the stoplogs. After the stoplogs are removed, the radial gates are closed to maintain the reservoir level at the dam crest. This allows the south fish ladder to function during the winter months.

The reservoir is fully emptied or dewatered only when work is required on the radial gates, or when excessive sediment accumulation in front of the turbine-pump inlet must be removed mechanically.

Canals

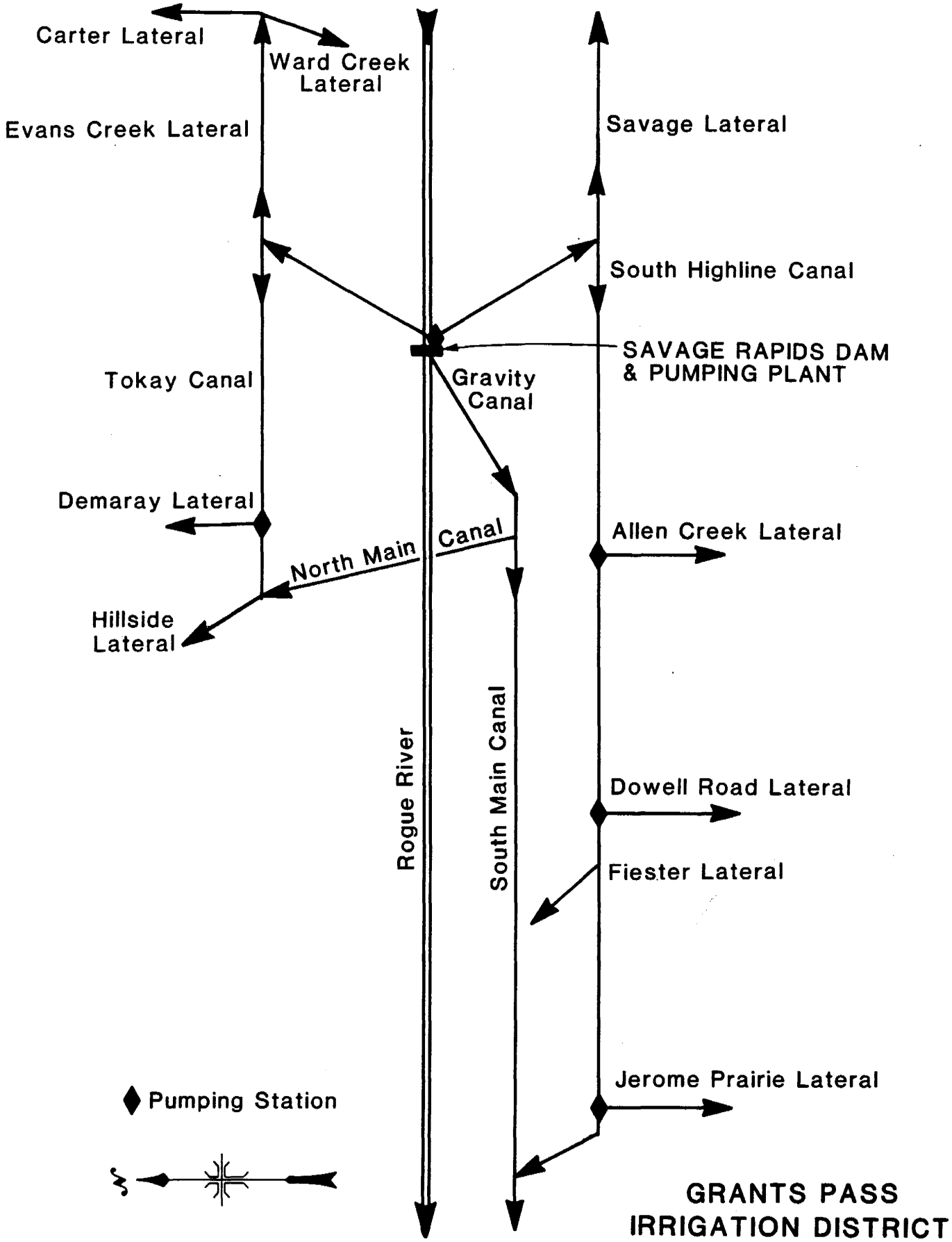
The main canals and laterals are South Highline Canal, Savage Lateral, Gravity Canal, Tokay Canal, and Evans Creek Lateral (see Grants Pass Irrigation District Schematic). Savage Lateral and Evans Creek Lateral carry water generally east into Jackson County, and the other canals carry water generally west into Josephine County. Gravity Canal serves the lowlands along the river on the south side of the river. Service to higher elevation lands on both sides of the river is provided by the other canals.

Gravity Diversion

The largest diversion (73 cfs) is through the headworks on the south side of the dam to Gravity Canal. Two slide gates control flows into the head of the canal.

Rotary Drum Screens

Two rotary-drum screens are located on Gravity Canal about 130 feet downstream from the headworks. Each screen is 5 feet in diameter by 8 feet long. A single paddle wheel provides the power to operate the two screen (see photo I-2).



GRANTS PASS IRRIGATION DISTRICT SCHEMATIC

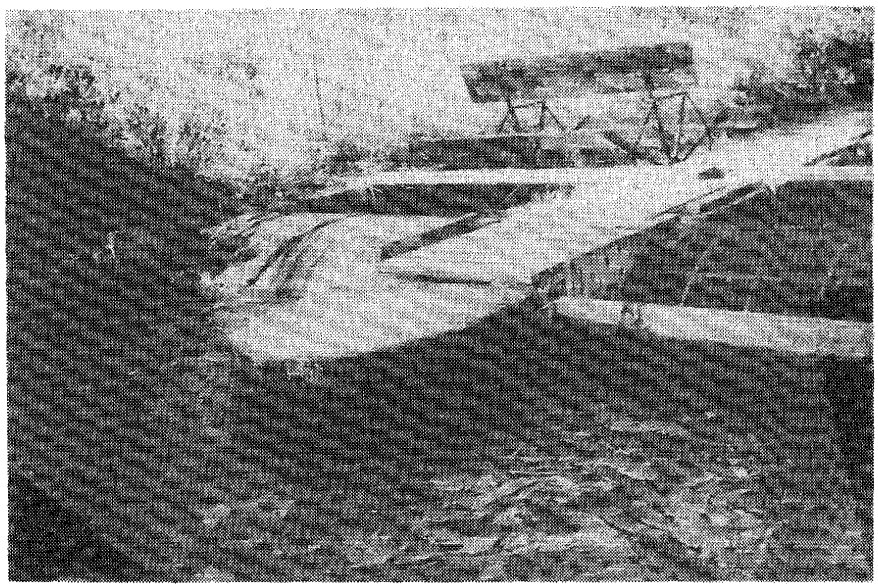


Photo I-2.—Gravity Canal rotary fish screen, partially closed for flow control by wooden stoplogs on the right side of the screen. The paddle wheel used to drive the rotating screens is also visible in the photo.

Pumping Operation

Pumping facilities, located at the right abutment (north side) of the dam, consist of two hydraucone turbines and three centrifugal pumps. The turbines operate at a hydraulic head of 29 feet. The left turbine drives a centrifugal pump with a capacity of 67 cfs which lifts water 90 feet to a distribution box on the south side of the river (South Highline Canal). The right turbine drives two pumps, connected in series, which provides a capacity of 40 cfs to lift water 150 feet to the distribution box on the north side of the river (Tokay Canal).

The hydraulic turbines and pumps operate at full or nearly full capacity throughout the irrigation season. Curtain gates operated by an electric hoist provide some control of flow to the turbines and pumps.

Sediment Control

Four sluice gates at the turbine structure are used to flush sediment deposits which build up in front of the screen structure. The combined capacity of the sluice gates is 2,000 cfs.

Pumping Plant Fish Screens

Designed to prevent small fish from entering the turbines and pumps, the fish screen structure consists of two vertical traveling screens, 8 feet wide and 32 feet high. They do not meet current National Marine Fisheries Service (NMFS) criteria. These screens operate when the pumps and turbines are running during the irrigation season. In the past few years, the screens have been damaged twice, resulting in stoppage of irrigation deliveries for significant periods of time.

North Fish Ladder

Approximately 150 feet long, the north fish ladder is a concrete structure with rectangular pools 8 feet long and 9 feet wide. The entrance is located near the base of the dam next to the exit of the discharge flow of the turbines. The exit of the fish ladder is located adjacent to the intake of the pumping plant.

South Fish Ladder

Approximately 100 feet long, the south fish ladder is a concrete structure containing 10 pools (see photo I-3.) Several fish resting pools and attraction channels extend from the Rogue River to the fish ladder entrance at the base of the dam (see photo I-4.). The ladder is somewhat unusual in that the ladder exits to Gravity Canal rather than directly to the reservoir. Fish moving upstream in the fish ladder exit the ladder into Gravity Canal just upstream of the rotary fish screens and must continue upstream through the headgates of the canal to exit to the river.

The south fish ladder also serves as the conveyance for downstream migrants which enter the headworks of the Gravity Canal. At the rotary screens, the downstream migrants move to a bypass which empties into the fish ladder which passes the migrants on downstream.

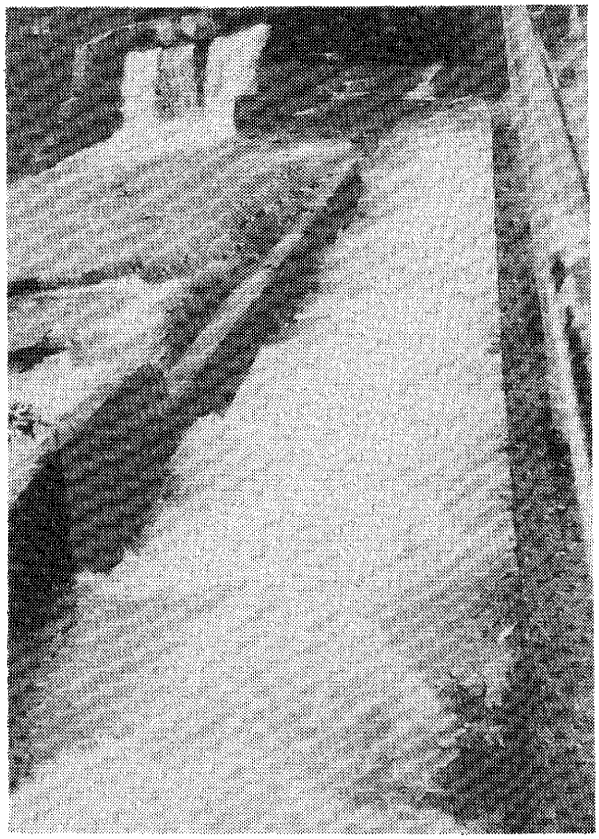


Photo I-3.—Downstream view of south fish ladder.

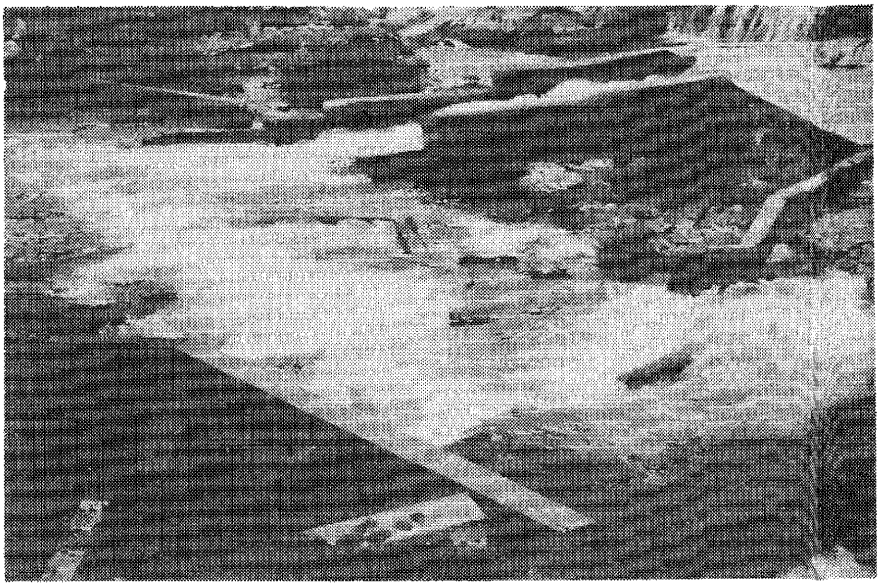
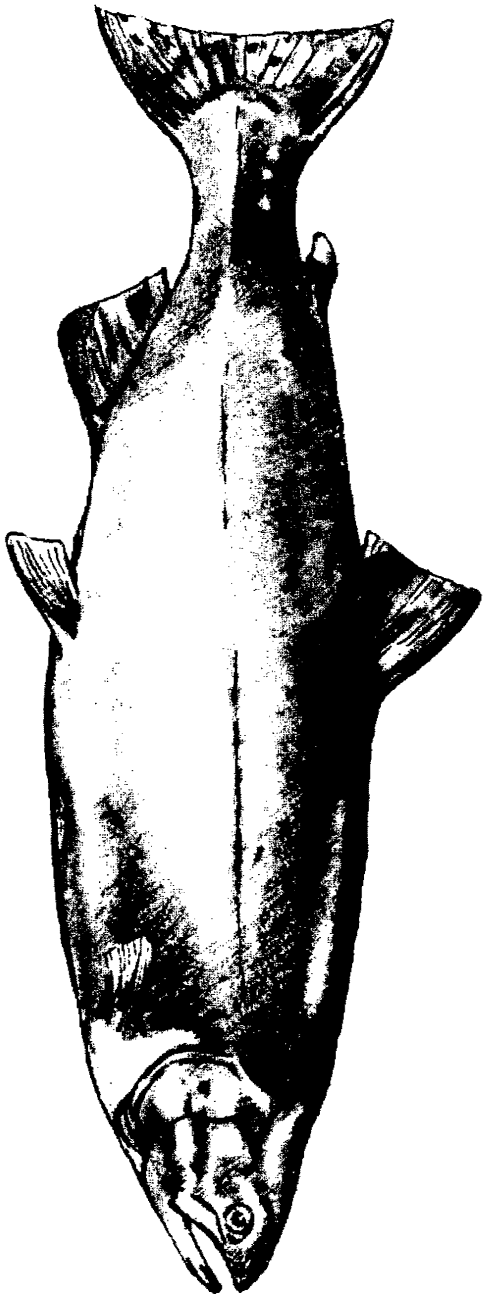


Photo I-4.—Fish resting pools at the downstream end of the south fish ladder.



Chapter II—Need for Action

INTRODUCTION

This document addresses and focuses on only one need--reduction of salmon and steelhead loss at Savage Rapids Dam.

There has been a longstanding recognition of fish passage problems at Savage Rapids Dam. Little was known about the specific needs of the various species migrating in the Rogue River at the time the dam and the first fish ladder were built. Consequently, fish passage was far from adequate. Mortality of upstream migrating adult fish and downstream migrating smolts was high. Smolts were especially vulnerable as they were swept through the operating turbines, swept over the top of the dam onto rocks and concrete below, or diverted into irrigation canals and open fields.

Concern for fish has resulted in a notable spirit of cooperation among Federal, State and local entities, organized fishing groups, and private citizens. Volunteers have spent many hours working with biologists, engineers, and construction workers to improve the fish passage facilities. All of these efforts have helped to reduce mortalities. But, there are still significant opportunities to further improve fish passage. Under ideal circumstances, state-of-the-art facilities are capable of passing almost 99 percent of the migrating fish and smolts.

FISH AS A NATIONAL RESOURCE

Water Resources Development Act

The Water Resources Development Act of 1986 (P. L. 99-662) provides a framework for interpreting the intent of Congress regarding national resources that might be associated with Federal water resource projects. Title 9, section 906e defines two categories of national resources:

- Those resources addressed by treaties of the United States, and
- Anadromous fish.

Anadromous fish found in the Pacific Ocean off the west coast of North America can travel great distances north and south from their streams of

origin. Because of the proximity of Canada and the United States, Canadian fish are often found in U.S. water and U.S. fish are often found in Canadian waters. Management of the Canadian harvest can be crucial to U.S. anadromous fish and vice versa. As a result, the anadromous fish found in these waters are the subject of a United States/Canadian fishing treaty.

The anadromous fish of the Rogue River fit both categories of national resources defined in P.L. 99-662. As a national resource, the anadromous fish of the Rogue River are worthy of every consideration to preserve and enhance their viability and to prevent them from becoming threatened or endangered.

Other Considerations

Poor fish passage at Savage Rapids Dam is only one of many factors that affect fish populations in the Rogue River. Most of the complex factors that affect salmon and steelhead populations are not within the purview of this study but should be recognized in any planning effort. These include fresh water habitat loss, forest management practices that may affect sedimentation or water temperatures, gravel mining, boating, passage at Gold Ray Dam and other upstream dams, harvest rates in fresh water and in the ocean, hybridization of wild and hatchery fish, predation, and general ocean conditions.

Considering the problems confronting salmon and steelhead in the Rogue River, a united front is needed to help protect and maintain the diversity and genetic integrity of the individual stocks of wild fish. Efforts to improve passage at Savage Rapids Dam will complement several region-wide conservation efforts to restore fish populations to sustainable levels. For example, on the Federal level, the President's Forest Plan of ecosystems management of forests within the range of the northern spotted owl will contribute to improved habitat conditions for fish as will the Fish and Wildlife Program of the Columbia River Basin under the Pacific Northwest Electric Power Planning and Conservation Act (P.L. 96-501). On the State level, Oregon has adopted model watershed restoration efforts for the Grande Ronde basin and the southern Oregon coast.

FISH PASSAGE

A detailed description of needs associated with fish passage at Savage Rapids Dam is presented in several documents (Reclamation 1974, 1976, and 1979 and USFWS 1990, 1994). That information is summarized here.

Fish Passage Construction History

The north fish ladder was completed was in 1921 at the same time as the dam was completed. The Oregon State Game Commission built the south fish ladder in 1934.

As early as 1928, recommendations for screening the turbines were submitted. Early attempts were not only expensive but failed to protect fish. Downstream migrating salmonids passed through turbines and pumps until 1958.

In 1941, State Game Commission field agents stressed the high priority of fish protection screens. Six years later, the commission began intensive investigations of fish losses. These investigations showed 14 to 38 percent mortality rates, depending on the size of the fish. The commission claimed a conservative estimate of 210,000 fish lost annually in the Tokay and South Highline Canals along with additional losses from injured fish passing through the hydraulic turbines.

Plans for a link-belt screen were completed in 1950 and incorporated in a 1951 Reclamation report (Reclamation 1951). However, the 82d Congress did not provide funds for fish screens. Construction of radial gates in 1954 required cofferdams to block and divert riverflow. This action blocked the spring chinook salmon run at the time. In addition, the base of the cofferdam remains in the river below the tailrace on the north side of the dam and maintains a pool level in the tailrace that is 24 inches too high for the entrance to the northside ladder. This combined with the 800-cfs discharge from the turbines which masks the north ladder entrance, results in an inadequate entrance attraction flow.

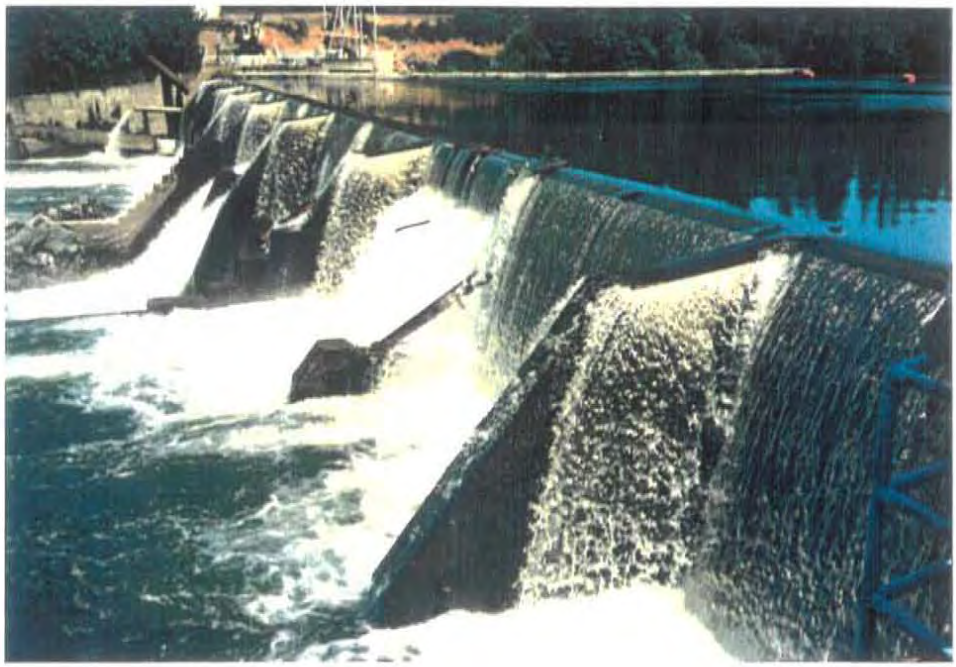
The 85th Congress appropriated $208,000 (P.L. 85-641) on a nonreimbursable basis to construct and install vertical traveling screens on the previously unscreened hydraulic turbines. Reclamation completed this project in April 1958. Thus, the 1958 irrigation season marked the first time since 1921 that downstream migrants were protected from losses in the turbine and pumping system. Some gaps in the screen structure were discovered and filled late in 1958. However, fish passage problems still remained. The velocity of flows moving through the screens and into the turbine bays was too great for many of the smaller fish to resist. These migrants were impinged (pushed) against the upstream face of the screen and injured or killed. A 1960 investigation further revealed that numerous gaps in screen side seals caused turbulence and backflows in front of the side seals and next to the bypass ports, which attracted fish away from the bypass ports and through the side seal gaps where they were then flushed through the turbines, suffering high mortality rates.

In 1971-73, Reclamation studied interim fish passage improvements. Congress authorized these interim improvements in 1974. In 1976, the final environmental statement (Reclamation 1976) for these interim improvements was filed with the Environmental Protection Agency (EPA). Some of these improvements, including new bulkhead gates, modifications on the south fishway, and new fish screens, were completed in 1981. In 1984, the fisheries study was deferred due to uncertain hydropower development on the Rogue River.

In 1986, minor modifications were made to the south fish ladder by local fishery groups under the overview of ODFW.

Migration Losses

By the mid-1960's, and after 19 years of investigation, ODFW became convinced that Savage Rapids Dam caused more fish passage damage than any other single factor on the Rogue River. Fish counting data resulted in the determination that runs using the river above Savage Rapids Dam declined, while runs below the dam increased. In 1981, the USFWS estimated that elimination of all fish passage losses at Savage Rapids Dam would result in a 22 percent increase in fish escapement at the site. The USFWS considers that estimate to be still valid today.



View of Savage Rapids Dam looking north at full pool elevation with flow over the crest.

View of Gravity Canal showing rotary drum fish screens.

Upstream Migration

Other than removing the dam, fish ladders are the only practical solution to provide a way for anadromous fish to continue their upstream migration. However, at present, the fish ladders do not function through a wide enough range of flows and conditions to adequately accommodate the year-round migration of several anadromous fish species.

North Fish Ladder.—The north fish ladder operates only during the irrigation season and is generally inadequate. Few fish use it due to insufficient attraction flows, improper entrance location, inability to control flows in the ladder, sediment and debris in the ladder, and shallow pool depth. Turbulence caused by discharge flows of about 800 cfs from the turbines occurs next to and under the ladder entrance and masks the ladder attraction flows.

South Fish Ladder.—The south fish ladder is a combination of pools and a fish ladder. This fishway is the primary anadromous fish path over the dam. Regulation of flows in the ladder is difficult, which causes passage conditions to vary greatly with fluctuating water levels in the river. Flows which exceed the capacity of the fishway overtop the walls and pour into an area of irregular rock outcropping containing willows and debris. Fish entering the fishway at high flows may become stranded in this area when flows decrease. Fish entering at low flows may have to jump as much as 3 feet vertically to enter some sections of the ladder. Constant attention is required to assure fish passage over the dam. Given the available personnel and operating practices at the dam, this level of close monitoring is not always feasible.

The reservoir is drawn down in the spring and fall to accommodate installing and removing stoplogs, flushing sediment from the turbine/pump intake area, and general maintenance activities. These operations tend to delay upstream migration for varying lengths of time because the south fish ladder is dewatered when the reservoir is lowered.

Radial Gates.—The radial gates in the dam are normally raised for a few days in April and again in October to install and remove the stop logs (raise or lower the reservoir surface level). GPID works with ODFW to time these events to the extent possible to minimize adverse fishery impacts. Salmon cannot swim against a velocity greater than 10 feet per second which is exceeded at the radial gates whenever the riverflow exceeds 2,000 cfs. Since the completion of Lost Creek Dam by the Corps, the flow in the river drops below 2,000 cfs only during the driest months

of the year, July-October, or during droughts. Thus, salmon cannot swim upstream through the open radial gates during the April maintenance period. A flow duration analysis indicates that riverflow exceeds 2,000 cfs about 25 percent of the time in October when the gates are opened to remove the stoplogs. Thus, the upstream passage through the radial gates is minor.

Downstream Migration

Loss of juvenile fish is a major concern at Savage Rapids Dam, aggravated by the fact that downstream migration peaks in the middle of the irrigation season. Earlier investigations by ODFW found that the highest mortality rates were associated with fish ranging from 4 to 8 inches long. Sample counts showed 38,000 fish lost in July 1959 alone, and that up to 10 percent of juvenile salmon and steelhead were impinged. Attempts to reduce losses by plugging some bypass ports to generate a stronger current toward the remaining bypass ports generally failed; fish impingement losses remained unchanged. New traveling screens in the 1970's helped reduce losses due to poor screens but the impingement problems remain uncorrected and these losses continue. Current downstream losses at the site are due to the following:

- Impingement on the traveling screens when the turbines are operating. There are annual losses of significant numbers of fingerlings and smolts, primarily spring chinook. This occurs because the large volume of water required by the turbines and pumps creates a flow velocity through the screens that is too great for small fish to overcome.

- Impingement on the rotary screens of the Gravity Canal. The flow velocities in the Gravity Canal system often cause juvenile fish to impinge on the rotary fish screens.

- Fish screens malfunctioning or are damaged. Although not a frequent occurrence, the loss of fingerlings and smolts can be quite high before the diversion can be stopped, and losses are reminiscent of the losses that occurred before screens were installed and:

  - Fish were pumped or diverted into irrigation canals and diverted out to fields or trapped at the end of the canal. When fish are diverted into the canal system, it is nearly impossible for them to escape back to the Rogue River.

  - Fish were damaged by the turbines.

  - Rapid release of pressure in the turbine and pumping systems cause internal hemorrhages. (Fish losses stemming from pressure hemorrhaging cannot be estimated, and these fish are not counted in total fish losses.)

- Juvenile fish pass over the dam and strike the sill at the bottom of the spillway.

- Predation. Juvenile fish, especially the smaller fry, are particularly vulnerable to predation when their downstream migration is slowed while passing through the slower moving water of the reservoir.

ENDANGERED SPECIES

At the time of this writing, none of the anadromous fish in the Rogue River system were listed as threatened or endangered under the ESA. However, on March 16, 1995, NMFS proposed the "Klamath Mountains Province Steelhead" (all steelhead stocks between Cape Blanco, Oregon and Cape Mendocino, California) for listing as threatened under the ESA. This proposal to list includes all steelhead runs in the Rogue River. On July 19, 1995, NMFS proposed three distinct populations of Coho salmon (from the San Lorenzo River in California to the Columbia River) for listing as threatened under the ESA; this includes the coho run of the Rogue River. In addition, all other anadromous trout species and Pacific salmon of Oregon, Idaho, Washington, California, and Montana (sea-run cutthroat trout and pink, chum, sockeye, and chinook salmon) are currently the subject of comprehensive status reviews. These are expected to be completed in 1995 and 1996.

The seriousness of depleted stocks of salmon, especially coho, prompted the Pacific Fishery Management Council to prohibit all ocean fishing for salmon in 1994 along the Washington and northern Oregon coasts and banned all fishing for coho. For 1995, coho fishing is again banned and ocean fishing for other salmon is open but the allowable catch is severely restricted compared to historic levels. Under these circumstances, any action available to enhance salmon and steelhead populations should be given serious consideration.

SUMMARY

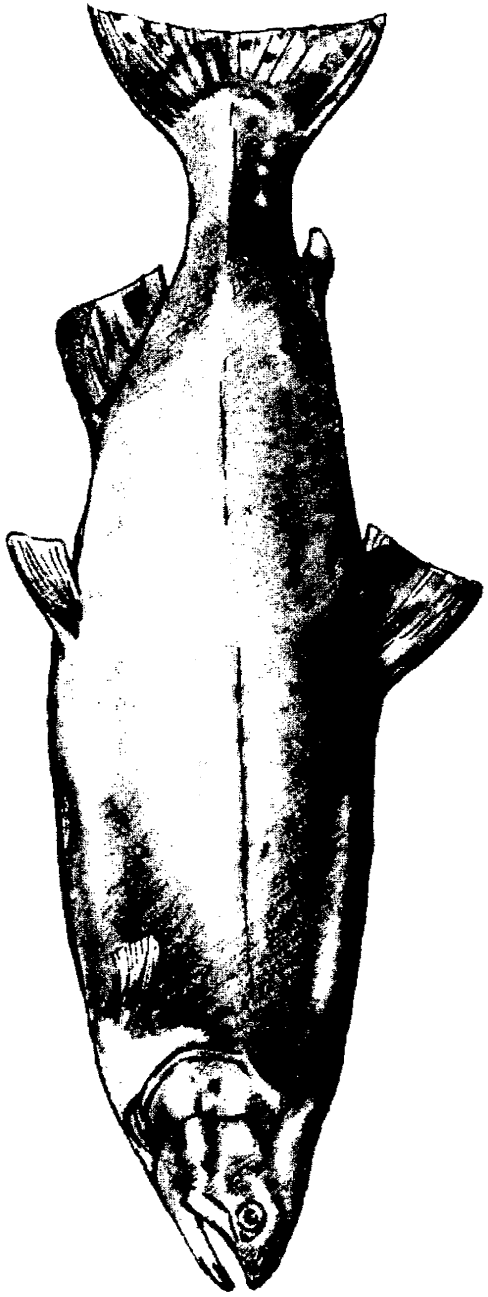
Savage Rapids Dam continues to be a major impediment to salmon and steelhead in the Rogue River basin. The significant fish losses mean that the full potential of basin production is not being realized. The existing fish passage facilities are inadequate, especially considering the dam's location on a major migration route. Table II-1 summarizes the continuing problems at Savage Rapids Dam.

The need for improving fish passage and reducing fish losses at Savage Rapids Dam is recognized by essentially all sectors of the public.

Table II-1.—Fish passage problems at Savage Rapids Dam
[Source: USFWS Planning Aid Memorandum, April 1990]

Item	Problem
1.	Poor regulation of flows in the south ladder.
2.	Unfavorable entrance to and exit conditions from the south ladder under all flows, i.e., ladder now exits through canal headworks; at high flows fish approach through channel behind ladder towards shore, and at low flows, fish may have to jump to enter some sections of ladder, etc.
3.	Poor attraction flows result in marginal use of the north ladder during operation.
4.	North ladder does not operate between irrigation seasons.
5.	Drawdown of the reservoir (after irrigation the season) dewaters the south ladder delaying upstream migration.
6.	Reservoir dewatering for removal or addition of stoplogs causes increased turbidity during fall and spring.
7.	Impingement of juvenile fish on screens.
8.	Increased trash and vegetation buildup because of flow regulation with Lost Creek Project or people dumping debris into Savage Rapids reservoir.
9.	Loss of juvenile fish and steelhead kelt[1] that pass over the dam and strike the sill or rocks below.
10.	Smolt losses due to pressure changes when the sluice gates are opened and the reservoir is at full pool.

[1]A kelt is an adult steelhead that returns to the ocean after spawning.



Chapter III—Preferred Alternative

DESCRIPTION

This chapter discusses the Preferred Alternative (Pumping Alternative) to resolve fish passage problems at Savage Rapids Dam.

The Pumping Alternative maximizes net national economic benefits as defined by Federal water project guidelines (Water Resources Council 1983). These guidelines generally require that Federal agencies recommend the alternative plan with the greatest net economic benefits; therefore, the Pumping Alternative is the Federally preferred alternative. State and Federal fish and wildlife agencies have indicated that the Pumping Alternative is their choice (see Attachments C and D). In January 1994, the GPID announced that it concurred and selected the Pumping Alternative as their preferred alternative (see Attachment E).

The Preferred Alternative consists of three parts: (1) replacement of GPID pumping and diversion facilities at the dam with two new pumping plants, one each on the north and south sides of the river; (2) removal of the dam and appurtenant structures and restoration of the site, and (3) forgiveness of the remaining debt to the Federal Government amounting to $290,525 as of 1994. (See Summary for an artist's conception of the pumping plants and associated facilities including service road access to the river inlets.)

ACCOMPLISHMENTS

The Preferred Alternative focuses on the area just downstream from Savage Rapids Dam upstream to the city of Rogue River (about 3.5 miles upstream). The accomplishments are confined to (1) fish passage improvement, (2) reestablishment of a free-flowing reach of river, and (3) extension of the useful life of irrigation diversion facilities. In addition, there would be minor changes in wildlife habitat, vegetation, recreation, and social and economic activities associated with that river reach, and there would be temporary adverse effects associated with construction.

With the Preferred Alternative, salmon and steelhead escapement[1] past Savage Rapids Dam would increase by about 22 percent. For this analysis, Reclamation is using the USFWS estimate that the increased escapement would be 26,700 salmon and steelhead and the accompanying increase in

[1]Fish escapement is the number of adult fish successfully returning to spawn.

harvest would be about 87,900 fish. A 1981 study by the USFWS (USFWS 1981) estimated that if all fish passage problems at Savage Rapids Dam were eliminated, salmon and steelhead escapement past the dam would increase by 26,700 fish, about 22 percent of the estimated total escapement at that time of 120,500 adult salmon and steelhead.

Because of criticism that the 1981 estimates were outdated, the ODFW recently undertook an analysis of potential anadromous fish escapement with the Preferred Alternative. This analysis is based on more recent efforts to model fish mortality associated with the dam and uses updated information on life cycle and abundance of the fish species. The ODFW analysis includes high, medium, and low estimates of increased anadromous fish escapement; the results range from a low of 7,624 fish to a high of 29,407 fish (see attachment D). Since the 1981 estimate falls within this range, Reclamation did not recalculate monetary benefits which are based on the 1981 estimate in this report. (See chapter VI for detailed discussion of fish passage and losses.)

The Rogue River from the site of the existing Savage Rapids Dam to the upper reach of the impoundment would be restored to a natural free-flowing, unobstructed river. This would provide additional spawning habitat for fall chinook salmon, eliminate impediment to fish movement, eliminate the current loss of anadromous fish due to passage problems, and benefit resident fish which would be free to move up and down the river to find suitable habitat as flow conditions change.

Removal of the dam and associated facilities eliminates the physical capability for gravity diversion and hydraulic power to drive pumps for irrigation diversions. Existing irrigation diversion facilities are replaced by construction of new electric pumping facilities which will provide a useful life of more than 50 years.

This alternative does not affect water rights, amount and timing of water diversions, annual river flow, ground water, or other natural resources and uses other than those identified above.

FACILITIES

Designs for the Preferred Alternative were made during the course of this study which was initiated in 1989. These designs are adequate for authorization but not for specifications or construction. Final designs would be completed in consultation with NMFS, USFWS, and ODFW during preconstruction.

Pumping Plants

Two pumping plants, one on the right or north bank and one on the left or south bank, would be constructed to provide a total pumping capacity of 150 cfs. Except for the intake, all facilities would be constructed above the 100-year flood level. Drawings 1313-D-1 and 1313-D-2 show the facilities.

The north pumping plant would have three equal-capacity pumps to serve the Tokay/Evans Canal system. The south pumping plant would have two sets of three equal-capacity pumps; three to serve the Highline/Savage Canal system and three to serve the Gravity Canal system. Serving each canal system with three equal-capacity pumps allows greater flexibility in operation.

Table III-1 summarizes pumping plant data.

Table III-1.—Pumping plant data

	North plant	South plant	
Item	Tokay/Evans	Highline/Savage	Gravity
Number of pumps	3	3	3
Pumping capacity (cfs)	32	59	59
Each pump			
Flow (cfs)	10.67	19.67	19.67
Flow (gallons per minute)	4,788	8,827	8,827
Total dynamic head (feet)	190	122	34
Motor size (horsepower)	300	350	100

Vertical turbine pumping units operating in a wet sump would be used and represent the simplest and possibly the quietest arrangement for ease of maintenance and operation. Each sump, the river inlet, and the connecting box culvert would be located at an elevation that would have the hydraulic capability to realize the pumping capacities shown in table III-1 under all reasonable conditions. The size of the inlet requirements are dictated by incoming flow velocities which must be no more than 0.4 feet per second in order to prevent the impingement of small fish. The inlet for the north pumping plant would be 4 feet high and 22 feet long while the inlet for the south pumping plant would be 4 feet high by 75 feet long. Each inlet would be equipped with 1/8-inch mesh fishscreen and trashracks to protect the screens.

Power for the pumps would be provided from an existing 12-kilovolt distribution line located next to State Highway 99 on the south side of the river. A pad mounted transformer would provide the needed voltage adjustment for the pumps. Simple "H" frame poles would support the powerline as it spans about 550 feet over the river from the south to the north pumping plant. No center support would be needed, and clearance would exceed the overhead minimum of 25 feet.

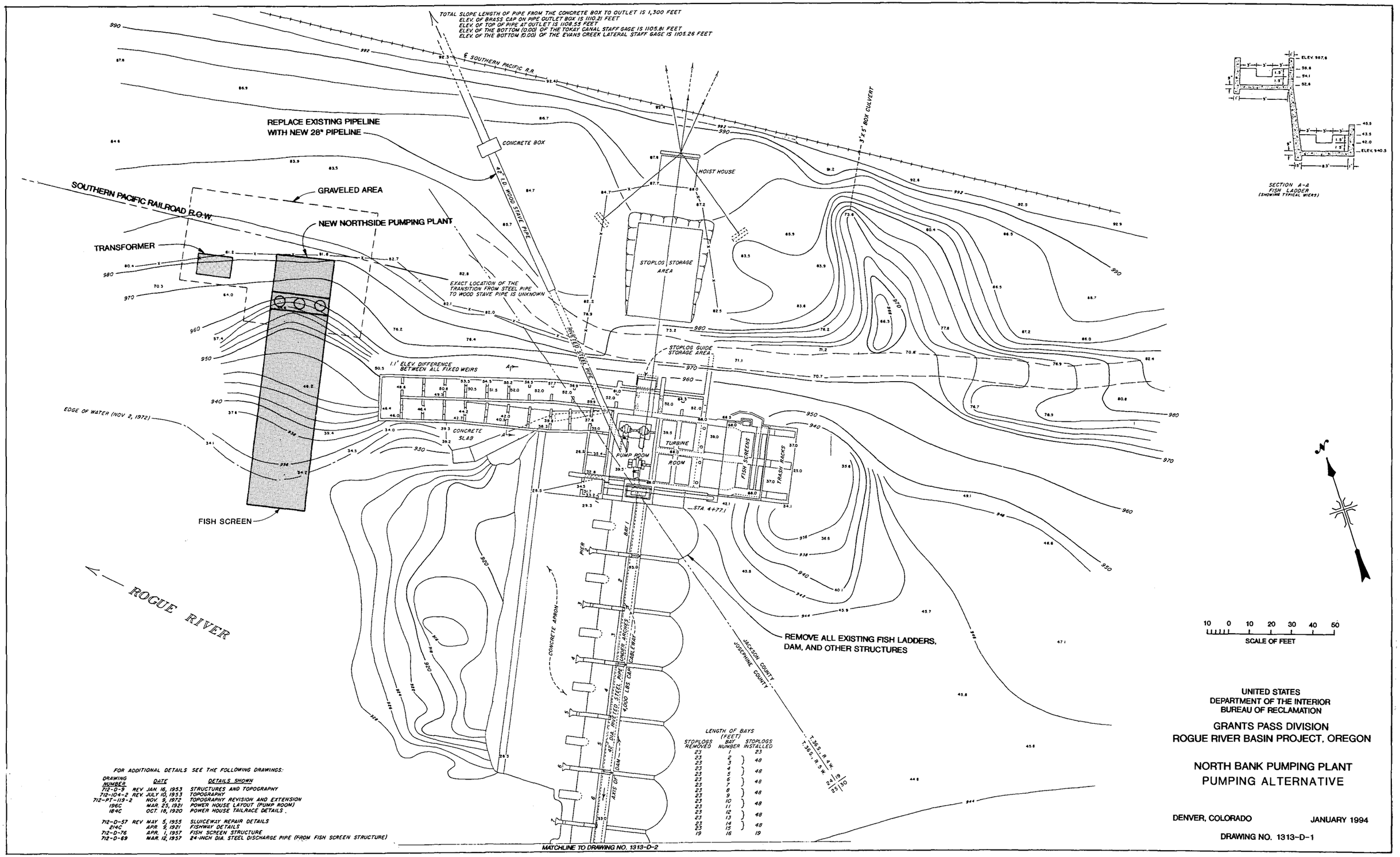
Since the pump motors would be located outside, noise abatement walls which reflect sound directly upward would be provided to reduce the overall noise level in the immediate vicinity. Careful attention to landscaping would also help attenuate pump noise as well as obscure the pumping plants from river or road view.

Discharge pipelines from the new pumping plants would be buried and would follow the general alignment of pipelines from the existing pumping plant. The north pipeline would terminate at the freeway where it would connect with the existing steel pipe under the freeway. The two south pipelines would terminate at new outlet structures at the heads of the Gravity and Highline Canals. The lengths and diameters of the pipelines are shown in table III-2.

Table III-2.—Pipe dimensions

Location	Diameter (inches)	Length (feet)
North plant to Tokay Canal[1]	28	1,450
South plant to South Highline Canal	38	478
South plant to Gravity Canal	38	30

[1]Connects to existing pipeline at freeway



FOR ADDITIONAL DETAILS SEE THE FOLLOWING DRAWINGS:

DRAWING NUMBER	DATE	DETAILS SHOWN
712-D-9 REV	JAN. 16, 1953	STRUCTURES AND TOPOGRAPHY
712-104-2 REV	JULY 10, 1953	TOPOGRAPHY
712-PT-119-2	NOV. 9, 1972	TOPOGRAPHY REVISION AND EXTENSION
196C	MAR. 25, 1921	POWER HOUSE LAYOUT (PUMP ROOM)
184C	OCT. 18, 1920	POWER HOUSE TAILRACE DETAILS.
712-D-57 REV	MAY 5, 1955	SLUICEWAY REPAIR DETAILS
214C	APR. 9, 1921	FISHWAY DETAILS
712-D-76	APR. 1, 1957	FISH SCREEN STRUCTURE
712-D-69	MAR. 12, 1957	24-INCH DIA. STEEL DISCHARGE PIPE (FROM FISH SCREEN STRUCTURE)

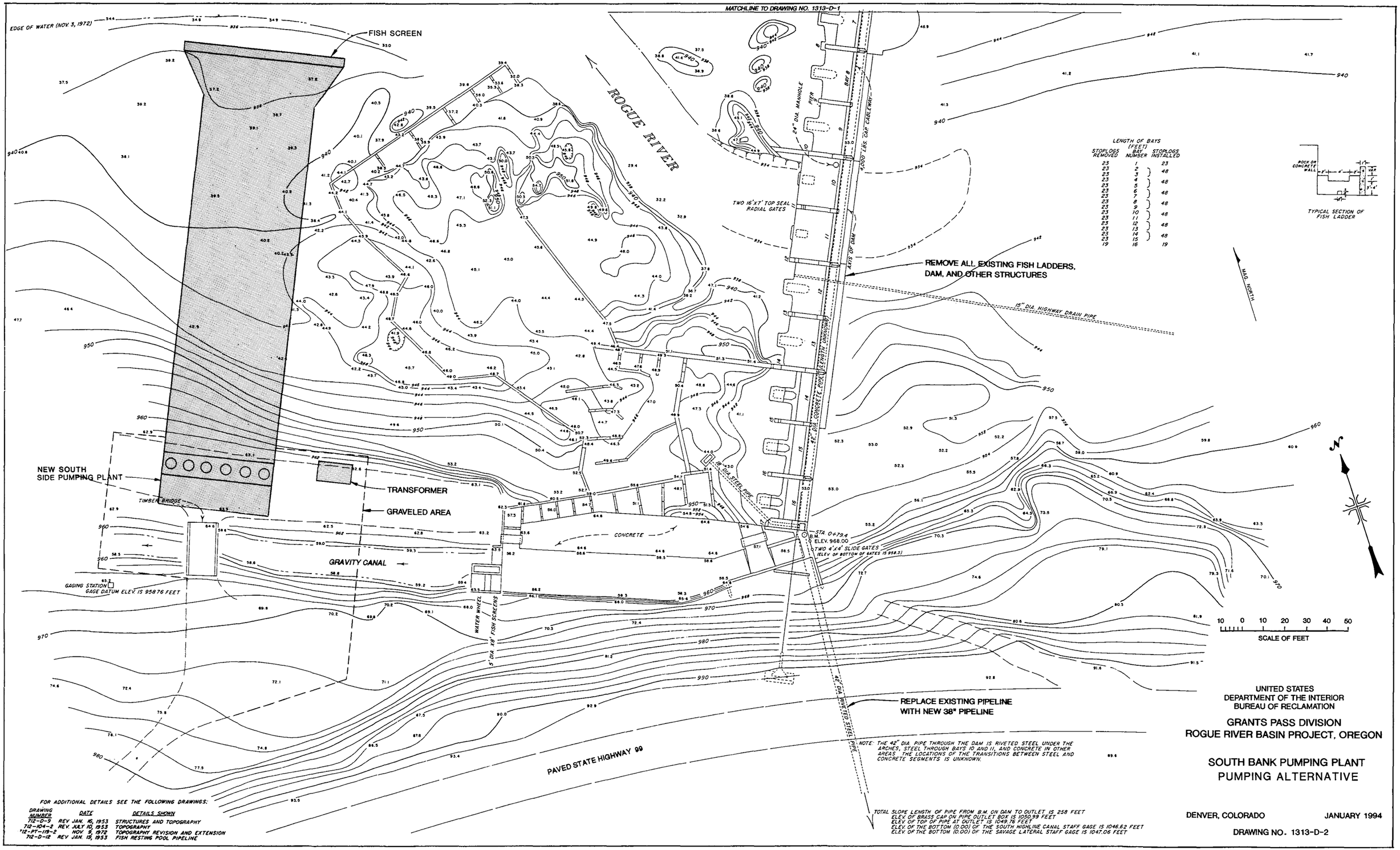
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

GRANTS PASS DIVISION
ROGUE RIVER BASIN PROJECT, OREGON

NORTH BANK PUMPING PLANT
PUMPING ALTERNATIVE

DENVER, COLORADO JANUARY 1994

DRAWING NO. 1313-D-1



LENGTH OF BAYS (FEET)

STOPLOGS REMOVED	BAY NUMBER	STOPLOGS INSTALLED
23	1	23
23	2	48
23	3	
23	4	48
23	5	
23	6	48
23	7	
23	8	48
23	9	
23	10	48
23	11	
23	12	48
23	13	
23	14	48
23	15	
19	16	19

FOR ADDITIONAL DETAILS SEE THE FOLLOWING DRAWINGS:

DRAWING NUMBER	DATE	DETAILS SHOWN
712-D-9	REV JAN. 16, 1953	STRUCTURES AND TOPOGRAPHY
712-104-2	REV. JULY 10, 1953	TOPOGRAPHY
*12-PT-118-2	NOV. 9, 1972	TOPOGRAPHY REVISION AND EXTENSION
712-D-12	REV JAN. 13, 1953	FISH RESTING POOL PIPELINE

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

GRANTS PASS DIVISION
ROGUE RIVER BASIN PROJECT, OREGON

SOUTH BANK PUMPING PLANT
PUMPING ALTERNATIVE

DENVER, COLORADO JANUARY 1994

DRAWING NO. 1313-D-2

Access Roads

Access to all construction sites, including the pumping plants, pipelines, and electric transmission lines, would be from existing county roads or State highways. Access to the north pumping plant site, just downstream from the dam on GPID-owned land, would be across the existing railroad right-of-way. Access to the south pumping plant site would be by the existing access road and across the uppermost reach of the Gravity Canal. The portion of Gravity Canal from the existing headworks to the outlet structure of the discharge pipelines would be filled in for parking and access. Access to these sites would be limited to operating personnel and not open to the public.

SAVAGE RAPIDS DAM REMOVAL

All existing structures would be demolished and removed from the site, including the dam, powerhouse and related facilities, hoist house and cable works, north and south fish ladders, and a portion of the Gravity Canal. The existing structures would be demolished primarily by mechanical means (jackhammer, bulldozer, and crane with wrecking ball) with minimal blasting. Blasting may prove faster and less obtrusive to humans and wildlife than the more prolonged demolition by mechanical means and may warrant further consideration at the time final designs are prepared. (See also "Construction Schedule.")

Disposal of Excavated and Other Materials

Excavated rock, concrete, and other waste materials would be removed and disposed of in a landfill within 10 miles of the construction site. The potential for salvaging has not been evaluated.

Any materials that are categorized as hazardous would be handled in accordance with Federal, State, and local laws.

Damsite and River Channel Restoration

The damsite and area immediately adjacent to GPID-owned land would be rehabilitated by revegetation and minimal landscaping to retain the approximate configuration and condition of a free-flowing river.

Portions of the river channel through the damsite area may need restoration. Shaping, stabilizing, revegetation, and landscaping that may be required would be carried out in consultation with the Jackson County Parks Department, ODFW, NMFS, and USFWS.

River Recreation Option

An option identified is to develop a challenging river course for rafts, drift boats, and kayaks in the vicinity of Savage Rapids. The design would depend on the as-yet-unknown configuration of Savage Rapids. If properly developed, visitors would be attracted to the area. The reach could be designed to allow jet boat passage or to act as a jet boat barrier. Conceptual plans would require considerable public involvement and interagency coordination to determine feasibility.

Costs have not been developed for this option. Cost sharing responsibilities would need to be in accordance with P.L. 89-72 as amended by Section 16 of P.L. 102-575.

CONSTRUCTION

The Preferred Alternative assumes a total construction period of 5 years including 2 years preconstruction activities and 3 years of actual construction.

Construction Cost

Construction costs for the Preferred Alternative are summarized in Table III-3. These costs include standard cost factors of 10 percent for unlisted items, 25 percent for contingencies, and 30 percent for noncontract (indirect) costs. Removal and disposal costs are included in the unit costs based on a haul distance of 10 miles. No values are included for salvaging existing materials or equipment.

Table III-3.—Construction cost of the Preferred Alternative[1]
(January 1993 Price Level)

Item	Cost
Remove Savage Rapids Dam	$4,967,000
North Pumping Plant	
Pumping plant (3 pumps), screens, T-lines, etc.	1,891,000
Tokay/Evans Canal discharge line	301,000
North total	$2,192,000
South Pumping Plant	
Pumping plant, (6 pumps) screens, etc.	$3,662,000
Gravity Canal discharge line	37,000
South Highline/Savage Canal discharge line	347,000
South total	$4,046,000
Total construction cost	$11,205,000

[1]Includes allowances for unlisted items, contingencies, and indirect costs

Materials

Sand, gravel, rock and other raw materials for construction are readily available from commercial sources in the area.

Construction Schedule

Three primary considerations affect scheduling construction activities:

- Safety of contractors performing the work.
- Effect of construction activity on migrating fish.
- Effect on the capability to deliver irrigation water.

Much of the construction activity would require work within the river channel but also requires a dry-site condition. To achieve dry-site conditions, temporary earth cofferdams would be needed at construction sites to divert the riverflow. The safest time of year for such work is during times of low flow. However, fish considerations may require that the in-river construction period take place during higher flow periods, and, as a result, increased safety features may be necessary.

Scheduling of actual construction and demolition activities would be determined in consultation with the Corps, Oregon Department of Environmental Quality (ODEQ), GPID, and the three agencies who have a major interest in fish (NMFS, ODFW, and USFWS). The State has determined that the period from June through about mid-September would be the least disruptive for migrating fish. In-river work and removal of the dam and appurtenant structures would be accomplished on schedules where the least potential damage to fish would occur.

The pumping plants would be constructed and operational before any part of the dam is removed to assure GPID's ability to maintain water delivery.

Three parameters would control all construction activities:

1. Construction within the riverbed itself would be limited to the period from June to September. Lengthy construction activities that must take place within the riverbed require the construction of cofferdams which would be placed (and removed) only during the time allowed for in-river work. Construction work within the confines of the cofferdam would not be considered in-river and could continue past the in-river construction period.

2. Construction would be scheduled to prevent jeopardizing the ability of GPID to deliver irrigation water to its patrons. The new pumping plants would be constructed first so they would be in place and ready to deliver water when demolition of the dam begins.

3. Construction activity would not be allowed to block the migration of anadromous fish. Contractors must be flexible so as to work on one side of the river at a time.

A conservative estimate of a 5-year construction period was assumed. This includes 2 years of preconstruction activities and 3 years of actual construction. The new pumping plants would be constructed during the first year of actual construction, and the dam and other facilities would be removed during the following 2 years.

OPERATION, MAINTENANCE, REPLACEMENT, AND POWER

Power

The average annual energy consumption is estimated at 5,675,800 kilowatt-hours (kWh) over the 6-month irrigation season; the maximum demand[1] is 1,600 kilowatts (kW). Table III-4 summarizes the power requirement.

Table III-4.—Electric power requirement

Month	Days of irrigation	Average pumping (cfs)	Average demand (kW)	Energy consumption (kWh)	
				Daily average	Total
May	28	130	1,390	33,300	932,400
June	30	140	1,490	35,800	1,074,000
July	31	145	1,550	37,100	1,150,100
August	31	150	1,600	38,300	1,187,300
September	30	130	1,390	33,300	999,000
October	10	130	1,390	33,300	333,000
Total	160				5,675,800

Costs

Estimated operation, maintenance, replacement, and power (OMR&P) costs for the Preferred Alternative are based on operating the plant as a semi-attended facility at full or nearly full capacity during a 23-week operating season; pumping rates would be adjusted as needed to avoid waste of water. Estimates were modeled using computer programs and procedures as well as historical data, based on the pump sizes described earlier in this section. The OMR&P costs identified in this document are for the new facilities described (pumping plants and associated facilities) and do not include costs associated with the operation of other GPID facilities. It is

[1]Demand is the instantaneous power requirement

assumed that power would be obtained from Pacific Power and Light Company. Costs are based on Agricultural Pumping Service Schedule 41, dated 16 December 1992. These charges include the energy charge of $0.03266 per kWh and a load charge of $800 plus $4 per kilowatt based on the average demand for the 2 highest months. Table III-5 summarizes project OMR&P costs.

Table III-5.—Annual OMR&P costs for the Preferred Alternative
(January 1993 Price Level)

Item	OM&R	Power	OMR&P
North pumping plant			
Pump plant, screens, T-line, etc.	$13,200	$82,400	$95,600
Tokay/Evans discharge line	300	0	300
North side subtotal	$13,500	$82,400	$95,900
South pumping plant			
Pumping plants, screens, etc.	$27,100	$110,200	$137,300
South Main Canal discharge line	200	0	200
Highline/Savage discharge line	300	0	300
South side subtotal	$27,600	$110,200	$137,800
Total	$41,100	$192,600	$233,700

ECONOMIC AND FINANCIAL ANALYSIS

Benefits

This alternative would produce non-consumptive use benefits related to anadromous and resident fish increases and indirect or secondary benefits. Because these monetary benefits are difficult to calculate and minor compared to direct consumptive use benefits, they were not fully identified and not included in the economic analysis.

Monetary benefits of the Preferred Alternative in this analysis are limited to salmon and steelhead and are based on an estimated increase in the annual escapement at the site of 26,700 salmon and steelhead. This would

increase the annual commercial and sport harvest by 87,900 salmon and steelhead and provide annual equivalent monetary benefits of $4,998,600. Table III-6 summarizes the relationship between escapement and anticipated increase in fish harvest by species, and table III-7 summarizes estimated harvest by species and type of harvest.

Table III-6.—Increased escapement and harvest with the Preferred Alternative
[Source: USFWS Planning Aid Memorandum, 1990]

Species	Escapement at Savage Rapids Dam	Catch/escapement ratio	Harvest increase
Fall chinook	8,200	5:1	41,000
Spring chinook	9,100	3:1	27,300
Coho	400	4:1	1,600
Winter steelhead	4,600	2:1	9,200
Summer steelhead	4,400	2:1	8,800
Total	26,700		87,900

Table III-7.—Distribution of increased salmon and steelhead harvest
[Source: USFWS Planning Aid Memorandum, 1990]

Species	Commercial harvest		Sport harvest		Total harvest
	Ocean	Freshwater	Ocean	Freshwater	
Fall chinook	30,750	—	5,125	5,125	41,000
Spring chinook	20,475	—	3,413	3,412	27,300
Coho	1,056	—	462	82	1,600
Winter steelhead	—	—	—	9,200	9,200
Summer steelhead	—	—	—	8,800	8,800
Total	52,281	—	9,000	26,619	87,900

Monetary benefits for commercial fishing values are based on average fish weight and value per pound. Sport fishing values are based on an average value per angler-day and the number of angler-days to catch one fish.

Commercially caught fall and spring chinook average 9.33 pounds and have a value of $2.30 per pound; a value of $22.30 per fish. Coho caught commercially average 4.73 pounds and have a value of $1.09 per pound; a value of $5.16 per fish. Ocean sport fishery for all of the species listed in table III-7 is valued at $60 per angler-day with an average effort of 1.08 angler-days per fish; a value of $64 per fish.

Fresh water sport fishing is valued at $51 per angler-day. Fall and spring chinook salmon, coho salmon, and summer steelhead require an average effort of 3.3 angler-days per fish; a value of $168.30 per fish. Winter steelhead require an average effort of 2.9 angler-days; value of $147.90 per fish.

Annual equivalent fishery benefits of $4,998,600 accruing to the Preferred Alternative are based on a 20-year period of analysis, a 5-year build up period, and an 8 percent discount rate. Table III-8 summarizes the annual monetary benefit by species and type of harvest.

Table III-8.—Estimated annual equivalent value of increased harvest[1]

Species	Commercial[3]	Sport[2]		Total
		Ocean	Freshwater	
Fall chinook	$568,800	$275,500	$715,500	$1,559,800
Spring chinook	378,700	183,500	476,400	1,038,600
Coho	4,500	24,800	13,500	42,800
Winter steelhead	0	0	1,228,600	1,228,600
Summer steelhead	0	0	1,128,800	1,128,800
Total	$952,000	$483,800	$3,562,800	$4,998,600

[1]The annual equivalent value is based on a discount rate of 8 percent over a 20-year period with a 5-year buildup.
[2]Benefits for sport fishing are based on an angler-day value of $60 for ocean fishing and an angler-day value of $51 for freshwater fishing. Ocean sport fishing values are based on a 1970 report by Mathews and Brown, *Economic Evaluation of the 1967 Sport Salmon Fisheries of Washington*, and the Pacific Fishery Management Council's March 1978 *Final Environmental Statement and Fishery Management Plan for Commercial and Recreational Salmon Fisheries off the Coasts of Washington, Oregon, and California Commencing in 1978*. Values for freshwater fishing were derived from a 1978 NMFS report, *Economic Benefits from Recreational Steelhead Fishing*, and a 1978 paper by Charbonneau and Hay *Determinants and Economic Values of Hunting and Fishing*. More recent values are not available for this analysis.
[3]All commercial harvest is assumed to be ocean. The methodology for quantification of economic benefits for commercially harvested salmon and steelhead is based on National Oceanographic and Atmospheric Administration Technical Memorandum NMFS F/NWR3, *Net Economic Values for Salmon and Steelhead from the Columbia River System*, P.A. Meyer, June 1982.

Costs

Project cost, consisting of construction costs plus interest during construction, totals $13,255,000. Construction costs based on a January 1993 price level are shown in table III-3. Interest during construction was calculated on the basis of a total 5-year construction period at the applicable Federal discount rate of 8 percent for 1994.

The annual equivalent cost of the Preferred Alternative, which includes the annual equivalent of the project cost and the annual OMR&P cost, is estimated at $1,583,700. Calculation of the annual equivalent of the project cost assumes a 20-year period of analysis and the 1994 Federal discount rate of 8 percent. Table III-9 summarizes project and annual costs.

Table III-9.—Project and annual costs of the Preferred Alternative

Item	Cost
Project cost	
Construction	$11,205,000
Interest during construction (8 percent over a 5-year construction period)	2,050,000
Total project cost	$13,255,000
Annual cost	
Annual equivalent of project cost[1]	1,350,000
Annual operation, maintenance, replacement, and power	233,700
Total annual cost	$1,583,700

[1]Total project cost annualized at 8 percent for a 20-year period

Benefit/Cost Analysis

A true benefit/cost analysis which compares annualized values for all of the costs to all of the benefits over the life of the project was not made for this analysis. Instead, costs and benefits were annualized over a 20-year period instead of the 100-year period that is normally used for a project life, and the only monetary benefits identified are those associated with salmon and steelhead. Although not identified, the project may produce some monetary benefits associated with recreation. The effect of using a short period for the analysis is that annualized benefits are slightly less than with

a longer period, and annualized costs are much higher than with a longer period. As a result, the comparison of benefits and costs using a shorter period is that the benefit/cost ratio is very conservative, i.e., much less than would be obtained using a longer period of analysis.

For this analysis, benefits and costs were annualized over a 20-year period using the 1994 Federal discount rate of 8 percent. Annual equivalent benefits of $4,998,600 compare with annual equivalent costs of $1,583,700 to provide a benefit/cost ratio of 3.2 to 1.

COST ALLOCATION AND REPAYMENT

A cost allocation was not made for this analysis. All of the benefits of the project are assumed to be associated with the salmon and steelhead; therefore, all of the costs were assigned to the anadromous fish function.

Costs of fish protection facilities at Savage Rapids Dam have in the past been nonreimbursable. It is assumed for this analysis that all of the costs associated with the anadromous fish function would be Federal costs and nonreimbursable. (Costs associated with the non-Federal portion of this study--the irrigation conservation function--would be paid by non-Federal entities and constitute cost share for this initiative.)

FUNDING

It was assumed for this analysis, that the capital costs of the Preferred Alternative would be 100-percent federally financed and funded and that funds would be expended as needed during the construction period. A total of $11,205,000 in actual funds would be expended over a 5-year period. About $1,345,000 would be required during the 2-year preconstruction period, and the remainder would be required during the 3 years of actual construction. Table III-10 summarizes the funding requirement by year (interest during construction is not shown).

Table III-10.—Construction funding schedule for the Preferred Alternative
(January 1993 price level)

Item	Preconstruction		Construction			Total
	Year 1	Year 2	Year 3	Year 4	Year 5	
Pumping plants	$249,000	$500,000	$5,489,000	$0	$0	$6,238,000
Dam removal	196,000	400,000	0	2,914,000	1,457,000	4,967,000
Total	$445,000	$900,000	$5,489,000	$2,914,000	$1,457,000	$11,205,000

Funding of all OMR&P costs would continue to be the responsibility of the GPID.

PERMITS AND REGULATORY COMPLIANCE

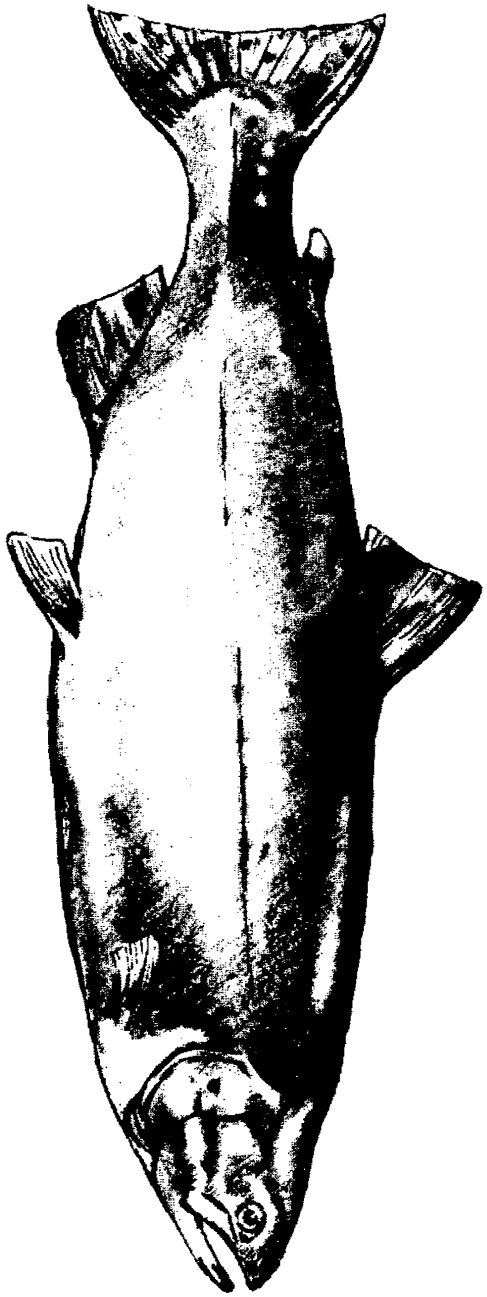
Prior to the initiation of construction activities, certain permits and other compliance issues must be addressed. Among these is the Clean Water Act. The Corps and the ODEQ would be contacted for compliance with the permitting requirements of sections 402 and 404 of the Clean Water Act. (See Consultation and Coordination chapter for additional discussion.)

VIABILITY

The Preferred Alternative was found to meet the four criteria of viability--completeness, effectiveness, efficiency, and acceptability. (See "Formulation and Evaluation" chapter.)

The Preferred Alternative includes all investment needed to provide for safe fish passage and continued irrigation diversion and would eliminate all salmon and steelhead loss due to irrigation diversion at this site. It has a large benefit/cost ratio and is the most efficient alternative identified. This alternative is supported and preferred by Federal and State fish and wildlife agencies, environmental and fishery interest groups, and the GPID Board

and is compatible with existing laws, regulations, and public policies. Some opposition to any action alternative is expected, and there is a portion of the public that would prefer another action alternative or no action.



Chapter IV—Dam Retention Alternative

DESCRIPTION

This chapter discusses the Dam Retention alternative to resolve fish passage problems at Savage Rapids Dam.

The Dam Retention Alternative includes two parts (1) modification of Savage Rapids Dam, improvement of the headworks of Gravity Canal, and replacement or rehabilitation of the aging hydraulic turbines, pumps, and associated facilities; and (2) removal of the existing fish ladders and screens and replacement with facilities that meet current NMFS criteria.

ACCOMPLISHMENTS

The Dam Retention Alternative focuses on the river area from just downstream to just upstream from Savage Rapids Dam. The accomplishments are confined to (1) fish passage improvement and accompanying harvest potential of salmon and steelhead and (2) extension of the useful life of irrigation diversion facilities. In addition there would be temporary effects associated with construction.

With the Dam Retention Alternative, annual salmon and steelhead escapement past Savage Rapids Dam would increase about 17 percent. For this analysis, Reclamation estimates that the increased escapement would be 20,700 fish and the associated increase in harvest would be about 68,100 fish. The ODFW recently undertook an analysis of potential anadromous fish escapement with the Dam Retention Alternative. Their analysis is based on more recent effort to model fish mortality associated with the dam and uses updated information on life cycle and abundance of the fish species. The results of high and low estimates of increased anadromous fish escapement range from 5,500 fish to 29,400 fish (see attachment D) Since the earlier estimate falls within this range, Reclamation did not recalculate the monetary benefits based on the new ODFW numbers.

Improved fish passage would also benefit resident fish which could more easily move up and downstream to find suitable habitat as flow conditions change.

The useful life of the irrigation diversion facilities that pump water to the Tokay Canal/Evans Creek Lateral system and to the South Highline Canal/Savage Lateral system would be extended for at least 50 years.

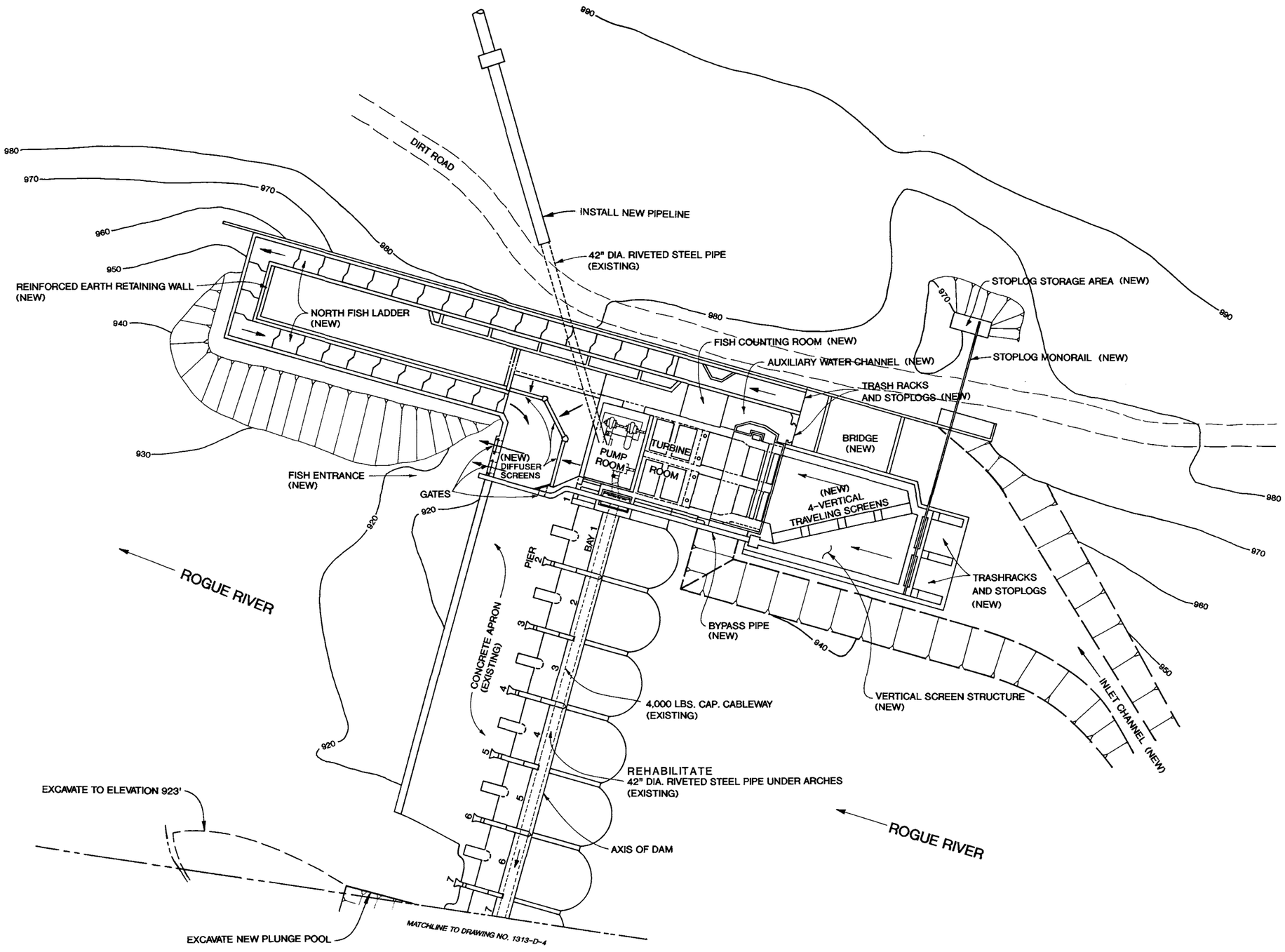
This alternative does not affect water rights, amount and timing of water diversions, annual river flow, operation of the pool formed by Savage Rapids Dam, ground water, current recreation activities, or other natural resources and uses other than those identified above.

FACILITIES

Savage Rapids Dam would be modified, fish passage and protective facilities and the pumps and turbines would be replaced (see drawing numbers 1313-D-3 and 1313-D-4). Overall designs for the Dam Retention Alternative were made during the course of this study which was initiated in 1989; however, some specific features are based on older designs. These designs are adequate for authorization but not for specifications or construction. Final designs would be completed in consultation with NMFS, USFWS, and ODFW during preconstruction.

Basic features include the following:

- Replace north and south fish ladders.
- Replace fish screens.
- Construct a juvenile fish counting facility.
- Excavate a plunge pool immediately downstream from the center of the dam and reshape portions of the south side of the river channel below the dam.
- Modify bays 8 and 9 at the center of the dam to direct overflows into the plunge pool.
- Replace existing turbines and pumps.
- Replace existing radial gates and gate controls.
- Improve public access to the south fish ladder for viewing migrating fish including:
    - Construct a safe intersection between the access road and State Highway 99.
    - Pave the existing parking lot.
    - Construct a viewing platform with handicap access to replace the existing viewing platform.



NOTES:

ONLY MAJOR IMPROVEMENT ITEMS ARE SHOWN.
EXISTING NORTH FISH LADDER IS NOT SHOWN.
EXISTING STOPLOG MONORAIL IS NOT SHOWN.
CONTOUR AND EXCAVATION LINES ARE APPROXIMATE.
(1) EXISTING FISH SCREENS WILL BE REMOVED AND REPLACED WITH DIAGONAL SCREENS.

10 0 10 20 30 40 50
SCALE OF FEET

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

GRANTS PASS DIVISION
ROGUE RIVER BASIN PROJECT, OREGON

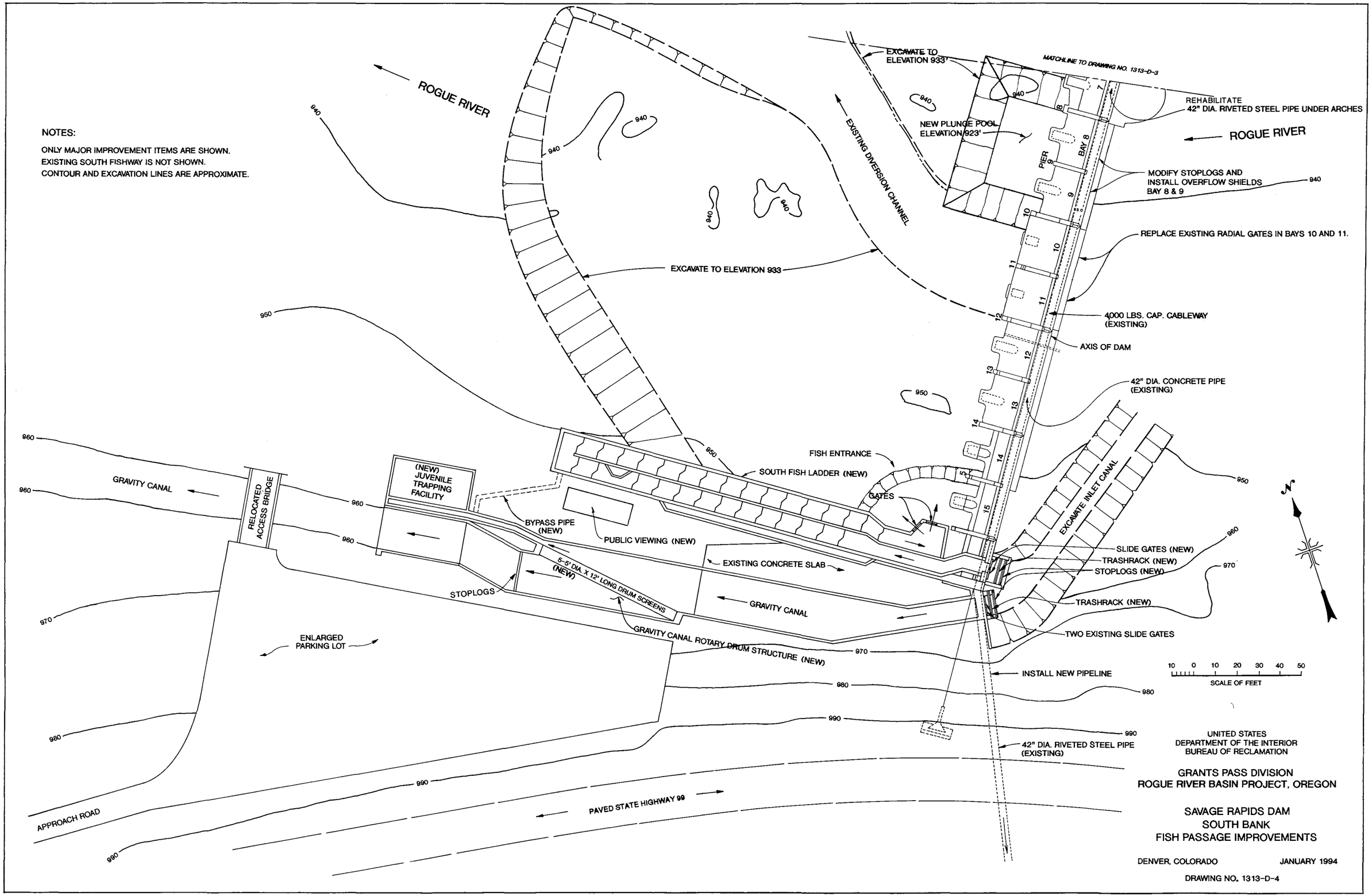
SAVAGE RAPIDS DAM
NORTH BANK
FISH PASSAGE IMPROVEMENTS

DENVER, COLORADO JANUARY 1994

DRAWING NO. 1313-D-3

NOTES:

ONLY MAJOR IMPROVEMENT ITEMS ARE SHOWN.
EXISTING SOUTH FISHWAY IS NOT SHOWN.
CONTOUR AND EXCAVATION LINES ARE APPROXIMATE.



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

GRANTS PASS DIVISION
ROGUE RIVER BASIN PROJECT, OREGON

SAVAGE RAPIDS DAM
SOUTH BANK
FISH PASSAGE IMPROVEMENTS

DENVER, COLORADO JANUARY 1994

DRAWING NO. 1313-D-4

Fish Ladders

Structures

Design of the new fish ladders at Savage Rapids Dam is based on drawings and specifications provided by USFWS and approved by NMFS. Although this design work was completed in the 1970's, USFWS and NMFS agree that the designs are adequate for cost estimating purposes.

The new ladders would be a vertical slotted-wall design that allows for self-regulation of flows, adequate resting areas for fish, and operation with nearly any flow. The design consists of 28 pools or cells that would be 8 feet wide by at least 10 feet long and up to 17 feet deep plus an entrance pool at the downstream end and an exit pool at the upstream end of the ladder. The entrance and exit of each ladder cell consist of a full-height vertical slot that is 15 inches wide (see Vertical Slot Fishways schematic). Although the vertical slots would not maintain a constant discharge, the ladders would provide fish passage over the range of riverflows. Under most operating conditions, there would be about 41 cfs of water passing through each fish ladder. Minimum water depth in each cell (measured at the vertical slot) would be about 6.8 feet. A level channel would lead from the last pool directly into the reservoir.

The ladder design (mirrored for the south and north banks) accommodates the lower pool elevation that is held between irrigation seasons. A level, 2-foot-wide channel with a floor elevation of 949.0 feet would extend from the reservoir along the side of the upper nine pools. This channel would enter the ninth pool from the upstream end via a slide gate.

The floor of each ladder would have a slope of 10:1 from the entrance pool at elevation 930.0 feet to the exit pool at elevation 958.0 feet. When the reservoir pool elevation is at maximum, the head loss between ladder pools would be approximately 1 foot (within NMFS criteria). Head losses between ladder pools would be proportionately less (and more desirable) with lower reservoir elevations.

Two slide gates, stoplogs, and trashracks to facilitate operation and maintenance would be located at the exit of the fish ladders (upstream end). These would be serviced by the existing monorail crane cableway.

Channels would be excavated from each fish ladder entrance and exit to the main channel of the river. These channels would allow fish to enter and exit the fish ladders during low river flows.

Dam bay No. 16 would be modified as part of the south fish ladder and would no longer function as a part of the dam spillway.

Attraction Flows

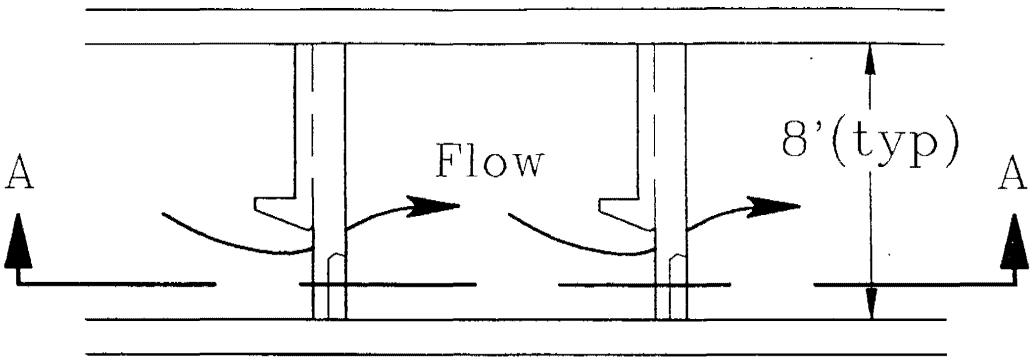
The hydraulic turbine discharge (approximately 800 cfs) would be routed to provide attraction flow for the north fish ladder during the irrigation season. These flows would discharge directly into the entrance pool through a diffuser screen which would smooth out turbulence and decrease velocities. Between irrigation seasons, flow would be released through the turbine sluice gates to the entrance pool to provide attraction flows. A slide gate on the south side of the entrance pool would be opened to help direct fish toward the fishway during periods when high riverflows passing over the spillway attract fish to the base of the dam. The entrance pool of the north ladder would have a floor elevation of 922.0 feet to accommodate and help reduce the turbulence of the turbine discharge flows.

Auxiliary attraction water for the entrance pool of the south fish ladder would be diverted through a baffle structure and diffuser screens before entering the downstream entrance pool. A semicircular pool with a 20-foot radius would be excavated to a minimum depth of 5 feet in front of the entrance pool to facilitate fish access. The entrance pool would be equipped with slide gates to provide control over the full range of expected riverflow conditions.

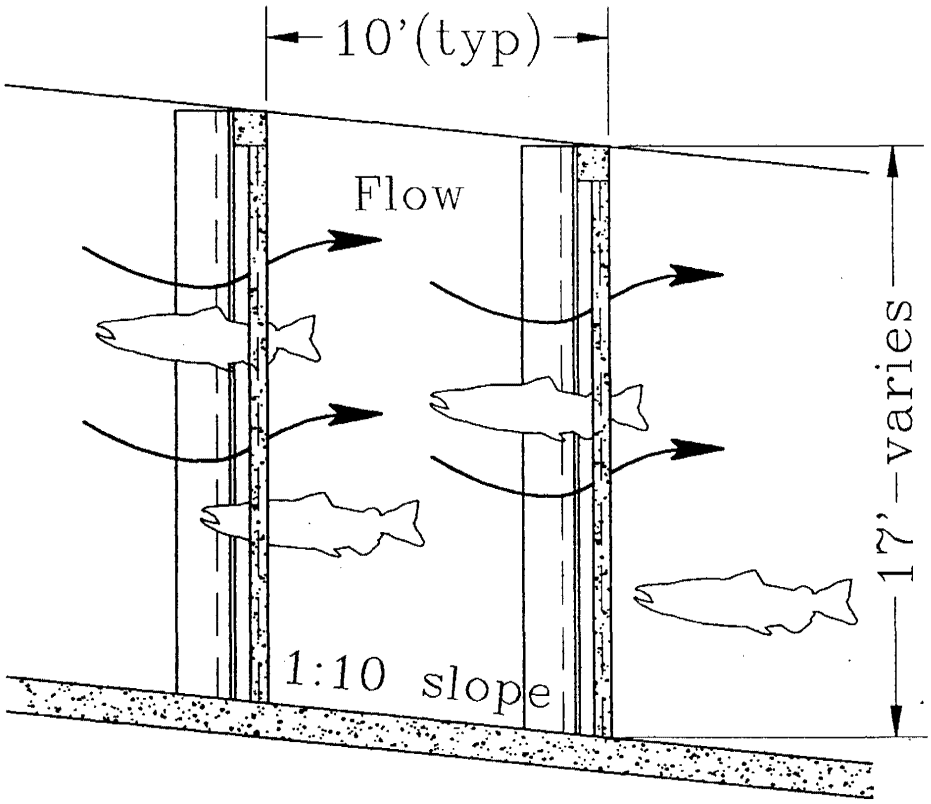
North Diversion

Vertical Fish Screens

The two existing vertical traveling fish screens on the north side of the dam would be removed, and the existing concrete support structure would be extended upstream approximately 75 feet and modified to accommodate the new screens. To help direct riverflows toward the structure, a short channel would be excavated toward the center of the river. Four new traveling fish screens would be installed at an angle of 30 degrees to riverflow (see Drawing No. 1313-D-3).



PLAN VIEW



SECTION A-A

VERTICAL SLOT FISHWAYS

Each screen unit would be 8 feet wide by 32 feet high (the same size as the present screen units) and would have a mesh with 1/8-inch clear openings. Velocity of the screen movement would be 10 feet per minute. Cleaning of screens would be accomplished in part by the sweeping flow across the screens and in part by a washing system that sprays water from behind and through the screens. The approach flow velocity (perpendicular to the screen face) would be a maximum of 0.4 feet per second. Sweeping flow (flow parallel to the screen face) would be approximately twice the approach velocity to help fish move along the screen surface to the inlet of the bypass. Fish would enter a 24-inch-diameter bypass pipe and exit next to the entrance of the fish ladder. Supporting piers for the screens would be flush with the face of the screen to optimize fish travel along the screen face and into the bypass inlet.

A new engine and electrical generator combination is included to operate the four screens in the event of power failure.

Turbines and Pumps

The existing turbine units along with the concrete/steel intake structures would be removed from the turbine room, and would be replaced with single-runner turbine units of conventional steel draft tube elbow intake and discharge cone configuration. These units are an inherently simpler design and present a relatively obstruction-free location in the turbine room. Each turbine would be equipped with a gear drive transmission to drive the horizontal, single stage, double-suction pumps which would pump the water into the Tokay and South Highline Canals. Pumps and hydraulic turbines are designed to provide a maximum pumping capacity of 32 cfs at 167 feet of dynamic head (Tokay Canal) and 59 cfs at 99 feet of dynamic head (South Highline Canal).

A new 28-inch-diameter steel pipe would be installed in the existing right-of-way to service the Tokay Canal, and a new 38-inch-diameter pipe would be installed to service the Highline Canal. Various gates, valves, hydraulic dampers, controls, and instrumentation would allow slow closing and throttling capabilities to meet varying diversion requirements.

Trashracks

New trashracks would be constructed at the entrance to the northside diversion to protect the vertical screens from large debris. Clear openings in the trashracks would be 10 inches wide by 24 inches high. Automatic trash rakes are not included in the design as initial investigation indicates that they would not be cost effective. Automatic trash rakes would be reevaluated during final design.

Stoplogs

Ten new, metal stoplogs would be provided to block off and dewater the north diversion facilities for routine maintenance and repair of the screens and hydraulic turbines. The stoplogs would fit into the slotted concrete piers of the two entrance bays. Each bay would hold five stoplogs which would be installed or removed separately by a traveling trolley hoist on an overhead monorail crane runway extending to the north bank. The stoplogs would be stored on the north bank.

Access Bridge

At present, vehicle access to the north side of the dam is through a locked gate and a private maintenance road that crosses the railroad right of way. This road would remain closed to the public for safety reasons.

A concrete bridge would be constructed to provide access for a mobile crane to lift the vertical screens for major repairs. Since use of a crane would be for short periods, a mobile crane would be rented as necessary and is not included as a capital expense. The 30-foot-wide bridge would be approximately 21 inches thick and span approximately 25 feet from the north bank to the vertical screen structure.

South Diversion

Gravity Canal

The headworks structure of the Gravity Canal would be modified for trashracks and stoplogs, and approximately 130 feet of the Gravity Canal between the headworks and the existing rotary drum screens would be lined with concrete. Existing openings in the canal to the fish ladder would be sealed, and the existing fish screen assembly would be removed and replaced.

Rotary Drum Screens

A bank of five rotary drum screens would be installed in the canal at an angle of approximately 15 degrees to canal flows. A new concrete structure would house the rotary drum screens. Each of the five rotary drum screens would be 5 feet in diameter and 12 feet long. Screen fabric would be a 4-mesh, 12-gauge stainless steel woven fabric with clear openings of 1/8 inch. The screens would be designed to operate within a submerged range of 70 to 80 percent of the screen diameter. Proper depth of flow would be maintained at the screens by use of the slide gates at the Gravity Canal headworks structure and by stoplogs downstream from the screens.

A 2-foot-wide bypass channel would lead from the screens to the south fish ladder; bypass flows could also be directed to the fish counting facility (see below). Sweeping flow velocity along the drum screen face would be about double the 0.4 feet per second flow velocity against the screen face. Maximum travel time for fish across the screen face is estimated at 2 minutes.

Included with the supporting structure for the screens is an overhead lifting frame, 3-ton hoist, motor, and drive mechanism to remove the screens during winter months and to do required maintenance work during the irrigation season. A 5-kW engine/generator combination would provide backup power to maintain drum operation in case of electric power failure.

Juvenile Fish Counting Facility

A juvenile fish counting facility similar to the design used at the Umatilla Project (Three Mile Falls Diversion Dam) would be constructed downstream from the fish screen. ODFW would operate the facility. During periods when juvenile fish are being counted, flows carrying juvenile fish would be directed to the counting facility before exiting to the fish ladder.

Bridge

The intent was to relocate an existing bridge that crossed Gravity Canal. To accomplish this, new concrete abutments would be constructed about 50 feet downstream from the old site. This bridge has since been removed from the site. A decision would be made during preconstruction on how to proceed.

Plunge Pool and Rock Excavation

A concrete-lined, plunge pool approximately 40 feet long by 70 feet wide and 10 feet deep would be constructed downstream from bays 8 and 9 of the dam. The plunge pool would provide a deep basin for fish to safely fall into if swept over the spillway portion of the dam. Irregular rock outcroppings below the plunge pool would be removed for more efficient and less turbulent flow.

Most of the rock area in the river channel in the vicinity of the existing south fishway would be excavated to elevation 933. This elevation is about 10 feet lower than the elevation of the middle of the rock area and would be below any tailwater elevation. Removing the rock would reduce turbulent flows below the dam and make it easier for the fish that come upstream along the south riverbank to find the attraction flow from the south fish ladder. Rock removal would also eliminate the stranding of fish in pools caused by rapid changes in water levels downstream from the dam.

Bay 8 and 9 Modifications

Spillway/Stoplogs

Replacement stoplogs for spillway bays 8 and 9 would be constructed with less depth than the four existing stoplogs to allow spills over the dam to be concentrated and directed into the new plunge pool. The most appropriate depth for the stoplogs would be determined during final designs. The stoplogs would be placed and removed by means of the existing electrically operated hoist and cableway located above the dam crest.

Crest Modification

Overflow shields constructed of steel plate would direct flow over the dam. The shields would be attached with pins to allow removal of the plates and stoplogs. These overflow shields would help pass fish gently over spillway section into the plunge pool. Final design of these structures would be coordinated with the USFWS and NMFS.

Radial Gates

The existing radial gates, which are nearing the end of their useful life, would be replaced. New seals, guides, gate hoists, control equipment, piping, and appurtenant facilities would be installed.

Access Road and Parking

The existing operation and maintenance access road on the right side (south) of the dam was never intended for public access and is unsafe. Parking is inadequate for the general public use that has developed at the south side of the dam. Features to improve the safety of the public using this access (to view migrating fish) would include a new paved access road from State Highway 99, culvert drain pipe, paved parking area, entry and walkway areas, and repairs and improvements to the existing bridge. Entry and walkway areas would be paved, have handrails, and meet handicap access requirements. The parking area would require a 2-inch asphalt layer over a 4-inch subbase. The access road would intersect State Highway 99 at a 90-degree angle, providing both improved and safer

access. The access road would conform to State highway specifications and include some grade improvements and surface paving. Data for the access road were provided by the Oregon Department of Transportation, Roseburg District Office.

Fish Viewing Platform

An educational fish viewing platform for public use would be located downstream on the left side of the south fish ladder and would be designed to accommodate handicapped persons. This platform would replace the existing fish viewing platform.

Interpretive signs would be developed for this site to explain fish passage and the opportunity to view fish. Signs would be constructed of durable material resistant to vandalism and extreme weather conditions. Specific sign size, type, design, text, and artwork would be developed during final designs.

Correction of Existing O&M Deficiencies

A 1990 Review of Operation and Maintenance report prepared by Reclamation identified many problems and inadequacies resulting from deferred maintenance over the years. By the end of 1992, 25-35 percent of the recommendations had been implemented. There remained 22 items that vary from highly specific actions to evaluation or establishment of general maintenance programs. These remaining items are included in the Dam Retention Alternative.

Three program items account for over 70 percent of the estimated total cost of corrections. These are: (1) replacement of four 4- by 6-foot slide gates, (2) establishment of a program to coat the stoplogs and replace the deteriorated seals, and (3) installation of a permanent lighting systems and permanent metal floor grates with fixed handrails within the dam gallery.

Many of the items relate to safety, e.g., removal of grease from floors and walls, replacement of existing wooden walkways and handrails with metal structures, adding handrails, providing signs, locking accessways, and fencing some areas.

Some of the items include establishing programs for training and preventive maintenance, inspection and annual maintenance of specific systems, and evaluation of current maintenance practices.

REMOVAL OF EXISTING FACILITIES

Removal of the existing fish ladders and other facilities to be replaced would be accomplished in the same manner as discussed for the Preferred Alternative. Waste materials such as concrete, wood, and steel, and excavated rock would be moved to a nearby landfill, and hazardous materials would be handled in accordance with existing Federal, State, and local laws.

CONSTRUCTION

A 6-year construction period was assumed for this alternative including 2 years of preconstruction activity and 4 years of actual construction. Facilities associated with irrigation would be completed during the first 2 years of actual construction, but fish passage facilities would not be completed until the final year. Delivery of irrigation water and passage of fish would not be interrupted during this period.

Construction Cost

January 1993 price levels were used in estimating construction costs. Construction cost factors include 10 percent for unlisted items, 25 percent for contingencies, and 30 percent for noncontract (indirect) costs. An allowance is included for contractor mobilization, preparatory work, and demobilization.

Since all construction activity would take place on existing GPID land or right-of-way, there would be no costs for land purchases or easements, with the exception of a small parcel of land needed to upgrade the intersection between State Highway 99 and the parking lot south of the dam. Estimated construction costs are shown in table IV-1.

Table IV-1.—Construction costs for the Dam Retention Alternative
(January 1993 price level)

Item	Cost
Fish enhancement	
River control—north side construction	$106,000
North fish ladder	3,410,000
Vertical fish screens	3,881,000
River control—south side construction	91,000
South fish ladder	2,070,000
Replace radial gates	1,856,000
Spillway/stoplogs	48,000
Removable dam crest overflow sections	560,000
Plunge pool	450,000
Downstream rock excavation	751,000
Gravity canal drum screens	792,000
Fish viewing platform	50,000
Access road/parking lot	110,000
Juvenile fish trap facility	611,000
Fish passage subtotal	$14,786,000
Irrigation	
North pipeline	344,000
South pipeline	465,000
Turbines and gearing	1,189,000
Pumps and remaining items	700,000
Correction of O&M existing deficiencies	150,000
Irrigation subtotal	$2,848,000
Total construction cost	$17,634,000

Materials

Sand, gravel, rock, and other raw materials for construction are readily available from commercial sources in the area.

Construction Schedule

To minimize construction effects on migrating fish, replacement and rehabilitation work performed on the dam, the fish ladders, and fish screens would be divided into two segments: (1) work on the north side of the dam which would be accomplished first and (2) improvements on the south side of the dam which would follow. This would assure that at least one fish ladder would be operational at all times.

To assure GPID's ability to maintain water deliveries, work that would affect GPID delivery of water would be performed between irrigation seasons.

Construction concerns including timing and in-river construction work are generally the same as for the Preferred Alternative (see Chapter III).

OPERATION, MAINTENANCE, REPLACEMENT, AND POWER

OMR&P Costs

Appraisal level cost estimates for annual OMR&P costs are based on Reclamation's experience with a similar facility (Three Mile Falls Diversion Dam, Umatilla River, Oregon). Adjustments were made to reflect conditions at Savage Rapids Dam. Actual power consumption to operate the facilities would not be significantly different from current usage. The operating season for irrigation facilities at Savage Rapids Dam is approximately 23 weeks per year and the fish ladders would be operated year round. Operation costs are based on an assumed amount of staff hours required to operate the facilities. Maintenance costs are based on assumed staff hours required to maintain the facilities in a reasonable manner. Replacement costs are based on the field cost of principal items multiplied by a replacement factor derived from Reclamation experience.

Power costs are based on the electric motor sizes appropriate for operation of dam maintenance equipment and the fish screens and an assumed number of hours of operation per day. These are the total power costs for dam and fish screen operation and are not incremental to current power costs. The long-term power rate for general energy consumption (as

opposed to the rate used for irrigation pumping) assumed for this estimate is $0.065 per kilowatt-hour. Table IV-2 summarizes OMR&P costs for the Dam Retention Alternative.

Table IV-2.—Annual OMR&P costs for the Dam Retention Alternative (January 1993 price level)

Item	OM&R	Power	OMR&P
Irrigation and fish passage			
North fish ladder	$10,000	$0	$10,000
Vertical fish screens	14,000	400	14,400
South fish ladder	10,000	0	10,000
Gravity canal drum screens	8,100	200	8,300
Access road/parking lot	200	0	200
North pipeline	300	0	300
South pipeline	200	0	200
Turbines and gearing	16,000	0	16,000
Pumps	10,000	0	10,000
Maintenance of dam facilities	25,000	200	25,200
Total irrigation and fish passage	$93,800	$800	$94,600
Juvenile fish trap facility	$10,000	$200	$10,200
Total	$103,800	$1,000	$104,800

Operation Schedule

Operation of facilities would generally remain unchanged, with the exception that both fish ladders would be operated year round. Irrigation diversion amounts and schedules would be the same as shown in table III-4, and the pool behind Savage Rapids Dam would continue to be raised at the beginning of the irrigation season and lowered at the end of the season.

ECONOMIC AND FINANCIAL ANALYSIS

Benefits

This alternative would produce nonconsumptive use benefits related to anadromous and resident fish increases and indirect or secondary benefits. Because these monetary benefits are difficult to calculate and minor compared to direct consumptive use benefits, they were not fully identified and not included in the economic analysis.

Monetary benefits of the Dam Retention Alternative in this analysis are limited to salmon and steelhead; monetary recreation and irrigation benefits were not identified. The fishery benefit is based on the concept that elimination of all loss would increase salmon and steelhead escapement by about 22 percent and that with the Dam Retention Alternative losses of about 5 percent would continue. That is, the Dam Retention Alternative would increase escapement by about 17 percent. A simple mathematical factor (17/22) was applied to all of fishery values derived for the Preferred Alternative (Table III-8).

Annual equivalent fishery benefit accruing to the Dam Retention Alternative would be $3,870,900. The annual equivalent benefit is based on a 20-year period, a 5-year build up, and a discount rate of 8 percent.

Costs

Project costs consisting of construction plus interest during construction total $21,343,000. Construction costs are based on a January 1993 price level and are shown in table IV-1. Interest during construction was calculated on the basis of a total 6-year construction period at the applicable Federal discount rate of 8 percent.

Annual costs including the annual equivalent of the project cost and the annual OMR&P accruing to the Dam Retention Alternative total $2,278,600. The annual equivalent of the project cost is based on a 1994 Federal discount rate of 8 percent over a 20-year period. Table IV-3 summarizes project and annual costs.

Table IV-3.—Project and annual costs for the Dam Retention Alternative

Item	Cost
Project cost	
Construction	$17,634,000
Interest during construction (8 percent over a 6-year period)	3,709,000
Total project cost	$21,343,000
Annual costs	
Annual equivalent of project cost[1]	$2,173,800
Annual operation, maintenance, replacement, and power	104,800
Total annual cost	$2,278,600

[1]Total capital costs annualized at 8 percent for a 20-year period

Benefit/Cost Analysis

A true benefit/cost analysis which compares annualized values for all of the costs to all of the benefits over the lifetime of the project was not made for this analysis. As with the Preferred Alternative, benefits and costs were annualized over a 20-year period instead of a 100-year period that is normally used for a project life. Other monetary benefits may be produced by the Dam Retention Alternative but were not identified for this analysis. The effects of this type of analysis on the benefit/cost ratio are the same as discussed for the Preferred Alternative.

For this analysis, benefits and costs were annualized over a 20-year period using the 1994 Federal discount rate of 8 percent. Annual equivalent benefits of $3,870,900 compare with annualized equivalent costs of $2,278,600 to produce a benefit/cost ratio of 1.7 to 1.

COST ALLOCATION AND REPAYMENT

A true cost allocation was not prepared. For this analysis all of the facilities and construction activities associated with fish passage, protection, counting, and viewing were assigned to an anadromous fish function. Remaining costs were assigned to the irrigation function. This results in capital costs of $14,786,000 assigned to an anadromous fish function and $2,848,000 assigned to the irrigation function.

Costs of fish protection facilities at Savage Rapids Dam have in the past been nonreimbursable. It is assumed for this analysis that all of the costs associated with the anadromous fish function would be Federal costs and nonreimbursable. Further it is assumed that all of the irrigation function costs would be privately financed, and no Federal funds would be involved.

FUNDING

For this analysis, it was assumed that capital costs assigned to the anadromous fish function would be federally funded and that those funds would be expended as needed. If federally funded, capital costs associated with the irrigation function would be reimbursable without interest under current Federal requirements. However, for this analysis, it was assumed that the irrigation function would be privately financed over a 30-year period at 6 percent interest. OMR&P costs associated with the juvenile fish trap facility would be assumed by the ODFW, and all other OMR&P costs would be paid by GPID.

Table IV-4 summarizes capital costs and the annual financial requirements of GPID and ODFW with the Dam Retention Alternative. GPID would continue to be responsible for existing debt to the United States. In mid-1994, this amounted to $290,525 (10 annual payments of $26,830 and a final payment of $22,225).

Table IV-4.—Annual payments

Item	Capital Cost	Annual Cost
GPID--Irrigation		
Irrigation capital costs	$2,848,000	[1]$207,000
All OMR&P (except fish trap facility)	--	94,610
Total of Dam Retention Alternative		$301,610
ODFW --Annual OMR&P (fish trap facility)	[2]$611,000	$10,200

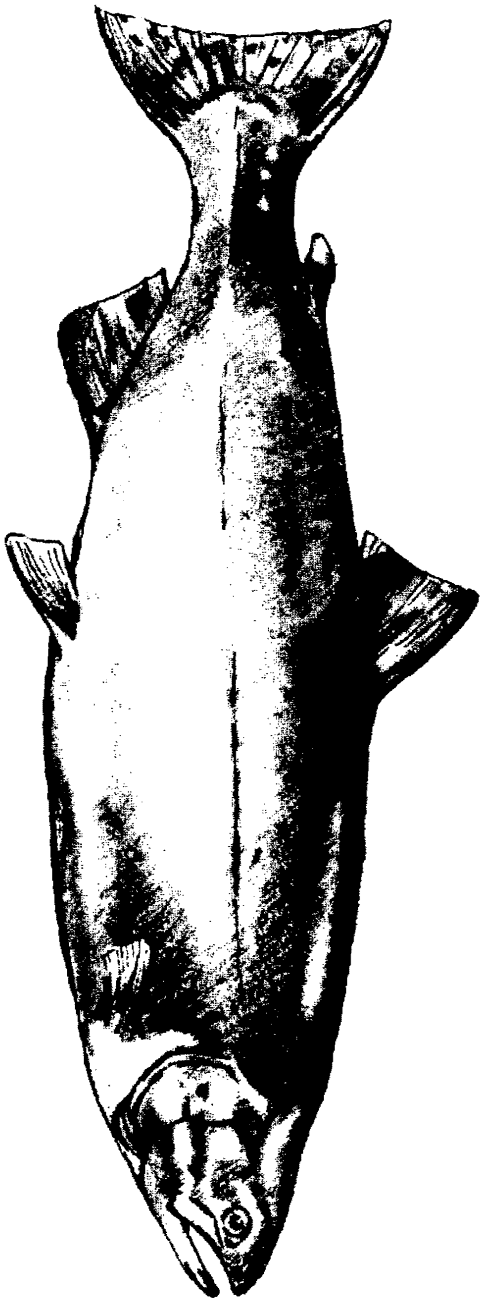
[1]Assumes private financing at 6 percent interest over a 30-year period.
[2]Included in Federal anadromous fish function cost.

PERMITS AND REGULATORY COMPLIANCE

Permit and regulatory compliance for the Dam Retention Alternative would be essentially the same as for the Preferred Alternative (see chapter III).

VIABILITY

The Dam Retention Alternative was found to meet the four criteria of viability--completeness, effectiveness, efficiency, and acceptability. (See "Formulation" chapter.) The Dam Retention Alternative includes all of the investment necessary to provide effective fish passage and protection with continued diversion of irrigation water. This alternative has a benefit cost ratio of 1.7 to 1 and is therefore cost effective. Although the Dam Retention Alternative is not as effective or as efficient as the Preferred Alternative, it is acceptable to most Federal, State, and local agencies. Some opposition is expected for any alternative, and this alternative is opposed by some fishery and environmental interests.



Chapter V—No Action Alternative

DESCRIPTION

The No Action Alternative is formulated (1) to establish anticipated future conditions including the needs expected to exist in the future and (2) to serve as a base for evaluation of action alternatives. Conditions that can be expected to exist in the future without implementation of any of the identified action alternatives are identified. These conditions are compared with the conditions expected with an action alternative to determine the potential net effects of an action alternative. Identification and evaluation of the No Action Alternative are required by NEPA.

For this study, the No Action Alternative assumes that the Bureau of Reclamation would neither act nor participate in an action to resolve fish passage problems at Savage Rapids Dam. However, the No Action Alternative does not assume that there would be an absence of all action. Continued loss of anadromous fish at Savage Rapids Dam is unacceptable to Federal, State, and local entities; private organizations; and many individuals. In addition, GPID is accountable for all the legal parameters specified by the State in GPID's temporary water permit. Two of those parameters are specifically directed at resolving the fish passage problems at Savage Rapids Dam. Without the current study and Federal funding, it is uncertain how these issues would be resolved.

Therefore, the No Action Alternative assumes that sometime in the future, fish passage problems would be resolved by some means. In the interim, anadromous fish losses would continue at the current or near the current level. The length of delay in implementing a solution would depend on the extent of legal intervention and the willingness of various entities to cost share in implementing a solution. It is possible that GPID's share of costs to implement a solution would exceed its income. If that happened, GPID would have to reorganize, combine with other entities, or cease to exist. Such action, or the threat of such action could result if there are further delays to implement a fish passage solution. If a species of Rogue River anadromous fish is listed under the ESA, it is likely that a passage solution would be implemented somewhat earlier under the direction of NMFS.

Several reasonable scenarios could be constructed to describe the future under the No Action Alternative. For this analysis, it has been assumed that anadromous fish losses at Savage Rapids Dam would continue at current or near current levels for up to 20 years.

ACCOMPLISHMENTS

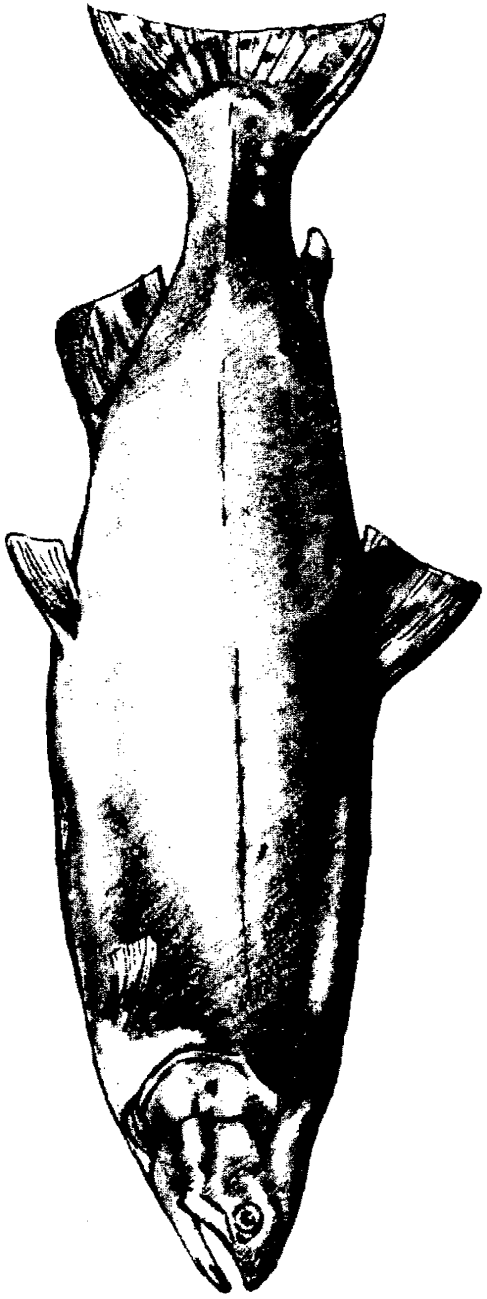
Under the No Action Alternative, fish passage problems would remain essentially unchanged. There would be no significant change in salmon and steelhead escapement. From time to time malfunctions in fish passage and protective facilities would result in large losses of salmon and steelhead.

Irrigation diversion would remain essentially unchanged. Over time, malfunctions in equipment would cause more frequent interruptions in service while repairs are made.

FACILITIES

The existing fish passage and protective facilities and GPID diversion facilities would remain essentially unchanged (see description in Chapter 1). As facilities continue to deteriorate, more frequent and more extensive repairs and replacements would be needed. The costs to maintain these facilities would increase over time.

Facilities operation would remain unchanged (see chapter 1). However, increases in irrigation district assessments would be needed to fund increased costs of repairs and replacements. No attempt was made to determine possible cost increases.



Chapter VI—Affected Environment and Environmental Consequences

PURPOSE

This chapter discusses the affected environment and environmental consequences of the alternatives and provides background material on current conditions. The major effect of the action alternatives is to enhance salmon and steelhead in varying amounts above current populations. This improvement would affect the fishery and related activities over a wide area from far upstream to the mouth of the Rogue River and into the ocean. Other effects of the alternatives would be limited primarily to the area of the seasonal reservoir formed by Savage Rapids Dam—from Savage Rapids Dam to the confluence of Evans Creek about 3.5 miles upstream. Effects on social well-being (except those related to increased salmon and steelhead) would be confined to the local area including, the cities of Grants Pass and Rogue River, the GPID service area, and the residents along the seasonal impoundment.

Background material on climate, physiography, economic conditions, and other aspects are provided in this chapter as an aid to reader understanding. The following categories of affected environment are discussed:

Economics	Hydrology
Water quality	Wild and Scenic Rivers
Land Use	Fish and wildlife
Vegetation	Endangered and threatened species
Recreation	Cultural resources
Air quality	Noise
Esthetics	Social well-being
Energy requirements	Indian Trust Assets

CLIMATE

The climate of the Rogue River basin is dominated by maritime influences which contribute to relatively mild, wet winters and warm, dry summers. The frost-free period is about 172 days at Grants Pass. Temperatures at Grants Pass vary from an average of 39 degrees Fahrenheit (°F) in January to 71 °F in July, although highs of 90 °F and even 100 °F are not uncommon. About 50 percent of the average annual precipitation of 32 inches falls from November through January, and less than 2 percent falls during July and August. Snow accumulates at high elevations during

winter and early spring and is the principal source of streamflow during late spring and summer.

Precipitation records for Grants Pass show a significant trend likely to affect area stream runoff. These records show a relatively wet period with average to above average rainfall beginning in 1950 and continuing through 1974 with only a few minor breaks. Beginning in 1975, there was an abrupt change to a dry trend. With the exception of a few years in the early 1980's, rainfall has continued well below average. The net loss to the area over the past 15 years has been approximately 50 inches of rain or the equivalent of going without rain for 1-1/2 years (Haskett 1991).

PHYSIOGRAPHY

The Rogue River basin consists of a narrow valley cut into the western slope of the Cascade Range, a broader central valley area, and another narrow section downstream where the Rogue River breaches the Klamath Mountains before entering the Pacific Ocean. The basin is bordered on the north by the Umpqua Mountains and on the south by the Siskiyou Range.

The Klamath Mountain region is rugged with narrow winding valleys and sharp divides, although local differences in elevation between valley bottoms and nearby ridges are usually less than 3,500 feet. Slopes of 30 degrees are common in the mountains. Low relief and subdued topography of the Grants Pass-Merlin area contrast sharply with the rugged hills and steep canyons along the western and northern basin boundaries.

Nearly all the valley lands lie below 1300 feet elevation. Lands along Evans Creek range from 950 to 1300 feet while those near Grants Pass range from about 920 to 1000 feet.

Stream gradients vary widely. Evans Creek drops 270 feet per mile in its headwaters and then levels off to about 30 feet per mile below RM 28. The Rogue River between the cities of Rogue River and Grants Pass drops an average of 9 feet per mile.

SEISMICITY

Savage Rapids Dam is located in the Klamath Mountains geomorphic division of southwestern Oregon. Some of the oldest rocks in Oregon,

estimated at 200 million years old, are exposed in this mountainous terrain. Although severe tectonic activity has folded and faulted most of these rocks into a complex assemblage, there are no known active faults in the area. The last major crustal disturbance occurred more than 60 million years ago.

The dam is in Zone 1 of the 1969 seismic risk map of Oregon. Zone 1 is classified as an area that can expect minor damage, corresponding to intensity V-VI on the Modified Mercalli Scale. The major earthquake on record, in 1873, had an intensity of VII. This earthquake was believed to be centered near the Oregon-California border between Crescent City, California, and Port Orford, Oregon, about 60 to 70 miles southwest from Savage Rapids Dam. The closest recorded earthquake to the dam was near Talent, Oregon, about 25 miles southeast, where an intensity V event was recorded on August 16, 1931. On April 14, 1920, an intensity V earthquake was recorded in the Crater Lake area, about 65 miles northeast of the dam. An intensity VI event on August 23, 1962, centered in northern California about 80 miles southwest of the dam, had an intensity V rating at Grants Pass, Oregon.

The foundation for the dam is partly on firm rock and partly on compacted, cemented gravel which forms a stable foundation. Given this foundation and the dam's design and construction, historic earthquakes would not have caused any significant damage to Savage Rapids Dam.

ECONOMIC AND DEMOGRAPHIC SETTING

The local economy of Jackson and Josephine Counties, which extend southward to the Oregon-California border, is based on agriculture and related agri-business, lumber, wood products, and tourism.

The lumber and wood products sector consists mainly of logging, lumber mills, and plywood manufacturing. 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. Douglas fir is the primary species used in the production of softwood plywood and lumber.

The mountains, lakes, and the Rogue River in particular provide abundant recreation opportunities. Many people come to fish for salmon and steelhead or to float or jetboat on the river. A significant industry has

developed to provide the services necessary to support the recreation and tourist economy.

Population

Population changes of the two counties have followed the Oregon State trend of the 1980's with most of the increase due to in-migration. A total of 53 percent of Jackson County and 73 percent of Josephine County population growth in the 1980's resulted from migration. The 1990 Census population in the two counties totaled approximately 209,000 persons—about 146,000 in Jackson County and 63,000 in Josephine County.

Grants Pass is the largest city in Josephine County with about 18,000 residents. If the surrounding urban area is included, the population swells to about 40,000. The city of Rogue River in Jackson County has a population of about 1,800 residents.

Employment

Employment in Jackson and Josephine Counties encountered wide swings during the 1980's. All sectors of the economy faced increases and decreases in employment. After reaching the bottom of an economic slump in 1982, the area economy began a strong upward climb. By 1988, substantial recovery had been generated in manufacturing and construction. Agricultural employment averages about 2,000 in Jackson County and 400 in Josephine County and has remained somewhat stable.

Since 1988, there has been a downward turn in the manufacturing industries of lumber and wood, but construction, trade, and services continue to grow. Jackson County's manufacturing has decreased by 12 percent, losing nearly 1,400 jobs in the lumber and wood industry. Non-manufacturing employment increased by 17 percent during the same period with increases in construction (18 percent), trade (17 percent), and services (33 percent). Jackson County's projected unemployment rate for 1993 is 8.5 percent.

In the same time period, Josephine County's manufacturing decreased by 23 percent, losing nearly 800 jobs in the lumber and wood industry. Non-manufacturing employment increased by 10 percent with increases in construction (24 percent), trade (4 percent), and services (19 percent). However, the projected 1993 unemployment rate for Josephine County was

11.5 percent. With unemployment running that high, Josephine County is classified as a "labor surplus area." Employers in areas receiving this designation are eligible for preference in obtaining Federal procurement contracts.

Income

Per capita income is one of the better measures of economic well-being and can also provide an indication of the level of economic activity within a local economy. County personal income is divided by total county population to arrive at the county per capita income. Personal income is made up of net earnings, dividends, interest, rent, and transfer payments.

In 1991, per capita income in Jackson County was $15,953, a increase of 4.9 percent over the previous year. Jackson County ranked 16th out of 36 Oregon counties in terms of per capita income in 1991 and was at 91 percent of Oregon State per capita income of $17,495.

Josephine County per capita income in 1991 was $14,004, a 1 percent increase over the 1990 figure. Josephine County ranked 34th out of 36 Oregon counties in terms of per capita income in 1991 and at just 80 percent of the Oregon State per capita income.

Analysis of the components of personal income indicates that a much smaller portion of personal income is derived from net earnings and much more is derived from other components than is average for the State and the Nation (see table VI-1). This indicates the population of the two counties is older and includes a higher percentage of retired persons. As more retired people enter the county, the percent of personal income derived from dividends, interest, rents, and transfer payments will continue to increase.

Table VI-1.—Percent of personal income by major component (1991)
[Source: State of Oregon Employment Department]

Area	Net earnings	Dividends, interest, and rent	Transfer payments
Nation	66.7	17.2	16.1
Oregon State	65.1	18.0	16.9
Jackson County	58.4	21.3	20.3
Josephine County	48.0	24.2	27.8

Effects of the Alternatives on Economic Conditions

Implementation of the action alternatives would have long term effects on the national economy due to an increase in salmon and steelhead production and the increased commercial and sport fishing harvest. Effects on the regional economy would be short-term only and would stem from construction.

Preferred Alternative

National Economic Development.—The Preferred Alternative would provide annual equivalent benefits of $4,998,600 due to increased annual harvest of salmon and steelhead. Derivation of NED benefits is shown in tables III-7 and III-8 in chapter III.

Regional Economic Development.—RED effects would be short term, limited to the 5-year construction period. The direct effect from construction on the economic output of the region is estimated at $15,200,000. Construction expenditures of $11 million would create approximately 120 jobs during a 5-year construction period. Personal income would increase by $2,205,000 with a total income increase of about $4,266,000.

Very little statistical data is available upon which to measure the economic value of recreation impacts. Use has not been monitored or user-day numbers collected on this stretch of the Rogue River. However, after consultation with experts knowledgeable about the local area, Reclamation does not foresee any significant increase or decrease in the use of the affected stretch of the river, but rather a change in the type of use (i.e., changing from a water skiing, jet skiing, motor boating area to a float trip, fishing [both float and bank], and jet boating area).

Scenic qualities would be reduced for some time and would change over the long term but that is not expected to affect local motel and recreational vehicle campsite use.

Property owners who have made improvements (boat docks or ramps) to take advantage of the seasonal lake would have individual losses and real estate values may drop temporarily. However, riverfront property would be expected to maintain its high value.

Dam Retention Alternative

National Economic Development.—The Dam Retention Alternative would provide annual equivalent benefits of $3,870,900 due to the increased annual harvest of salmon and steelhead.

Regional Economic Development.—RED effects would be short term, limited to the 6-year construction period. The direct effect from construction on the economic output of the region is estimated at $23,900,000. Construction expenditures of $17 million would create approximately 190 jobs during a 6-year construction period. Personal income would increase by $3,950,000 with a total income increase of about $6,713,000.

The GPID would be responsible for financing and funding $2,848,000 of the construction costs. Assuming a repayment period of 30 years and an interest rate of 6 percent, the increased costs to the GPID due to construction of the Dam Retention Alternative would be $207,000 annually throughout the repayment period.

No Action Alternative

The No Action Alternative would have no effect on national or regional economic development.

WATER

Water supply, water rights, and water use are important components of the JCWMIS study which was initiated in part to provide help to the GPID in addressing these issues and identifying potential conservation measures. These issues are fully addressed in a separate report on facilities improvements (DNA 1994).

Resolution of the water rights issues will have an effect on the sizing of irrigation diversion facilities and, therefore, on the cost of alternatives. The future amount of irrigation diversion, which will be settled through resolution of the water right issues with the State of Oregon, is the only factor related to water supply. The annual irrigation diversion in the future is expected to be less than that of the past. The best estimate and the rate of diversion assumed for this study is 150 cfs, the current estimated requirement, which compares with the historical diversion of 180 cfs.

Since the amount of diversion will be the same for all alternatives including the no action alternative, selection of a fish passage alternative will have no effect on water supply. Discussion of water supply, water rights, and water use in this report is limited and provided only for background information.

Rogue River

The average annual runoff of the Rogue River is over 2.5 million acre-feet at Grants Pass and 8 million acre-feet at the mouth. Flows at Grants Pass have ranged from 500 cfs to as high as 152,000 cfs. During late winters and early spring, flows at Grants Pass have reached 35,000 cfs (bankfull capacity) about every other year.

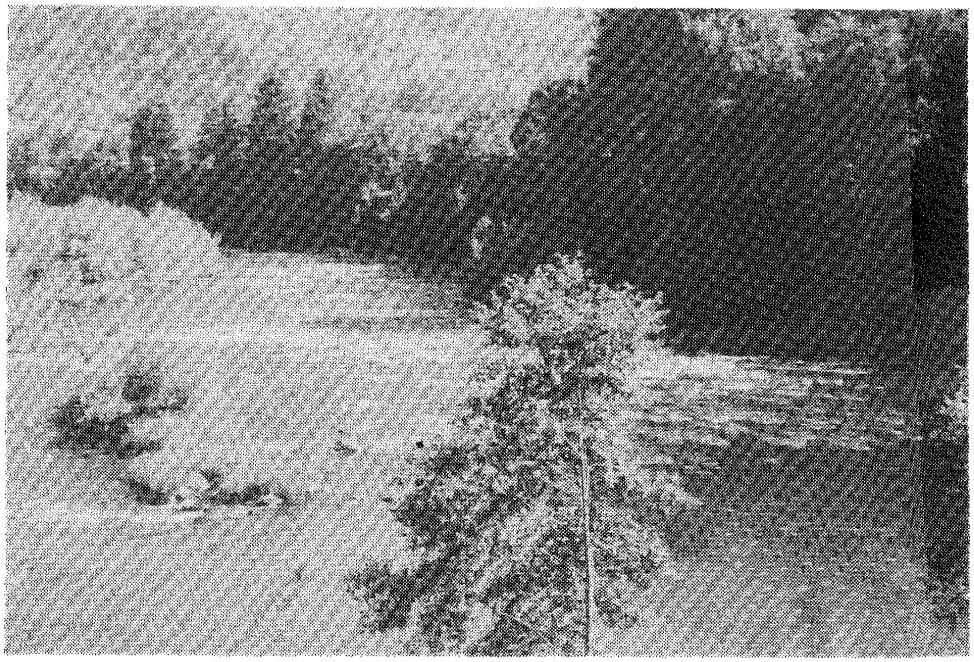


Photo VI-1.—Rogue River near Greens Creek, below Savage Rapids Dam.

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. Under current operation, 70 to 75 percent of the riverflow in July and August is from Lost Creek Dam releases. Flow duration analyses show that with the Lost Creek Dam operation, the State minimum flow requirement of 1,200 cfs at Savage Rapids Dam (OWRD 1985) can be met 92 percent of the time.

Figures VI-1 and VI-2 show the runoff patterns of the Rogue River at Grants Pass (OWRD 1985).

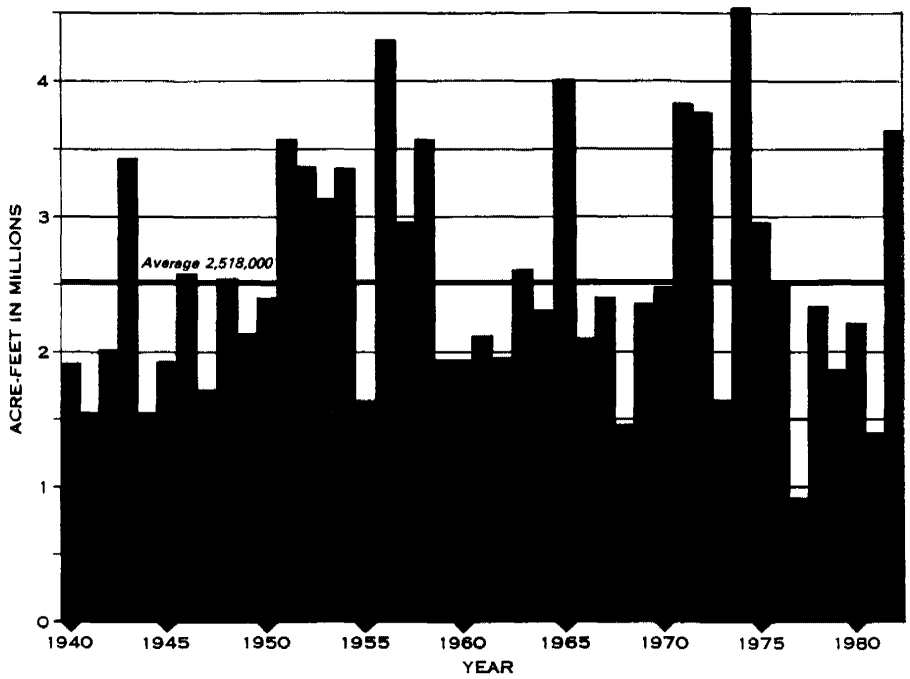


Figure VI-1.—Annual runoff of the Rogue River at Grants Pass.

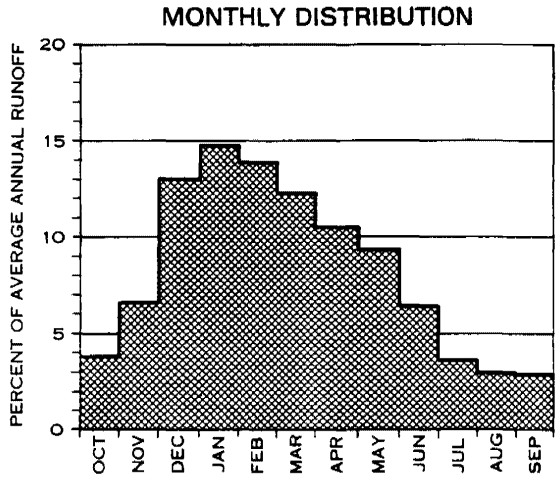


Figure VI-2.—Monthly distribution of Rogue River runoff at Grants Pass.

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. Oregon Statute 538.270 prohibits the use of main stem Rogue River for industrial use and for hydroelectric power development below RM 157 (50 miles upstream from Savage Rapids Dam) to avoid potential conflicts with anadromous fish runs. Moreover, the potential for further out-of-stream use of the Rogue River is severely restricted.

A 1988 Oregon Court ruling in Diack v. City of Portland proclaimed that no actions can be taken which affect the instream flow of those sections of Oregon's waterways that have been designated as wild and scenic (see "Wild and Scenic Waterways"). In response to the Diack decision, the State set standards of acceptable instream flows for the lower Rogue River, as shown in table VI-2.

Table VI-2.—Minimum, maximum, and recommended flows for the Rogue River State Scenic Waterway (Applegate River to Lobster Creek) [Source: Oregon Water Resources Department]

	Flow (cubic feet per second) near Agness (gauge 14372300)[1]					
				Recommended		
Month	Minimum[2]	Maximum[2]	Average[3]	Fish[4]	Recreation	Scenic waterway
January	3,104	13,340	6,933	1,600	3,500	3,500
February	3,071	30,282	8,598	1,600	3,500	3,500
March	2,207	17,750	7,572	1,600/3,200	3,500	3,500
April	2,455	15,086	5,609	3,200	3,500	3,500
May	2,577	8,158	4,315	3,000	2,000	3,000
June	2,140	5,363	3,250	2,700	2,000	2,700
July	1,829	3,446	2,383	1,800	2,000	2,000
August	1,858	3,370	2,321	1,800/2,400	2,000	2,000/2,400
September	1,630	3,187	2,249	2,400/1,500	2,000/1,600	2,400/1,600
October	1,421	3,497	2,281	1,300	1,600	1,600
November	1,386	16,652	4,857	1,600	1,600/3,500	1,600/3,500
December	2,124	29,250	7,038	1,600	3,500	3,500

[1] A "/" indicates that flow changes in mid-month.
[2] Minimum and maximum flows are the lowest and highest mean monthly flows measured during 1981-1990.
[3] Average flow is the 50-percent exceedance mean monthly flow value as estimated by the Oregon Department of Water Resources for period of record 1981-1990.
[4] Fish flows are recommended through analysis of research by McPherson and Satterthwaite (ODFW).

Under currently defined 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 1991a). Some storage water may be available between June 1 and October 15 from existing Corps reservoirs. Applegate Lake has about 45 acre-feet of storage available and Lost Creek Reservoir has about 3,000 acre-feet of storage available.

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. GPID facilities are used to divert water from the Rogue to smaller streams under an ODFW water right. Historically, the out-of-stream diversion at Savage Rapids Dam has average about 180 cfs, (recently 170 cfs) although the total water right was much higher. The nonconsumptive instream use to power the pump turbines is 800 cfs.

Future out-of-stream diversions by the GPID are expected to range from about 117 to 145 cfs as GPID implements its conservation plan (Newton 1994).

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

The Rogue River is generally clear and the chemical, physical, and biological qualities are excellent. During flood periods brought on by intense fall and winter storms, the river is turbid and sediment-laden but still well below problem limits. Recorded maximum turbidity levels are about ten times lower than levels that adversely affect salmon. Hot, dry periods in the summer can produce undesirable high water temperatures; however, this effect has been moderated by storage releases from Lost Creek Reservoir.

Because of the relatively small size of the impoundment of Savage Rapids Dam, water rapidly flows through this reach. As a result, all water quality parameters of the reservoir are the same as for the Rogue River.

Ground Water

Several separate actions have recently taken place to develop a better understanding of the ground-water systems in the study area. The primary concern for this interest is facility service planning by both the city of Grants Pass and Josephine County. Ground-water resources were reviewed recently (Haskett 1991). Under a jointly funded contract, DNA recently completed a ground-water management program (Newton 1992). DNA has brought together several other studies and has attempted to fill some of the gaps with additional work. The study ends at the Josephine-Jackson county line. However, the geologic conditions within the Evans Creek drainage and between the county line and the city of Rogue River are similar, and it can be assumed that the following summary from Newton's report would also apply to this part of the study area:

> "Operation of the reservoir does not significantly affect ground-water levels except in the close vicinity of the river. 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."

Effects of the Alternatives on Water

Preferred Alternative

The current instream right to power the hydraulic turbines would be forfeited as pumping power would be provided by electric motors. Other water rights would be unaffected. Elimination of the reservoir is not expected to have a significant effect on ground-water levels. Shallow wells near the reservoir edge, that in effect pump directly from the river, would be affected over the entire year to much the same extent as they are now affected for 9 months when the reservoir is lowered.

Water quality would be reduced slightly during construction due to increased turbidity. Contractors will be required to use methods to reduce turbidity during construction. Compliance with the various State, local, and Federal permit processes, especially as required under sections 402 and 404 of the Clean Water Act, will 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. None of these are considered to be significant.

About 320 acre-feet (516,000 cubic yards) of sediment have accumulated behind the dam and consists of 32 percent sand, 52 percent silt, and 16 percent clay. Chemical analyses of sediment samples show that trace elements trapped within the sediments are below or within the baseline range for soils of the Western United States.

Given the slope of the Rogue River from the dam to the ocean as well as the frequency and magnitude of flood events, nearly all of the accumulated sediment would be transported downstream. Finer silt and clay materials should remain in suspension throughout the lower river until reaching the ocean. Due to the volume of the Rogue River, no significant increase in measurable turbidity would be expected. Sand-sized materials would move more slowly, partially filling the pools in the pool-riffle environment downstream and filling the interstitial space among the gravel and cobble in slower moving channel areas in much the same manner as normal erosional processes. Virtually all sediment would be transported out of the existing reservoir area within 5 to 10 years. Because movement will primarily occur during flood events, which are normally turbid, any increase in turbidity resulting from the accumulated sediment would be insignificant.

The temperature of river water at the site may decrease slightly with the swifter flow of water in the natural channel, and dissolved oxygen content would be higher. No quantification of these values is available.

Dam Retention Alternative

Water rights would not be affected. Turbidity would increase slightly during construction but the increase would be temporary and would have no significant effect on the quality of riverflows. Contractors would be required to minimize adverse water quality changes during construction. Compliance with the various State, local, and Federal permit processes, especially as required under sections 402 and 404 of the Clean Water Act, will provide adequate mitigation of normal construction impacts.

No Action Alternative

This alternative would have no effect on water use or water quality.

WILD AND SCENIC RIVERS

Under The Wild and Scenic Rivers Act of 1968, a reach of the Rogue River was included as a component of the national wild and scenic rivers system. This reach extends from its confluence with the Applegate River (about RM 95), just west of the city of Grants Pass, to Lobster Creek Bridge (about RM 11), 88 miles downstream. The State of Oregon system of scenic rivers includes the same river reach and two more reaches in the Rogue River basin. The additional reaches are: (1) the main stem Rogue River from the headwaters to RM 173 and (2) the Illinois River from the Deer Creek confluence (RM 47) downstream to the mouth at the confluence with the Rogue River (Rogue River RM 47). These river reaches are shown in figure VI-3.

The action alternatives (Preferred Alternative and the Dam Retention Alternative) do not invade any river reach in the national system of wild and scenic rivers or the state system of scenic rivers and would not diminish the scenic, recreation, or fish and wildlife values or have any effect on streamflows. The greatest concern is potential effects on water quality. Temporary, but insignificant increases in turbidity could be expected during construction as summarized under "Effects of the Alternatives on Water." Sediment would be transported downstream over a period of years under the Preferred Alternative, but would be moved during high flow and flood events. During these events turbidity due to the Preferred Alternative would be insignificant compared with the background turbidity. Salmon and steelhead fish production of the Rogue River would be significantly increased as discussed under "Effects of the Alternatives on Fish."

In summary, the action alternatives would have no significant or measurable adverse effect on any wild and scenic river, but would have a large positive effect due to increased populations of salmon and steelhead. A Section 7(a) Determination by the U.S. Forest Service and the BLM concurs with this assessment (see attachment J).

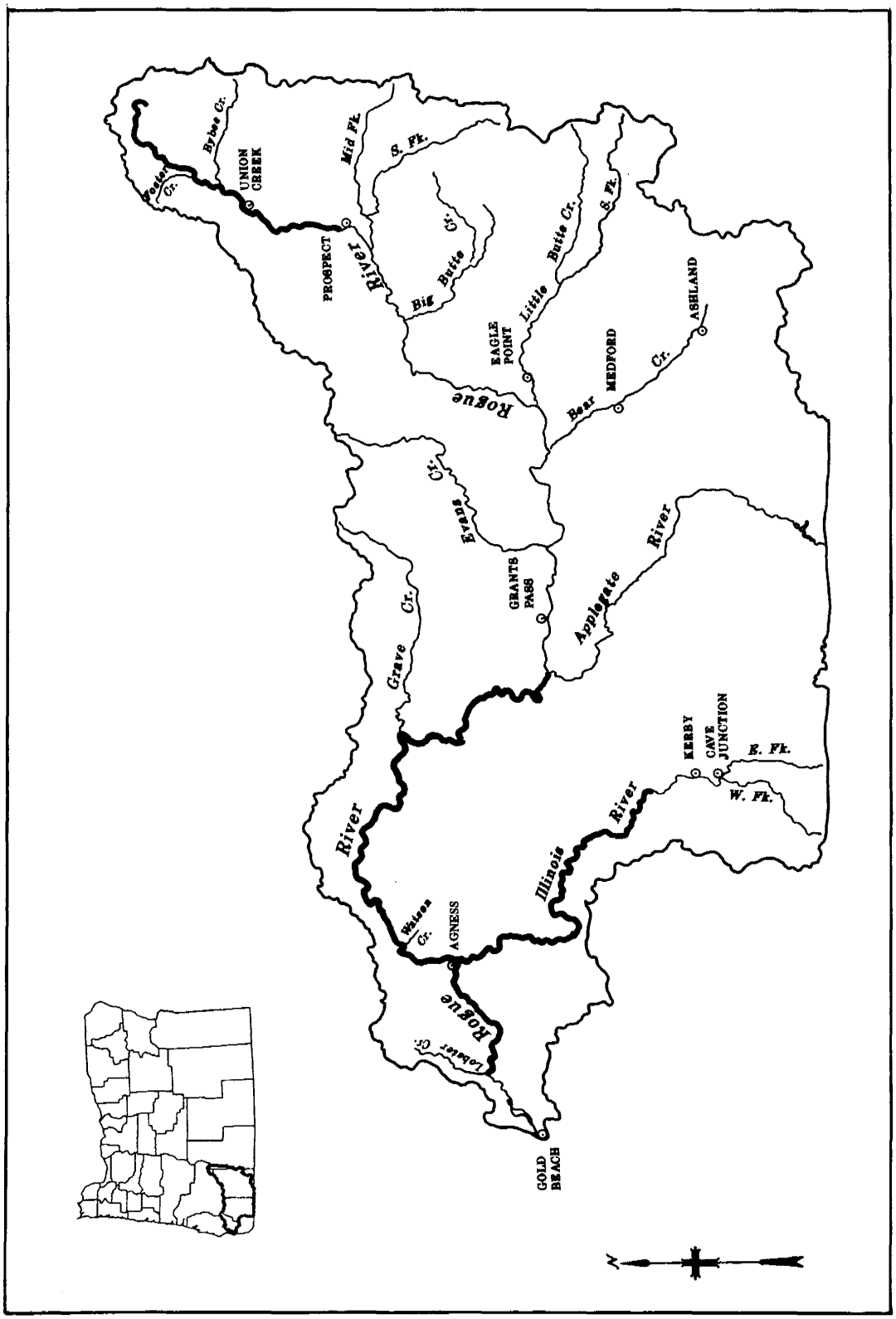


Figure VI-3.—Rogue River basin scenic waterways.

LAND USE

Most agricultural land consists of pasture, range, and woodland. Approximately 298,000 acres of land (17 percent) is in farms in Jackson County and about 37,000 acres (4 percent) in Josephine County. Lands served by the GPID are mostly in small tracts (3 acres or less), with few full-time commercial agricultural operations.

Urban growth and agriculture compete for suitable flat lands. Irrigated lands within GPID have decreased from about 12,000 acres in the 1930's to about 7,760 acres at present. Irrigated lands consist mainly of pasture, alfalfa, gardens, and lawns. Hillsides surrounding the valley areas are covered with forested growth. Land adjacent to the Rogue River has been developed for both residential and commercial use.

Local zoning regulations have been developed in accordance with the policies of the Oregon Land Conservation and Development Commission. Much of the land originally classified as arable and which once represented potential expansion of irrigated agriculture, is now zoned as forest or woodland reserve. Stringent use restrictions apply to these lands and they are no longer available for irrigation.

Lands around the reservoir above Savage Rapids Dam are zoned for a variety of uses that include woodland resources, exclusive farm use, rural residential, suburban residential, and open space reserve. Between the dam and the bridge that crosses the river at Rogue River, there are about 263 tax lots that could be classified as lakeside. Of these, 214 lots access directly on the river and the remaining 49 lots are close with a view of the river but do not access directly on the river. Included are 16 businesses that include motels, campgrounds, and other small enterprises. As of June 1990, approximately 184 homes/cabins had been built along the shores of the reservoir and there were approximately 122 vacant lots. Some of these vacant lots are used by their owners on a temporary basis for camping or day-use activities.

Effects of the Preferred Alternative on Land Use

Approximately 1 to 1.5 acres of land would be required for the pumping plants and appurtenant facilities.

A total of 110 acres of seasonal flatwater would be eliminated and the area would revert to a riverine environment. It is assumed that the GPID flood easement on these lands would be abandoned and landowners would extend their current property uses and permanent fixtures toward the new high waterline. There may be some short term shifts or disruptions in land values but the Preferred Alternative is not expected to affect land values in the long term.

Whether additional development will be made at Savage Rapids Park is unclear as Jackson County has returned control of the land to GPID. However, other public parks at the upper end of the reservoir and private camping sites located around the seasonal reservoir would likely extend development to the new high waterline.

This alternative would have no effect on prime and unique farmlands.

This alternative would affect the flood plain only in the 3.5-mile reach of river upstream from the pumping plants. The high waterline would be closer to the river center with elimination of the seasonal reservoir. Since floods are controlled primarily by Lost Creek Dam upstream, this alternative would not be expected to significantly affect the potential for flooding. However, development on private lands toward the new high waterline and into the flood plain could be expected with some increased potential for flood damage.

Elimination of the seasonal reservoir would allow development of some wetland vegetation in the area. It is unlikely that any increase would be significant.

Effects of the Dam Retention Alternative on Land Use

This alternative would have no effect on land use.

Effects of the No Action Alternative on Land Use

This alternative would have no effect on land use.

FISH

The Rogue River supports a large population of anadromous salmonids including spring and fall chinook salmon, coho salmon, summer and winter steelhead trout, and sea-run cutthroat trout. Of these, steelhead trout and chinook salmon are the most abundant and the most widely distributed. The ODFW has indicated that the Rogue River basin supports the largest population of wild anadromous salmonids in Oregon.

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; the latter two are anadromous. The Rogue River fisheries are nationally known for diversity and productivity.

Coastal stocks of salmon and steelhead are at very depressed levels. Coho stocks have been especially hard hit by poor ocean survival conditions. These, as well as adverse conditions locally, are reflected in depressed fish counts at Gold Ray Dam.

At the time of this writing, none of the resident or anadromous fish found in the Rouge River were listed under the Endangered Species Act, however the status of most salmon and anadromous trout species are being reviewed by the NMFS (see also "Endangered and Threatened Species" section).

Aquatic Habitat

The historic diversity and productivity of the Rogue River indicate that the river is healthy. Although logging, urban, and agricultural development have likely had a detrimental effect in some areas, the overall quality of the aquatic system is considered excellent by fish biologists.

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, which rely on the river current to carry them downstream to the ocean, 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.

Anadromous Fish

Anadromous refers to species that spend a portion of their life cycle in salt water but spawn in fresh water. Salmon, steelhead trout, sturgeon, shad, and lamprey are the most common anadromous species. Salmon and some other anadromous species die shortly after spawning. Steelhead trout, in contrast, may survive to spawn more than once, returning to the sea after each spawning period.

Salmonid Species

Two distinct races of steelhead exist in the Rogue River—summer run and winter run. Adult summer steelhead enter the river from June to September, moving slowly upstream, occasionally holding near the mouth of cooler tributaries. Generally, the first winter freshets cause these fish to move into smaller tributaries of the middle and upper Rogue River system; spawning commences in mid-January.

The run of winter steelhead is larger and more widely distributed. This race enters the system primarily in mid-October and are found in most streams of the drainage where spawning is not precluded by a lack of water flow, lack of spawning habitat, or the presence of natural or man-made passage barriers.

A fish run unique to some coastal streams including the Rogue River is a run of "half-pounders." These are immature steelhead that have been in the ocean for about 2 months and swim upstream with the summer run of adult spawners. They appear to be too immature to spawn and those that successfully avoid capture and other dangers probably return to the ocean.

There are also two runs of chinook salmon—spring and fall. Adult spring chinook enter the Rogue River in the spring, remain in the main stem above Gold Ray Dam through the summer, and spawn in the fall. Fall chinook enter the system early in the fall and spawn through December, tending to use the river and tributary systems below Gold Ray Dam.

Coho salmon ascend the system as mature adults in the fall and spawn through January in smaller tributaries below Gold Ray Dam.

Sea-run cutthroat trout enter the Rogue River primarily in summer and early fall, migrating as far up as the Illinois River at RM 27.1. These fish normally do not spawn until the fall freshets are adequate to permit entry into the tributary streams.

About 375,000 anadromous salmonids with an estimated value of $31.5 million are produced annually (ODFW 1985). Included in this total is an annual sport and commercial harvest of 162,000 chinook salmon and an annual sport harvest of 95,000 steelhead (ODFW 1988). The ODFW has a management policy giving first and highest consideration to the protection and enhancement of wild (as opposed to hatchery bred) anadromous fish stocks.

Fish Passage

Detailed study of fish passage issues at Savage Rapids Dam were completed in the 1970's. Since then, numerous studies of Rogue River fisheries have been completed or are ongoing by ODFW in conjunction with the Corps Rogue River Basin Project.

Facilities in the basin that affect the salmon and steelhead or actual passage conditions at Savage Rapids Dam include Lost Creek Dam at RM 157 on the main stem Rogue River, Elk Creek Dam on Elk Creek (a tributary at RM 152), and Cole M. Rivers Fish Hatchery (located just downstream from Lost Creek Dam and operated by ODFW). The Corps recently published an environmental document (Corps 1991) which contains an abundance of information regarding the life cycles of the various salmonids in the Rogue system, effects of temperature, turbidity, and the flow regulation provided by Lost Creek Dam.

The last estimate of salmon and steelhead passage at Savage Rapids Dam was prepared by USFWS in 1981 (USFWS 1981) and was based on averages of escapement upstream at that time. Counts at Gold Ray Dam, 18 miles upstream from Savage Rapids Dam, are only partially indicative of the numbers passing Savage Rapids Dam. Fall chinook spawn in two main stem areas between the two dams. Chinook and steelhead also spawn in the Evans Creek drainage; summer steelhead spawn mostly in the tributaries and winter steelhead spawn mostly in the main stem of Evans Creek.

Table VI-3 shows that the 1981 estimate of average passage of salmon and steelhead at Savage Rapids Dam was 120,500 fish. Passage estimated at Gold Ray for the high year, low year, recent 10-year average, and the entire 52-year record are shown. Counts at Gold Ray Dam have been highly variable in recent years. The highest count at Gold Ray Dam was over 140,000 fish in 1987 and the lowest count in recent years was about 23,600 fish in 1992. The average for the period 1984-1993 is 76,081 fish passing Gold Ray Dam.

Table VI-3.—Estimated salmon and steelhead passage

Year	Spring Chinook	Fall Chinook	Coho	Steelhead Summer	Steelhead Winter	Total
1981 USFWS estimate of average passage at Savage Rapids Dam						
Average	49,700	8,500	1,000	37,300	24,000	120,500
Counts at Gold Ray Dam						
Average 1984-1993	43,584	7,532	2,934	11,117	10,914	76,081
Average (52 years)	31,126	3,148	1,981	6,016	9,317	51,598
High year (1987)	81,581	10,699	5,395	24,955	17,587	140,217
Low year (1959)	13,972	735	371	865	4,550	20,493

A major concern in estimating current fish passage is that operation of Lost Creek Dam and Cole M. Rivers Fish Hatchery have changed salmon and steelhead passage at Savage Rapids Dam. Annual releases of spring chinook smolts from the hatchery have averaged about 1.6 million beginning in 1986. Summer and winter releases have varied over time, but an annual release of 150,000 smolts per stock is intended.

Fall chinook spawning has shifted further upstream because of (1) flow changes due to Lost Creek Dam and (2) hatchery production and release of spring chinook. Chinook salmon have also increased because ocean harvests have been reduced to protect Klamath River stocks which mix with Rogue River stocks in the ocean off northern California and southern Oregon. Coho salmon increases are connected with higher releases from

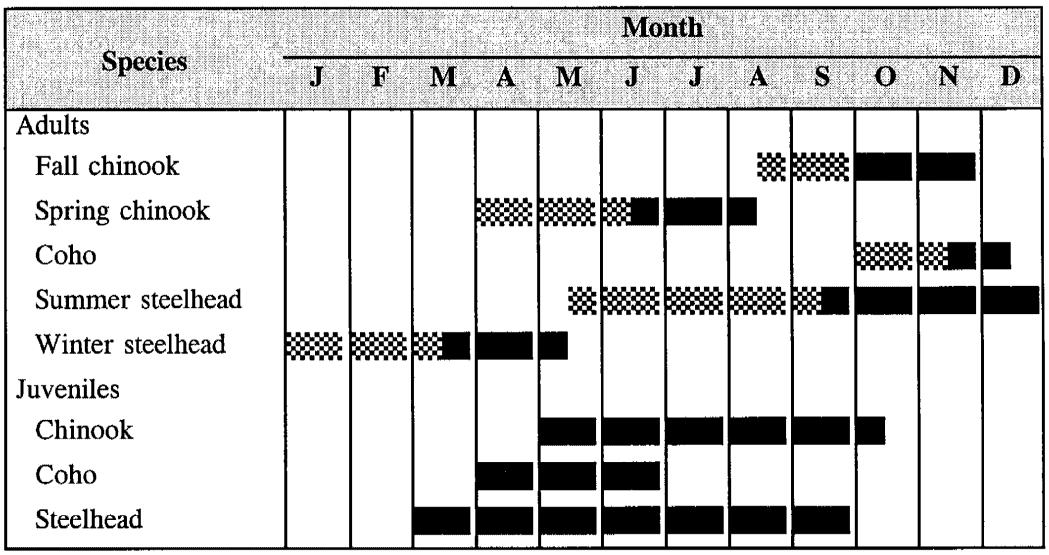
the hatchery, making the coho run in the Rogue River essentially a hatchery run.

Because of the many changes in the last 20 years and the variability in runs in recent years, the 52-year average and counts made more than 30 years ago at Gold Ray Dam probably don't have much validity in estimating current passage. In addition, the ratio of escapement past Savage Rapids Dam compared to escapement past Gold Ray Dam appears to have changed but the magnitude of change is not known.

Reclamation chose to use the 1981 USFWS estimate of salmon and steelhead escapement past Savage Rapids Dam for the analysis in this report. All fish population and fishery effects are based on the 1981 estimate including the estimate that elimination of all passage problems at the site would increase escapement at the site by 22 percent. USFWS has recently indicated that this estimate of 22 percent remains valid (see attachment C).

Migration Periods

Counts of upstream migrants at Gold Ray Dam and of juvenile fish caught in a downstream migrant trap at Savage Rapids Dam indicate that salmon and steelhead migrate upstream or downstream in all months. Figure VI-4 summarizes the timing of adult and juvenile migrations.



▒ = period of first one-half of adult migration

Figure VI-4. Migration of salmon and steelhead past Savage Rapids Dam.

Resident Fish

Resident trout are native to most streams. Rainbow trout are common in the middle and upper Rogue River system. Coastal cutthroat trout are found in the headwater sections of most high elevation tributaries. Brook trout and brown trout, introduced species, are found primarily in the North Fork Rogue River between Prospect and Union Creek.

Warm-water game fish are most abundant in various lakes, reservoirs, and ponds; however, harvestable populations are found in some sections of the main stem Rogue River. The most prevalent species are black crappie, largemouth bass, bluegill, brown bullheads, and green sunfish.

The most abundant nongame fish include suckers, carp, roach, sculpins, dace, and red-sided shiners. Not all species are found throughout the basin, but overlapping ranges of the various species encompass nearly all fresh waters of the Rogue system.

Effects of the Alternatives on Fish

Preferred Alternative

The use of cofferdams during construction and staging of construction activities on one side of the river at a time would allow upstream and downstream fish movement to continue during construction.

The Preferred Alternative would improve fish habitat in the 3.5-mile reach as the seasonal impoundment changes to a riverine environment. Restoration of this reach would provide additional habitat for fall chinook spawning. Full realization of this potential may require the State Marine Board to prohibit or carefully control jet boat use in this reach. Release of accumulated sediment from the reservoir reach is not expected to have a significant effect on water quality (see "Effects of the Alternatives on Water") or fish.

Man-made fish passage problems at Savage Rapids Dam would be eliminated resulting in an increase in the escapement of salmon and steelhead at the site. Salmon and steelhead escapement at Savage Rapids Dam would be increased about 22 percent. This escapement assumes the catch-to-escapement ratios and the harvest increases of 87,900 salmon and steelhead shown in table III-6 in Chapter III. Recently, the ODFW made

high, medium, and low estimates of potential escapement increases with the Preferred Alternative (see attachment D). Table VI-4 summarizes the earlier estimate and the recent ODFW estimates of increased escapement by species.

Table VI-4.—Increased salmon and steelhead escapement with the Preferred Alternative

Species	1981 Estimate	ODFW Estimates		
		Low	Medium	High
Spring chinook	9,100	3,458	5,493	13,340
Fall chinook	8,200	1,389	2,205	5,356
Coho	400	220	350	849
Summer steelhead	4,400	1,071	1,701	4,131
Winter steelhead	4,600	1,486	2,360	5,731
Total	26,700	7,624	12,109	29,407

Improved escapement at Savage Rapids Dam under this alternative would help in the recovery of any anadromous species that may be listed under the ESA

In addition to anadromous fish benefits, the Preferred Alternative 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 has been made.

Dam Retention Alternative

The use of cofferdams and staging of construction activities to one side of the river at a time would allow one fish ladder to function at all times so that fish movement would not be impeded during construction.

There would be no change in a fish habitat of the 3.5 mile reservoir reach with the Dam Retention Alternative.

Manmade fish passage problems at Savage Rapids Dam would be reduced resulting in an estimated increase in a salmon and steelhead escapement of about 17 percent. Total harvest increases would be about 68,100 salmon and steelhead based on earlier estimates. Recently, ODFW made high and low estimates of an increased escapement for the Dam Retention Alternative. The ODFW cautions that their high estimate is very optimistic and is based on maintaining fish passage facilities in peak conditions and does not account for any possible acute incidents such as screen failure. Table VI-5 summarizes increased escapement using the earlier estimate that assumes a 5 percent loss due to passage and the recent high and low estimates of the ODFW.

Table VI-5.—Increased salmon and steelhead escapement with the Dam Retention Alternative

Species	1981 Estimate	ODFW Estimates	
		Low	High
Fall chinook	6,400	1002	5,356
Spring chinook	7,000	2,495	13,340
Coho	300	159	849
Summer steelhead	3,400	773	4,131
Winter steelhead	3,600	1,072	5,731
Total escapement	20,700	5,442	29,407

Improved escapement at Savage Rapids Dam under this alternative would help in the recovery of any anadromous species that may be listed under the ESA

In addition to anadromous fish benefits, the Dam Retention Alternative would benefit resident fish which could more easily move up and down the river to find a suitable habitat as flow conditions change. No estimates of resident fish populations have been made.

No Action Alternative

The No Action Alternative would have not change fish habitat or fish passage. Fish passage losses would continue at the same rate as in the past.

WILDLIFE

The area surrounding the reservoir formed by Savage Rapids Dam can be classified as urban and suburban. Interstate Highway 5 borders the reservoir on the north and State Highway 99 borders the reservoir on the south. As a result, wildlife found in the area is composed mostly of those species associated with water/riparian areas and high levels of human disturbance. Waterfowl species are the most common with the greatest numbers occurring in the spring and fall migration periods. However, some species are present year-round. Diving ducks (mergansers, scaup, redheads, and goldeneye) are common in the pool immediately upstream from the dam because of the numbers of small fish in the area. Migratory song birds are also common users of wooded forest or shrub areas. Wading or shore birds use the area mostly during drawdown when floats, bars, and shoreline are available and human disturbance is limited. Fur-bearing mammals (mink, beaver, river otter, muskrat, nutria, raccoon) may use the area intermittently but are not likely to be permanent residents.

Other species that may use the area include upland game species that are found in the agricultural areas of the basin—ring-necked pheasant, California quail, mourning dove, and bandtailed pigeon. Resident brush rabbits and western gray squirrels are present but limited.

Effects of the Preferred Alternative

Construction would disturb wildlife which would temporarily move out of the area. This disturbance would be short term and would not be significant, especially as the site is within an urban setting.

Some waterfowl species that currently use the seasonal reservoir would be displaced by other wildlife associated with more riverine conditions. Because the existing shoreline area is highly developed as private homes or businesses, human disturbances would continue to be high. Changes in wildlife populations would not be significant.

Effects of the Dam Retention Alternative

Construction would disturb wildlife which would temporarily move out of the area. This disturbance would be short term and would not be significant, especially as the site is within an urban setting.

Effects of the No Action Alternative

The No Action Alternative would have no effect on wildlife.

VEGETATION

Natural vegetation in the Grants Pass area consists of oak/madrone deciduous woods and pine/Douglas fir mixed conifer forest. The general land cover is a natural woody forest with a mixed shrub/herbaceous understory.

The shoreline along the seasonal reservoir is highly developed consisting of scattered houses, lawns, gardens, small pastures, parks, and recreation vehicle campgrounds. In some areas, deciduous trees and shrubs form dense riparian vegetation. Alder, ash, cottonwood, willow, snowberry, sumac and blackberry are common along the shoreline.

When the reservoir is lowered at the end of the irrigation season, some persistent grasses are revealed but most of the land between the reservoir high waterline and the natural high waterline of the river is rocky or gravelly and bare of vegetation.

Effect of the Preferred Alternative

An area of about 3 acres would be affected by construction. Most if not all of this area has been highly disturbed by past construction activities and during the construction period this area would be denuded of vegetation. At the completion of construction, the area where the dam was removed, the area around the pumping plants and the staging areas for construction would be reshaped to blend with the natural contours and reseeded. In the long term, these areas would assume a more natural aspect and probably support more wildlife than currently.

The area between the natural high waterline of the Rogue River and the high waterline of the seasonal impoundment would fill in with natural vegetation appropriate to a riverine environment. Vegetation along the old high waterline could be expected to gradually change in character. Since all of this area is privately owned, landscaping, planting, and maintenance will vary by ownership.

Because of the seasonal nature of the reservoir, raised during the irrigation season and lowered the remainder of the year, permanent wetlands have not developed as a result of reservoir operation. Elimination of the seasonal reservoir would have no effect on wetlands.

Effect of the Dam Retention Alternative

An area of about 2 acres would be affected by construction. During the construction period, most if not all of this area would be denuded of vegetation. At the completion of construction, the disturbed area would be reshaped to blend with the natural contours and reseeded. In the long term, this area would assume the current aspect.

Effect of the No Action Alternative

The No Action Alternative would have no effect on vegetation compared to the current and historical operation of the dam.

ENDANGERED AND THREATENED SPECIES

Some species of plants and animals in the general area are listed as endangered or threatened under the ESA. Endangered species are defined as any species which is in danger of extinction throughout all or a significant portion of its range. Threatened species are defined as species which are likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Although candidate species have no technical protection under the ESA, Reclamation's policy is to avoid adverse effects to these species to the extent possible and provide mitigation if needed. These species are included here for general information as it is possible some candidates could be listed prior to project completion.

View immediately upstream of Savage Rapids Dam at full pool elevation.

View further upstream with the seasonal lake at full pool elevation showing development and typical vegetation along the shoreline.

Fish

Currently there are no ESA listed fish species within the Rogue River system, but steelhead trout and coho salmon have recently been proposed for listing. In addition, all other anadromous trout species of Oregon, Idaho, Washington, California, and Montana and all other Pacific salmon are currently the subject of comprehensive status reviews. These species include sea-run cutthroat trout and chum, sockeye and chinook salmon. The reviews are to be completed throughout 1995 and 1996.

Coho Salmon (*Oncorhynchus kisutch*)

On July 19, 1995, NMFS proposed three distinct populations of Coho (Central California Coast, Southern Oregon/Northern California Coasts, and Oregon Coast) for listing as threatened under the ESA. This includes the coho run of the Rogue River.

Steelhead (*Oncorhynchus mykiss*)

On March 16, 1995, NMFS proposed the "Klamath Mountains Province Steelhead" (all steelhead stocks between Cape Blanco, Oregon and Cape Mendocino, California) for listing as threatened under the ESA. This includes all steelhead runs of the Rogue River.

Wildlife

Listed Species

Bald Eagle (Haliaeetus leucocephalus).—The bald eagle is listed as threatened. Bald eagles are known to migrate through the area and spend some time foraging on the Rogue River during migration. No active nests are located along or near the reservoir area.

Northern Spotted Owl (Strix occidentalis).—This owl is listed as a threatened species. Although it may be found in the general area, habitat along the Rogue River in the vicinity of the reservoir area is not suitable for the species.

Candidate Species

Pacific Western Big-Eared Bat (Plecotus townsendii townsendii).—This bat is a candidate category 2 species. Category 2 indicates a species for which existing information indicates listing may be warranted, but biological information to support a proposed rule is lacking. Occurrence of the bat within 2 miles of the Rogue River has been documented. Preferred habitat includes caves and sometimes buildings.

Northwest Pond Turtle (Clemmys marmorata marmorata).—This turtle is a candidate category 2 species. Preferred habitat consists of ponds and small lakes with abundant vegetation, but the turtle is also found in marshes, slow moving streams, reservoirs, and occasionally in brackish water. The reservoir formed by Savage Rapids is not preferred habitat because of the seasonal transition between the lake and swift flowing stream.

Northern Red-Legged Frog (Rana aurora aurora).—This frog is a candidate category 2 species. Preferred habitat is in and near ponds or other permanent water with extensive vegetation. The frog is also found in damp woods.

Plants

No species of threatened or endangered plants are known to be in the area. However, one Federal candidate category 2 species has been found in the general area. The coral seeded allocarya (*Plagiobothrys figuratus var. corrallicarpus*) has been found in three locations west of Grants Pass. All three locations are about 1 mile from the river. Habitat along the reservoir does not appear suitable for the plant.

Effect of the Alternatives on Threatened and Endangered Species

Available data were examined, and a survey of the area that would be affected by the project was made with representatives of fish and wildlife agencies. The habitat of the affected area is not suitable for any listed species except the bald eagle. Effects on wintering bald eagles would be insignificant and limited to temporary disturbance during construction. Elimination of the seasonal reservoir would have no effect on wintering

bald eagles. The affected area is unsuitable to all candidate species except fish and, possibly, the Pacific western big-eared bat which would not be affected.

Reclamation has determined that none of the alternatives would likely have any measurable effect on any ESA-listed or candidate species. There would be positive effects on the salmon undergoing status review and steelhead trout recently proposed for listing as threatened under ESA. (See "Effects of the Alternatives on Fish" for discussion of the positive effects of the Preferred and Dam Retention Alternatives.) The No Action Alternative would have no effect on listed or candidate wildlife species but would continue to cause losses in steelhead and salmon populations.

RECREATION

General

Throughout the Rogue River basin, recreation and tourism are considered to be the fastest growing economic activities (OWRD 1985). The Rogue River is nationally and internationally recognized for its diverse recreation opportunities. Visitors as well as residents use the river and adjacent land for fishing, hunting, camping, backpacking, hiking, boating (including whitewater), jet skiing, picnicking, photography, nature study/viewing, and sightseeing. Water skiing is limited to reservoirs. Federal, State, county, and city governments and private industry have been instrumental in providing numerous parks, recreation facilities, and opportunities to accommodate users.

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

Boating is becoming increasingly popular. Between 1987 and 1989, boat registration in Jackson County increased 6.1 percent and in Josephine County increased 7.1 percent to respective totals of 9,293 and 3,840 boats. Although no figures are available, the use of drift boats, rafts, and other floating devices probably increased at an even greater rate. 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. Boating activity for area rivers and lakes is shown in table VI-6.

Table VI-6.—Boating activity (boating-days)
[Source: 1990 Statewide Boating Survey, Oregon]

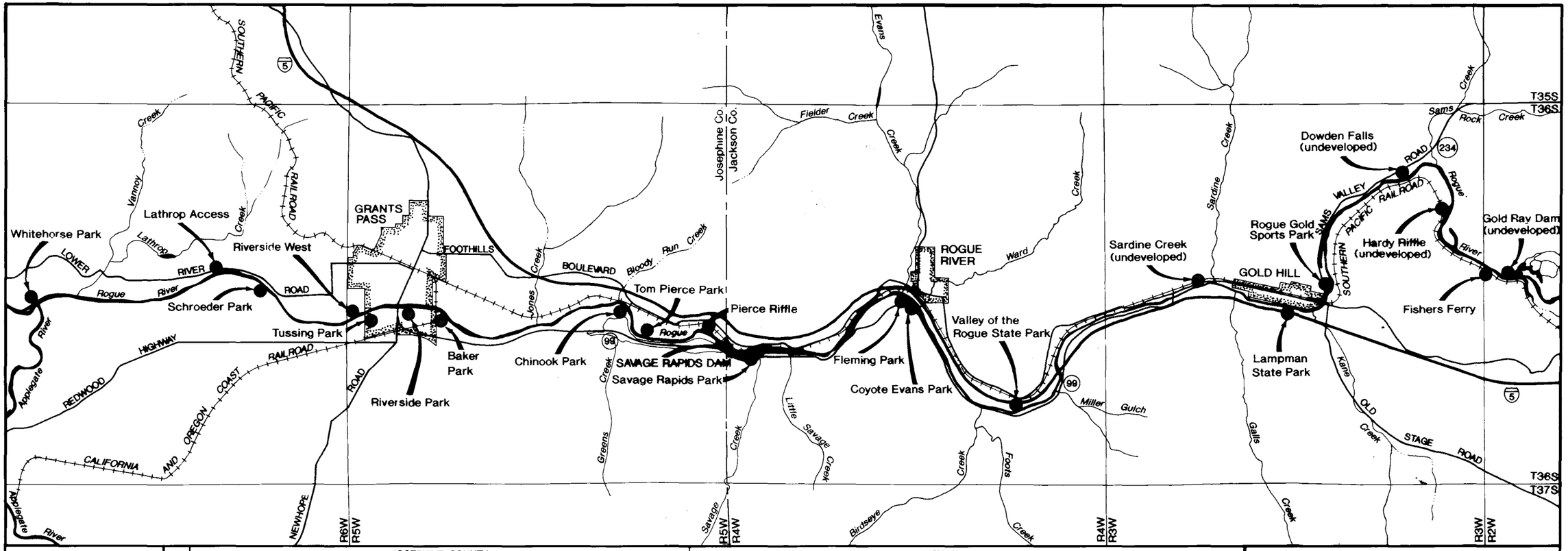
Body of water	Fishing	Cruising	Skiing	Sailing
	Jackson County			
Emigrant Lake	5,681	110	6,459	1,227
Fish Lake	7,071	705	-	-
Howard Prairie Reservoir	16,294	1,465	1,721	3,624
Hyatt Reservoir	727	-	-	-
Lost Creek Reservoir	36,359	3,752	13,301	468
Rogue River	13,146	914	-	-
Savage Rapids Reservoir	-	[1]520	-	-
Willow Creek Reservoir	2,506	376	734	-
Applegate Reservoir	5,020	26	-	-
Subtotal	86,804	7,348	22,735	5,348
	Josephine County			
Illinois River	129	-	-	-
Rogue River	18,642	1,830	1,335	129
Selmac Lake	1,005	26	-	-
Subtotals	19,758	1,856	1,335	129
Total	106,562	9,204	1,335	5,477

[1]All boating-days, including water skiing but not other activities such as jet skiing, and floating using durtbags or tahitis.

Savage Rapids Reservoir

For this study, the affected environment with regard to recreation is limited to the Rogue River corridor from Coyote Evans Park near the city of Rogue River to Savage Rapids Dam, adjacent lands, and the area just downstream from the dam. Coyote Evans park is located at the upper end of the Savage Rapids Dam impoundment.

Except as noted below, Federal, State, and local agencies have not counted the actual number of visitors nor enumerated the types of activities along this reach of the Rogue River. However, Reclamation has consulted a number of recreation professionals and obtained local opinions. Recreation areas and facilities for all locations in and near the general area are shown on the Public Recreation Areas map.



SITE NAME	WHITEHORSE (COUNTY)	LATHROP ACCESS (COUNTY)	SCHROEDER (COUNTY)	RIVERSIDE WEST (CITY)	TUSSING (COUNTY)	RIVERSIDE (CITY)	BAKER (CITY)	CHINOOK (COUNTY)	TOM PIERCE (COUNTY)	PIERCE RIFFLE (COUNTY)	SAVAGE RAPIDS (COUNTY)	FLEMING (CITY)	COYOTE EVANS (CITY)	VALLEY OF THE ROGUE (STATE)	SARDINE CREEK (COUNTY) (future boat ramp)	LAMPMAN (STATE)	ROGUE GOLD (CITY & COUNTY)	DOWDEN FALLS (COUNTY) (future boat ramp)	HARDY RIFFLE (COUNTY) (undeveloped)	FISHERS FERRY (COUNTY)	GOLD RAY DAM (COUNTY) (future boat ramp)
	JOSEPHINE COUNTY										JACKSON COUNTY										
FACILITIES																					
BEACH			X					X			X										
POTABLE WATER	X		X	X		X			X			X	X	X			X				
BOAT RAMP	X	X	X				X	X		X	X		X	X			X			X	
TOILETS	X		X	X		X		X	X	X	X	X	X	X			X			X	
CAMPGROUND	X		X											X							
DAYUSE/ PICNIC AREA	X	X	X	X	X	X		X	X	X	X	X	X	X		X	X				
OTHER	trail, nature viewing area, shelter		ball field, tennis & basketball courts	tennis courts & ball fields		shelters, ball field, lawn bowling		handicap fishing pier	trail, playground ballfields, shelters	trail, nature viewing area				freeway rest area	fishing access		tennis courts	fishing access	fishing access	fishing access	fish viewing ladder, old power plant

EXPLANATION

● Recreation Area

N

1 0.5 0 1
SCALE OF MILES

UNITED STATES
DEPARTMENT of the INTERIOR
BUREAU of RECLAMATION

GRANTS PASS DIVISION,
ROGUE RIVER BASIN PROJECT, OREGON

JOSEPHINE COUNTY WATER MANAGEMENT IMPROVEMENT STUDY

PUBLIC RECREATION AREAS

Denver, Colorado *January 1991*

Recreation activities on the reservoir include the use of motor boats for water skiing and riding for pleasure, jet skiing, swimming, and limited fishing. These activities are limited somewhat since the reservoir is narrow. Drift boat, canoe, and raft use on the reservoir are extremely low. The State estimated approximately 520 motorized boating-days on the reservoir in 1990 (Oregon State Marine Board 1990).

Jackson County Parks Department has surveyed auto license plates at Savage Rapids Park and concluded that the primary users of the reservoir are people who live in the area, mostly from the city of Grants Pass. The area is close and easily accessible for short duration visits.

Although tourists use the area, the use is probably secondary to fishing and whitewater boating/rafting on the Rogue River. The reservoir is not a primary or secondary destination site for any significant number of non-local visitors. As noted above, even local use is limited because of the narrow surface area of the reservoir which contributes to crowding and creates safety problems, limited public access, and limited facilities.

Fishing and Fish Viewing

Josephine County Parks Department and Jackson County Parks Department have indicated that the quality of fishing 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, but stocking was stopped in 1994 to avoid conflict with wild fish. The current policy is that no planting will be made in the main stem Rogue River below Lost Creek Dam, about 32 miles upstream from Gold Ray Dam.

Although the area on the left (south) abutment of the dam is not designed 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. No estimate of this use is available.

Most of the fishing in this 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.

Public Facilities

At the upstream end of the reservoir and within the city of Rogue River, a 4-acre parcel of land has been developed into two day-use parks—Coyote Evans and Fleming Parks. These parks are operated and maintained by the city of Rogue River. Savage Rapids Park, located a short distance upstream from Savage Rapids Dam, is operated and maintained by a private entity under contract to the GPID. Jackson County ordinances allow camping on sites for up to 30 days. All of these campgrounds stay very busy during the high use season from May to September.[1]

Coyote Evans Park.—Leased to the city of Rogue River by the ODFW, this park caters mainly to river users and serves as a primary launch and takeout location for floatboaters and jet boaters who use the river upstream from the reservoir. Some people using canoes and drift boats travel downstream and takeout at Savage Rapids Park; but, according to the Jackson County Parks Department, the number is very low. Facilities at Coyote Evans Park include a picnic area, barbecue grills, and vehicle parking. The Jackson County Parks Department estimates that over 50,000 people visit the park each year.

Fleming Park.—Adjacent to Coyote Evans Park and owned and operated by the city of Rogue River, this park serves as a local picnic and fishing area, as a rest stop for travelers because of its proximity to Interstate 5, and accommodates one commercial concession which provides jet boat rides on the Rogue River upstream from the reservoir. Facilities include restrooms, barbecue grills, picnic tables, and open-space areas. Jackson County Parks Department estimated that this park had 100,000 visitors during 1989.

Savage Rapids Park.—Savage Rapids Park is the only public access adjacent to the reservoir. In 1975, Jackson County leased 10 acres of land from GPID and developed this recreation site, one-quarter mile upstream from the dam. Currently, 5 acres have been developed to provide a boat launching facility, picnic area, restrooms, vehicle parking, and a beach. In 1989, one county official estimated visitation at about 50,000 people.

The county deferred development of the remaining 5 acres of land until funds were available and has now returned the development to GPID. The park is now operated as a fee park under a year to year contract. Future development and operation of the park is uncertain.

[1]Jackson County Parks Department, personal communication.

Private Facilities

The State has declared much of the Rogue River above Savage Rapids Dam as navigable. In Oregon, this designation means private ownership of adjacent land extends only to the mean high waterline of the river. The river and the lands below the high waterline are public.

Where a reach of river has not been declared navigable, the State defines adjacent land ownership as extending to the middle of the watercourse. The Rogue River in the vicinity of Savage Rapids Dam and its impoundment has not been declared navigable. Public access to these waters is very limited and has caused considerable tension—"no trespassing" signs are common throughout this area.

Commercial.—Four areas on the south side of the reservoir have been privately developed for commercial recreation, as shown in table VI-7. These operations provide overnight and long-term camping.

Table VI-7.—Commercial campgrounds

Campground	Number of sites
Rogue River RV Park	21
Have A Nice Day	15
Circle RV Park	25
Unnamed new site	12

Residential—As of mid-1993, landowners had installed 106 permanent boat docks, 9 floating boat docks, and 38 boat ramps along the reservoir shoreline for personal use.

Effect of the Alternatives on Recreation

Preferred Alternative

Removing the dam would result in the restoration of a natural river channel and more fish would migrate upstream unimpeded. Fishing opportunities would be greatly enhanced in the 3-mile reach upstream from the dam.

The heavy concentration of fish and fishermen between the dam and Pierce Riffle would be eliminated as fish disperse over this reach and the 3-mile reach upstream from the pumping plants.

The popular activity of viewing migrating fish at the Savage Rapids Dam fish ladders would be eliminated. The nearest opportunity for viewing anadromous fish passing up a fish ladder would be Gold Ray Dam, approximately 18 river miles upstream.

There may be an opportunity to revamp Savage Rapids Park as a public access point for the river; however, the future of the park is uncertain at this time.

The current 520 days of motorized boat use on the seasonal reservoir would be dispersed to other sites. Travel to Lost Creek Lake, Howard Prairie Lake east of Ashland, or other area reservoirs for motorized boating will be more time consuming and expensive. Yet, these reservoirs offer safer and better opportunities for such boating since they are wider and larger than Savage Rapids reservoir. (Galesville Reservoir, located north of Grants Pass and outside the two-county area, is nearer than many other reservoirs and could be expected to receive some of the displaced use.)

Private recreation facilities associated with water recreation such as boating docks constructed by homeowners and business will become unusable. Some of these may be reconstructed closer to the new waterline and others may be abandoned or removed.

Use of drift boats, kayaks, rafts, and "durtbags" (large styrofoam-filled vinyl bags) through the 3-mile river reach above the pumping plants would likely increase. If the rapids are passable, some jet boat use could be expected. The potential for disturbance of spawning fish might lead to the regulation or prohibition of jetboat use in this reach. Changes in the length, duration, and type of boating activities would probably be most noticeable between Valley of The Rogue State Park and Grants Pass. Since this area is relatively urban, tours through the reach would not be as popular as tours through more scenic portions of the Rogue. Generally, commercial operators consider only the Rogue River west of the junction of the Applegate River or stretches of the river east of the city of Rogue River scenic for commercial purposes. However, jet boat tours might use the Savage Rapids reach as a new corridor between scenic areas.

Since this area is close to populated areas, residents and tourists could use this area for shorter, more convenient trips. Many of the commercial outfitters contacted indicated that their clients are interested in short-duration trips such as this area could provide. Rapids are the most important consideration for rafters—the configuration of rapids at the site may prove to be a barrier, a tough challenge, or just a fun ride.

Although the types of recreation activities will change, overall recreational use is not expected to change significantly. Public access to this river reach will remain essentially unchanged and problematic since public access is limited primarily to Savage Rapids Park.

Dam Retention Alternative

This alternative would have no effect on recreation.

No Action Alternative

This alternative would have no effect on recreation.

CULTURAL RESOURCES

River Corridor

The Rogue River corridor has been extensively used by prehistoric as well as historic populations, and the potential for cultural resource sites may be significant in undisturbed areas. Because of extensive disturbance due to construction in the past in areas that would be affected by new construction, it is unlikely that there are any significant resources near the dam and a survey is considered unnecessary (see "Consultation and Coordination" chapter).

Savage Rapids Dam

Savage Rapids Dam does not qualify as an historic structure. Reclamation conducted a thorough investigation of the dam and sent the results to the State Historic Preservation Officer (SHPO) for evaluation. The results of

the State's review are contained in a letter dated August 1, 1990. The SHPO agreed ". . . the dam is not eligible for the National Register of Historic Places."

Effect of the Alternatives

It is unlikely that any alternative would have an effect on cultural resources. Construction of the Preferred Alternative and the Dam Retention Alternative would take place in areas that have been highly disturbed. For that reason, it is unlikely that there would be any impact to prehistoric or historic cultural resources.

If prehistoric or historic cultural resources are identified before or during project construction, Reclamation will consult with the SHPO and the Advisory Council on Historic Preservation to determine significance and subsequent action. The resources would be preserved or mitigated. Mitigation could include excavation, avoidance, or documentation consisting of an historic overview, measured drawings, and photographs.

AIR QUALITY

Air quality in the Grants Pass area is generally good. Outdoor burning is occasionally banned but the reason is fire danger, not air quality considerations. Temperature inversions in the winter can cause decreases in air quality, but inversions are short lived because of the frequency of storms and rains.

The alternatives would have no significant effect on air quality except temporary effects associated with construction. There may be some minor and temporary impacts from construction activity, but these would be controlled by compliance with existing State permit requirements and local ordinances.

NOISE

Savage Rapids Dam is located in an urban setting with highways located on both sides of the river and a railroad on one side. As a result the noise level at the dam is fairly high.

Effect of the Preferred Alternative

Construction will result in an increased level of noise during the construction period. Contractors will be required to implement methods and operations that keep noise to an acceptable level. Brief periods of intense noise and lower levels of increased noise over a longer period can be expected. Various methods for removal of the existing facilities will be explored as intense noise for short periods (e.g., blasting) may be more acceptable than less intense noise for longer periods. This concern will be addressed during final designs.

In the long-term, the electrically powered pumping plants will add to the noise level in the general vicinity. Careful siting of facilities, addition of vegetation, and a design that focuses sound upwards will generally mitigate noise. Noise from operation of the existing dam will be eliminated. The noise level is not expected to change significantly.

Effect of the Dam Retention Alternative

Construction will result in an increased level of noise during the construction period, and contractors will be required to implement methods and operations that keep noise to an acceptable level.

In the long term, there would be no change in the level of noise at the site.

Effect of the No Action Alternative

This alternative would have no effect on noise levels.

ESTHETICS

Savage Rapids Dam is an intrusion into the general riverine view of the Rogue River. However, the area is generally urban or suburban with an interstate highway on one side and a State highway on the other side of the river in the reach from Savage Rapids Dam to the city of Rogue River. When the reservoir is raised to create the seasonal impoundment, the view of the area is generally that of a small, narrow lake. When the reservoir is drained, the view of some reaches is that of a river with wide, cobble shores that are bare of vegetation.

Effect of the Preferred Alternative

Construction of the pumping plants and demolition of Savage Rapids Dam would result in confusion and a constantly changing construction scene. These effects would be short term and are not considered significant in an urban setting.

Removal of the dam would change the scenic view from that of a small lake to a natural river. Native vegetation would reestablish through natural processes within 5 years where not seeded. Reseeding in the area of dam removal and construction of the pumping plants would result in substantial vegetation coverage in 2 years. In some cases, the river surface would no longer be visible from residences because the slope of the riverbank would block the view. In these cases, the change would be similar to what is currently experienced between irrigation seasons.

The pumping plants, pipelines, and overhead power transmission lines are designed to blend with the natural environment and would be less obtrusive than the existing dam.

Effect of the Dam Retention Alternative

Construction at Savage Rapids Dam would result in a constantly changing construction scene. These effects would be short term and are not considered significant in an urban setting.

Effect of the No Action Alternative

This alternative would have no effects on esthetics.

SOCIAL WELL BEING

Effect of the Preferred Alternative

Lakeside residents will become riverside residents. The docks and lake access facilities they have constructed will become unusable. They will have to travel farther than the end of their property line if they wish to

participate in flatwater recreation activities. Their summertime view of the lake will become a year-round view of the river. Some residents have said they will be glad to be rid of the noise associated with water skiing and jet skiing.

Local recreationists will have to travel farther to participate in flatwater recreation.

Some tour guide and boat rental businesses feel that tourism could actually increase as people are attracted to a "new" stretch of river for fishing, floating, etc. Businesses near the river will likely continue to have the same, if not an increased, level of business.

Helicopters would no longer have a fairly large area deep enough to scoop up water for fighting forest fires. However, many smaller, adequate sites should exist in the area but would not be as convenient as the existing reservoir and would vary with river lows.

Since a supply of construction workers exits in the local area, no influx of construction workers is likely. Over a short period (3 to 6 years) construction jobs will provide employment for some unemployed individuals. Other businesses may see a short-term increase in sales.

Effect of the Dam Retention Alternative

The Dam Retention Alternative will have little effect on most residents and would have no effect on those that currently use or live next to the reservoir.

Effect of the No Action Alternative

The No Action Alternative will have no effect on most residents. Salmon and steelhead fishery interests and environmental groups would probably continue to work toward removal of the dam. Patrons of the GPID, will be left in a state of anxiety on the future status of the GPID until such time as solutions are implemented.

ENERGY REQUIREMENTS

Effect of the Preferred Alternative

Conversion from hydraulic to electrically operated pumps will increase the annual power consumption at the site by an estimated 5,675,800 kWh. This is equivalent to the average use of about 380 homes in the Pacific Northwest. Forecast deficits would be increased but such an increase is not significant on a regional basis.

Effect of the Dam Retention Alternative

Electric power consumption at the site would not be increased significantly.

Effect of the No Action Alternative

There would be no effect from this alternative.

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, and no Indian trust assets such as hunting and fishing rights have been identified in the basin (see "Consultation and Coordination" chapter).

ENVIRONMENTAL JUSTICE

Neither the Preferred Alternative nor the Dam Retention Alternative would have an adverse impact on minorities or low-income populations and communities.

UNAVOIDABLE ADVERSE EFFECTS

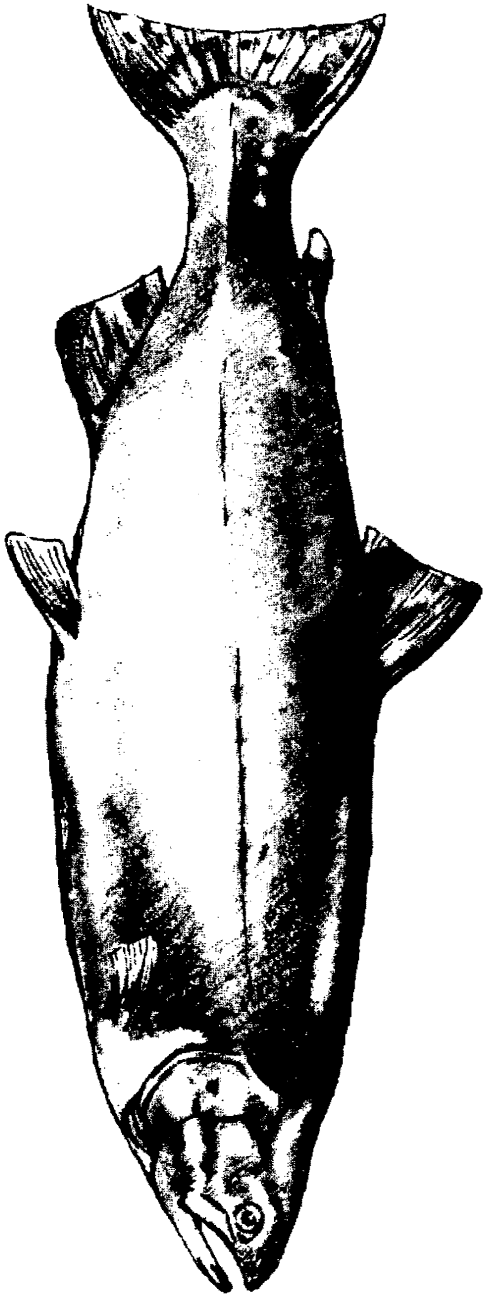
The Preferred Alternative would have two unavoidable adverse effects—loss of 110 acres of seasonal flatwater and increased electric power consumption. Neither is considered significant. Safer flatwater recreation is available at several reservoirs in the area, and the flatwater recreation loss would be offset by increased whitewater and other recreation associated with a free flowing river. The increased power consumption is not considered significant to the integrated Pacific Northwest Power Pool.

No unavoidable adverse effects were identified for the Dam Retention Alternative and the No Action Alternative.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The Preferred Alternative would eliminated 110 acres of seasonal flatwater and associated recreational opportunities. In addition, there would be an annual electric power commitment of 5,675,800 kWh.

No irreversible and irretrievable commitments of resources were identified for the Dam Retention Alternative and the No Action Alternatives.



Chapter VII—Consultation and Coordination

PUBLIC INVOLVEMENT

Participation by the public and by State, Federal, County, and local entities was an integral part of plan formulation and evaluation for the JCWMIS. This participation reflects the high level of interest in the Rogue River and its uses. The public involvement program was designed to address requirements of Federal planning regulations and NEPA.

In early 1987, various departments of Josephine County and the County Commissioners appealed to the Commissioner of Reclamation to initiate a water management study for the County. In 1988, Reclamation initiated the JCWMIS in cooperation with Josephine County and the GPID. A wide range of local and environmental groups including the city of Grants Pass, the Izaak Walton League, WaterWatch of Oregon, and others showed support for the study. Further support was sought in 1990, at which time the NMFS and the American Fisheries Society agreed to participate in the study.

Public involvement activities were somewhat complicated by two events in 1990—issuance of a temporary water right permit to GPID and a significant reduction in participation by Josephine County because of budget restrictions. A draft of the temporary water right permit, made available in 1989, showed that the permit would be conditional on several factors. These included formation of a Permit Oversight Committee (POC), conducting studies of water conservation and other potentials, and annual progress reports to the Oregon Water Resources Commission. As a result of these changes, GPID and the POC became the central focus for public involvement activities for the JCWMIS.

The general public and cooperating agencies took part in the initial scoping phase, and a public involvement program was developed early and revised as needed. Some public involvement activities focused exclusively on fish passage and some focused exclusively on water conservation and facilities management. Most public involvement activities, however, involved an intermix of interests and concerns. GPID developed a public involvement program early in the study and, along with the POC, has carried out much of the public involvement since 1990. POC meetings were open to the public.

POC Members

The POC included the representatives of the following:

- GPID
- A non-voting member of the GPID
- City of Grants Pass
- Josephine County
- ODFW
- OWRD
- Bureau of Reclamation
- Natural Resources Conservation Service
- WaterWatch of Oregon

Agencies

The principal agencies that provided information or participated in the study were:

Federal: Reclamation, Bureau of Land Management (BLM), USFWS, NMFS, NRCS, and Forest Service
State: ODFW and OWRD
Local: GPID, city of Grants Pass, Jackson County, and Josephine County

Other Entities

Several environmental or other specific interest groups were actively involved in study activities or provided information. These include the following: American Fisheries Society, Izaak Walton League, Rogue River Flyfishers, and WaterWatch of Oregon.

General Activities

Much of the public involvement activities consisted of telephone or in-person contacts with individual representatives of various interests. Other activities often involved small group meetings. Many of these meetings and contacts were made to coordinate study activities, discuss study progress and findings, and to answer general questions. As an example, the Reclamation planning team met with special interest groups and private

citizens to discuss the JCWMIS and tour GPID facilities in 1989. GPID made numerous mailings to its patrons, appeared on radio shows to answer questions, and placed informational material in the local newspaper.

Reclamation prepared a progress report on the fish passage portion of the JCWMIS which was released to study participants and the interested public in July 1992.

Major public involvement activities included public meetings held in February and October of 1991 and in October 1993. Newsletters were sent by the POC to GPID patrons and to residents around the seasonal lake in November 1990 and in July 1991. GPID sent newsletters to their patrons in September 1991, March 1992, and November 1992. The planning report/draft environmental statement was distributed for public and agency review and comment in December 1994 and a public hearing was held in Grants Pass in February 1995. These activities provided opportunity for public comment on all aspects of the fish passage portion of the JCWMIS.

COORDINATION WITH FEDERAL AND STATE FISH AND WILDLIFE AGENCIES

The JCWMIS was closely coordinated with USFWS, ODFW, and NMFS. These agencies participated in identification of fish passage issues, fisheries and fish habitat in the area, and updating other information. USFWS, in cooperation with the NMFS and the ODFW, prepared a Planning Aid Memorandum in April 1990 and a draft Fish and Wildlife Coordination Act Report in 1994. ODFW provided a position paper on alternatives to GPID in December 1993. NMFS and USFWS were consulted and provided information on endangered species.

Fish and Wildlife Coordination Act Report

Findings of the Draft Fish and Wildlife Coordination Act Report were used in determining monetary and other fish and wildlife benefits of the alternatives (a copy of the Final report is included as Attachment C). The USFWS recommends that:

- Reclamation should seek authorization to remove Savage Rapids Dam and replace it with pumping plants.

- Implementation should be on an accelerated time frame.
- Funding should be nonreimbursable because of the substantial benefits to anadromous fish.
- The construction schedule should be closely coordinated with USFWS, ODFW, and NMFS.

Oregon Department of Fish and Wildlife

In December 1993, ODFW released a "position paper" to GPID (see Attachment D). ODFW indicated that:

- Their preferred alternative is dam removal.
- Replacement of fish passage structures would be acceptable provided that state-of-the-art passage structures were installed and properly maintained and operated.
- ODFW would not support any alternative that proposes to modify existing fish passage and protective structures.

Endangered Species Consultation

Consultation with the USFWS is required under section 7 of the Endangered Species Act. As an initial step in this consultation, Reclamation requested a list of threatened and endangered species from both the USFWS and the NMFS. Two species listed as threatened—bald eagle and northern spotted owl—were included in the list. In addition, there are several candidate species found in the area.

This Planning Report/Environmental Statement (PR/ES) is intended to serve as Reclamation's biological assessment of the potential effects of the alternatives on listed species. (An assessment is required under the ESA.) As indicated elsewhere, Reclamation has determined that none of the alternatives would have an effect on listed species and would have no effect on candidate species. The effects of the alternatives on anadromous fish undergoing status review or proposal for listing would be beneficial as discussed in more detail elsewhere in this document.

CULTURAL RESOURCES CONSULTATIONS

Cultural resource consultations were initiated in the 1970's when interim fish passage improvements were proposed. Findings at that time indicated that all of the affected area had been highly disturbed and it was unlikely that any cultural resources would be found. For that reason, a cultural resource survey was not needed. Areas that would be affected by implementation of the action alternatives identified in this document have been further subject to disturbance due to construction and OM&R activities since the 1970's. As a result, a cultural resource survey is not considered necessary for implementation of either action alternative. If cultural resources are found during construction, the SHPO would be consulted and appropriate actions would be taken to preserve or document any resources found.

A Reclamation historian researched the history of Savage Rapids Dam and consulted with the GPID and historical societies of Josephine and Jackson Counties. In 1991, an interpretive historic report on the dam was submitted to the SHPO who concurred in the assessment that Savage Rapids Dam was not eligible for listing in the National Record of Historic Places (see attachment H).

INDIAN TRUST ASSETS

The United States has a trust responsibility to protect and maintain rights reserved by or granted to American Indian tribes or Indian individuals by treaties, statutes, and executive orders. In 1993, the Department of the Interior and Reclamation established a policy of avoiding adverse effects to Indian Trust Assets (ITA's) where possible and assessing potential impacts to ITA's as a part of NEPA compliance policy. ITA's are defined as legal interests in property held in trust by the United States for Indian tribes or individuals, or property that the United States is otherwise charted by law to protect. Included are lands, minerals, hunting and fishing rights, water rights, and instream flows.

The public involvement program related to scoping and developing alternative actions to improve fish passage at Savage Rapids Dam were open to all public interests. No ITA's were identified through the public involvement program. A survey of lands that could be affected by the alternatives found that none of those lands were owned by Native

Americans. Consultation with the Bureau of Indian Affairs, indicates that there are no known ITA's in the Rogue River basin.

An assessment of impacts to ITA's is not needed because there are no identified ITA that would be affected.

RECREATION CONSULTATIONS

A Reclamation recreation specialist toured the project area and consulted with Josephine and Jackson County Parks Departments, Josephine County Planning Department, BLM, and OWRD on recreation opportunities and the use of the seasonal impoundment and adjacent lands. The general consensus of the various agencies was that the alternatives would have negligible impacts on recreation.

REGULATORY COMPLIANCE

This document was prepared in compliance with the National Environmental Protection Act of 1969 (Public Law 91-190) and current regulations and guidelines established by the Department of the Interior and Reclamation. A Notice of Intent to prepare an environmental statement was published in the *Federal Register* on July 26, 1993, page 39834.

It is the intent of this document to comply with other applicable laws and Executive Orders. This section discusses some of the applicable legislation.

National Historic Preservation Act (Public Law 89-665)

This act provides for the maintenance of an expanded program to preserve historic properties throughout the United States. It provides for an Advisory Council on Historic Preservation with the responsibility to review and comment on all Federal actions that affect properties eligible for listing or already listed in the National Register of Historic Places. Subsequent amendments designated the SHPO as the individual responsible for administering programs for the state. Consultation with the SHPO has been concluded.

Clean Water Act (33 U.S.C. 1251 et seq.)

This act aspires to "maintain the chemical, physical, and biological integrity of the Nation's water" by eliminating pollutant discharge into navigable waters of the United States. It established an effluent limitation and discharge permitting program. It required owners/operators of each point source to obtain a permit and monitor and maintain effluent records.

Section 404 of the Act establishes a permit program administered by the Corps to regulate discharge of dredge and fill materials into United States waters. Required permits, including a National Pollutant Discharge Elimination System permit, would be obtained before construction through coordination with EPA, the State of Oregon, and the Corps.

Fish and Wildlife Coordination Act of 1958 (Public Law 85-624)

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 fish and wildlife agency through consultation directed toward the prevention of fish and wildlife losses and development/enhancement of these resources. Coordination with the USFWS and ODFW have been completed in compliance with the intent of this act and a final Fish and Wildlife Coordination Act Report has been received. (See also "Fish and Wildlife Coordination Act Report" in this chapter.)

Endangered Species Act of 1973 (Public Law 93-205)

This act provides for the protection of animal and plant species currently in danger of extinction (endangered) and those species that may become so in the near future (threatened). Section 7 of the Act sets forth the procedural requirements to ensure that Federal actions do not adversely impact threatened or endangered (T&E) species or their critical habitats. First, a determination is made whether the project area contains any T&E species, and then a biological assessment of impacts on the T&E species is made. A copy of the biological assessment is transmitted to the USFWS or NMFS

office having jurisdiction. If a "may affect" determination is made, a request to enter into formal consultation accompanies the biological assessment. The USFWS or NMFS evaluates the assessment and responds back to Reclamation with a biological opinion or a request for additional information or time within a 60-day period.

The appropriate fish and wildlife agencies have provided Reclamation with a list of threatened and endangered species found in the area, and Reclamation has made an assessment of potential impacts. This PR/ES serves as Reclamation's biological assessment that neither of the action alternatives is likely to adversely affect listed species and would have a beneficial effect on all fish species through improved fish passage.

Wild and Scenic Rivers Act of 1968 (Public Law 90-542)

Selected rivers are placed in the National Rivers Inventory to be preserved in a free flowing condition and to protect their local environments. Currently, portions of the Rogue River have been placed in the National Rivers Inventory. The Wild and Scenic Rivers Act precludes Federal assistance to water resource projects that would invade or unreasonably diminish the scenic, recreational, and fish and wildlife values of a wild and scenic river. In addition, the State of Oregon has placed portions of the Rogue River in the State inventory of wild and scenic rivers.

Reclamation has assessed potential impacts. This PR/DES served as an assessment that none of the action alternatives would invade or have a significant negative effect on the Rogue River. The only significant or measurable effect that either action alternative would have on the Rogue River is to enhance salmon and steelhead. A Section 7(a) Determination by the U.S. Forest Service and the BLM concurs with this assessment (see attachment J).

Executive Order 11988 (Floodplain Management, 1977)

Federal agencies are required to reduce the risk of floodplain loss; minimize the impact of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values provided by floodplains in carrying out specific actions. For water diversion projects,

there is no alternative to the construction of some of facilities within the floodplain. Reclamation addresses this executive order, in part, by locating most facilities above the 100-year flood elevation and by designing other structures to withstand the 100-year flood. The Preferred Alternative would slightly reduce potential damage and the Dam Retention Alternative would have no effect on flood damage potential.

Executive Order 11990 (Protection of Wetlands, 1977)

This executive order provides for minimal destruction, loss, or degradation of wetlands, and for action to preserve and enhance the values of wetlands by Federal agencies in fulfilling land management responsibilities. The pool formed by Savage Rapids Dam is a seasonal pool raised for 6 months and lowered for 6 months. For that reason, there are no permanent wetlands in the affected area that result from the pool or would be eliminated by removal of the dam. None of the alternatives would have a measurable effect with regard to wetlands.

DISTRIBUTION LIST

Copies of this PR/FES were distributed to all of the agencies, organizations, and individuals listed in this section. In December 1994, the PR/DES was distributed for review and comment to agencies, organizations, and individuals. The open period for comment was from December 15, 1994 to March 20, 1995. A public hearing for oral testimony was held on February 16, 1995 in Grants Pass, Oregon, and the period until February 27, 1995 was open for written testimony of those who could not attend the hearing or wished to supplement their oral remarks. The following marks are used in the distribution list to show receipt of the PR/DES, written comment on the PR/DES, and testimony for the hearing:

✓ Received a copy of the PR/DES from Reclamation
✎ Provided written comments on the PR/DES
⏲ Provided oral or written testimony for the hearing record

U.S. Congressional Delegation

✓ Honorable Mark Hatfield, U.S. Senate, Washington DC; Portland OR; Salem OR
✓ Honorable Bob Packwood, U.S. Senate, Washington DC; Portland OR
✓ Honorable Wes Cooley, House of Representative, Washington D.C., Medford OR
✓ Honorable Peter A. DeFazio, U.S. House of Representatives, Washington DC; Eugene OR; Coos Bay OR
✓ Honorable Robert F. Smith, House of Representatives Washington D.C.; Medford OR, Salem OR

State Delegation

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

✓ Honorable Brady Adams, Oregon State Senate, Grants Pass OR
✓ Honorable Lenn L. Hannon, Oregon State Senate, Ashland OR

✓ Honorable Eldon Johnson, Oregon House of Representatives, Medford OR
✓ Honorable Bill Markham, Oregon House of Representatives, Riddle OR
✓ Honorable Bob Repine, Oregon House of Representatives, Grants Pass OR
✓ Honorable John Watt, Oregon House of Representatives, Medford OR

Federal Agencies

✓ Advisory Council on Historic Preservation, Washington DC
✓ Bonneville Power Administration, Portland OR, Boise, ID
✓ Bureau of Indian Affairs, Washington DC
✓ Bureau of Land Management, Medford OR
✓ Council on Environmental Quality, Washington DC
✓✎ Environmental Protection Agency, Region, Seattle WA
✓ Environmental Protection Agency, Washington DC
✓ Federal Energy Regulatory Commission, Washington DC
✓✎ National Marine Fisheries Service, Portland OR
✓✎ National Park Service, Seattle WA
✓ National Park Service, Washington D.C.; Denver CO
✓ Northwest Power Planning Council, Portland OR
✓ Natural Resources Conservation Service, Grants Pass OR; Bend OR
✓ U.S. Army Corps of Engineers, Portland OR

✓ U.S. Army Corps of Engineers, Lost Creek Project, Trail OR
✓ U.S. Fish & Wildlife Service, Portland OR
✓ U.S. Fish & Wildlife Service, Washington DC
✓ U.S. Fish and Wildlife Service, Ecological Services, Sacramento CA
✓ U.S. Forest Service, Rogue River National Forest, Medford OR
✓ U.S. Forest Service, Siskiyou National Forest, Grants Pass OR

Indian, State, and Other Agencies

✓ Lower Elwha S'Klallam Tribe, Director Natural Resources, Port Angeles WA
✓ Oregon Department of Fish & Wildlife, Portland OR
✓ Oregon Department of Fish & Wildlife, Central Point OR; Grants Pass, OR
✓ Oregon Department of Fish & Wildlife, Watershed Health Team, Grants Pass OR
✓ Oregon Department of Transportation, Roseburg District Office, Roseburg OR
✓ Oregon Parks and Recreation Department, Salem OR
✓ Oregon Water Resources Commission, Salem OR
✓ Oregon Water Resources Department, Salem OR; Grants Pass OR

Local Entities

✓ City of Grants Pass, Mayor, Grants Pass OR
✓ City of Grants Pass, City Manager, Grants Pass OR
✓ City of Grants Pass, Utility Manager, Grants Pass OR
✓ City of Rogue River, Mayor, Rogue River OR
✓ Grants Pass Chamber of Commerce, Grants Pass OR
✓ Grants Pass Irrigation District, Grants Pass OR
✓ Jackson County Commission, Medford OR
✓ Jackson County Parks & Recreation Department, Medford OR
✓ Josephine County Commission, Grants Pass OR
✓ Josephine County Parks Department, Grants Pass OR
✓ Josephine County Planning Office, Grants Pass OR
✓ Josephine County Water Resources Department, Grants Pass OR
✓ Josephine Soil and Water Conservation District, Wolf Creek OR
✓ Rogue River Chamber of Commerce, Rogue River OR
✓ Rogue Valley Council of Governments, Central Point OR

Libraries

✓ Josephine County Public Library, Grants Pass OR
✓ Medford Public Library, Medford OR
✓ Rogue River Public Library, Rogue River OR

Radio and TV Media

✓ KAGI Radio News - 930, Grants Pass OR
✓ KAJO - 1270, Grants Pass OR
✓ KDRV - Channel 12, Medford OR
✓ KFMJ - FM 96.9, Grants Pass OR
✓ KOBI - Channel 5, Medford OR
✓ KTVL - Channel 10, Medford OR

Newspapers

✓ Medford Mail Tribune, Medford OR
✓ Grants Pass Daily Courier, Grants Pass OR
✓ Rogue River Press, Rogue River OR

Organizations and Individuals

✓✎ American Fisheries Society, Oregon Chapter, Corvallis OR; Bethesda MD
✓✎ American Rivers, Washington DC; Seattle WA
✓ American Water Resources Association, Bethesda MD
✓ Bitterroot Native Growers, Corvallis MT
✎ Center for International Environmental Law, Washington DC
⊘ Curry Guides Assn., Grants Pass OR
✓ David J. Newton Associates, Inc., Portland OR
✓ Defenders of Wildlife, Washington DC
✓ Ducks Unlimited, Long Grove IL
✓ Environmental Defense Fund, Inc., New York NY
✓ Foster Wheeler Environmental, Bellevue WA
✓ Friends of the Earth, Seattle WA
✓ Greystone Development Consultants Inc., Englewood CO
✓ Harza NW, Bellevue WA
✓ Hydrowire Newsletter, Kansas City
✎ International Rivers Network, Berkeley CA

✓ Izaak Walton League of America, Grants Pass OR
✓✎ Izaak Walton League of America, Portland OR
⏲ Josephine County Farm Bureau, Grants Pass OR
✎ Kalmiopsis Audubon Society of Curry County, Port Orford OR
ManTech Inc., Corvallis OR
✓ Meyer Resources, Inc., Metchosin BC
✎ Morrison's Rogue River Lodge, Merlin OR
✓ National Audubon Society, New York NY
✓ National Water Resources Association, Arlington VA
✓ National Wildlife Federation, Washington DC
✓ Natural Resources Defense Council, Inc. New York NY
✎ Northwest Environmental Defense Center, Portland OR
✓ Northwest Steelheaders, Milwaukee OR
✓ Oregon Guides & Packers, Gold Beach OR; Eugene OR
⏲ Oregon Guides and Packers Assn., Grants Pass OR
✎⏲ Oregon Natural Resources Council, Portland OR
✓ Oregon Rivers Council, Eugene OR
✓ Oregon Trout, Portland OR
✓⏲ Oregon Water Resources Congress, Salem OR; Ashland OR
✓ Pacific Fisheries Management Council, Portland OR
✓✎ Pacific States Marine Fisheries Commission, Gladstone OR
✎ Piazza & Piazza, Medford OR
✎ Randy Nelson's Lower Rogue Canyon Outfitters, Central Point OR
✎ River Trips Unlimited, Medford OR
✓ Robert E. Meyer Consultants Inc., Beaverton OR
✓✎ Rogue Flyfishers, Medford OR
✓✎ Rogue River Guides Association, Medford OR
Rogue River Guides Association, Grants Pass OR
⏲ Rogue River Wilderness, Inc., Grants Pass OR
⏲ Sierra Club, Oregon Chapter, Monmouth OR
✓ Sierra Club, San Francisco CA
✓ Sierra Club, Rogue Group, Medford OR
✓ Siskiyou Audubon, Grants Pass OR
S.P. Cramer & Associates, Gresham OR
✓ Stone and Webster, Boston MA
✓ STRA, Arlington VA
✓ Ted Sorenson Engineers, Idaho Falls
✓ The Nature Conservancy, Arlington VA
✓ The Wildlife Society, Bethesda MD
✓ The Fund for Animals, Inc., New York NY; Silver Spring MD
✎ Three Rivers Watershed Council, Inc., Rogue River OR
✓ Total Quality NEPA, Superior CO
✓ Trout Unlimited, Vienna VA

✓ Trout Unlimited, Middle Rogue Steelhead Chapter, Grants Pass OR
✓⏲✎ WaterWatch of Oregon Inc., Portland OR
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Mr. Ron Jensen, Lakewood CO
Mr. Bob Jones, Merlin OR
Ms. Dorothy M. Jones, Grants Pass OR
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Mr. Jerry Kl----, unknown
Ms. Alexandria Khoury, Grants Pass OR
Mr. and Mrs. Vernon Kirkbride, Cave Junction OR
Mr. L.H. Kirtley, Grants Pass OR
Ms. Vivian Kirtley, Grants Pass OR
Ms. Elaine Lake, Rogue River OR
Mr. James Lamp, Jr., Central Point OR
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Mr. Arnold C. Law, Grants Pass OR
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Mr. Robert McElroy, Grants Pass OR
Mr. Douglas M. McGeary, Medford OR
Ms. Alice Mangil, Unknown

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✓ Mr. Patrick M. Murphy
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⏲ Ms. Jean Nightingale, Grants Pass OR
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⏲ Ms. Annette Olson, Grants Pass OR
⏲ Mr. Andy Olson, Grants Pass OR
⏲✎ Ms. Geneva Oran, Grants Pass OR
✎ Mr. Chris Orsinger, Eugene OR
✎ Mr. Stephen K. Parsons, Dallas OR
✎ Mr. Jon Pearson, Talent OR
✎ Mr. Kathy Peckham, Grants Pass OR
⏲ Mr. Bruce W. Peddicord, Grants Pass OR
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✎ Ms. Juanita Pickett, Grants Pass OR
⏲ Mr. Gene Reedy, Grants Pass OR
✓ Mr. Joe Rohleder, Waldport OR
⏲ Mr. Hank Rogers, Ashland OR
⏲ Mr. Jack D. & Ms. Clarabell D. Russell, Grants Pass OR
⏲ Mr. Hal Schmoll, Grants Pass OR
✓ Ms. Jean Shaffer, Monmouth OR
⏲ Mr. John J. Shaw, Grants Pass OR
⏲ Mr. Iris Shores, Grants Pass OR
⏲ Mr. Dale M. Smith, Grants Pass OR
⏲ Mr. Eric Smith, Jacksonville OR
Ms. Floy Ann Smith, Grants Pass OR
⏲ Ms. Gloria D. Smith, Portland OR
✎ Mr. Mark H. Smith, Tigard OR
⏲ Mr. Bob Staal, Ashland OR
⏲ Mr. Eric Staal, Ashland OR
⏲ Mr. Charles Stevens, Grants Pass OR
⏲ Mr. Willis Stiehl, Rogue River OR

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⏲ Mr. Mark Swisher, Ashland OR
✓ Mr. Edward S. Syrjala, Centerville MA
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⏲ Ms. Pella Taylor, Grants Pass OR
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✎ Mr. Steven Tichenor, Grants Pass OR
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✎ Mr. Hank Vann, Grants Pass OR
⏲ Mr. Don and Ms. Nancy Vogel, Grants Pass OR
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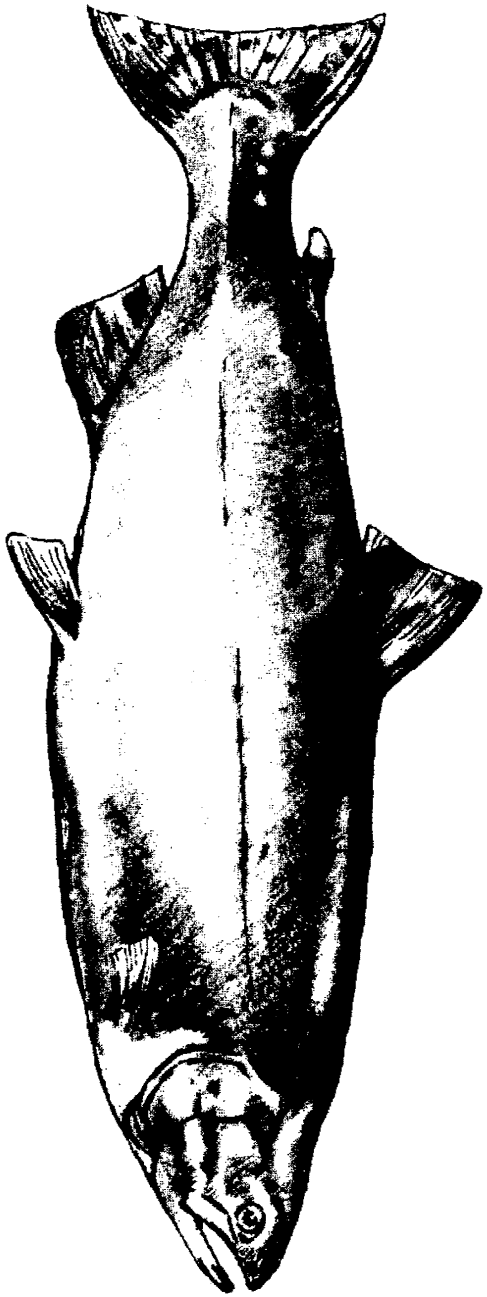
⏲ Ms. Kathleen Whisonant, Grants Pass OR
✎ Ms. Sarah M. Willson, Wolf Creek OR
✓ Mr. M. John Youngquist, Water Resources Consultant, Roseburg OR



Chapter VIII—Formulation and Evaluation

GENERAL PLANNING CRITERIA

This investigation was conducted according to the *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies* (P&G) (Water Resource Council 1983). Formulation and evaluation of alternatives followed Reclamation policy and procedures for implementing NEPA and other applicable Federal rules and regulations. The overall Federal objective for such planning is to contribute to national economic development consistent with protecting the Nation's environment.

Alternatives were formulated in a systematic manner to ensure that a full range of reasonable alternatives was identified. Under the P&G, one alternative is developed that maximizes net national economic development benefits to the Nation (national economic benefits exceed costs). Plans which address State and local concerns or emphasize other functions may also be formulated. A no action plan is identified which describes conditions that would exist in the future if the current planning effort does not result in implementation of a development plan. The no action plan also serves as a base from which to measure the benefits and impacts of the alternative development plans.

Each identified alternative was tested against four criteria to determine if it is viable. The four criteria are:

- Completeness—the extent to which a plan accounts for all investments or actions to ensure realization of planned effects.
- Effectiveness—the extent to which a plan alleviates specified problems.
- Efficiency—the extent to which a plan is responsive to the most cost-effective means of alleviating specified problems while being consistent with protecting the Nation's environment.
- Acceptability—the plan is workable with respect to State and local entities and the public and is compatible with existing laws, regulations, and public policies.

After viable alternatives were formulated they were evaluated and compared through a four-account system that consists of:

1. The national economic development account which displays changes in the economic value of the national output of goods and services.

2. The environmental quality account which displays nonmonetary effects on significant natural and cultural resources.

3. The regional economic development account which displays changes in the distribution of regional economic activity.

4. The social well-being account which displays plan effects not reflected in the other accounts.

FORMULATION PROCESS

Potential actions for improving fish passage at Savage Rapids Dam have been under study and alternatives identified since the 1970's. These alternatives were presented in a variety of publications for public review and were commonly discussed among fishery resource agencies, water resource agencies, and special interest fishery and environmental groups. Alternatives from earlier studies were reviewed as part of the formulation process and newer technology and experience gained over the intervening years were applied in reformulating and modifying the alternatives. All of the formulation activities were under the direction or review of the POC (see Consultation and Coordination chapter).

Nonstructural Alternatives

A viable nonstructural alternative was not identified, and indeed, is not possible. Since the focus of this study is a problem caused by man-made structures, any viable alternative would require structural changes of some kind.

Non-viable nonstructural alternatives could be formulated but there was no attempt to do so in this study. Any action that would ignore the anadromous fishery or that would not significantly improve fish passage at Savage Rapids Dam would be unacceptable.

No Action Alternative

A No Action Alternative was formulated to (1) identify anticipated conditions including the needs expected to exist in the future and (2) to provide a baseline for evaluation of the action alternatives. Identification and evaluation of a No Action Alternative is also required by NEPA. The No Action Alternative assumes that the current study would end, and that an action alternative would not be implemented. In formulating a No Action Alternative, Reclamation recognized that the continued loss of salmon and steelhead at Savage Rapids Dam is unacceptable to Federal, State, and local entities; private organizations; and many individuals. The major uncertainties are (1) the action(s) that would be taken and (2) the timeframe of that action.

For this analysis, it was assumed that salmon and steelhead losses at Savage Rapids Dam would continue at current or near current levels for up to 20 years. As a result, the analysis of benefits and costs for this study are based on a 20-year period in contrast to a 100-year period (life of project facilities) normally used with Reclamation projects.

Structural Alternatives

The purpose of formulating more than one alternative is to address the varying concerns and interests of the publics that may be affected. For example, under the P&G criteria one alternative should maximize economic benefits to the Nation. Other alternatives may be formulated to better address local or State concerns. However, an alternative must pass the four criteria of viability to be considered. For example, an alternative that does not substantially reduce salmon and steelhead losses would not meet the effectiveness criteria and would not be considered.

Two structural alternatives were identified that meet the four criteria of viability.

- Remove the dam and build pumping plants along the river to supply GPID with irrigation water (Preferred (Pumping) Alternative).

- Redesign and replace existing fish ladders and screens using state-of-the-art technology and replacement of irrigation pumping facilities (Dam Retention Alternative).

Optional features and variations of the pumping alternative were identified and discussed at length in a 1992 Progress Report (Reclamation 1992a). These options generally relate to pump sizes and locations. Consideration and selection among the options were based primarily on irrigation water management considerations and costs as these options were considered equivalent for fish passage considerations. The final arrangement of pumps and pipes discussed in the preferred alternative was selected after cost comparisons indicated that two new pumping facilities, one on each side of the river, with a connecting overhead power transmission line, would be less costly than one pumping site on the south side of the river and a buried pipe extending across the river to supply the Tokay Canal and Evans Creek Lateral. The option of three equal-sized pumps versus two equal-sized pumps per canal served was selected on the basis of increased operational flexibility.

A potential recreation element was identified for the pumping alternative but is not proposed as a feature in this document. This option consists of constructing a challenging river course for rafts, drift boats, and kayaks in the river reach where the dam is removed. The design would depend on the as-yet-unknown configuration of Savage Rapids, but could be designed to allow jet boat passage or to be a barrier to jet boats. This option appears to be beyond the scope of this study. Future consideration of this action would not be precluded if the pumping alternative is implemented.

Formulation Concerns

At the outset of this study, it was clear that an acceptable alternative must include (1) improved anadromous fish passage and (2) facilities for GPID water diversion. Although there were elements of the public that proposed alternatives that included only one function, these alternatives were considered unacceptable and not developed or analyzed.

The range of possible diversion options is limited to retaining Savage Rapids Dam for gravity diversion and hydraulic pumping power or installing electric powered pumps. Concepts for improving fish passage were limited to: removal of Savage Rapids Dam, construction of new fish passage and protective facilities, and modification of current fish passage and protective facilities. State and Federal fish and wildlife agencies indicated that the latter would not be acceptable.

As a result, it was clear that there could be only two viable alternatives: (1) remove Savage Rapids Dam and construct some arrangement of pumping plants and (2) retain Savage Rapids Dam and replace current fish passage and protective facilities and hydraulic pumps with new facilities.

Concerns related to retaining and to removing Savage Rapids Dam are rather polarized. Some people want to retain the dam, primarily for the flatwater recreation benefit of the seasonal reservoir. Federal and State fish and wildlife agencies, environmental groups, and many local interests want the dam removed. These views were considered during the formulation process and major points of discussion are summarized below.

Dam Removal

Major concerns expressed by the public on dam removal were:

- Effect on recreation values with elimination of the seasonal lake created by dam operations.
- Effect of sediment release on fish habitat downstream.
- Effect of long-term power costs for pumping.
- Cost sharing responsibilities.

Return of the Federal investment was an expressed concern. Analysis by Reclamation indicated that the Federal investment would be recovered in about 10 years with dam removal (Preferred Alternative) assuming the current Federal discount rate of 8 percent.

Dam Retention

The major concern related to retention of the dam is the future of GPID and the long-term integrity of the action. Rapid urban development has significantly altered the composition of GPID patrons. Past indifference and lack of cooperation between developers and administering officials have left GPID with a number of patrons who are unable to receive water. In some areas, right-of-way access to service distribution systems has been severely hampered. Recently, State legislation has made it possible and more affordable for all irrigation district patrons (those who receive water and those who do not) to buy out of irrigation districts if they feel their

needs are not being met. These actions increase uncertainty and the potential for an irrigation district to suffer financial difficulties.

One concern is that immediate action would be needed to ensure safe fish passage if GPID should become insolvent in the future. Another concern is that the Federal cost of improving fish passage while retaining the dam would not be recovered. Reclamation analysis indicates that based on the monetary costs and benefits of the Dam Retention Alternative, the Federal Government would recover its investment in about 15 years assuming the current Federal discount rate of 8 percent.

Some of these concerns could be alleviated if a vigorous and forceful program were developed to:

- Market GPID's services.
- Improve operational efficiencies.
- Achieve consistent cooperation between developers and city and county administrators where GPID services are involved.
- Enforce laws that protect GPID's interests.

COMPARATIVE ANALYSES

An abbreviated four-account display of the two action alternatives—pumping alternative (Preferred Alternative) and the Dam Retention Alternative—is presented here. Significant differences exist between the two action alternatives primarily in the National Economic Development Account and salmon and steelhead resources of the Environmental Quality Account. Meaningful differences between the alternatives in regional economic development, other environmental quality categories, and other social effects are not apparent from the available data.

Concern has been expressed by the public that data on fish losses and values are out of date and new studies should be conducted. Another concern expressed is a lack of data on the potential effects on local business with removal of the dam and loss of the seasonal reservoir. Reclamation considers existing data sufficient for decisionmaking.

National Economic Development (NED)

The NED account describes beneficial effects of a plan in terms of (1) the economic value of the national output of goods and services, (2) the value of output resulting from external economies, and (3) the value associated with the use of otherwise unemployed or under-employed labor resources. Adverse effects of the plan are described in terms of opportunity costs of resources used in project investment and operation.

In this analysis, benefits from external economies and the value associated with unemployed or under-employed labor resources were not identified.

The NED benefits of the Preferred Alternative and the Dam Retention Alternative are based on an increase in the monetary value of commercial and sport harvest of the salmon and steelhead fishery. This increase stems from an increase in salmon and steelhead escapement at Savage Rapids Dam of 22 percent with the Preferred Alternative and about 17 percent with the Dam Retention Alternative. NED effects are summarized in table VIII-1

Table VIII-1.—National economic development account

Component	Preferred Alternative (Pumping Alternative)	Dam Retention Alternative
Beneficial effects[1]		
Fish enhancement	$4,998,600	$3,870,900
Adverse effects (costs)[1]		
Project investment	$1,350,000	2,173,800
Operation	233,700	104,800
Total	$1,583,700	$2,278,600
Benefit-cost ratio	3.2 to 1	1.7 to 1
Economic rate of return	23.2 percent	12.6 percent
Net annual benefits	$3,414,900	$1,592,300

[1]Annual equivalent using the 1994 Federal discount rate (8 percent) for a 20-year period.

Environmental Quality

The environmental quality account is a nonmonetary description of beneficial and adverse changes in the ecological, aesthetic, and cultural attributes of natural and cultural resources.

The primary long-term effect of the two action alternatives would be to increase the escapement of salmon and steelhead passing the current site of Savage Rapids Dam. The preferred alternative, in addition, would eliminate the seasonal reservoir. The 3.5 mile reach immediately upstream of Savage Rapids Dam would revert to a free flowing reach with permanent vegetation being reestablished next to the new high waterline. The site of the existing dam would revert to native vegetation. The alternatives would not affect any other geographical area. Except for effects on the salmon and steelhead, most effects of the action alternatives would be temporary short-term effects due to construction. Environmental effects are summarized in Table VIII-2.

Table VIII-2.—Environmental quality account

Category	Preferred Alternative (Pumping Alternative)	Dam Retention Alternative	No Action
Biological resources			
Salmon and steelhead	Escapement increase of 26,700	Escapement increase of 20,700	Continued loss at near current rate, possible listing as threatened or endangered
Resident fish	No measurable change, increased movement	No measurable change	No measurable change
Wildlife	Minor adverse impacts during construction. Insignificant long-term increase along river corridor	Minor negative impacts during construction	No change from present
Vegetation	Minor adverse impacts during construction. Small increase of vegetation along shoreline	Minor adverse impacts during construction	No change from present
Threatened and endangered species	No impact	No impact	No impact
Ecological systems			
Aquatic	Aquatic ecology of the 3.5-mile reach upstream from the dam would change to a typical riverine ecology. Aquatic productivity could increase slightly	No change from present	No change from present
Terrestrial	Slight improvement in streamside vegetation. No significant impact on existing vegetation.	No change from present	No change from present
Water quality	Slight decrease in quality during construction	Slight decrease in quality during construction	No impact
Air quality	Slight decreased during construction	Slight decrease during construction	No impact
Sound quality	Increased noise during construction with brief periods of intense noise. Slight increase in noise near operating pumping plants	Increased noise during construction with brief periods of intense noise.	No impact
Visual quality	Change from seasonal small reservoir view to permanent river view	No change from present	No change from present
Land quality	No significant change from present	No change from present	No change from present
Streams and stream systems	3.5 miles of the Rogue River changed from seasonal reservoir to free flowing year-round	No change from present	No change from present
Lakes and reservoirs	Loss of 110 acres of seasonal reservoir	No change from present	No change from present
Open spaces and greenbelts	Area formerly inundated seasonally would be developed over time resulting in some loss of open space	No impact	No impact
Cultural resources	No impact	No impact	No impact

Regional Economic Development (RED)

The RED account described beneficial effects in terms of NED benefits that accrue to the region, plus transfer of income to the region from outside the region, and increased regional employment. Negative effects are those transfers from the region to outside the region.

The primary effects of the two alternatives on the regional economy would be beneficial effects from construction and OM&R. Short-term and long-term effects on recreation, businesses, and property values were not quantified since significant or measurable changes are not anticipated with either action alternative.

All of the regional economic development effects identified for the two action alternatives are short-term temporary effects that result from construction. Construction impacts represent the initial dollar impact on the regional economy. Once spent, a given dollar within a regional economy may be respent a number of times resulting in a multiplier effect. For this analysis, the expenditure-based economic impacts for the construction area are determined in output (sales), total income or earnings (labor income: wages, salaries, and proprietors' income), and employment. Jackson and Josephine Counties are defined as the region for this analysis.

Construction impacts are short-term corresponding to the length of the planned construction as well as the distribution of spending across that period. This period is 5 years for the Preferred Alternative and 6 years for the Dam Retention Alternative. Table VIII-3 summarizes regional economic effect.

Table VIII-3.—Regional economic development account
(short-term construction impacts)

Item	Preferred Alternative (Pumping Alternative)	Dam Retention Alternative
Construction period	5 years	6 years
Construction expenditure (total)	$11,000,000	$17,000,000
Regional output (total)	$15,200,000	$23,900,000
Employment	120 jobs	190 jobs
Increased personal income (annual)	$2,205,000	$3,950,000
Increased total income (annual)	$4,266,000	$6,713,000

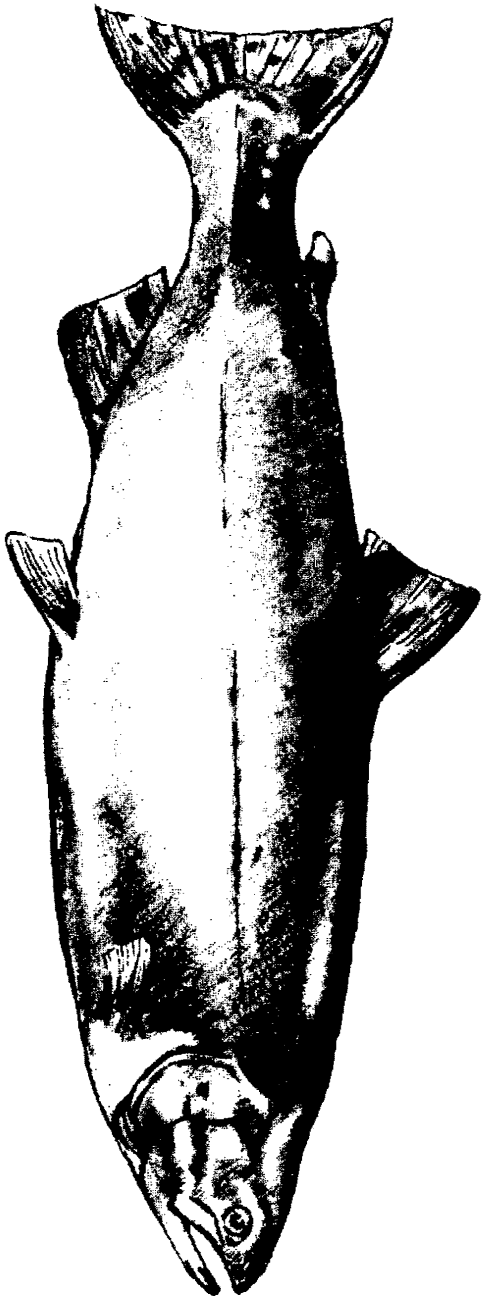
A local impact of the Dam Retention Alternative would be repayment of construction costs assigned to the GPID. The construction cost to be borne by the GPID totals $2,848,000. If financed over 30 years at 6 percent interest, this cost would increase the total of GPID's annual assessments by an estimated $207,000.

Other Social Effects

The other social effects account summarizes effects that cannot be satisfactorily quantified or described in the other three accounts. Included are urban and community effects; life, health and safety factors; displacements; long-term productivity; and energy requirements and conservation. Social effects of the alternatives accrue primarily from construction (short-term effects) and removal of Savage Rapids Dam including loss of the seasonal reservoir (long-term effects). Other social effects are summarized in table VIII-4.

Table VIII-4.—Other social effects account

Component	Preferred Alternative (Pumping Alternative)	Dam Retention Alternative	No Action
Urban and Community			
Employment	Construction employment would provide about 120 jobs for 5 years	Construction employment would provide about 190 jobs for 6 years	
Income	Short-term increase in personal and other income. The few construction jobs would temporarily increase family income for those affected	Short-term increase in personal and other income. The few construction jobs would temporarily increase family income for those affected	No impact
Population	No impact	No impact	No impact
Attitudes	Favored by most fish and wildlife agencies and interests and whitewater recreationists	Favored by many or most property owners with river frontage (214 tax lots)	Favored by a minority
Life, Health, and Safety			
Safety	Traffic hazards increased during construction. Flatwater boating hazards eliminated. Whitewater recreation hazards increased	Traffic hazards increased during construction	No impact
Environment	Minor impacts (noise, air, and water) for those living near the construction area	Minor impacts (noise, air, and water) for those living near the construction area	No impact
Displacements			
Services and facilities	Some change of business emphasis from flatwater to river activities.	No impact	No measurable impact
Recreation	Reduced flatwater recreation in the immediate area. Increased opportunity for whitewater recreation.	No impact	No impact
Family	Those with riverfront lots would lose adjacent flatwater recreation.	No impact	No impact
Energy			
Power	Increase of projected Northwest energy shortfall by 5,675,800 kilowatt-hours (equivalent to the needs of 380 households)	Insignificant increase	No impact



Chapter IX—Bibliography

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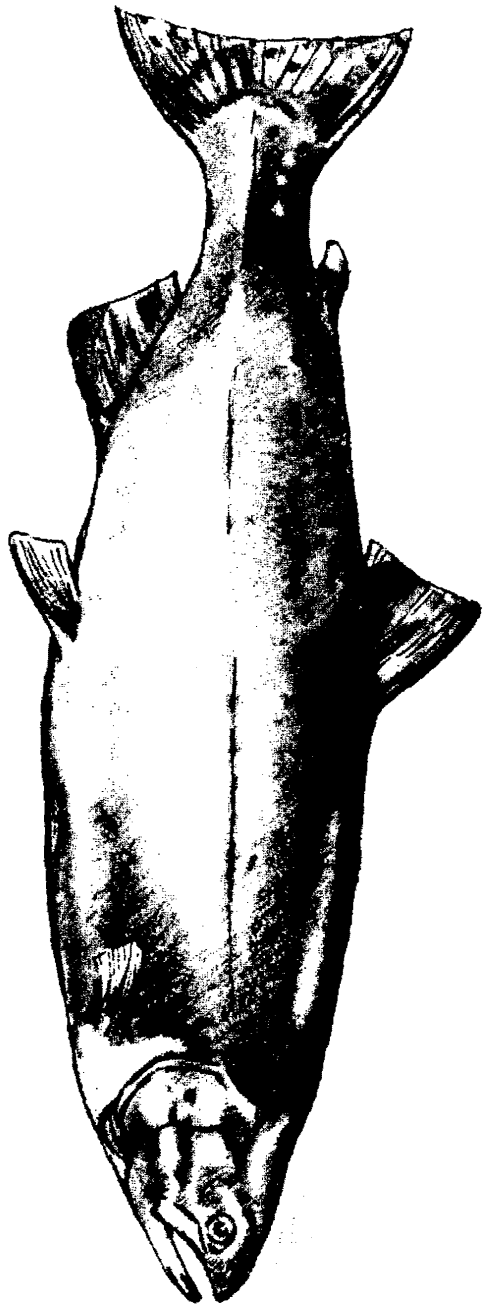

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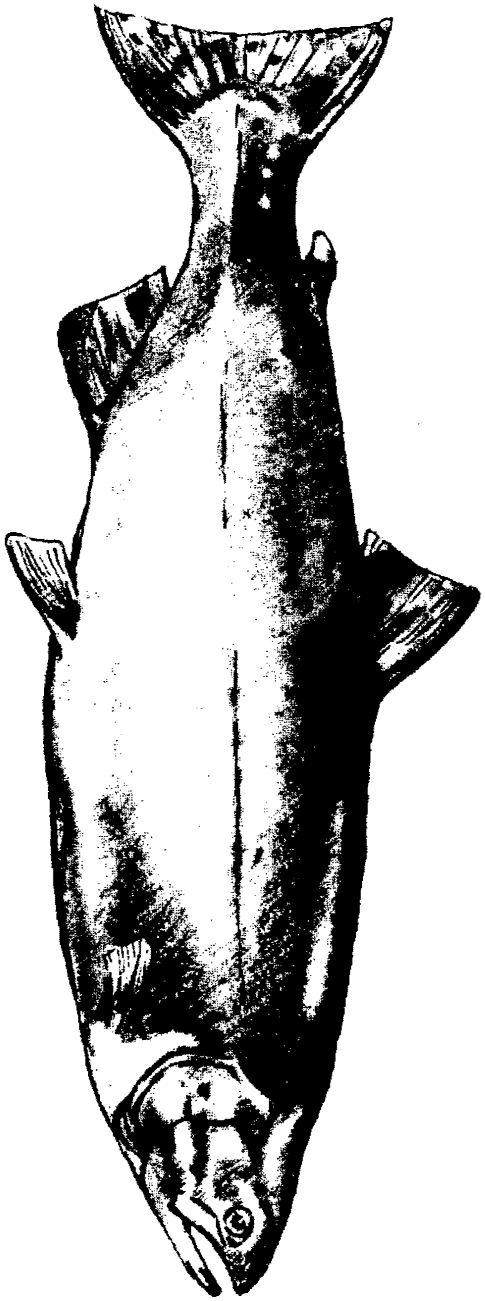

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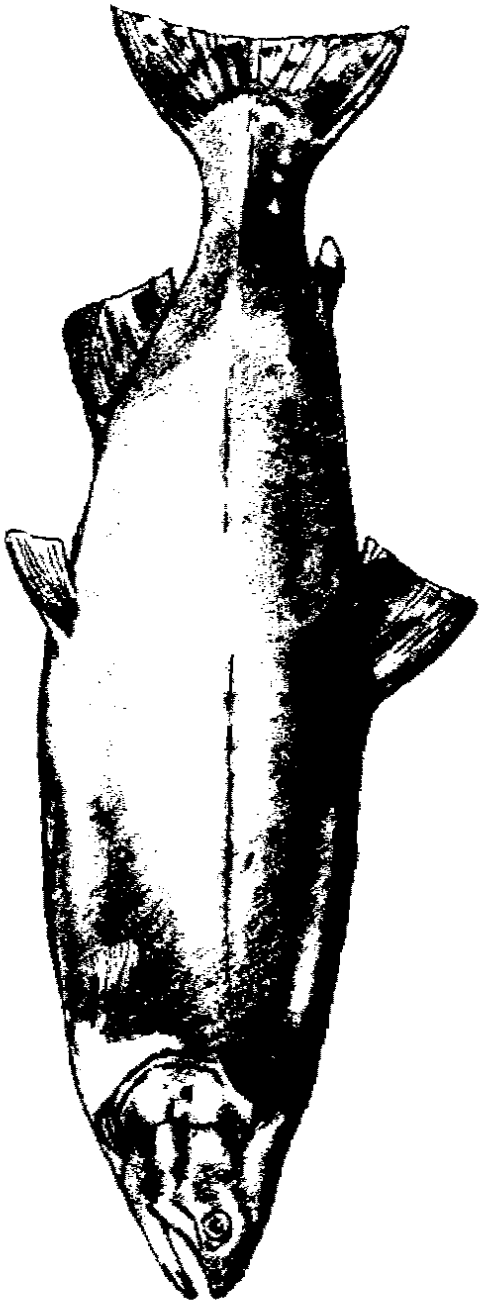


Attachment A—Glossary

Abutment.—Area of a riverbank that contacts the end of a dam. Left and right directions always assume the observer is looking downstream.

Acre-foot.—The amount of water that could cover 1 acre to a depth of 1 foot. Equivalent to 43,560 cubic feet or 325,851 gallons.

Anadromous fish.—Fish that ascend rivers from saltwater to spawn.

Appraisal level of detail.—The level of detail necessary to facilitate a decision to proceed with detailed study and evaluation of any alternative.

Appraisal study.—A study that incorporates an appraisal level of detail.

Aquatic.—Growing in water, not terrestrial.

Aquifer.—A water bearing stratum in permeable rock, sand, or gravel.

Bay.—Segment of a structure between structural/supporting piers.

Canal headworks.—The beginning of a canal.

Cofferdam.—A temporary, watertight enclosure around a construction site in a body of water. The cofferdam enables dry-site work conditions.

Cultural resource.—Any building, site, district, structure, or object that has archeological or cultural significance.

Demand.—The instaneous power requirement. Electrical demand is measured in kilowatts.

Diack decision/flows.—A 1988 Oregon Supreme Court decision requiring the Oregon Water Resources Department to establish water levels necessary to support recreation, fish, and wildlife in all State designated scenic waterways. No new permit for water use can be approved if that use would reduce the "Diack flow."

Durtbag.—A large, Styrofoam-bead filled vinyl bag used as a raft.

Easement.—An interest in land owned by another that entitles its holder to a specific limited use or uses. GPID's easements allow rights-of-way to operate and maintain canals and laterals.

Energy.—The power to do work. Electrical energy is measured in kilowatt-hours.

Elevation.—Elevation is always expressed as feet above mean sea level

Endangered species.—A species which is in danger of extinction throughout all or a significant portion of its range. To term a run of salmon "endangered" is to say that particular run is in danger of extinction.

Escapement.—Fish that return to spawn.

Feasibility study.—A study with sufficient detail of data and designs to make a economic and environmental decisions to proceed or not to proceed with implementation. Final designs are usually completed after a decision is made to implement a project.

Freshet.—A large increase in streamflow caused by heavy rains or melting snow.

Fingerling.—A juvenile fish, usually under 3-inches in length. (See also fry and smolt.)

Fish ladder or fishway.—A structure that carries water over or around an instream obstruction and allows fish to swim upstream past the obstruction.

Fish screen.—A structure that allows water passage but prevents fish passage (through water diversion facilities).

Fry.—Fish between the egg and fingerling stages. Depending on the species of fish, fry can measure from a few millimeters to a few centimeters in length. (See also fingerling and smolt.)

Habitat.—The environment of a biological population.

Harvest.—Commercially or recreationally caught fish.

Hydrology.—The science of water in nature: its properties, distribution, and behavior.

Impinge.—To strike, especially with a sharp collision. Fish impinging a fish-screen may be fatally injured.

Instream flows.—Water flows for designated uses within a defined stream channel such as minimum flows for fish, wildlife, recreation, or esthetics.

Irretrievable.—See irreversible.

Irreversible.—A commitment of resources that cannot be reversed, except perhaps in the extreme long term. An extinct species is the classic instance of an irreversible loss.

Juvenile (fish).—An immature fish that has not attained full growth (includes fry, fingerlings and smolts).

Kelt.—A steelhead that has spawned and is returning to the sea.

Log boom.—A line of floating timbers usually constructed to deflect floating material and waves away from a structure such as a dam.

Mitigation.—Specific action that can be implemented to reduce or eliminate adverse project impacts.

Modified Mercalli Scale.—A scale, used to describe earthquake intensity, which has twelve divisions ranging from I (not felt by people) to XII (nearly total damage).

Net economic benefits.—Monetary benefits less costs.

No Action Alternative.—The alternative that describes future conditions that would exist without the development of the action alternatives. The no action alternative serves as a base to measure the effects of the action alternatives.

Ogee.—An elongated "S" shape often used for dam spillways.

Plunge pool.—As used in this report, a pool constructed at the bottom of a dam or other hydraulic structure.

Public.—Any interested group or individual, including Federal, State and local agencies, special-interest groups, ad hoc groups, and the general citizenry.

Pumplift.—The vertical distance that a pump raises water.

Radial gate.—A pivoted gate with a circular arc face. The gate swings about the pivot when opening.

Reach.—A portion of a stream or a river.

Redd.—The nest that a spawning female salmon digs in gravel to deposit her eggs.

Riparian.—Related to or living or located on a water course.

Rotary-drum screen.—Cylindrical screen that rotates continuously to remove accumulated debris and allow water to flow through.

Run.—Seasonal upstream migration of anadromous fish.

Salmonids.—A family of fish that includes salmon and steelhead.

Sediment.—Any very finely divided organic and/or mineral matter deposited by water in nonturbulent areas.

Slack water.—Slow flowing water such as impoundments behind a dam.

Smolt.—Adolescent salmon or steelhead that is undergoing changes preparatory for living in salt water. Usually 3 to 7 inches long. (See also fry and fingerling.)

Spillway.—A waterway associated with a dam for release of water above a specific elevation.

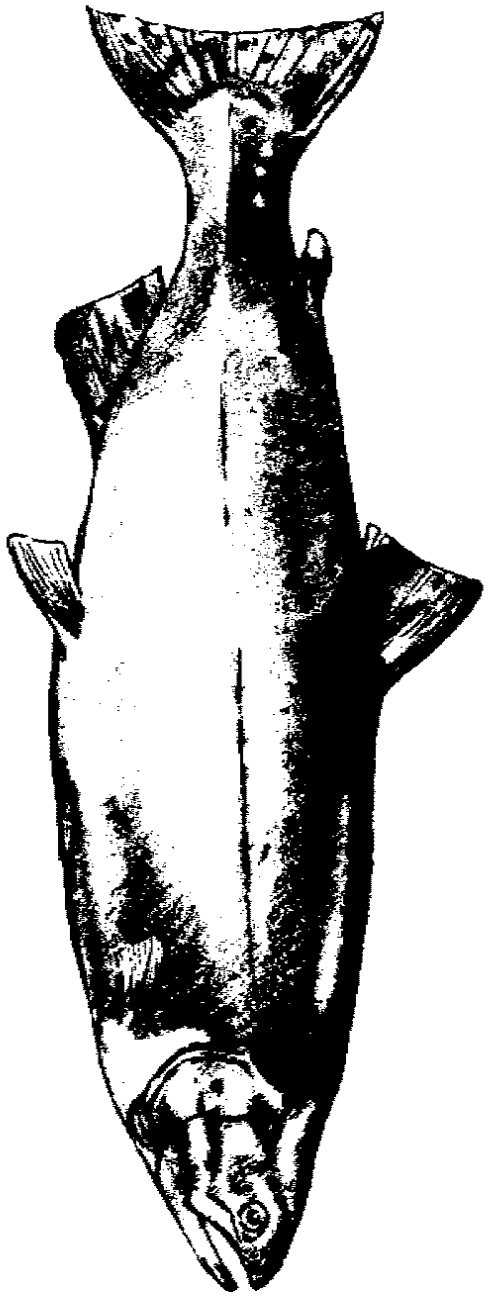
Stoplog.—A wooden plank or fabricated material structure that is added to the structural crest of a barricade to raise the water level.

Tahiti.—A type of raft.

Threatened species.—A species which is likely to become endangered within the foreseeable future.

Turbidity.—The scattering and absorption of light that makes water look murky; caused by matter suspended in the water.

Wetland.—Generally, an area characterized by periodic inundation or saturation, hydric soils, and vegetation adapted for life in saturated soil conditions.



Attachment B—GPID Temporary Water Permit

STATE OF OREGON

COUNTY OF JOSEPHINE

PERMIT TO APPROPRIATE THE PUBLIC WATERS

THIS PERMIT IS HEREBY ISSUED TO

GRANTS PASS IRRIGATION DISTRICT 503-476-2582
200 FRUITDALE DRIVE
GRANTS PASS, OREGON 97527

to use the waters of the ROGUE RIVER a tributary of PACIFIC OCEAN, in the amounts and for the period of time specified below, to make up for a deficiency in rate of diversion allowed under existing rights for Irrigation.

This Permit is issued approving Application 69246. The date of priority is AUGUST 21, 1987.

The amount of water allowed herein, together with the amount allowed under Permit 45828 shall be limited to a diversion of not to exceed 90 cubic feet per second or its equivalent in case of rotation, measured at the point of diversion. The right to use water under this permit is in addition to that described by Certificate recorded at page 50650, State Record of Water Right Certificates.

This permit shall expire on October 1, 1994, unless extended by the Water Resources Commission, or unless earlier cancelled for failure to comply with any of the conditions listed below. No later than March 1, 1994, permittee shall present to the Water Resources Commission for review and approval, a range of plans with options to reduce or eliminate the need to appropriate water under this permit, together with the permittee's recommended option.

The Permittee understands and agrees that permittee shall not perfect any right to use of water under this permit, except in conformity with and in the amount, if any, specified in the plan to be approved by the Water Resources Commission under this permit to guide reduction of permittee's water use.

PREAMBLE:

The purpose of this permit, in combination with existing water rights providing for use from the two points of diversion as described below, is to temporarily allow diversion at the permittee's historical rates and quantities and to meet any deficiencies in rate and quantities as defined in OAR 690-11-010 (4) until such time as the Water Resources Commission adopts a plan of water use reduction under this permit or cancels this permit.

The initial phase of this permit shall be called the "Study Phase". It is contemplated by the permittee, the Commission and other interested parties that the permittee, along with the United States Department of the Interior, Bureau of Reclamation, and other interested entities will conduct certain studies and investigations, and gather and assemble certain information and data, all as more particularly described below. This phase shall culminate in the formulation and presentation of a range of plans for conservation and improvements by the District designed to reduce or eliminate the need to appropriate water under this permit. These plans shall be submitted by the permittee to the Water Resources Commission by March 1, 1994.

Following submission of the foregoing plans by the permittee, the Water Resources Commission shall consider and adopt a plan of conservation and improvements by the District. This shall be designated the "Plan Adoption Phase", and a plan shall be adopted by October 1, 1994.

Following adoption of a plan by the Water Resources Commission, it is contemplated that this permit may be extended into what shall be known as the "Implementation Phase", during which the permittee will carry out the programs and make the improvements, if any, contained in the plan adopted by the Commission.

The points of diversion are located as follows:

point (1) LOT 8, SE 1/4 SE 1/4, Section 24, T 36 S, R 5 W, WM;
550 FEET NORTH & 320 FEET WEST FROM SE CORNER, SECTION 24.

point (2) LOT 1, SE 1/4 SE 1/4, Section 24, T 36 S, R 5 W, WM;
900 FEET NORTH & 20 FEET WEST FROM SE CORNER, SECTION 24.

Appropriation of water as authorized under this permit shall be subject to the instream water right of 935 cubic feet per second at the mouth of the Rogue River and subject to the conditions as follows:

STUDY PHASE

1. By March 1, 1994, the permittee shall present to the Commission for review and approval a range of options ranging from reduction to elimination of the need to appropriate water under this permit, together with its recommended option. The permittee shall obtain, develop, study, document, and consider the following:

   a. The water needs for Grants Pass Irrigation District. The water need considerations shall include climatic factors, soil types, topography, irrigation practices, prevailing crop types, and beneficial uses.

   b. The number of full and part time farms and their locations and number of acres irrigated and the crop value they produce.

   c. The number of irrigated acres in urban, suburban and industrial use and their location.

   d. Feasibility and cost of providing city water to urban, suburban, and industrial users.

   e. Feasibility and benefits of converting the district, or a portion of the district, into a water-use district or into a municipal system. Consideration shall be given to possibilities of selling the GPID's certificated water right and/or its canal system to be used for flood water drainage purposes in order to pay off the bonding on Savage Rapids Dam and to finance a move to city water or other municipal system.

f. Alternative points of diversion and methods of supplying the water to users including supplying municipal water or water from other irrigation districts.

g. Potential system improvements and operation measures which could conserve water and improve water conveyance and water use efficiency. Consideration shall be given to programs to improve on-farm efficiencies and water requirements that result from a fully enclosed (pressurized) delivery system.

h. Estimation of improvements in system efficiency which would accrue through implementation of each identified project an measure.

i. Identification of the locations at which the benefits of each project and measure would accrue including the impact on diversion rates and quantities.

j. Identification and quantification of any other beneficial uses, including but not limited to habitat, ground water recharge, instream flows to tributaries, and aesthetics. In addition, identify who the applicant or permittee should be for each of those uses.

k. Fish losses caused by Savage Rapids Dam and GPID canal system and the operation thereof. This consideration shall also include identification of options that will reduce or eliminate fish losses that may be associated with the GPID diversion and conveyance system.

l. Potential improvements and operational measures including removal of Savage Rapids Dam, which would improve fish passage and habitat and decrease fish losses. Identify the cost and benefits of such projects and measures.

m. Availability of unappropriated water for use under this permit and whether or not stored water is being used.

n. Identification of the estimated cost of each project and measure.

o. Provision of a proposed schedule for implementation of the plan.

2. The permittee shall continue its ongoing conservation and maintenance program.

3. The permittee shall form a committee to assist and provide input in the gathering of information and in the development and formulation of the options. If possible, the committee shall include representation from the GPID including a non-voting member of the GPID , the City of Grants Pass, Josephine County, Oregon Department of Fish and Wildlife, National Marine Fisheries Service, Bureau of Reclamation, Soil Conservation Service and one representative designated by WaterWatch of Oregon, Inc.

4. Beginning in the year 1992, the permittee shall submit by February 1 of each year, progress reports detailing the efforts of the permittee in gathering the required information and preparing the required plan and options.

PLAN ADOPTION PHASE:

5. After completion of the Study Phase of the permit, and by March 1, 1994, the permittee shall submit to the Water Resources Commission for review the results of the Study, the range of possible options that were developed, and the option recommended for implementation. The Water Resources Commission shall review and then adopt a plan of conservation and improvements for the district. In addition to considering the options presented by the permittee, the Commission may adopt modifications of those options and develop its own proposals in the plan. Any option adopted shall contain a schedule for implementation of the option. Any option adopted may reduce the amount of water allowed to be diverted under this permit consistent with the plan. It is contemplated that upon adoption of the plan, the Commission will renew and extend this permit consistent with the provisions of the plan.

IMPLEMENTATION PHASE:

6. After the adoption of an option by the Water Resources Commission, the permittee shall implement the plan in accordance with the schedule and reduce its diversions as may be provided therein.

7. By February 1 of each year during the Implementation Phase of the permit, the permittee shall submit to the Water Resources Commission a report detailing the efforts of the permittee in implementing the plan and the effectiveness of the plan.

PERMIT EXTENSIONS:

8. Unless extended by the Water Resources Commission, this permit shall expire on October 1, 1994. Extensions of time may be granted by the Water Resources Commission in increments of up to five years if the Water Resources Commission finds that the permittee has exercised due diligence in complying with the conditions of this permit and with the conditions of any plan adopted and that it would not impair or be detrimental to the public interest to extend the permit. The Water Resources Commission may modify the conditions of the permit as a condition of any extension.

9. At the request of the permittee, the Water Resources Commission may determine that modifications in the approved plan are in the public interest and may order such modifications subject to paragraph 10 below.

PUBLIC INTEREST HEARINGS:

10. The permittee or any other person or party may object to the plan adopted by the Water Resources Commission, to any modification to an adopted plan or to an extension of time granted by the Water Resources Commission except as to extensions of time granted in accordance with and in contemplation of the implementation schedule of an adopted plan. Any objection shall be on the basis that the plan, modification or extension impairs or is detrimental to the public interest under ORS 537.170. Upon objection thereto, a contested case hearing shall be held under ORS 183.310 to 183.550 in order to determine whether or not the plan, modification or extension would impair or be detrimental to the public interest under ORS 537.170. Any objections to the plan adopted by the Commission, to any modifications to the adopted plan or to any extensions of time granted by the Commission must be made within 60 days of the time of adoption, modification or extension.

11. This permit is for the appropriation of natural flow, not stored water. Use of stored water must be by separate permit and contract with the appropriate agency.

Failure to comply with the above conditions may result in cancellation of this permit.

The use shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the proposed place of use under the Permit is as follows:

	ACRES	1/4 1/4	DLC/LOT	SECTION	TOWNSHIP	RANGE, WM
Irrigation	12.00	SW NW		3	36 S	4 W
Irrigation	0.20	SE NW		3	36 S	4 W
Irrigation	27.60	NW SW		3	36 S	4 W
Irrigation	19.40	SW SW		3	36 S	4 W
Irrigation	0.50	NE NW		3	37 S	6 W
Irrigation	11.10	NW NW		3	37 S	6 W
Irrigation	0.80	SE NE		4	36 S	4 W
Irrigation	37.10	NE SE		4	36 S	4 W
Irrigation	28.70	SE SE		4	36 S	4 W
Irrigation	35.30	NE NE		4	37 S	6 W
Irrigation	30.35	NW NE		4	37 S	6 W
Irrigation	6.50	SE NE		4	37 S	6 W
Irrigation	26.60	NE NW		4	37 S	6 W
Irrigation	24.90	NW NW		4	37 S	6 W
Irrigation	2.30	NW SW		5	36 S	5 W
Irrigation	2.00	SE SW		5	36 S	5 W
Irrigation	17.90	NE NE		5	37 S	6 W
Irrigation	36.60	NW NE		5	37 S	6 W
Irrigation	19.20	SW NE		5	37 S	6 W
Irrigation	0.40	SE NE		5	37 S	6 W
Irrigation	38.30	NE NW		5	37 S	6 W
Irrigation	35.30	NW NW		5	37 S	6 W
Irrigation	8.20	SW NW		5	37 S	6 W
Irrigation	23.30	SE NW		5	37 S	6 W

Irrigation	0.20	NE SW		5	37 S	6 W
Irrigation	1.80	NW SE		5	37 S	6 W
Irrigation	2.00	SW NE		6	36 S	5 W
Irrigation	9.00	SE NE		6	36 S	5 W
Irrigation	1.00	NE SW		6	36 S	5 W
Irrigation	1.70	SE SW		6	36 S	5 W
Irrigation	22.00	NE SE		6	36 S	5 W
Irrigation	1.20	NW SE		6	36 S	5 W
Irrigation	23.00	SW SE		6	36 S	5 W
Irrigation	21.80	SE SE		6	36 S	5 W
Irrigation	17.20	NE NE		7	36 S	5 W
Irrigation	10.70	NW NE		7	36 S	5 W
Irrigation	23.10	SW NE		7	36 S	5 W
Irrigation	3.70	SE NE		7	36 S	5 W
Irrigation	12.50	SE SW		7	36 S	5 W
Irrigation	6.20	NE SE		7	36 S	5 W
Irrigation	4.70	NW SE		7	36 S	5 W
Irrigation	1.46	SW SE		7	36 S	5 W
Irrigation	10.80	SE SE		7	36 S	5 W
Irrigation	8.00	NW NE		8	36 S	5 W
Irrigation	15.40	SW NE		8	36 S	5 W
Irrigation	18.40	SE NE		8	36 S	5 W
Irrigation	7.39	NE NW		8	36 S	5 W
Irrigation	1.60	NW NW		8	36 S	5 W
Irrigation	10.79	SE NW		8	36 S	5 W
Irrigation	4.10	NE SW		8	36 S	5 W
Irrigation	1.72	NW SW		8	36 S	5 W
Irrigation	3.60	SE SW		8	36 S	5 W
Irrigation	19.70	NE SE		8	36 S	5 W
Irrigation	20.70	NW SE		8	36 S	5 W
Irrigation	10.66	SW SE		8	36 S	5 W
Irrigation	21.80	SE SE		8	36 S	5 W
Irrigation	2.90	NE NE		9	36 S	4 W
Irrigation	4.20	NE SE		9	36 S	4 W
Irrigation	25.20	SE SE		9	36 S	4 W
Irrigation	1.80	NW SW		9	36 S	5 W
Irrigation	15.10	SW SW		9	36 S	5 W
Irrigation	14.10	NW NW		10	36 S	4 W
Irrigation	13.90	SW NW		10	36 S	4 W
Irrigation	13.70	NW SW	10	10	36 S	4 W
Irrigation	16.00	SW SW	10	10	36 S	4 W
Irrigation	3.60	SW SE	10	0	36 S	6 W
Irrigation	35.30	SE SE	10	10	36 S	6 W
Irrigation	19.50	SW SW	10	11	36 S	6 W
Irrigation	0.80	NE NE	10	13	36 S	6 W
Irrigation	25.90	SW NE	10	13	36 S	6 W
Irrigation	13.60	SE NE	10	13	36 S	6 W
Irrigation	3.50	NE NW	10	13	36 S	6 W
Irrigation	1.90	NW NW	37	13	36 S	6 W
Irrigation	6.00	NW NW	1	13	36 S	6 W
Irrigation	25.40	SW NW	37	13	36 S	6 W
Irrigation	14.40	SW NW	2	13	36 S	6 W
Irrigation	36.80	SE NW		13	36 S	6 W
Irrigation	39.10	NE SW	10	13	36 S	6 W

Irrigation	25.40	NW	SW	37	13	36 S	6 W
Irrigation	14.60	NW	SW	3	13	36 S	6 W
Irrigation	0.20	SW	SW	37	13	36 S	6 W
Irrigation	21.16	SW	SW	4	13	36 S	6 W
Irrigation	33.20	SE	SW		13	36 S	6 W
Irrigation	31.80	NE	SE	10	13	36 S	6 W
Irrigation	33.20	NW	SE	10	13	36 S	6 W
Irrigation	35.60	SW	SE	10	13	36 S	6 W
Irrigation	29.60	SE	SE	10	13	36 S	6 W
Irrigation	2.05	SW	SW	10	14	36 S	5 W
Irrigation	2.20	SE	SW	10	14	36 S	5 W
Irrigation	0.30	SW	SE	10	14	36 S	5 W
Irrigation	0.70	SE	SE	10	14	36 S	5 W
Irrigation	3.00	NE	NE	37	14	36 S	6 W
Irrigation	4.90	NE	NE	12	14	36 S	6 W
Irrigation	1.90	NW	NE	37	14	36 S	6 W
Irrigation	15.60	NW	NE	11	14	36 S	6 W
Irrigation	37.70	SW	NE	37	14	36 S	6 W
Irrigation	39.00	SE	NE	37	14	36 S	6 W
Irrigation	2.00	NE	NW	37	14	36 S	6 W
Irrigation	18.70	NE	NW	10	14	36 S	6 W
Irrigation	1.50	NW	NW	37	14	36 S	6 W
Irrigation	4.90	NW	NW	9	14	36 S	6 W
Irrigation	5.30	SW	NW	37	14	36 S	6 W
Irrigation	1.60	SW	NW	8	14	36 S	6 W
Irrigation	27.60	SE	NW	37	14	36 S	6 W
Irrigation	11.99	NE	SW	37	14	36 S	6 W
Irrigation	2.40	NW	SW	5	14	36 S	6 W
Irrigation	29.90	SW	SW	5	14	36 S	6 W
Irrigation	25.80	SE	SW	6	14	36 S	6 W
Irrigation	40.00	NE	SE	37	14	36 S	6 W
Irrigation	30.20	NW	SE	37	14	36 S	6 W
Irrigation	1.90	SW	SE	37	14	36 S	6 W
Irrigation	14.50	SW	SE	7	14	36 S	6 W
Irrigation	3.30	SW	SE	2	14	36 S	6 W
Irrigation	2.80	SE	SE	37	14	36 S	6 W
Irrigation	25.14	SE	SE	1	14	36 S	6 W
Irrigation	5.60	NW	NW	10	15	36 S	4 W
Irrigation	23.80	SW	NW	10	15	36 S	4 W
Irrigation	4.14	SE	NW	10	15	36 S	4 W
Irrigation	7.40	NE	SW	10	15	36 S	4 W
Irrigation	23.00	NW	SW	10	15	36 S	4 W
Irrigation	9.40	SW	SW	10	15	36 S	4 W
Irrigation	17.90	SE	SW	10	15	36 S	4 W
Irrigation	0.10	NW	SE	10	15	36 S	4 W
Irrigation	12.70	SW	NW	10	15	36 S	5 W
Irrigation	2.60	NE	SW	10	15	36 S	5 W
Irrigation	11.60	NW	SW	10	15	36 S	5 W
Irrigation	38.60	SW	SW	10	15	36 S	5 W
Irrigation	10.40	SE	SW	10	15	36 S	5 W
Irrigation	17.20	NE	NE	10	15	36 S	6 W
Irrigation	2.80	NW	NE	10	15	36 S	6 W
Irrigation	0.90	SE	SW	5	15	36 S	6 W
Irrigation	1.40	NE	SE	6	15	36 S	6 W

Irrigation	15.40	SW SE	5	15	36 S	6 W
Irrigation	27.30	SE SE	6	15	36 S	6 W
Irrigation	28.30	NE NE	10	16	36 S	4 W
Irrigation	17.60	NW NE	10	16	36 S	4 W
Irrigation	24.30	SW NE	10	16	36 S	4 W
Irrigation	24.80	SE NE	10	16	36 S	4 W
Irrigation	1.00	SE SW	10	16	36 S	4 W
Irrigation	14.50	NE SE	10	16	36 S	4 W
Irrigation	17.00	NW SE	10	16	36 S	4 W
Irrigation	3.70	SW SE	2	16	36 S	4 W
Irrigation	5.30	SE SE	1	16	36 S	4 W
Irrigation	2.70	NE NW	10	16	36 S	5 W
Irrigation	16.80	NW NW	10	16	36 S	5 W
Irrigation	0.80	SW NW	1	16	36 S	5 W
Irrigation	0.70	SW NW	38	16	36 S	5 W
Irrigation	3.50	SE NW	38	16	36 S	5 W
Irrigation	4.60	SE NW	37	16	36 S	5 W
Irrigation	9.00	SE NW	2	16	36 S	5 W
Irrigation	14.10	NE SW	3	16	36 S	5 W
Irrigation	11.10	NE SW	37	16	36 S	5 W
Irrigation	3.10	NE SW	38	16	36 S	5 W
Irrigation	12.00	NW SW	38	16	36 S	5 W
Irrigation	6.80	NW SW	37	16	36 S	5 W
Irrigation	9.50	SW SW	37	16	36 S	5 W
Irrigation	12.60	SE SW	37	16	36 S	5 W
Irrigation	9.90	NE SE	10	16	36 S	5 W
Irrigation	0.80	NW SE	10	16	36 S	5 W
Irrigation	7.20	SW SE	10	16	36 S	5 W
Irrigation	35.20	SE SE	10	16	36 S	5 W
Irrigation	17.38	NE NE	10	17	36 S	5 W
Irrigation	15.60	NW NE	10	17	36 S	5 W
Irrigation	3.38	SW NE	2	17	36 S	5 W
Irrigation	5.70	SW NE	10	17	36 S	5 W
Irrigation	5.13	SE NE	1	17	36 S	5 W
Irrigation	5.92	SE NE	10	17	36 S	5 W
Irrigation	2.60	SE NW	38	17	36 S	5 W
Irrigation	0.70	NE SW	38	17	36 S	5 W
Irrigation	0.50	NE SE	38	17	36 S	5 W
Irrigation	0.40	NW SE	38	17	36 S	5 W
Irrigation	2.88	NE NE	10	18	36 S	5 W
Irrigation	7.00	NE NW	10	18	36 S	5 W
Irrigation	18.50	NW NW	10	18	36 S	5 W
Irrigation	20.70	SW NW	10	18	36 S	5 W
Irrigation	1.40	SE NW	10	18	36 S	5 W
Irrigation	8.70	NE SW	10	18	36 S	5 W
Irrigation	0.30	NW SW	10	18	36 S	5 W
Irrigation	14.50	SW SW	10	18	36 S	5 W
Irrigation	24.60	SE SW	10	18	36 S	5 W
Irrigation	1.10	SW NW	10	19	36 S	4 W
Irrigation	3.40	NW SW	10	19	36 S	4 W
Irrigation	2.60	SE SW	3	19	36 S	4 W
Irrigation	0.10	NW NE	6	19	36 S	5 W
Irrigation	11.53	SW NE	6	19	36 S	5 W
Irrigation	7.60	SE NE	7	19	36 S	5 W

Irrigation	19.23	NE NW	2	19	36 S	5 W
Irrigation	7.58	NW NW	3	19	36 S	5 W
Irrigation	3.80	SW NW	3	19	36 S	5 W
Irrigation	4.40	SW NW	4	19	36 S	5 W
Irrigation	18.68	SE NW	5	19	36 S	5 W
Irrigation	5.50	NE SW	10	19	36 S	5 W
Irrigation	0.50	NW SW	4	19	36 S	5 W
Irrigation	5.30	SW SW	10	19	36 S	5 W
Irrigation	32.00	SE SW	10	19	36 S	5 W
Irrigation	2.90	NE SE	10	19	36 S	5 W
Irrigation	3.00	NW SE	10	19	36 S	5 W
Irrigation	22.48	SW SE	10	19	36 S	5 W
Irrigation	13.95	SE SE	10	19	36 S	5 W
Irrigation	0.90	SE NE	5	20	36 S	4 W
Irrigation	2.50	NW SW	10	20	36 S	4 W
Irrigation	1.30	NE SE	5	20	36 S	4 W
Irrigation	1.70	NE NE	10	20	36 S	5 W
Irrigation	5.60	NW NE	9	20	36 S	5 W
Irrigation	6.40	NW NE	38	20	36 S	5 W
Irrigation	14.80	SW NE	2	20	36 S	5 W
Irrigation	18.60	SE NE	10	20	36 S	5 W
Irrigation	1.80	NE NW	3	20	36 S	5 W
Irrigation	0.80	NW NW	5	20	36 S	5 W
Irrigation	9.00	SW NW	5	20	36 S	5 W
Irrigation	5.70	SE NW	6	20	36 S	5 W
Irrigation	7.60	NE SW	10	20	36 S	5 W
Irrigation	10.90	NW SW	10	20	36 S	5 W
Irrigation	16.00	SW SW	10	20	36 S	5 W
Irrigation	30.00	SE SW		20	36 S	5 W
Irrigation	13.30	NE SE	8	20	36 S	5 W
Irrigation	5.20	NW SE	7	20	36 S	5 W
Irrigation	19.00	SW SE		20	36 S	5 W
Irrigation	23.51	SE SE	8	20	36 S	5 W
Irrigation	29.90	NE SE		20	36 S	6 W
Irrigation	1.40	NE NE		21	36 S	5 W
Irrigation	22.40	NW NE		21	36 S	5 W
Irrigation	30.27	SW NE	2	21	36 S	5 W
Irrigation	17.10	SE NE	1	21	36 S	5 W
Irrigation	12.90	NE NW		21	36 S	5 W
Irrigation	11.50	NW NW		21	36 S	5 W
Irrigation	29.79	SW NW		21	36 S	5 W
Irrigation	19.20	SE NW		21	36 S	5 W
Irrigation	6.60	NE SW	3	21	36 S	5 W
Irrigation	1.00	NE SW	6	21	36 S	5 W
Irrigation	7.60	NW SW	4	21	36 S	5 W
Irrigation	3.40	NW SW	5	21	36 S	5 W
Irrigation	21.77	SW SW	5	21	36 S	5 W
Irrigation	20.90	SE SW	6	21	36 S	5 W
Irrigation	2.00	NE SE	1	21	36 S	5 W
Irrigation	2.00	NE SE	8	21	36 S	5 W
Irrigation	12.50	NW SE	2	21	36 S	5 W
Irrigation	1.40	NW SE	7	21	36 S	5 W
Irrigation	6.40	SW SE		21	36 S	5 W
Irrigation	18.50	NE NE	8	21	36 S	6 W

Irrigation	4.40	NW	NE	7	21	36 S	6 W
Irrigation	3.90	NW	NE	15	21	36 S	6 W
Irrigation	26.00	SW	NE	9	21	36 S	6 W
Irrigation	5.90	SW	NE	14	21	36 S	6 W
Irrigation	36.70	SE	NE		21	36 S	6 W
Irrigation	16.20	SE	NW	10	21	36 S	6 W
Irrigation	36.20	NE	SW		21	36 S	6 W
Irrigation	38.40	NW	SW		21	36 S	6 W
Irrigation	26.60	SW	SW		21	36 S	6 W
Irrigation	38.80	SE	SW		21	36 S	6 W
Irrigation	38.80	NE	SE		21	36 S	6 W
Irrigation	36.60	NW	SE		21	36 S	6 W
Irrigation	37.40	SW	SE		21	36 S	6 W
Irrigation	37.20	SE	SE		21	36 S	6 W
Irrigation	2.30	NW	NE		22	36 S	4 W
Irrigation	14.20	NE	NW		22	36 S	4 W
Irrigation	1.80	NW	NW		22	36 S	4 W
Irrigation	2.80	SE	NW		22	36 S	4 W
Irrigation	0.20	NE	SW	3	22	36 S	4 W
Irrigation	0.90	NE	NE	8	22	36 S	5 W
Irrigation	0.10	NW	NE	7	22	36 S	5 W
Irrigation	27.20	SW	NE	7	22	36 S	5 W
Irrigation	33.40	SE	NE	8	22	36 S	5 W
Irrigation	1.10	NE	NW	3	22	36 S	5 W
Irrigation	22.40	NW	NW		22	36 S	5 W
Irrigation	0.40	SW	NW	4	22	36 S	5 W
Irrigation	5.20	SE	NW	6	22	36 S	5 W
Irrigation	12.20	NE	SW	6	22	36 S	5 W
Irrigation	17.90	NE	SE		22	36 S	5 W
Irrigation	17.70	NW	SE		22	36 S	5 W
Irrigation	33.90	NE	NE		22	36 S	6 W
Irrigation	35.60	NW	NE		22	36 S	6 W
Irrigation	39.40	SW	NE		22	36 S	6 W
Irrigation	38.80	SE	NE		22	36 S	6 W
Irrigation	13.60	NE	NW	1	22	36 S	6 W
Irrigation	11.30	NW	NW	2	22	36 S	6 W
Irrigation	38.30	SW	NW		22	36 S	6 W
Irrigation	36.30	SE	NW		22	36 S	6 W
Irrigation	35.60	NE	SW		22	36 S	6 W
Irrigation	22.10	NW	SW		22	36 S	6 W
Irrigation	30.30	SW	SW		22	36 S	6 W
Irrigation	27.90	SE	SW		22	36 S	6 W
Irrigation	34.60	NE	SE		22	36 S	6 W
Irrigation	38.80	NW	SE		22	36 S	6 W
Irrigation	27.40	SW	SE		22	36 S	6 W
Irrigation	34.00	SE	SE		22	36 S	6 W
Irrigation	4.95	NE	NE		23	36 S	5 W
Irrigation	24.50	NW	NE	3	23	36 S	5 W
Irrigation	32.80	SW	NE	2	23	36 S	5 W
Irrigation	21.60	SE	NE		23	36 S	5 W
Irrigation	11.60	NE	NW	4	23	36 S	5 W
Irrigation	2.50	NE	NW	7	23	36 S	5 W
Irrigation	4.11	NW	NW	5	23	36 S	5 W
Irrigation	6.20	NW	NW	6	23	36 S	5 W

Irrigation	21.00	SW NW	6	23	36 S	5 W
Irrigation	14.50	SE NW	7	23	36 S	5 W
Irrigation	14.10	NE SW	8	23	36 S	5 W
Irrigation	13.50	NW SW		23	36 S	5 W
Irrigation	3.90	SE SW		23	36 S	5 W
Irrigation	5.70	NE SE	1	23	36 S	5 W
Irrigation	3.50	NW SE	2	23	36 S	5 W
Irrigation	0.30	NW SE	9	23	36 S	5 W
Irrigation	3.00	SW SE	9	23	36 S	5 W
Irrigation	1.00	SE SE	10	23	36 S	5 W
Irrigation	2.70	NE NE	1	23	36 S	6 W
Irrigation	14.20	NE NE	2	23	36 S	6 W
Irrigation	31.90	NW NE	2	23	36 S	6 W
Irrigation	33.20	SW NE	2	23	36 S	6 W
Irrigation	36.20	SE NE	3	23	36 S	6 W
Irrigation	31.10	NE NW		23	36 S	6 W
Irrigation	37.40	NW NW		23	36 S	6 W
Irrigation	33.60	SW NW		23	36 S	6 W
Irrigation	36.70	SE NW		23	36 S	6 W
Irrigation	36.70	NE SW		23	36 S	6 W
Irrigation	25.00	NW SW		23	36 S	6 W
Irrigation	29.80	SW SW		23	36 S	6 W
Irrigation	36.01	SE SW		23	36 S	6 W
Irrigation	34.60	NE SE		23	36 S	6 W
Irrigation	32.10	NW SE		23	36 S	6 W
Irrigation	15.90	SW SE		23	36 S	6 W
Irrigation	25.80	SE SE		23	36 S	6 W
Irrigation	0.30	SW NW		24	36 S	5 W
Irrigation	0.20	NE SW	3	24	36 S	5 W
Irrigation	0.50	NE SW	6	24	36 S	5 W
Irrigation	13.30	NW SW	4	24	36 S	5 W
Irrigation	1.50	SW SW	5	24	36 S	5 W
Irrigation	6.80	SE SW	6	24	36 S	5 W
Irrigation	1.70	NW SE	7	24	36 S	5 W
Irrigation	9.00	SW SE		24	36 S	5 W
Irrigation	1.30	SE SE	8	24	36 S	5 W
Irrigation	17.70	NE NE		24	36 S	6 W
Irrigation	37.10	NW NE		24	36 S	6 W
Irrigation	28.00	SW NE	2	24	36 S	6 W
Irrigation	8.00	SE NE	1	24	36 S	6 W
Irrigation	7.90	NE NW		24	36 S	6 W
Irrigation	35.40	NW NW	4	24	36 S	6 W
Irrigation	6.40	SW NW	4	24	36 S	6 W
Irrigation	4.30	SW NW	5	24	36 S	6 W
Irrigation	1.20	SE NW	3	24	36 S	6 W
Irrigation	0.40	SE NW	6	24	36 S	6 W
Irrigation	23.60	NE SW	6	24	36 S	6 W
Irrigation	26.40	NW SW		24	36 S	6 W
Irrigation	22.00	SW SW		24	36 S	6 W
Irrigation	24.60	SE SW		24	36 S	6 W
Irrigation	8.40	NE SE	8	24	36 S	6 W
Irrigation	5.50	NW SE	7	24	36 S	6 W
Irrigation	16.20	SW SE		24	36 S	6 W
Irrigation	16.20	SE SE		24	36 S	6 W

Irrigation	21.18	NE NE	25	36 S	6 W
Irrigation	36.70	NW NE	25	36 S	6 W
Irrigation	24.30	SW NE	25	36 S	6 W
Irrigation	27.80	SE NE	25	36 S	6 W
Irrigation	30.70	NE NW	25	36 S	6 W
Irrigation	34.80	NW NW	25	36 S	6 W
Irrigation	15.70	SW NW	25	36 S	6 W
Irrigation	0.80	NW SW	25	36 S	6 W
Irrigation	20.10	NE SE	25	36 S	6 W
Irrigation	22.65	NW SE	25	36 S	6 W
Irrigation	12.20	SW SE	25	36 S	6 W
Irrigation	29.78	SE SE	25	36 S	6 W
Irrigation	25.70	NE NE	26	36 S	6 W
Irrigation	20.30	NW NE	26	36 S	6 W
Irrigation	32.00	SW NE	26	36 S	6 W
Irrigation	27.60	SE NE	26	36 S	6 W
Irrigation	28.60	NE NW	26	36 S	6 W
Irrigation	23.10	NW NW	26	36 S	6 W
Irrigation	26.59	SW NW	26	36 S	6 W
Irrigation	33.10	SE NW	26	36 S	6 W
Irrigation	16.90	NE SW	26	36 S	6 W
Irrigation	27.20	NW SW	26	36 S	6 W
Irrigation	34.30	SW SW	26	36 S	6 W
Irrigation	11.80	SE SW	26	36 S	6 W
Irrigation	25.50	NE SE	26	36 S	6 W
Irrigation	13.50	NW SE	26	36 S	6 W
Irrigation	1.00	SW SE	26	36 S	6 W
Irrigation	4.00	SE SE	26	36 S	6 W
Irrigation	34.10	NE NE	27	36 S	6 W
Irrigation	13.70	NW NE	27	36 S	6 W
Irrigation	8.40	SW NE	27	36 S	6 W
Irrigation	26.70	SE NE	27	36 S	6 W
Irrigation	19.40	NE NW	27	36 S	6 W
Irrigation	30.50	NW NW	27	36 S	6 W
Irrigation	4.50	SW NW	27	36 S	6 W
Irrigation	12.56	NE SE	27	36 S	6 W
Irrigation	10.80	SE SE	27	36 S	6 W
Irrigation	16.91	NE NW	28	36 S	5 W
Irrigation	30.74	NW NW	28	36 S	5 W
Irrigation	29.60	SW NW	28	36 S	5 W
Irrigation	4.40	SE NW	28	36 S	5 W
Irrigation	14.80	NW SW	28	36 S	5 W
Irrigation	0.10	SW SW	28	36 S	5 W
Irrigation	37.20	NE NE	28	36 S	6 W
Irrigation	33.10	NW NE	28	36 S	6 W
Irrigation	12.60	SW NE	28	36 S	6 W
Irrigation	14.10	SE NE	28	36 S	6 W
Irrigation	22.40	NE NW	28	36 S	6 W
Irrigation	0.40	NW NW	28	36 S	6 W
Irrigation	8.20	SW NW	28	36 S	6 W
Irrigation	4.80	SE NW	28	36 S	6 W
Irrigation	0.05	NW SW	28	36 S	6 W
Irrigation	0.70	NE NW	29	36 S	4 W
Irrigation	28.40	NW NW	29	36 S	4 W

Irrigation	3.90	SW NW		29	36 S	4 W
Irrigation	34.10	NE NE		29	36 S	5 W
Irrigation	37.60	NW NE		29	36 S	5 W
Irrigation	32.00	SW NE		29	36 S	5 W
Irrigation	27.00	SE NE		29	36 S	5 W
Irrigation	33.70	NE NW		29	36 S	5 W
Irrigation	25.00	NW NW		29	36 S	5 W
Irrigation	0.20	SW NW		29	36 S	5 W
Irrigation	12.00	SE NW		29	36 S	5 W
Irrigation	2.00	NE SE		29	36 S	5 W
Irrigation	1.20	SW NE		29	36 S	6 W
Irrigation	5.70	SE NE		29	36 S	6 W
Irrigation	13.60	NE SW		29	36 S	6 W
Irrigation	4.00	NW SW		29	36 S	6 W
Irrigation	7.00	SW SW		29	36 S	6 W
Irrigation	24.20	SE SW		29	36 S	6 W
Irrigation	1.90	NE SE		29	36 S	6 W
Irrigation	18.60	NW SE		29	36 S	6 W
Irrigation	26.60	SW SE		29	36 S	6 W
Irrigation	4.30	SE SE		29	36 S	6 W
Irrigation	24.50	NE NE		30	36 S	4 W
Irrigation	29.20	NW NE		30	36 S	4 W
Irrigation	0.60	SW NE		30	36 S	4 W
Irrigation	8.50	NE NW		30	36 S	4 W
Irrigation	2.80	NW NW	1	30	36 S	4 W
Irrigation	13.70	SE NW		30	36 S	4 W
Irrigation	1.60	NE SW		30	36 S	4 W
Irrigation	20.40	NE NE		30	36 S	5 W
Irrigation	25.40	NW NE		30	36 S	5 W
Irrigation	10.30	SW NE		30	36 S	5 W
Irrigation	24.40	NE NW		30	36 S	5 W
Irrigation	31.80	NW NW		30	36 S	5 W
Irrigation	36.00	SW NW		30	36 S	5 W
Irrigation	14.70	SE NW		30	36 S	5 W
Irrigation	23.40	NW SW		30	36 S	5 W
Irrigation	25.40	SW SW		30	36 S	5 W
Irrigation	3.90	SE SE		30	36 S	6 W
Irrigation	24.50	NW NW		31	36 S	5 W
Irrigation	26.80	NE SW		31	36 S	5 W
Irrigation	25.00	NW SW		31	36 S	5 W
Irrigation	19.00	SW SW		31	36 S	5 W
Irrigation	25.40	SE SW		31	36 S	5 W
Irrigation	18.80	NE NE		31	36 S	6 W
Irrigation	6.40	NW NE		31	36 S	6 W
Irrigation	1.70	SW NE		31	36 S	6 W
Irrigation	8.00	SE NE		31	36 S	6 W
Irrigation	21.70	NE NE		32	36 S	6 W
Irrigation	37.40	NW NE		32	36 S	6 W
Irrigation	32.70	SW NE		32	36 S	6 W
Irrigation	31.50	SE NE		32	36 S	6 W
Irrigation	37.00	NE NW		32	36 S	6 W
Irrigation	24.00	NW NW		32	36 S	6 W
Irrigation	26.40	SW NW		32	36 S	6 W
Irrigation	26.10	SE NW		32	36 S	6 W

Irrigation	6.40	NE SW	32	36 S	6 W
Irrigation	2.50	NW SW	32	36 S	6 W
Irrigation	21.20	SW SW	32	36 S	6 W
Irrigation	17.30	SE SW	32	36 S	6 W
Irrigation	30.00	NE SE	32	36 S	6 W
Irrigation	27.40	NW SE	32	36 S	6 W
Irrigation	37.80	SW SE	32	36 S	6 W
Irrigation	32.50	SE SE	32	36 S	6 W
Irrigation	4.60	SW NE	33	36 S	6 W
Irrigation	3.10	NW NW	33	36 S	6 W
Irrigation	33.60	SW NW	33	36 S	6 W
Irrigation	26.75	SE NW	33	36 S	6 W
Irrigation	39.40	NE SW	33	36 S	6 W
Irrigation	25.80	NW SW	33	36 S	6 W
Irrigation	35.60	SW SW	33	36 S	6 W
Irrigation	26.50	SE SW	33	36 S	6 W
Irrigation	24.80	NW SE	33	36 S	6 W
Irrigation	30.70	SW SE	33	36 S	6 W
Irrigation	16.70	SE SE	33	36 S	6 W
Irrigation	2.80	SW SW	34	36 S	6 W
Irrigation	11.20	NW NW	35	36 S	6 W
Irrigation	26.40	NE NE	36	36 S	6 W
Irrigation	16.10	NW NE	36	36 S	6 W
Irrigation	17.15	SW NE	36	36 S	6 W
Irrigation	34.59	SE NE	36	36 S	6 W
Irrigation	1.42	SE NW	36	36 S	6 W
Irrigation	35.40	NE SE	36	36 S	6 W
Irrigation	30.70	NW SE	36	36 S	6 W
Irrigation	25.70	SW SE	36	36 S	6 W
Irrigation	20.00	SE SE	36	36 S	6 W

Total: 7761.77 Irrigated acres.

Actual construction work has begun. Special conditions above under the various "Phases" of the project contain other specific performance requirements.

Failure to comply with any of the provisions of this permit may result in action including, but not limited to restrictions on the use, civil penalties, or cancellation of the permit.

By law, the land use associated with this water use must be in compliance with statewide land-use goals and any local acknowledged land-use plan.

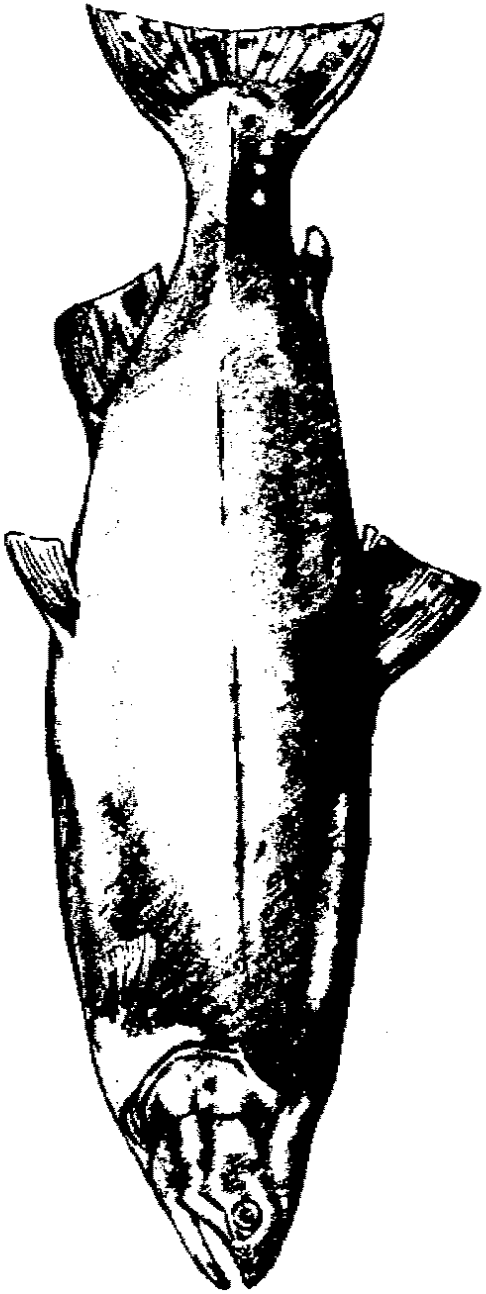
The use of water allowed herein may be made only at times when sufficient water is available to satisfy prior rights, including rights for maintaining instream flows.

This proposal was reviewed and approved by the Water Resources Commission on April 17, 1989.

Issued this date, April 13, 1990.

William H. Young

Water Resources Department
William H. Young, Director



Attachment C—USFWS Coordination Act Report and ESA Correspondence

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Portland Field Office
2600 S.E. 98th Avenue, Suite 100
Portland, Oregon 97266
(503) 231-6179 Fax: (503)-231-6195

BUREAU OF RECLAMATION
150 OMJ 1/31
151 RLC 2/1

January 26, 1994

Ref: 1-7-94-SP-114

Douglas James
Bureau of Reclamation
1150 North Curtis Road
Boise, Idaho 83706-1234

Dear Mr. James:

This is in response to your letter, dated December 21, 1993, requesting information on listed and proposed endangered and threatened species that may be present within the area of the Savage Rapids Dam Fish Passage Project in Josephine County, Oregon. The U.S. Fish and Wildlife Service (Service) received your letter on December 27, 1993.

We have attached a list (Attachment A) of threatened and endangered species that may occur within the area of the Savage Rapids Dam Fish Passage. The list fulfills the requirement of the Service under Section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 USC 1531 et seq.). The Bureau of Reclamation requirements under the Act are outlined in Attachment B.

Pursuant to 50 CFR 402 *et seq.*, the Bureau of Reclamation is required to determine whether projects may affect threatened and endangered species, and/or critical habitat. A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) which are major Federal actions significantly affecting the quality of the human environment as defined in NEPA (42 U.S.C. 4332 (2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to the Biological Assessment be undertaken to determine whether they may affect listed and proposed species. Recommended contents of a Biological Assessment are described in Attachment B, as well as 50 CFR 401.12.

If the Bureau of Reclamation determines, based on the Biological Assessment or evaluation, that threatened and endangered species and/or critical habitat may be affected by the project, the Bureau of Reclamation is required to consult with the Service following the requirements of 50 CFR 402 which implement the Act.

Attachment A includes a list of candidate species under review for listing. These candidate species have no protection under the Act but are included for consideration as it is possible candidates could be listed prior to project completion. Thus, if a proposed project may affect candidate species, the Bureau of Reclamation is not required to perform a Biological Assessment or evaluation or consult with the Service. However, the Service recommends addressing potential impacts to candidate species in order to prevent future conflicts. Therefore, if early evaluation of the project indicates that it is likely to adversely impact a candidate species, the Bureau of Reclamation may wish to request technical assistance from this office.

Your interest in endangered species is appreciated. If you have questions regarding your responsibilities under the Act, please contact Joe Burns at (503) 231-6179. All correspondence should include the above referenced case number.

Sincerely,

for Russell D. Peterson
Field Supervisor

Attachments

cc: PFO-ES
BFO-SE
ODFW (Nongame)
ONHP

ONHP/JB/NP/SP114

ATTACHMENT B

FEDERAL AGENCIES RESPONSIBILITIES UNDER SECTIONS 7(a) and (c) OF THE ENDANGERED SPECIES ACT

SECTION 7(a) - Consultation/Conference

Requires: 1) Federal agencies to utilize their authorities to carry out programs to conserve endangered and threatened species;

2) Consultation with FWS when a Federal action may affect a listed endangered or threatened species to insure that any action authorized, funded or carried out by a Federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of Critical Habitat. The process is initiated by the Federal agency after they have determined if their action may affect (adversely or beneficially) a listed species; and

3) Conference with FWS when a Federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed Critical Habitat.

SECTION 7(c) - Biological Assessment for Major Construction Projects [1/]

Requires Federal agencies or their designees to prepare a Biological Assessment (BA) for construction projects only. The purpose of the BA is to identify any proposed and/or listed species which are/is likely to be affected by a construc- tion project. The process is initiated by a Federal agency in requesting a list of proposed and listed threatened and endangered species (list attached). The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable). If the BA is not initiated within 90 days of receipt of the species list, the accuracy of the species list should be informally verified with our Service. No irreversible commitment of resources is to be made during the BA process which would foreclose reasonable and prudent alternatives to protect endangered species. Planning, design, and administrative actions may be taken; however, no construction may begin.

To complete the BA, your agency or its designee should: (1) conduct an on- site inspection of the area to be affected by the proposal which may include a detailed survey of the area to determine if the species is present and whether suitable habitat exists for either expanding the existing population or for potential reintroduction of the species; (2) review literature and scientific data to determine species distribution, habitat needs, and other biological requirements; (3) interview experts including those within FWS, National Marine Fisheries Service, State conservation departments, universities, and others who may have data not yet published in scientific literature; (4) review and analyze the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat; (5) analyze alternative actions that may provide conservation measures and (6) prepare a report documenting the results, including a discussion of study methods used, any problems encountered, and other relevant information. The BA should conclude whether or not a listed or proposed species will be affected. Upon completion, the report should be forwarded to our Portland Office.

[1/] A construction project (or other undertaking having similar physical impacts) which is a major Federal action significantly affecting the quality of the human environment as referred to in NEPA (42 U.S.C. 4332.(2)c). On projects other than construction, it is suggested that a biological evaluation similar to the biological assessment be undertaken to conserve species influenced by the Endangered Species Act.

ATTACHMENT A

FEDERALLY LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES AND CANDIDATE SPECIES THAT MAY OCCUR IN THE AREA OF THE SAVAGE RAPIDS DAM FISH PASSAGE 1-7-94-SP-114

LISTED SPECIES[1]

Birds

Bald eagle	*Haliaeetus leucocephalus*	LT
Northern spotted owl	*Strix occidentalis caurina*	LT

PROPOSED SPECIES

None

CANDIDATE SPECIES[2,3]

Mammals

Pacific western big-eared bat	*Plecotus townsendii townsendii*	C2

Documented occurrence within 2 miles of the Rogue River

Amphibians and Reptiles

Northwestern pond turtle	*Clemmys marmorata marmorata*	C2
Northern red-legged frog	*Rana aurora aurora*	C2

Plants

Coral seeded allocarya	*Plagiobothrys figuratus* var. *corallicarpus*	C2

Documented historical occurrence from Grants Pass

(E) - Endangered *(T) - Threatened* *(CH) - Critical Habitat*
(S) - Suspected *(D) - Documented*

(C1)- Category 1: Taxa for which the Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.

(C2)- Category 2: Taxa for which existing information indicates may warrant listing, but for which substantial biological information to support a proposed rule is lacking.

(3A)- Category 3A: Taxa for which the Service has persuasive evidence of extinction.

(3B)- Category 3B: Names that on the basis of current taxonomic understanding do not represent taxa meeting the Act's definition of "species."

(3C)- Category 3C: Taxa that have proven to be more abundant or widespread than was previously believed and/or those that are not subject to any identifiable threat.

** If a vertebrate or plant, a single asterisk indicates taxon is possibly extinct. If an invertebrate, a single asterisk indicates a lack of information for the taxon since 1963.*

*** Consultation with National Marine Fisheries Service required.*

[1] *U. S. Department of Interior, Fish and Wildlife Service, July 15, 1991, Endangered and Threatened Wildlife and Plants, 50 CFR 17.11 and 17.12.*

[2] *Federal Register Vol. 56, No. 225, November 21, 1991, Notice of Review-Animals*

[3] *Federal Register Vol. 58, No. 188, September 30, 1993, Notice of Review-Plants*

ORIGINAL

CONTROL NO. _____

FOLDER ID _____

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
ENVIRONMENTAL & TECHNICAL SERVICES DIVISION
911 NE 11th Avenue · Room 620
PORTLAND, OREGON 97232
503/230-5400 FAX 503/230-5435

JAN 27 1994

F/NWO3

Mr. Douglas J. James
Regional Environmental Officer
Bureau of Reclamation
Pacific Northwest Region
1150 North Curtis Road
Boise, Idaho 83706-1234

Re: Species List Request for Savage Rapids Dam Evaluation Project

Dear Mr. James:

The National Marine Fisheries Service (NMFS) has reviewed your letter of December 21, 1993, requesting a list of threatened or endangered species for the Savage Rapids Dam project. It is our understanding that you are performing an environmental evaluation of the project, which could result in a range of possible actions from "no action" to dam removal.

We have enclosed a list of anadromous fish species presently listed as endangered or threatened under the Endangered Species Act (ESA). This inventory includes only anadromous species under NMFS jurisdiction that occur in the Pacific Northwest. The U.S. Fish and Wildlife Service should be contacted regarding the presence of species falling under its jurisdiction.

Available information indicates that none of the anadromous fish species listed as threatened or endangered under the ESA are known to be present in the proposed action area. Moreover, your project area does not fall within critical habitat for listed Snake River salmon (December 28, 1993, 58 FR 68543).

As per your request, we have also identified anadromous species in your proposed action area that are presently under NMFS review for listing under the ESA. The species present are coho salmon (*Oncorhynchus kisutch*) and steelhead (*Oncorhynchus mykiss*).

Please refer to the ESA section 7 implementing regulations, 50 CFR Part 402, for information on the consultation process. If you have further questions, please contact Steve Stone, of my staff, at (503) 231-2317.

Sincerely,

Brian J. Brown

for Merritt E. Tuttle
Division Chief

Enclosure

ENDANGERED OR THREATENED ANADROMOUS SPECIES UNDER NATIONAL MARINE FISHERIES SERVICE JURISDICTION THAT MAY OCCUR IN THE PACIFIC NORTHWEST OR ADJACENT COASTAL WATERS

Listed Species (Threatened or Endangered)

Sacramento River Winter-Run Chinook Salmon	*Oncorhynchus tshawytscha*
Snake River Sockeye Salmon	*Oncorhynchus nerka*
Snake River Fall Chinook Salmon	*Oncorhynchus tshawytscha*
Snake River Spring/Summer Chinook Salmon	*Oncorhynchus tshawytscha*

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Oregon State Office
2600 S.E. 98th Avenue, Suite 100
Portland, Oregon 97266
(503) 231-6179 FAX: (503) 231-6195

BUREAU OF RECLAMATION OFFICIAL FILE COPY
JUL 20 1995
ACTION MADE BY

TO	INIT	DATE
6309		
6311		
6519		
FILE		

July 18, 1995

Memorandum

To: Regional Director, Pacific Northwest Region, U.S. Bureau of Reclamation, Boise, Idaho
Attn: Bob Hamilton

From: Acting State Supervisor, Oregon State Office, U.S. Fish and Wildlife Service, Portland, Oregon

Subject: Final Fish and Wildlife Coordination Act Report, Savage Rapids Dam, Grants Pass Division, Rogue River, Oregon (BR)

This memorandum and the attached detailed report is the Fish and Wildlife Coordination Act (Act) Report under authority of Section 2b of the Act (PL 85-624, as amended). The report has been reviewed and concurred in by the National Marine Fisheries Service (NMFS) and Oregon Department of Fish and Wildlife (ODFW) as indicated in the attached letters. It is our understanding that the information will be used by the Bureau of Reclamation (BR) in a final feasibility level planning report and environmental impact statement for the Josephine County Water Management Improvement Study, Jackson and Josephine Counties, Oregon.

The preferred Federal action is to remove Savage Rapids Dam (SRD) and replace it with pumping plants to provide water to the Grants Pass Irrigation District (GPID), and finally resolve long-term fish passage problems that continue to exist at the dam. This action supports the decision of the Board of Directors of GPID as identified in its Water Management Study final report to the Oregon Water Resources Commission (WRC), dated March 8, 1994. The final report documents completion of the Study phase mandated by the GPID supplemental water permit of April, 1990. That permit temporarily allowed the GPID to continue diversion at the historic rate while studying a number of issues, including identification of existing water use, realistic water needs, alternative water supplies, water conservation needs, and fish passage issues at SRD. On October 28, 1994, the WRC accepted the GPID plans and granted extension of the temporary permit until October 15, 1999 for continued full service to GPID lands with a requirement for implementation of the preferred plan for fish passage (dam removal).

The findings of the Water Management Study were developed by an oversight committee consisting of the BR, Oregon Department of Fish and Wildlife (ODFW), Fish and Wildlife Service (FWS), GPID, and its consultant, David Newton

Associates, Natural Resources Conservation Service, Oregon Water Resources Department (OWRD), WaterWatch of Oregon, City of Grants Pass, Josephine County and other local interests. While GPID was formed in 1917 to irrigate a potential area of about 18,400 acres, and the original permit for water use was for 230 cubic feet per second (cfs); the historic diversion rate has ranged between 180 and 190 cfs and the maximum area irrigated was about 12,000 acres. A final proof survey completed by OWRD identified 7,755 irrigated acres and a water right for 96.94 cfs was issued.

The Water Management Study results identify the need for pumping plants sized to provide 150 cfs maximum discharge during the peak use month of August. Operationally, flows would range from a low of 100 cfs during startup and shutdown in April and October, 130 cfs in May and September, 140 cfs during June, 145 cfs in July, and 150 cfs peak in August, with a seasonal average of 139 cfs. Two pumping plants would be constructed, one on each side of the river, in the immediate vicinity of SRD utilizing existing rights-of-way. Flows would be delivered utilizing the existing distribution system. The pumping plants would be constructed before the dam is removed to insure delivery of water to GPID and continuous fish passage, then the dam would be removed. Construction scheduling will be extremely important because species of anadromous fish are present in the Rogue River year round, sometimes in very large numbers. Total costs of the preferred plan is approximately $11.2 million.

Fish passage issues at SRD have a long history, beginning with completion of the dam in 1921 with only a northside fish ladder, and not until 1934 was a southside ladder completed by the Oregon State Game Commission. In 1971 Congress authorized the BR to conduct a feasibility study of the Grants Pass Division, Rogue River Basin Project, including fish passage issues at SRD. A special report of FWS and BR in 1974, and subsequent Final Environmental Impact Statement, resulted in Congressional authorization to implement passage measures but appropriations did not support completion of the work. Some interim measures were completed between 1977-88.

The potential benefits with fish passage improvements were examined in detail in this feasibility study and still provide adequate data for estimating reasonable benefits. Additional studies to document the means and extent of harm to fish with existing conditions have been identified by ODFW, NMFS, and FWS, but funding levels and time frames have not accommodated these studies. The ODFW recently completed an independent analysis of potential benefits with passage improvements (Appendices A & B to detailed report) that is based on the latest information available for the Rogue River Basin anadromous fish. This work was completed to determine the relevancy of the earlier studies to existing conditions in the basin.

The 1970's analysis of benefits completed by NMFS estimated that approximately 45 percent of the spawning population of anadromous fish occurred upstream of SRD, ranging from 100 percent for spring chinook to 11 percent for fall chinook. Assuming a total estimated average, upstream passage of 120,450 adults to SRD, dam removal and elimination of all passage problems and associated losses would increase fish escapement by 26,700 adult fish, or

about a 22 percent increase (9,100 spring chinook, 8,200 fall chinook, 400 coho, 4,400 summer steelhead, and 4,600 winter steelhead).

Although some anadromous fish stocks in the Rogue River are at depressed levels (coho and some steelhead runs), operation of the Corps' Lost Creek Project and associated flow changes and operation of Cole Rivers hatchery for mitigation, has shifted a larger percentage of the basins production upstream of SRD. This is especially true for fall chinook, summer steelhead, and coho. Also, run sizes to the Rogue River vary as much as 10-fold, and the percent of total run component for each species/race by year also varies. Other changes that occur annually in terms of water year and conditions at SRD, operation of the project (GPID operations), hatchery practices and operation of the Lost Creek Project, also influence total numbers of fish at SRD and how they are impacted by existing passage conditions. The ODFW analysis looked at a range of mortalities to reflect this variability and found that the earlier work was still well within the range of benefits that could be expected.

Accordingly, the resource agencies recommend that the 22 percent of total run size to SRD (as estimated by counts upstream at Gold Ray Dam (18 river miles), can be used to develop a range of benefits for fish passage improvements. This range of benefits can be developed by looking at the high year, low year, last 10-year average, and an average for the total 53-year period of counts (1942-1994) at Gold Ray Dam. Numbers for this range of benefits are an increase of 30,847 adults in the high year (1987), 4,508 adults in the low year (1959), 17,227 adults for the last 10-year average (1985-1994), and 11,640 adults for the entire 53-year period average. Breakdowns by species and race are presented in the detailed report.

This range of benefits allows for a risk analysis to reflect the variability that exists within any given year for run size, while the ODFW analysis reflects the variability in mortality to adult and juvenile fish, which also changes with water conditions for a given year and associated operational practices at SRD. Thus, the 26,700 additional adult fish that would return with removal of SRD, even accounting for additional fish that would be harvested (see detailed report) are within the range of benefits from either analysis, and a reasonable estimate of benefits for purposes of this study.

An alternative to the preferred plan includes leaving SRD in place and renovating all fish passage facilities and the pumping system. While fish benefits would be substantial with this plan, the earlier analysis of benefits estimated that losses of about 5 percent of adult passage to SRD would still occur. This difference may be low because some problems (predation in the pool and at the dam) would still remain, and the opportunity to restore fall chinook spawning in gravels in the impounded reach would not be realized. Of even greater concern for the long term, with the continued urban development of the GPID service area and lands being converted to housing and placed on the Grants Pass City's water supply system, a smaller and smaller patronage may be responsible for the O & M costs. This could be particularly difficult with the higher costs of the dam retention alternative and the need to maintain expensive new fish facilities and upkeep on an old, outdated dam. For the above reasons, it is the recommendation of the resource agencies that dam removal is the most viable option at this time and dam retention should

not be a preferred plan. Only minor changes to wildlife would occur with either plan.

The NMFS has proposed that the Klamath Mountain Province steelhead (including runs in the Rogue River) be listed as a threatened species under the Endangered Species Act, and coho salmon stocks have also been petitioned for listing and may be proposed at any time. Both steelhead and coho are adversely impacted by the existing poor passage conditions at SRD and would benefit with dam removal. Additionally, habitat restoration projects in the upper Rogue basin are being implemented under several major initiatives, and increased passage of fish (upstream and downstream) at the SRD location would further the benefits of these restoration projects.

Because of the substantial benefits to anadromous fish in the Rogue River Basin with the preferred plan, and the strong connection between dam removal and habitat restoration projects being implemented on both public and private lands in the basin, the resource agencies also recommend that the BR seek to implement this plan on an accelerated basis - possibly seeking action through a congressional add-on appropriation. It is further recommended that the costs of implementing this plan be considered a Federal, non-reimbursable cost because benefits are substantially for anadromous fish, species of high national interest, some stocks of which are at very low levels of escapement and may be placed on the Endangered Species list for protection. Early efforts now to reverse declines could be important first steps to recovery.

Based on the summary of information here, and the details and discussions presented in the attached report, it is the recommendation of the Fish and Wildlife Service, Oregon Department of Fish and Wildlife, and National Marine Fisheries Service, that:

1) The Bureau of Reclamation seek Congressional authorization to remove Savage Rapids Dam and replace it with pumping plants to permanently resolve long standing fish passage problems at the dam;

2) Implementation of these measures be sought on an accelerated time frame to expedite restoration efforts for declining stocks of anadromous fish in the Rogue River Basin;

3) Funding for this effort be a non-reimbursable Federal cost because of the substantial benefits to anadromous fish; and

4) The construction schedule for dam removal be coordinated closely with the FWS, ODFW, and NMFS to coordinate the specifics of in-water work schedules and activities with fishery concerns.

Please let us know of your response to these recommendations and of any changes in project plans or details that would require new or additional analysis by the resource agencies.

RLG/ae

Attachments

Ronald L Gaust

cc: ODFW, Portland, OR
ODFW, Central Point, OR
NMFS, Portland, OR
USBR, Vancouver, WA
GPID, Grants Pass, OR
OWRD, Salem, OR

Oregon

DEPARTMENT OF
FISH AND
WILDLIFE

March 28, 1995

Mr. Russell Peterson
Field Supervisor - Portland Field Office
U.S. Fish and Wildlife Service
2600 S.E. 98th Ave., Suite 100
Portland, Oregon 97226

Subject: May, 1994 Draft Fish and Wildlife Coordination Act Report (FWCAR), Savage Rapids Dam, Grants Pass Division, Rogue River, Oregon

Dear Russ:

Oregon Department of Fish and Wildlife (ODFW) reviewed the subject draft report last year, and several staff sent comments to you in the form of "marked-up" copies of the report. We understand that you are still in the process of revising and producing the final report, which will be submitted to the U.S. Bureau of Reclamation (BOR) to assist them in preparing a final environmental statement on fish passage improvements for Savage Rapids Dam.

Since the draft Coordination Act Report was distributed, ODFW has conducted an independent analysis of fish increases expected from the two primary alternatives under consideration, dam removal and dam retention with facility improvements. Two reports describing this analysis and results were provided to your staff in October, 1994 and March, 1995, when the reports were completed. We are also attaching copies of these reports to this letter. ODFW's analysis incorporates recent information regarding fish hatchery releases and sport and commercial harvest. While this new analysis confirms that both alternatives will result in significant fish population increases, ODFW does not believe it is necessary for U.S. Fish and Wildlife Service (USFWS) to revise its estimates of fish benefits in the FWCAR. However, the FWCAR should reference this analysis and acknowledge that the range of population increases estimated from this analysis encompasses the point estimates identified in the FWCAR and earlier analyses.

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Operation and Maintenance: ODFW's analysis is based on field and laboratory studies of fish survival at dams in the Pacific Northwest, including passage through or around fish ladders, screens, and spillways. For the dam retention alternative, relatively high fish survival was assumed, based on study results at state-of-the-art fish passage facilities installed at other locations. It is important to note that these field studies were conducted soon after installation of new facilities and careful attention was paid to ensuring that the facilities were in peak operating condition. The FWCAR should specifically state that fish benefits estimated for the dam retention alternative assume fish passage facilities are operated and maintained in peak condition throughout the life of the project. It should also be noted that this assumption increases the risk that the dam retention alternative fish benefits may not be as high as estimated.

Range of Benefits versus Point Estimates: ODFW's analysis provides a range of estimated fish benefits expected from each alternative. This approach recognizes the inherent variability in benefits expected when fish populations and harvest levels vary significantly between years and when fish passage survival at screens, ladders and spillways varies within and between years. Although it is easier to compare the two alternatives using point estimates of costs and benefits, ODFW suggests that the FWCAR identify ranges of estimated benefits, which present a more realistic picture than point estimates.

Benefits to Sensitive Fish Populations: Similar to earlier analyses by USFWS and National Marine Fisheries Service (NMFS), ODFW's analysis shows that those populations which are largest will accrue the greatest benefits from improvements at Savage Rapids Dam. The economic analysis of fish benefits conducted by BOR applies this same concept: dollar benefits are higher as numbers of fish increase. Unfortunately, this type of analysis, while straightforward and simple to understand, fails to acknowledge the greater value to society of protecting sensitive fish populations from further declines. For some populations, this may mean stemming a gradual decline and preventing the population from being listed under state or federal Endangered Species Acts. The savings that accrue to society by not having to list a species have probably not been calculated, although there is ample evidence that species listing and recovery efforts incur substantial costs to both public and private sectors. If any of the salmon or steelhead populations that pass Savage Rapids Dam are eventually listed as either threatened or endangered, the value of fish passage improvements in terms of species recovery should also be considered. Clearly, the value of increasing a listed species population by, for instance, 100 or 1000 fish per year, should be as high or higher than increasing a robust population at a proportionally equivalent rate. Although ODFW does not recommend USFWS attempt to place a value on candidate or threatened or endangered species, the FWCAR should acknowledge these difficult-to-quantify values.

Non-use values: In addition to benefits resulting from increased populations of sensitive or listed species, the FWCAR should discuss other values, such as non-consumptive uses (viewing spawning fish), existence and passive use values resulting from increases in all species affected by the dam. Although ODFW does not believe it necessary for USFWS to derive economic benefits for these types of values, we recommend that the FWCAR acknowledge the other, non-economic benefits of increased fish populations in the Rogue River.

Threatened and Endangered Species

Since the Draft ES was released, NMFS has proposed to list Klamath Mountain Province steelhead under the federal Endangered Species Act. The wild summer and winter steelhead of the Rogue River are considered by NMFS to be a part of this population. In the next year, NMFS will solicit and analyze comments and additional scientific data to decide whether or not to list this population. ODFW recommends that the FWCAR clearly describe NMFS' most recent action, proposed process for further review, and how the proposed fish passage improvements at Savage Rapids Dam could aid in recovery efforts. ODFW is especially concerned that the proposed listing not be used as reason to delay implementation of the preferred alternative. Whether or not Rogue River steelhead are listed, fish passage improvements at Savage Rapids Dam will benefit these and other fish populations.

ODFW appreciates the excellent coordination efforts of USFWS in preparing and revising the draft FWCAR. We hope that these additional comments will assist you in preparing the final report.

Sincerely,

Stephanie Burchfield

Stephanie Burchfield
Water Resources Program Manager
Habitat Conservation Division

Attachments

c: Bob Hamilton, BOR - Boise
Dan Shepard, GPID - Grants Pass
Doug Parrow, OWRD - Salem
Jeff Curtis/Bob Hunter, WaterWatch (Public Information Request)

UNITED STATES DEPARTMENT OF COMMERCE
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MAY 1 5 1995

F/NWO3

Mr. Russell Peterson
Field Supervisor, Portland Field Office
U.S. Fish and Wildlife Service
Attn: Ron Garst
2600 S.E. 98th Ave., Suite 100
Portland, OR 97266

RE: Fish and Wildlife Coordination Act Report, Savage Rapids Dam, Rogue River, Oregon

Dear ~~Mr. Peterson~~ Ron:

The National Marine Fisheries Service (NMFS) has reviewed the U.S. Fish & Wildlife Service's (USFWS) Fish & Wildlife Coordination Act Report (Attachment C of the Bureau of Reclamation's December 15, 1994, Planning Report and Draft Environmental Statement for Fish Passage Improvements at Savage Rapids Dam). NMFS concurs with the USFWS' recommendations in the Fish and Wildlife Coordination Act Report that Savage Rapids Dam be removed to permanently resolve fish passage problems at the dam.

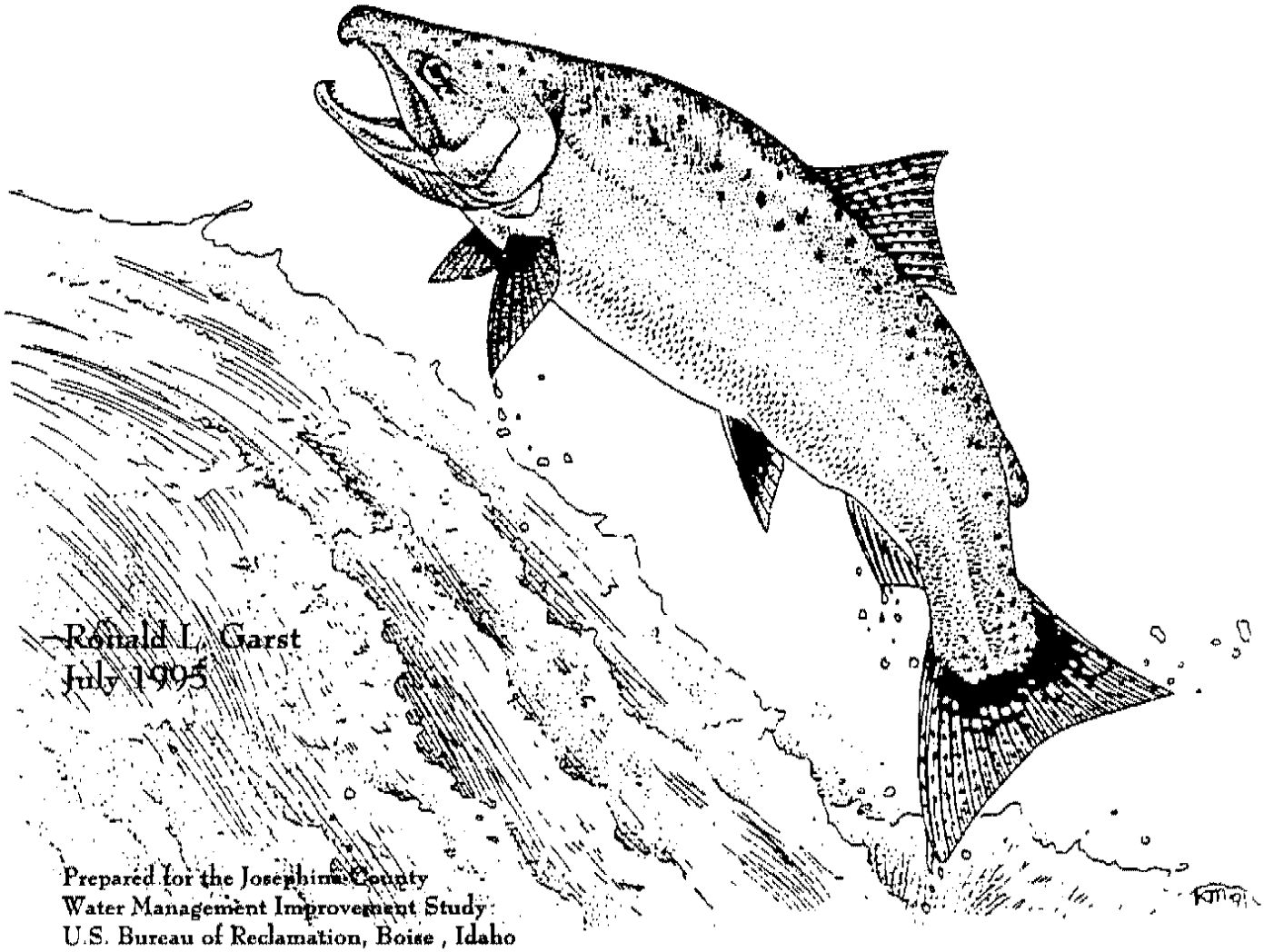
Questions concerning our comments should be directed to Lance Smith, of my staff, at (503) 231-2307.

Sincerely,

Brian J. Brown
for Jacqueline V. Wyland
Division Chief

cc: BR - Robert Hamilton
ODFW - Stephanie Burchfield
GPID - Dan Shephard
Donald R. Greenwood

IMPACTS OF THE PROPOSED SAVAGE RAPIDS DAM REMOVAL ON FISH AND WILDLIFE RESOURCES



Ronald L. Garst
July 1995

Prepared for the Josephine County
Water Management Improvement Study
U.S. Bureau of Reclamation, Boise , Idaho
by the Oregon State Office
U.S. Fish and Wildlife Service, Portland, Oregon

PREFACE

This is the Fish and Wildlife Service's detailed report on the proposed Savage Rapids Dam Removal, Josephine County Water Management Improvement Study, Jackson and Josephine Counties, Oregon.

Our analysis of project impacts on fish and wildlife resources is based on project information and engineering data provided by the U.S. Bureau of Reclamation through December, 1994. Our analysis is based on a 50-year project life. A planning aid letter was submitted on this project in April, 1990.

It should be noted that the proposed project may be subject to permits over which the Fish and Wildlife Service has review responsibilities. Accordingly, our report does not preclude an additional and separate evaluation by the Service, pursuant, to the Fish and Wildlife Coordination Act (16 U.S.C. 661, et seq.), if eventual project development requires a permit. All such permits are subject to separate review by the Service under existing statues, executive order, memorandum of agreement and other authorities. In review of permit application, the Fish and Wildlife Service may concur, with or without stipulations, or object to the proposed work, depending on specific construction practices which may impact fish and wildlife resources.

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INTRODUCTION

This report contains an evaluation of the impacts of removal of Savage Rapids Dam (SRD) on fish and wildlife resources. It was prepared in cooperation with the Oregon Department of Fish and Wildlife (ODFW), National Marine Fisheries Service (NMFS), Northwest Region of the Bureau of Reclamation (BR), and Grants Pass Irrigation District (GPID). Letters of concurrence from ODFW and NMFS are attached to the executive summary. Contents are based partially on information contained in other reports: 1) Draft Planning Report and Environmental Impact Statement (USBR, 1994); 2) Final Water Management Study Report (GPID, 1994); 3) Fish Passage Improvements Progress Report (USBR, 1992); 4) Savage Rapids Dam, Grants Pass Division, Planning Aid Memorandum from FWS to BR (FWS, 1990); and 5) earlier evaluations of fish losses and benefits associated with SRD and dam removal (FWS, 1981 and NMFS, 1979) and 6) current analysis of SRD impacts on Rogue River anadromous fish (ODFW, 1994 & 1995).

The GPID was formed in 1917 to irrigate a potential area of about 18,400 acres and the original permit for water use was issued for 230 cubic feet per second (cfs); however, the historic diversion rate has ranged between 180 and 190 cfs and the maximum area irrigated has been about 12,000 acres. A final proof survey completed by the Oregon Water Resources Department (OWRD) identified 7,755 irrigated acres and a water right of 96.94 cfs was issued in 1982. Subsequently, GPID applied for a permit to use additional water because of its inability to operate on this smaller amount, and that action became the subject of a dispute between OWRD, GPID and other parties. A negotiated agreement followed which allowed GPID to: 1) divert the average historical diversion for a period of time, during which GPID was to identify needed improvements to the diversion and delivery system; 2) implement conservation measures, where possible, as part of their management plans; 3) justify a need for any water greater than 96.94 cfs; and 4)identify solutions to the fish passage problems at SRD. These findings are presented in the GPID Water Management Study final report to the Oregon Water Resources Commission dated March 8, 1994. On October 28, 1994, the Oregon Water Resources Commission completed its review of the GPID plans and accepted them, granting an extension of a temporary permit until October 15, 1999. This permit allows for continued full service to GPID lands and the requirement to implement the preferred plan for fish passage (dam removal) within the permit time period.

Issues that were examined by GPID include water use and water needs, alternative water supplies, water conservation measures, existing and future land use and how it would affect water use, other beneficial uses (besides irrigation) supported by the present system, and fish losses caused by SRD and the water conveyance system. The findings of the study were developed by an oversight committee consisting of BR, ODFW, FWS, OWRD, GPID and its consultant, David Newton Associates, Natural Resources Conservation Service (SCS), WaterWatch of Oregon, City of Grants Pass, Josephine County, and other local interests. The issue of anadromous fish passage problems at SRD are considered to be of Federal interest because anadromous fish are species of high national interest, the subject of international treaties, some stocks have been petitioned and subsequently proposed for listing under the

Endangered Species Act, and the Federal Government has a history of involvement at SRD though contractual agreement between the GPID and the BR.

In 1971 congress authorized the BR to conduct a feasibility study of the Grants Pass Division, Rogue River Basin Project, including fish passage issues at SRD. A special report of FWS and BR in 1974, and subsequent Final Environmental Impact Statement, resulted in Congressional authorization to implement the interim measures in that report. Ongoing detailed studies indicated economic benefits for either dam removal or rehabilitation of the existing facilities, and controversies developed between these two choices. Solicitations for bids to replace the north fish ladder received only one response (which exceeded available funds) and, in 1979, a decision was made to expend remaining funds on interim improvements until agreement and sufficient funds were available for a permanent solution. The preferred Federal action is to build pumping plants, then remove SRD. The pumping plants would provide water to GPID, and, at the same time, finally resolve long-term fish passage problems existing at the dam. This action supports the decision of the Board of Directors of GPID as identified in the final Water Management Study Report, the permit extension as granted by the Commission, and is the economical and biological solution to the existing fish passage problems.

DESCRIPTION OF THE AREA

Savage Rapids Dam (SRD) is located on the Rogue River at River Mile (RM) 107 about 5 miles east of the City of Grants Pass, Oregon **(Figure 1)**. The Rogue River heads in the Cascade Range near Crater Lake and flows over 215 miles to its confluence with the Pacific Ocean at Gold Beach, Oregon. Elevations range from sea level to 8,356 feet at the highest point in the drainage. The total basin area encompasses over 5,000 square miles. 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 climate of the Rogue Basin is dominated by maritime influence which contributes to relatively mild, wet winters and warm, dry summers. Normally about 50 percent of the annual precipitation occurs from November through January, and less than 2 percent falls during July and August. Grants Pass receives about 31.5 inches of precipitation annually, with 90% occurring from October through April. Snow accumulates at higher elevations during winter and early spring and becomes the principle source of run-off during late spring through summer. During winter months, only 10 to 20 percent of the flow at the Rogue River mouth originates from Lost Creek Dam (Rm 157) but, in July and August, 70 to 75 percent of the total flow is from releases at the dam. (ODFW, 1985).

The Rogue River Basin is surrounded by the Siskiyou Mountains to the south, Cascade Range to the east and north (Umpqua Divide) and the Coast Range to the west. At its upper and lower end, the basin is a relatively narrow valley surrounded by heavily-forested lands managed intensively for timber resources. The basin's interior valley is broader and used mostly for agricultural purposes, supporting the area's population centers and economic development. Medford, Oregon, the largest city in the region, is located about 30 miles southeast of Grants Pass. Most of the useable land within the valley is well developed and fully utilized within limits imposed by soils, climate,

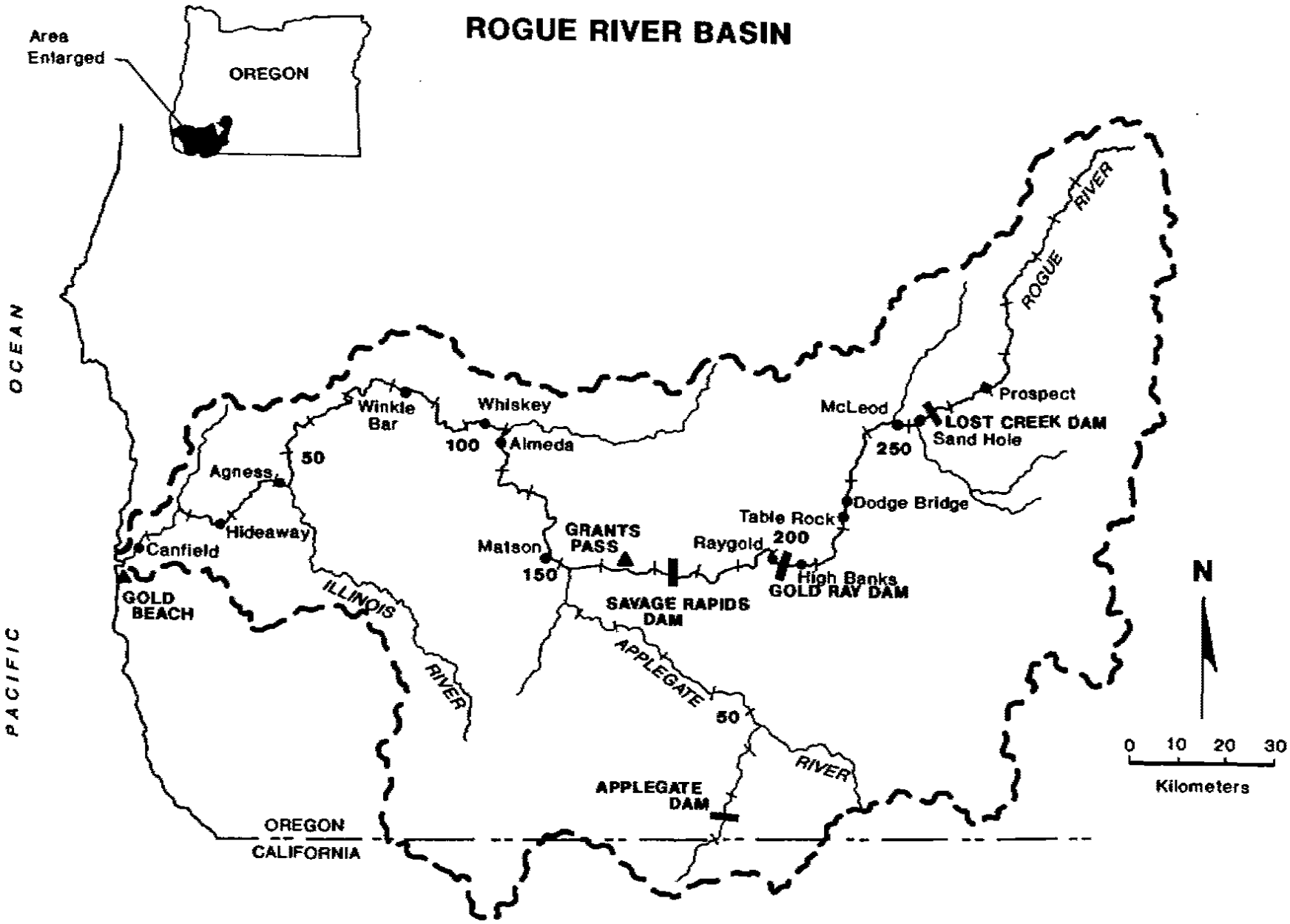

Figure 1. Map of the Rogue River Basin (Oregon Department of Fish and Wildlife, 1985).

topography, water, and-land use categories. Urban growth has significantly encroached on commercial agricultural land and continues to do so in the GPID service
area. The City of Grants Pass is located in the central and western portion of the service area and the urban growth boundary for the city encompasses about 60 percent of the service area. **Figure 2** shows the configuration of the GPID service area and distribution system of major canals and laterals relative to the location of SRD and the Rogue River. At the downstream end of the project area, the 27-mile Hellgate Recreation Area, a segment of the National Wild and Scenic Rogue River, begins at the confluence of the Applegate River and continues to Grave Creek. This river reach provides a broad range of land-and-water based recreation opportunities managed by the Bureau of Land Management (BLM) Medford District.

DESCRIPTION OF THE PROJECT

Savage Rapids Dam is 464 feet long and has a maximum height of 39 feet. From north to south the structure consists of a fish ladder, a pumping plant-sluiceway structure, a 16-bay overflow spillway section (398 feet long and 11 feet deep), two 16-foot by 7-foot radial river gates under two spillway bays, and a gravity canal headworks. During the irrigation season, stoplogs are installed in the spillway bays to raise the river surface elevation behind the dam by 11 feet. This allows diversion to be made by gravity through the canal headworks and by pumping with direct-connected hydraulic turbine-driven pumps to four canals at higher elevations. Fish facilities at the dam now include the north fish ladder and south fishway for upstream migrants, traveling screens, and a bypass system in the turbine-pump intake channels as well as rotary screens in the Gravity Canal to protect downstream migrants.

Engineering details of the specific structure, operations, and passage conditions at SRD have been presented in numerous documents in the past (FWS/BR, 1974) (BR, 1976) and (BR, 1979) and are not repeated here. **Table 1** shows a brief history of fish passage studies and construction activities that have occurred at the dam. Not all of the interim fish passage measures recommended and funded by PL 93-493 were implemented (see 1977-81, Table 1). Although replacement of the north ladder was recommended and funded, the one bid received to do the work was substantially greater than the funds remaining, and, consequently, this work was never done (BR, 1981). In 1979 a decision was made to expend remaining funds on interim improvements until agreement and sufficient funds were available for a permanent solution. New fish screens on the north side and minor modifications to the southside ladder were completed in 1981. In 1984 further fisheries study was deferred because of uncertainties regarding potential hydropower development at SRD. The last fisheries improvement measures implemented at SRD were completed in 1986 with minor modifications to the south ladder made by local fishery groups, with overview by the ODFW.

Efforts by BR to reinitiate feasibility level planning were delayed until 1988, which was when the present study began. The 1970's evaluation of fish passage problems at SRD led to the evaluation of two basic fish passage/water supply alternatives which is the basis for much of the work with the present

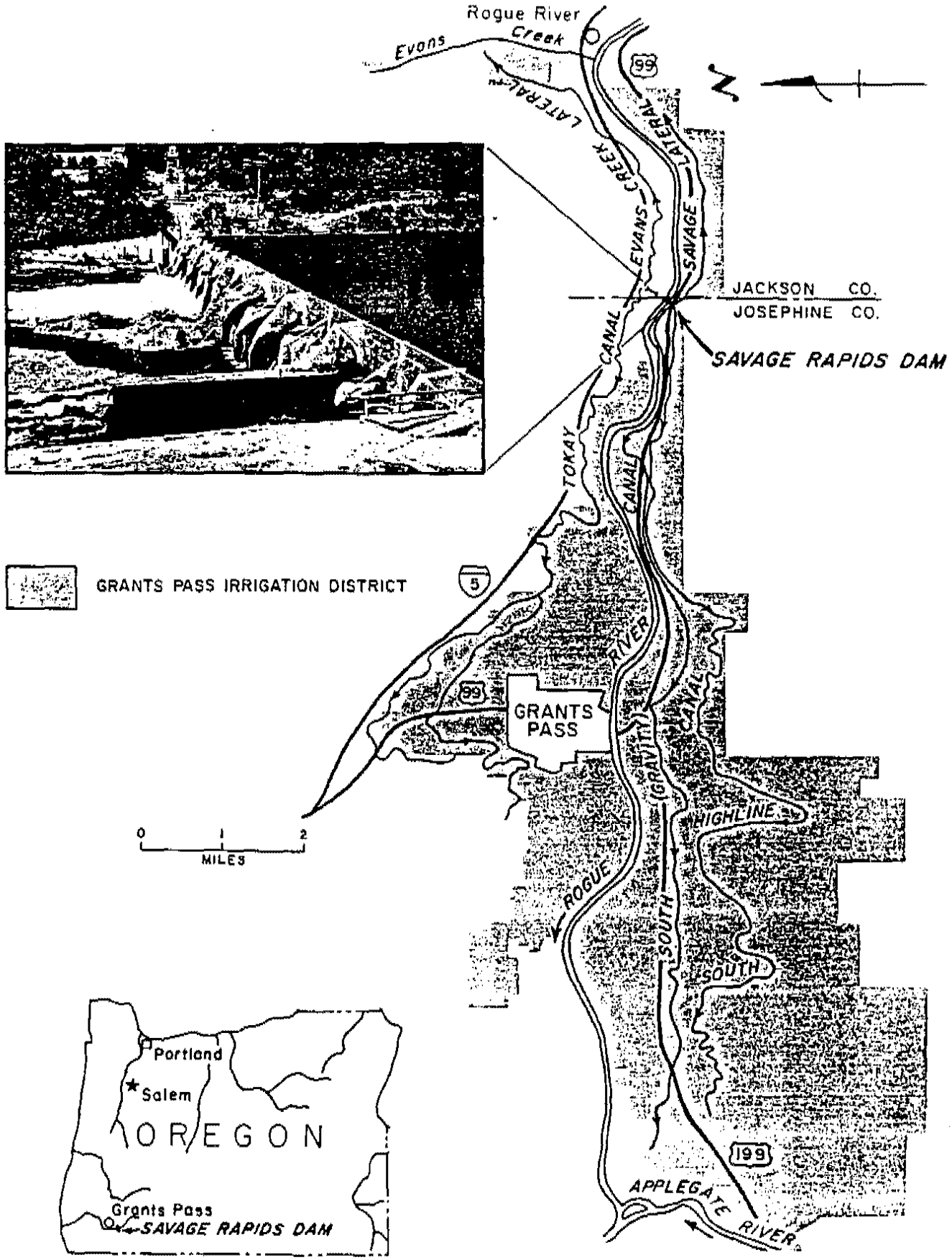

Figure 2. Savage Rapids Dam and GPID. (USBR, 1979)

Table 1. A brief history of fish passage studies and construction at Savage Rapids Dam, Rogue River, Oregon

YEAR	ITEM
1921	Savage Rapids Dam constructed with only a northside fish ladder.
1934	South fishway built by the Oregon State Game Commission.
1954	USBR installed steel stoplogs and two river gates to replace the deteriorated bascule gates.
1958	Vertical traveling water screens installed on the two, previously unscreened, hydraulic turbines.
1964-1968	Reports of ODFW and USFWS on continuing problems with fish screens.
1971	Feasibility Study for Grants Pass Division authorized (P.L. 92-199) to examine: (1) Interim fish passage problems at Savage Rapids Dam (Phase I). (2) Potential for rehabilitating GPID distribution system, and permanent solution to fish passage problems (Phase II)
1971-73	Studies conducted by USBR for interim fish passage improvements at Savage Rapids Dam.
1974	Congress authorized (P.L. 93-493) construction of interim fish passage improvements based on joint USFWS/USBR report (March, 1974).
1976	Final Environmental Statement filed on anadromous fish passage improvements at SRD. These were interim measures pending a final fish passage program. Some measures outlined in the EIS included: (1) New bulkhead gates in front of the fish screens to facilitate maintenance, (2) Modify south fishway, (3) Replace north fishway, and (4) Other miscellaneous measures.
1977-81	Installation of interim fish passage improvements (rehabilitation and addition to south fishway, renovation of north fishway, bulkhead gates and fish screens).

Continued on next page...

Continuation...

Table 1. A brief history of fish passage studies and construction at Savage Rapids Dam, Rogue River, Oregon

YEAR	ITEM
1979	Formulation Working Document summarizing Phase II study results. Basic conclusions following public review included: (1) Prospects poor for a Federal project to improve irrigation facilities, so discontinue study; 2) Upstream and downstream fish passage still a major problem, so further measures should be taken; continue this part of study.
1984	Fisheries study deferred because of uncertainty regarding hydropower development on the Rogue River.
1986	Minor modifications to portions of south ladder accomplished by local fishery groups with ODFW overview.

Water Management Study: 1) Dam retention with new fish facilities; 2) Dam removal with new pumping plants. These are summarized below:

Dam Retention Alternative

Replace north fish ladder, new screens on turbine and pump bays, replace south fish ladder, new south canal fish screens, stoplog modifications, plunge pool modification, new radial gates, juvenile fish trapping facility, public access facility - BR estimated construction costs equal $17.6 million (1993 costs). These costs include the replacement of the existing pumps, turbines, and discharge lines which have exceeded their useful service life, but not replacement of the cableway/stoplog system.

Dam Removal Alternative

Remove SRD and restore dam area and construct new pumping plants (2) in the vicinity of the existing dam, with maximum capacity of 150 cfs discharge for peak use period - BR estimated construction costs equal $11.2 million (1993 costs). This plan includes contructing a transmission line across the river at the pump sites.

Because of: 1) the additional costs for the dam retention alternative; 2) the additional fish passage benefits with dam removal (discussed later); 3) the concern for possible continued fish losses and long term need for high levels of operation, maintenance and replacement activities with dam retention (also discussed later); and 4) the support of the GPID board and Water Resources Commission for dam removal, the resource agencies believe that dam removal coupled with the construction of new pumping plants should be the preferred Federal plan. It is the recommended fish passage plan evaluated in this report.

The Water Management Study results identify the need for pumping plants sized to provide 150 cfs maximum discharge during the peak use month of August. Operationally, flows would range from a low of 100 cfs during startup and shutdown in April and October, 130 cfs in May and September and 150 cfs peak in August, with a seasonal average of 139 cfs. Anticipated monthly flow needs by canal are summarized below, with the system needs totaled.

CANAL	MAY	JUNE	JULY	AUGUST	SEPT.	SEASONAL AVERAGE
TOKAY & EVANS	27.75	30.00	31.00	32.00	27.75	29.70
GRAVITY	51.25	55.25	57.00	59.00	51.25	54.75
HIGHLINE & SAVAGE	51.00	54.75	57.00	59.00	51.00	54.55
TOTAL	130.00	140.00	145.00	150.00	130.00	139.00

Two pumping plants would be constructed, one on each side of the river, in the immediate vicinity of SRD utilizing existing rights-of-way. Flows would be

delivered utilizing the existing distribution system. The pumping plants would be constructed before the dam is removed to insure delivery of water to GPID and continuous fish passage. Coffer dams would be required on each side of the river to protect the construction sites for the pumping plants. Construction scheduling will be extremely important because species of anadromous fish are present in the Rogue River year round, sometimes in very large numbers. Schedules will be developed during the detailed design stage of implementation.

As required by its water use permit conditions, numerous other measures are proposed to be implemented by GPID for systems improvements and water conservation, and will be adopted for implementation as approved by the Water Resources Commission in October, 1994. The proposed action of dam removal and replacement with pumping plants is identified as a Federal action because of the significant benefits to anadromous fish in the Rogue River Basin. It is the only action evaluated in detail in this report.

BIOLOGICAL RESOURCES

EXISTING CONDITIONS

Fish

The Rogue River basin supports a large population of anadromous salmonids, including spring and fall chinook salmon, coho salmon, summer and winter steelhead trout, and cutthroat trout. Chinook and steelhead are the most plentiful species while the cutthroat are least abundant and occur primarily in the lower river. In total, about 375,000 anadromous salmonids are produced annually, valued at $31.5 million (ODFW, 1985). This includes about 162,000 chinook salmon harvested annually by sport and commercial fisherman and about 95,000 steelhead caught by sportsmen in the Rogue River (ODFW, 1988). The Rogue River fisheries are not only attractive to residents of the northwest, but are nationally renowned for their diversity and productivity. 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. The Rogue River basin supports the largest wild population of anadromous salmonids in Oregon (ODFW, 1988). 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. 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 (Corps) Rogue Basin Project.

Since most of the detailed study of fish passage issues at SRD were completed in the 1970's (Table 1), numerous studies of the Rogue River fisheries have been completed or are ongoing by ODFW in conjunction with the Corps' Rogue River Basin Project. Project features that affect either the basins fisheries, or actual passage conditions at SRD, include Lost Creek Dam at RM 157 on the mainstem Rogue River, the partially completed Elk Creek Dam on Elk Creek (a tributary at RM 152), Applegate Dam on the Applegate River (a tributary just downstream of Grants Pass) and Cole M. Rivers Fish Hatchery.

The fish hatchery is located just downstream of Lost Creek Dam and was constructed to mitigate for the impacts of the Rogue Basin Project on anadromous fish. It is operated by the ODFW and annually has produced about 2 million spring chinook salmon (smolts and pre-smolts); 200,000 coho Salmon; and 150,000 each of summer and winter steelhead trout. Releases of spring chinook pre-smolts began in 1984, peaked with a release of 800,000 in 1987, but was discontinued in 1989 because of concerns with residualism impacting wild fish. Some fall chinook were also released between 1982-1987 to study distribution in the ocean fishery, but these releases (averaging about 34,600/yr for the period) have also been discontinued. Spring chinook smolt releases have averaged about 1.6 million since 1986. The number of summer and winter steelhead releases fluctuates from year to year but the goal is to release 150,000 1-year old smolts annually for each species. Additionally, about 120,000 2-year-old winter steelhead smolts are split between the Rogue and Applegate Rivers, and since 1991 summer steelhead production has been increased by an additional 70,000 1-year-old smolts to the Rogue River. All fish produced for the Rogue River are released at the hatchery while Applegate River fish are trucked to that river and released.

Lost Creek Dam has been operational since 1977 and provides flows and temperature control to enhance anadromous fish. Elk Creek Dam construction was started in 1986 and has since been stopped by court order. The dam is about 50 percent complete and fish passage is still being provided for at the dam since flows are not being regularly impounded and significant habitat is available upstream in the basin. A fish trap and haul facility constructed downstream is being used by ODFW to collect fish for relocation upstream. It is anticipated that this facility will be used on a permanent basis until a final decision and plan of operation (or removal)is developed for Elk Creek Dam.

Although Lost Creek, Applegate, and Elk Creek (if it is completed) Dams are primarily for flood control, another major purpose of the Rogue Basin Project is to enhance anadromous fish runs. An important part of this effort has been to monitor and evaluate project operations and fishery resources to develop specific recommendations on how best to operate the projects and meet the intended purposes of fishery enhancement - or at the very least avoid conditions that would be detrimental to the production and harvest of wild salmon and steelhead. A brief list of the Rogue Basin Fisheries Evaluation Studies conducted by ODFW and funded by the Corps is presented in **Table 2**.

Generally, on a coastwide basis throughout the Pacific Northwest, salmon and steelhead stocks are at very depressed levels and all anadromous salmonid species in the region are now candidates for listing under the Endangered Species Act (ESA). Coho stocks have been especially hard hit by poor ocean survival conditions associated with the recent El Nino as well as more locally distributed chinook stocks such as Klamath River, southern Oregon (some Rogue populations included) and Columbia River tule stocks. The ocean and inriver fisheries had extremely restricted, or, in some cases, completely foregone seasons in 1994 because of the conservation crisis facing many of these stocks. Similar restrictions are anticipated in 1995. These included no ocean sport or commercial harvest for coho and only limited commercial or inriver sport harvest for chinook salmon.
Within the Rogue River Basin, winter steelhead of the Illinois River were petitioned for listing, but NMFS found that this stock did not qualify for

Table 2. A brief chronology of Rogue Basin fisheries evaluation studies Conducted by ODFW for Lost Creek and Elk Creek Dams.

YEAR	ITEM
1973	SMOLT PHYSIOLOGY AND HATCHERY STUDIES STARTED.
1974	LOST CREEK DAM FIELD STUDIES STARTED: SPRING CHINOOK — COHO SALMON FALL CHINOOK — WATER CHEMISTRY SUMMER STEELHEAD — BENTHIC BIOLOGY WINTER STEELHEAD — SALMONID GENETICS
1976	SALMONID GENETICS STUDY COMPLETED.
1976-77	LOST CREEK DAM CLOSURE STUDY CONDUCTED.
1977	WATER CHEMISTRY AND BENTHIC BIOLOGY STUDIES COMPLETED. HATCHERY EVALUATION FUNDING TAKEN OVER BY USFWS.
1979	SMOLT PHYSIOLOGY STUDY COMPLETED.
1980-82	STUDY WITH O.S.U. ON FALL CHINOOK MORTALITY CONDUCTED.
1981	LOST CREEK DAM WINTER STEELHEAD SAMPLING COMPLETED. LOST CREEK DAM JUVENILE SAMPLING REDUCED. CREEL SURVEYS REDUCED.
1985	LOST CREEK DAM FISHERIES EVALUATION PHASE 1 COMPLETION REPORT.
1986	LOST CREEK DAM FALL CHINOOK, SUMMER STEELHEAD, AND COHO SAMPLING COMPLETED.
1987	ELK CREEK DAM STUDIES STARTED.
1988	STUDIES REMAINING ARE ELK CREEK DAM AND LOST CREEK DAM SPRING CHINOOK.
1988-91	ELK CREEK DAM FISHERIES EVALUATION - ANNUAL PROGRESS REPORTS
1990	LOST CREEK DAM EFFECTS ON WINTER STEELHEAD, PHASE II COMPLETION REPORT
1991	LOST CREEK DAM EFFECTS ON COHO SALMON, PHASE II COMPLETION REPORT
1992	LOST CREEK DAM EFFECTS ON FALL CHINOOK, PHASE II COMPLETION REPORT
1993	ELK CREEK DAM FISHERIES EVALUATION - COMPLETION REPORT
1994	LOST CREEK DAM EFFECTS ON SUMMER STEELHEAD, PHASE II COMPLETION REPORT

protection under the ESA because it did not meet the definition of a "species." They did initiate a status review of all steelhead runs along the west coast (exclusive of the Columbia River), and on March 16, 1995, proposed that the Klamath Province steelhead be listed as a threatened species under the ESA. The Klamath Province steelhead was determined to be a discrete Evolutionary Significant Unit (ESU) with a distinct life history pattern (half-pounder returns) that includes all stocks of steelhead between Cape Blanco, Oregon, and Cape Mendocino, California (Federal Register, Vol. 60, No. 51, Pg. 14253-60). This ESU includes both the summer and winter run steelhead in the Rogue River. The proposal found that most of the steelhead populations within the ESU were in significant decline, even with hatchery production included, and that there were not likely any naturally self-sustaining populations. Reasons for decline were a combination of logging, mining, agriculture, municiple, industrial, and agricultural dams (including some with no passage or poor passage conditions), harvest and/or hatchery practices, and poor ocean survival conditions. Critical habitat was not proposed in this rulemaking and will be proposed seperately. The proposal to list these steelhead starts a one-year review process to collect comments, new information, and analyze conservation and restoration measures before the listing would become final.

The NMFS has also found that the petition to list coho salmon throughout its range in Oregon, Washington, California, and Idaho is warranted, and is undergoing a 1-year status review that was due for completion on October 20, 1994. NMFS expects this ruling to be announced in the summer of 1995 for six different population groups that have been identified within the range of the petition.

In March 1991, the American Fisheries Society provided a list of depleted Pacific salmon, steelhead, and searun cutthroat stocks, and found that Rogue River coho were at a high risk of extinction, and the summer steelhead were at moderate risk of extinction. Reasons for decline of these species were listed as:

> "The present or threatened destruction, modification, or curtailment of its habitat or range. (In addition to habitat damage, this category includes mainstem passage and flow problems, and predation during reservoir passage or residence.)"
>
> "Over utilization for commercial, recreational, scientific, or educational purposes. (This category includes overharvest in mixed-stock fisheries.)"
>
> "Other natural or man-made factors affecting its continued existence, hybridization, introduction of exotic or translocated species, predation not primarily associated with mainstem passage and flow problems, competition. (This category includes negative interactions with hatchery fish, such as hybridization, competition and disease. Also included here are poor ocean survival conditions.)"

How anadromous fish are affected by passage conditions at SRD is a function of numerous factors, i.e., the number, size, and condition of fish at the dam; time of year and particular water conditions (high or low flows, spill, rate of pumping, radial gates open or closed, ladders in operation); and the efficiency of the fish facilities in providing optimum passage conditions (good attraction flows, regulated and consistent flows through the ladders, appropriate screen velocities, tight seals and no places for delay or injury, etc.). These are discussed in greater detail below for the existing conditions at SRD.

The total numbers of adult anadromous fish passing SRD for the earlier studies (NMFS, 1979 & FWS, 1981) were estimated to be 120,500, including 49,700 spring chinook; 8,500 fall chinook; 1,000 coho; 37,300 summer steelhead; and 24,000 winter steelhead. This was assumed to be about 45 percent of the total spawning population in the basin at that time. More recent figures for the Rogue River Basin estimate a total return of adults to freshwater of about 260,000 fish, including 30,000 spring chinook; 45,000 fall chinook; 8,000 coho; 130,000 summer steelhead (includes half-pounders); and 47,000 winter steelhead (ODFW, 1992). Using the same percentage of inriver harvest and distribution of spawners upstream of SRD as earlier studies, these more recent adult returns would breakdown as a total of 90,100 adults upstream of SRD, which includes 36,940 spring chinook; 6,880 fall chinook; 810 coho; 28,420 summer steelhead; and 17,050 winter steelhead.

While these numbers suggest lower estimates than the earlier figures, and the most recent years have been at depressed levels (ODFW, 1992), the concern was raised in earlier studies (FWS, 1990) that changes in the Rogue River with operation of the Lost Creek Project and Cole Rivers Hatchery would increase the number of fish subject to passage problems at SRD. A better, more long-term indicator of fish numbers at SRD are the counts at Gold Ray Dam. **Table 3** lists the estimated returns of adult salmon and steelhead to Gold Ray Dam (GRD) from 1942 to the present. Indeed, since 1977, the average numbers for this period have increased for all species (almost doubling for fall chinook) and the total numbers for each year are up by about an average 30 percent, when compared to the averages for the entire 52 year period. (see bottom of Table 3).

Fish counts at Gold Ray Dam (18 miles upstream) are a good indicator of fish numbers passing there are a good estimate of numbers passing SRD except for fall chinook (because mainstem spawning areas occur on the Rogue River between the two dams (ODFW, 1985),) and steelhead. Evans Creek is the only major tributary in that reach and it receives some fall chinook and significant steelhead use. Thus, figures for fall chinook and steelhead at Gold Ray Dam would be less than numbers at SRD. ODFW estimated about 3 times as many fall chinook spawning between the dams compared to the average count at GRD (for the 1942-93 period)(ODFW, 1995). The Gold Hill area, including Evans Creek, is a major producer of summer steelhead, with fish spawning in numerous tributaries co Evans Creek (ODFW, 1990). The mainstem of Evans Creek is used by winter steelhead. The ODFW estimate of numbers of spawning summer and winter steelhead between the two dams, as compared to their average counts at GRD (1942-93 period) are 60% and 43% respectively (ODFW, 1995).

Table 3. Estimated Numbers of Salmon and Steelhead Adults Migrating Over Gold Ray Dam, Rogue River, 1942 to Present.

Run Year	Spring Chinook	Fall Chinook	Coho	Summer Steelhead	Winter Steelhead	Total
1942	41,779	1,670	4,608	7,387		55,444
1943	36,136	1,611	3,290	5,648	15,314	61,999
1944	30,632	1,223	3,230	5,530	13,380	53,995
1945	31,996	1,641	1,907	7,302	16,083	58,929
1946	28,374	1,691	3,840	4,448	8,729	47,082
1947	33,637	1,176	5,340	3,221	9,653	53,027
1948	26,979	757	1,764	2,133	8,605	40,238
1949	18,810	1,233	9,440	3,618	8,052	41,153
1950	15,530	1,204	2,007	4,583	8,684	32,008
1951	19,443	1,489	2,738	3,262	5,744	32,676
1952	15,888	2,558	320	4,200	10,648	33,614
1953	31,465	2,083	1,453	3,831	10,945	49,777
1954	24,704	955	2,138	2,222	7,228	37,247
1955	15,714	B36	480	1,703	5,239	23,972
1956	28,068	1,884	421	2,753	8,775	41,901
1957	17,710	1,060	1,075	1,323	4,508	25,676
1958	15,016	700	732	1,293	3,855	21,596
1959	13,972	735	371	865	4,550	20,493
1960	24,374	1,843	1,851	2,034	6,901	37,003
1961	31,775	1,260	232	2,408	8,965	44,640
1962	31,395	1,265	457	3,603	9,901	46,621
1963	40,567	960	3,831	1,508	9,024	55,890
1964	37,327	1,137	168	778	6,431	45,841
1965	47,644	1,776	482	2,144	7,310	59,356
1966	31,422	1,166	178	2,092	12,463	47,321
1967	14,693	1,800	89	1,637	5,150	23,369
1968	19,469	912	149	693	7,235	28,458
1969	59,043	2,190	530	7,768	6,559	76,090
1970	45,101	3,068	160	6,088	13,789	68,206
1971	29,473	2,407	181	4,909	9,442	46,412
1972	30,788	2,756	185	3,559	16,826	54,114
1973	35,276	3,816	1 93	5,236	9,566	54,087
1974	17,006	2,309	146	7,858	7,108	34,427
1975	21,483	2,312	154	8,338	10,367	42,654
1976	21,570	2,648	44	3,529	6,048	33,839

Continued on next page...

Table 3. Estimated Numbers of Salmon and Steelhead Adults Migrating Over Gold Ray Dam, Rogue River, 1942 to Present (Cont'd).

Run Year	Spring Chinook	Fall Chinook	Coho	Summer Steelhead	Winter Steelhead	Total
1977	16,403	5,181	522	11,352	4,724	38,182
1978	47,221	5,878	756	4,977	7,867	66,699
1979	38,207	3,093	1,744	14,867	12,767	70,678
1980	36,932	2,906	5,617	7,773	13,371	66,599
1981	17,213	4,767	6,725	11,929	8,197	48,831
1982	29,942	4,595	670	13,654	6,337	55,198
1983	12,511	3,839	1,493	7,581	9,728	35,152
1984	12,690	3,184	3,236	7,397	9,486	35,993
1985	40,545	8,455	1,170	7,511	10,462	68,143
1986	89,522	14,239	4,072	14,598	16,664	139,095
1987	81,581	10,699	5,395	24,955	17,587	140,217
1988	82,591	11,497	6,882	19,283	15,019	135,272
1989	60,332	6,903	1,401	12,411	14,595	95,642
1990	24,589	3,650	697	5,959	10,487	45,382
1991	12,350	3,176	2,562	4,975	4,547	27,610
1992	5,545	6,825	3,928	3,486	3,775	23,559
1993	26,103	6,711	3,486	10,595	6,499	53,394
1994	14,076	11,530	10,685	11,085	6,581	53,957
Average (all years)	30,809	3,306	2,176	6,112	9,271	52,907
Average (77-94)	37,310	6,211	2,873	10,782	10,124	67,185
Percentage Increase	21	87%	32%	76%	9%	27%

Count Period

Spring Chinook	March	1	to	August 15
Fall Chinook	August	15	to	December 15
Coho	Sept.	15	to	January 30
Summer Steelhead	May	15	to	December 31
Winter Steelhead	January	1	to	May 15

Table 4 shows a comparison of earlier estimates of SRD passage with counts at Gold Ray Dam, for the high and low year counts, as well as the last ten year average and total period average. These figures show that the earlier estimates of passage at SRD more closely match numbers of escapement during periods of large returns, and are substantially greater than low return years or the long term average (realizing that the differences are not as great as shown because of fall chinook and steelhead production between SRD and Gold Ray Dam). For this analysis the resource agencies recommend that counts at Gold Ray Dam be used as a direct indicator of the numbers of adult fish passing SRD. This will allow a risk analysis based on the wide range in the numbers of returning adults annually and the associated wide range in benefits. This evaluation is presented in the "with the project" section of the report. While numbers will be conservative, substantially underestimating passage for fall chinook and to a lesser extent, summer steelhead and winter steelhead, they are based on actual counts of fish over a long period of time.

Table 4. Comparison of adult fish passage at Savage Rapids Dam (FWS, 1981) with counts at Gold Ray Dam for a high, low, 10-year average (1985-94) and the total 53yr period of record.

	SRD	GOLD RAY DAM			
SPECIES	FWS, 1981	High Yr. 1987	Low Yr. 1959	10yr Avg. 1985-1994	53yr AVG.
Spring Chinook	49,700	81,581	13,972	43,740	30,809
Fall Chinook	8,500	10,699	735	8,386	3,306
Coho	1,000	5,395	371	4,036	2,176
Summer Steelhead	37,300	24,955	865	11,488	6,112
Winter Steelhead	24,000	17,587	4,550	10,656	9,271
TOTALS	120,500	140,217	20,493	78,306	52,907

The timing of adult and juvenile fish migration also has a role in how anadromous fish are impacted at SRD. This is because different passage conditions exist at the structure at different seasons of the year (e.g. north ladder only operates during the irrigation season, flows vary by season, etc.); and the condition and size of fish varies by season and species, e.g., spring chinook hold in the upper river 3 to 4 months prior to spawning after passing SRD, while many fall chinook are ripe by the time they pass SRD and may spawn soon afterwards. The best indicators of timing for fish at SRD are the count periods for adult fish upstream at Gold Ray Dam, and catches of juvenile fish in the downstream migrant trap at SRD. **Table 5** summarizes this information.

Table 5. Timing of fish passage at Savage Rapids Dam[1]

SPECIES	TIMING
ADULTS	
Fall Chinook	Aug 16 - Nov 30 (50% thru late Sept)
Spring Chinook	April 1 - Aug 16 (50% thru middle June)
Coho	Oct 1 - Dec 15 (50% thru middle Nov)
Summer Steelhead	May 16 - Dec 31 (50% thru middle Sept)
Winter Steelhead	Jan 1 - May 15 (50% thru middle March)
JUVENILES	
Chinook	May - October
Coho	April - June
Steelhead	March - September

A number of changes have occurred that have influenced the distribution of anadromous fish in the Rogue River Basin, besides the obvious influence of Cole M. Rivers Hatchery and its operation. These changes have influenced the number of fish upstream of SRD, as well as the harvest rate of fish in the river and in the ocean. A general summary of some of these changes is listed in **Table 6**.

While Table 3 shows that the concerns about increased fish numbers at SRD has occurred, and Table 6 explains some of the likely reasons for these changes, other factors have also had an influence. Chinook numbers have been increasing above SRD because of the shift of fall chinook spawning to areas further upstream and the operation of Coles River Hatchery (spring chinook releases), although, at the same time, wild chinook production has decreased by about 60 percent. Another factor contributing to the increased counts of chinook is reduced ocean harvest to protect Klamath River stocks of chinook. Rogue and Klamath River stocks are mixed in the ocean off Northern California and Southern Oregon and reduced harvest has contributed to the increased returns (ODFW, 1989). Coho increases are associated with increased releases from Cole M. Rivers Hatchery (ODFW, 1985), as the coho run in the Rogue River upstream of Gold Ray Dam may now be basically a hatchery run. Remnant runs of wild fish may still exist in Elk Creek and Big and Little Butte Creeks, but strong correlations exist between adult counts at Gold Ray Dam and returns to the

[1]Information for adults is from count periods at Gold Ray Dam, while data for juveniles is from the trap at SRD or from seining data (ODFW, 1980) before the trap is operated.

Table 6. General changes associated with operation of Lost Creek Dam as they affect Rogue River fisheries and numbers of fish subject to passage problems at SRD.

CHANGE
1. Wild spring chinook production decreased and hatchery production increased.
2. Spring chinook wild fry abundance decreased in 1978-1984 but may have increased 1985-1993.
3. Earlier spring chinook fry emergence from gravel and reduced abundance influences faster growth in river and earlier ocean entry .
4. Spring chinook adults mature at earlier ages (2-4 years) and don't contribute to the fisheries at lower rates than older adults (5 years)
5. Relative abundance of fall chinook increased in the upper Rogue River.
6. Spawning distribution of spring chinook shifted downstream while fall chinook shifted upstream.
7. Spring chinook are more valuable to the river fishery than fall chinook, while fall chinook contribute best to the ocean fishery.
8. Commercial harvest of chinook decreased because of lower fishing effort and a decrease in age at maturity for spring chinook.
9. Reduced prespawning mortality for chinook is strongly correlated with increased flow and lower temperatures from Lost Creek Dam.
10. Angler harvest in the river increased when prespawning mortality was decreased.
11. Winter peak flows are reduced with flood control operations and summer base flows are increased substantially in the Rogue River.
12. Returns of wild and hatchery summer steelhead have covaried between 1976-1991.

hatchery. Total steelhead numbers are reduced from long-term averages, with increases in hatchery fish and decreases in wild fish, probably related to concerns for habitat losses in tributaries as it effects wild fish production and poor ocean conditions for young steelhead (ODFW, 1994).

Opponents to dam removal have cited increased counts at Gold Ray Dam as evidence that at the least, fish losses at SRD are overstated, or at worst, losses do not really occur and runs are increasing upstream despite SRD. The resource agencies believe that most of the increases in run size upstream of SRD can be attributable to changes in the Rogue River associated with operation of the Lost Creek Dam Project (Table 6), and that there are still ample reasons to believe significant losses occur at SRD because of existing fish passage problems. A summary of the continued passage problems as they have been identified thus far is listed in **Table 7**. Most recently, an ODFW fish passage expert has visited the site and discussed the passage problems from first hand, one-time observation of conditions at SRD during that visit (ODFW, 1994, Frank Young memo). It is important to note that no evaluation of effectiveness has occurred for the passage measures that have been implemented, and in some cases (e.g. juvenile fish screens) the measures do not comply with existing fish passage criteria, or are not in use during extended periods because of breakdown or the generally poor condition of equipment and ongoing maintenance problems and/or practices. Separate photos of the north and south side areas of the dam show conditions of spill, false attraction, and generally poor passage conditions(**Figure 3**).

In summary, increases in runs of anadromous fish upstream of SRD (as evidenced in counts at Gold Ray Dam) does not mean that passage problems do not exist, but that runs could have been even greater if the problems did not exist or were minimized. Increased escapement of fish upstream of SRD, and an increased proportion of the Rogue Basin production coming from the upper basin, only means more fish are subject to poor passage conditions and the increased likelihood of fish losses. The most recent example of this is the failure of the bottom seal on one of the gravity canal drum screens in September 1991 and the estimated 100,000 spring chinook smolts directed into the canal (ODFW, 1991). Until a permanent solution to the passage problems is implemented, losses will continue and the full production potential of the Upper Rogue River Basin will not be realized.

Wildlife

Habitats in the immediate vicinity of SRD include a narrow strip of riparian vegetation on both sides of the river, disturbed areas of grass, weeds, or exposed soils associated with parking, maintenance, or visitor uses, and the river and reservoir pool upstream of the dam. The riparian vegetation consists of cottonwood, willow, alder, blackberries, nettle, and common understory grasses and forbes. The largest piece of this habitat occurs on the south shore just downstream of the South ladder and is less than 2 acres in size. Riparian vegetation on the river shore upstream of the dam has been mostly eliminated with private landowner or business practice and the desires to see the river and/or have access to it.

Table 7. Summary of continuing fish passage problems at Savage Rapids Dam, Rogue River, Oregon.

Problems

1. Regulation of flows in the south ladder.

2. Unfavorable entrance and exit conditions from the south ladder under all flows, i.e. ladder now exits through canal headworks; at high flows fish approach through channel behind ladder towards shore, and at low flows, fish may have to jump to enter some sections of ladder, etc.

3. Marginal use of the north ladder at all times during its operation because of poor attraction flows, steep gradient and small pools.

4. North ladder only operates during irrigation season.

5. Delays during drawdown of the reservoir (after irrigation season) because of dewatering of the south ladder or in the spring with installation of the stoplogs.

6. Increased turbidity during fall and spring flushing that occurs when crest is dewatered for removal or addition of stoplogs.

7. Impingement of juvenile fish on screens, or juveniles bypassing the screens with faulty seals or screen breakdown.

8. Increased trash and vegetation buildup because of flow regulation with Lost Creek Project or people dumping debris into Savage Rapids reservoir.

9. Loss of juvenile fish passing over the dam and striking the sill or rocks below; increased spill during irrigation season with increased summer flows from Lost Creek Project.

10. Steelhead kelt mortality for the same reasons (9 above).

11. Smolt losses to pressures at the sluce gates when at full pool.

12. Increased predation from Umpqua squawfish in areas immediately upstream and downstream of SRD.

Savage Rapids Dam, Rogue River

*Fig. 1**

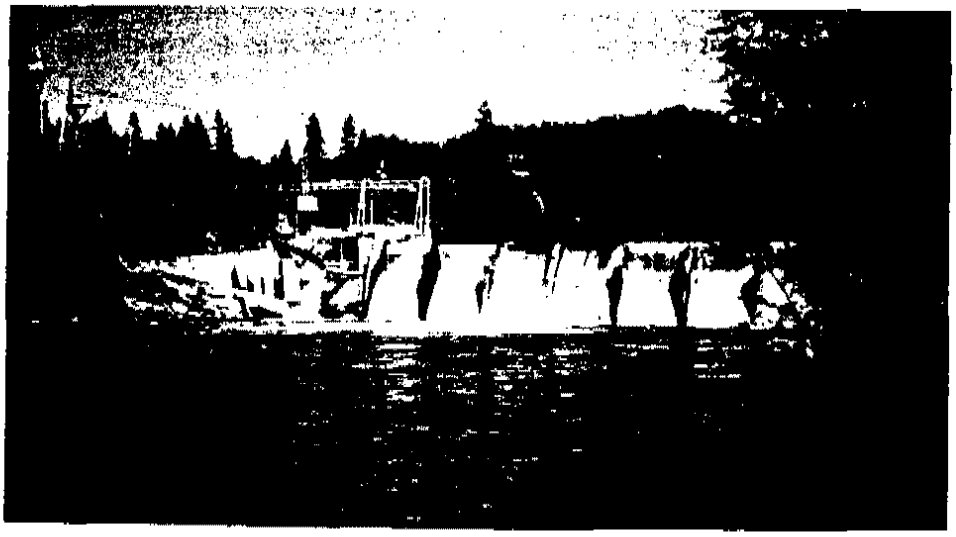

*Fig. 2***

***Fig. 1:** Savage Rapids Dam - north side spill over major obstacle to upstream migration of salmon and steelhead.
****Fig. 2:** Crest of dam - spill onto bedrock results in poor attraction of fish to ladders. Lower pools at south ladder create "hodge-podge" of passageways for fish to navigate.

During the irrigation season (April through September) when the stoplogs are in place, the level of the river is increased by about 11 feet and a small reservoir is formed behind the dam. This creates a slack-water pool of about 110 surface acres that extends upriver for approximately 3.5 miles. This shoreline area is heavily occupied by private homes or businesses, many of which have small docks, boat ramps, steps or other access means to the water. Swimming, fishing, boating, jet skiing, and water skiing are common summertime activities. In the winter, the reservoir is evacuated as the stoplogs are removed and the pool becomes riverine, with mostly river conditions of gravel bars, cobble, sand and mud flats along the shore, except for a small pool located immediately behind the dam.

Wildlife use of these habitats is mostly by those species associated with water/riparian areas where human disturbance is high. Waterfowl species are the most common, with greatest numbers occurring during spring and fall migration periods, although some species are present year-round. Diving ducks (mergansers, scaup, redheads, goldeneye, etc.) are common in the pool immediately upstream of the dam because of the numbers of small fish in this area. Migratory song birds are also common users of wooded forest or shrub areas, again mostly during spring and fall migrations. Use by wading or shore birds is limited to those areas and times when their habitats (flats, bars, shorelines) are available (drawdown) and human disturbance is limited. Aquatic mammals (mink, beaver, river otter, muskrat, nutria, raccoon) may use the area intermittently but are not likely to be permanent residences of the area.

FUTURE WITH THE PROJECT

Fish

Removal of SRD would allow unimpeded movement of anadromous fish both upstream and downstream in the Rogue River, and eliminate fish losses that presently occur. Pumping plant intakes would be placed well into the river at sites with adequate depth and flow, and with screens that meet existing screen criteria, so it is anticipated there would be relatively little (if any) fish losses with the new pumping operations.

Although some current anadromous fish runs to the Rogue River are at depressed levels (ODFW, 1992), operation of the Corps' Lost Creek Project and Cole Rivers hatchery has shifted a larger percentage of the basins production upstream of SRD (especially fall chinook, summer steelhead, and coho). Also, run sizes to the Rogue River vary as much as 10-fold, and the percent of total run component for each species/race varies by year(Table 3). Other changes that occur annually in terms of water year and conditions at SRD, operation of the irrigation system(GPID operations), hatchery practices and operation of the Lost Creek Project, also influence total numbers of fish at SRD and how they are impacted by passage conditions. Periodically since 1985 the resource agencies have discussed and recommended detailed biological studies to better understand and document the means and extent of losses at SRD, but these have never been accomplished.

The earlier prediction of losses (NMFS, 1979 & FWS, 1981) was determined by computing estimated losses that would occur for both adults moving upstream as well as for juveniles moving downstream, as a percent of the total number of

fish passing the dam, by species and race. Benefits were portrayed as increased numbers of adults returning to the Rogue River when the losses were eliminated or reduced, depending on the alternative. SRD removal and replacement with pumps would effectively eliminate all the losses. The earlier estimate was 22 percent of the total run size at SRD.

Because there have been no detailed biological studies, the resource agencies recommend that the 22 percent of total run size at SRD (as estimated by counts at Gold Ray Dam) can be used to depict a range of benefits for passage improvements for the present analysis. This range can be developed by looking at the high year, low year, last 10-year average, and an average for the total 53-year period of counts (1942-1994) at Gold Ray Dam. This analysis shows that the benefits would range from 30,850 adults in the high year (1987); 4,508 adults in the low year (1959); 17,227 adults for the last 10-year average (1985-1994); and 11,640 adults for the entire 53-year period average. Breakdowns by species and race are presented in **Table 8**.

This new analysis generates estimated benefits by mathematical calculations in a spread sheet format that varies the percentage mortalities by species and lifestage. It uses updated distribution abundance, both hatchery and wild stock, catch and escapement ratios, sport versus commercial catch, and other relevant information for each species. The range of mortalities were used based on other dams in the region with fish facilities and reasonable estimates by fish passage experts where studies have been conducted to document the mortality rates of these various fish passage facilities. This range of mortalities recognizes the variability in conditions that influence how fish are affected by passage conditions (beyond just the actual numbers of fish returning) and gives a range of values within which an average, annual loss (impact) likely lies. The mortalities ranged from a low of 5 percent for steelhead and 10 percent for salmon, up a high of 30 percent for all species, with the dam removal alternative. The dam retention alternative used low range mortalities of zero percent for both adults and juveniles (all species) and high range mortalities of 3 percent adults and 5 percent juveniles (all species).

The analysis looked at both escapement and harvest together, thus representing the total effect on production from the basin, and the full range of benefits with passage improvements. This is in contrast with the earlier analysis which looked as escapement only and calculated harvest benefits separately. **Table 9** shows a summary of the range of benefits from the ODFW updated analysis in comparison with the earlier analysis from the 1979-81 information. Based on new estimates of catch escapement ratios from the ODFW work (**Table 10**) the earlier escapement levels were used to generate existing production levels so that the estimate could be compared to these new numbers. The 26,700 spawning adults from the earlier work would represent a production level of 57,444 adults compared to the ranges of adults in the new ODFW analysis 20,865 to 93,541 for dam removal. The ODFW work has the advantage of using up-to-date information on the status and relevant life history requirements for Rogue Basin stocks of anadromous fish, and also shows that the earlier work is still a reasonable estimate of the potential benefits that would occur with passage improvements. Given the substantial number of anadromous fish passing upstream of SRD, and the very poor passage conditions that exist there now, even the lowest range of mortalities provides substantial benefits with improvements.

Table 8. Range of estimated benefits in increased adult anadromous fish returns to the Rogue River with removal of Savage Rapids Dam based on counts at Gold Ray Dam.

SPECIES	First Analysis[2]	High Year (1987)	Low Year (1959)	Last 10 Year Avg. (1985-94)	Since Lost Crk. (1977-94)	Period Avg. (1942-1994)
Spring Chinook	9,100	10,487	1,533	5,857	5,025	3,958
Fall Chinook	8,200	9,562	1,397	5,340	4,582	3,608
Coho	400	311	44	173	150	117
Summer Steelhead	4,400	4,935	721	2,756	2,364	1,862
Winter Steelhead	4,600	5,552	811	3,101	2,660	2,095
TOTAL	26,700	30,847	4,508	17,227	14,781	11,640

Using Gold Ray Dam counts for SRD passage adds a conservative factor to these benefits because of production that occurs in the mainstem Rogue River and tributaries (Evans Creek and other drainages) between these two structures. This is especially true for fall chinook and steelhead. Gold Ray Dam counts are good estimates for SRD passage numbers for spring chinook and coho salmon.

The range of numbers shown in Table 8 are developed by using the same total percentage (22%), with the same ratio for each species as its part of the total (i.e. 9,100 spring chinook out of 26,700 fish means spring chinook is 34% of the total returns to SRD, as based on counts at Gold Ray Dam. However, another likely source of variation in fish benefits with passage improvements, is the variation in rates of mortalities to adults and juveniles that would occur with different passage conditions. In other words, vary the 22 percent.

Based on criticisms that the earlier analysis and not representative of current conditions for Rogue Basin anadromous fish, and to show the benefits based on a range in levels of mortalities to both juvenile and adult fish, the ODFW conducted a separate analysis of potential benefits with passage improvements at SRD (ODFW Oct. 94 and March, 95). The details of this separate analysis are attached as appendix A & B to this report.

[2] From earlier analysis of benefits (NMFS, 1979 & FWS, 1981).

Table 9. Estimated range of benefits (increased production) from ODFW updated analysis compared to earlier analysis for SRD fish passage improvement alternatives.

SPECIES	NMFS, 79 & USFWS, 81[3]		ODFW 94 & 95[4]				
	(Escapement)	(Harvest)	Dam Removal			Dam Retention	
			(H)	(M)	(L)	(H)	(L)
Spring Chinook	9,100	9,100	30,548	14,097	6,326	30,548	2,495
Fall Chinook	8,200	16,400	13,737	7,927	5,338	10,675	1,002
Coho	400	400	1,929	890	400	1,809	787
Summer Steelhead	4,400	2,728	25,697	10,402	4,665	25,697	1,072
Winter Steelhead	4,600	2,116	21,630	10,304	4,136	21,630	159
	26,700 +	30,744					
TOTALS:	57,444		93,541	43,620	20,865	90,358	5,515

[3] Includes only dam removal alternative, dam retention has 5% less benefits because of some passage problems that would continue with new facilities (FWS, 1990). Harvest levels are determined based on catch:escapement ratios (Table 10) to develop comparable production numbers to ODFW work.

[4] Each alternative has a range of benefits - high (H) medium (M) or low (L), based on different mortalities to adults and/or juveniles, and include both escapement and harvest to show the range in total increases in productino (See Appendix A & B for spreadsheet analysis from ODFW, 1994 & 1995).

Table 10. Updated Economic Information for Conducting Benefit Analysis of Fish Passage Improvements at Savage Rapids Dam

Species	Catch[5] Escapement	%Commercial[6] Sport Harvest	Avg.[7] Weight	Exvess[8] Price	#Days[9] Sport Harvest
Spring Chinook	2:1	90:10	9.3 lbs.	$1.69	1.08
Fall Chinook	1:1	78:22	9.3 lbs.	$1.69	1.08
Coho[10]	1:1	66:34	5.3 lbs.	$1.25	1.08
Summer Steelhead (Hatchery Only-31%)	2:1	0:100			3.3[11]
Winter Steelhead (Hatchery only-23%)	2:1	0:100			2.9[12]

[5] From ODFW estimations of SRD impacts on salmon steelhead (ODFW, 1995).

[6] Statewide average for eighteen-year period, 1971-1988 (Pacific Fisheries Management Council, 1989).

[7] 1987 Statewide Average (ODFW, 1989).

[8] Ten-year Average for Period 1978-1987 (ODFW, 1989).

[9] Eight-year Average for Period 1981-1988 (Pacific Fisheries Management Council, 1989).

[10] While there was no harvest of Rogue River coho in the 94 and 95 seasons, it is assumed there would be a modest harvest rate in recovering populations based on passage improvements at SRD and implementation of other restoration efforts (watershed health initiatives, Northwest Forest Plan, etc.)

[11] Steelhead catch effort calculated from ODFW creel census information associated with Elk Creek Project (ODFW, 1989). Information is applicable to hatchery population because wild fish are catch and release only.

[12] Same as 11.

In summary, even though these numbers are conservative, they represent significant numbers of fish under any circumstances, and would contribute significantly to increased productivity in the Rogue River Basin at a time when some runs are at depressed levels and much effort is focusing on restoration and recovery.

Wildlife

Only minor changes to wildlife would occur with removal of SRD. A 110-acre, 3.5-mile-long seasonal reservoir (irrigation season) would be converted from a slack water pool to a free-flowing river. Some waterfowl species that use the pool area for foraging and resting would be displaced by wildlife associated with riverine (flowing) conditions. Dippers, mergansers, mallards, mink, raccoon, and numerous shorebirds and waders would use exposed shorelines, riffles or gravel/sand bars and flats that are now flooded during the irrigation season, i.e. when most of the shoreline is someone's back yard. Because the existing shoreline area is highly developed as private homes or businesses, and human disturbance would continue to be high with dam removal (river uses may shift from existing private use to increased public use for water-related activities, e.g., floating, rafting, boating, etc.), overall wildlife use of the project area would remain low. About 2 acres of riparian tree and shrub habitat in the area of the existing dam would be removed when the pumping plants are installed.

DISCUSSION

The preferred Federal action is to remove Savage Rapids Dam (SRD) and replace it with pumping plants to provide water to the GPID, and finally resolve long-term fish passage problems that continue to exist at the dam. This action supports the decision of the Board of Directors of GPID as identified in its Water Management Improvement Study final report to the Oregon Water Resources Commission, dated March 8, 1994; and the action of the Water Resources Commission in issuing a permit for continued withdrawal of water at SRD by GPID, pending removal of the dam within 5 years and replacement with pumps (Oct., 1994).

An alternative to the preferred plan includes leaving SRD in place and renovating all fish passage facilities and the pumping system. While fish benefits would be substantial with this plan, the earlier analysis of benefits estimated that losses of about 5 percent of adult passage at SRD would still occur. This difference may be low because some problems (predation in the pool and at the dam) would still remain, and the opportunity to restore fall chinook spawning in gravels in the impounded reach would not be realized. The ODFW analysis (Appendix B) provides a range of benefits for evaluating this alternative of SRD retention and passage improvements. The assumptions for the low range values are that the existing passage conditions at the dam cause low percentage losses to fish, and with improvements in fish passage, some low level of losses would likely continue, thus a small difference between the two. Conversely, the high range assumes an existing high level of losses, and no losses with the new passage facilities (unrealistic), and thus a large difference between the two. The straight-across assumption from the earlier report (FWS, 1990) of about five percent losses that would still occur are well within the range of values developed by the ODFW analysis.

Additionally, the dam retention plan would cost approximately $6.4 million more, and still be subject to short-term but significant fish losses at any time when there may be a system failure with any of the new fish facilities. A similar situation happened most recently in the fall of 1991 when the bottom seal on one of the gravity canal drum screens failed, and up to 100,000 spring chinook smolts were diverted into the canal. The ODFW estimated that of these about 10,000 fish were lost.

Of even greater concern for the long term with dam retention is the ongoing urban development of the GPID service area and lands being converted to housing and placed on the Grants Pass City's water supply system. This means there may be a smaller and smaller patronage responsible for the O & M costs. This could be particularly difficult with the higher costs of the dam retention alternative and the need to maintain expensive new fish facilities and upkeep on an old, outdated dam. At any such time that the costs of doing business could not be met, if the GPID would cease to exist, then the facilities could become the public's responsibility. If this unfortunate scenario occurred in the future, under either alternative, then the preferred plan has the distinct advantage in that it has dealt with what would be the biggest liability, the dam. For these reasons, it is the recommendation of the resource agencies that dam removal is the only viable option at this time, and dam retention would not be preferred by the Federal government.

To avoid a listing of salmon or steelhead species under the Endangered Species Act, it will be necessary to protect the diversity and genetic integrity of individual stocks of anadromous fish and insure connectivity between these stocks. This means recognizing the value of wild fish and the habitat it takes to produce these fish. This concept has formed the broad basis for several region-wide conservation efforts to restore fish populations to sustainable levels. Most notable in the region include the Northwest Forest Plan for ecosystems management of forests within the range of the northern spotted owl, and the Fish and Wildlife Program of the Columbia River Basin under the Northwest Power Act.

A recently completed draft handbook for identification and prioritization of salmon restoration opportunities in Oregon identifies the need to focus on healthy ecosystems and relatively sound stocks of fish as the most important starting point (Pacific Rivers Council, 1995). This system was developed by a working group that included fishery scientists, resource managers, fishing interests and conservation groups, and a test of the process was initiated in three broad western Oregon regions. A preliminary ranking from this effort identified the Lower Rogue River Basin below Gold Ray Dam as one of two areas with a "very high priority" for restoration. This area was targeted because it has several areas identified by the Northwest Forest Plan and American Fisheries Society for restoration work, and it has a history of relatively large, healthy, and/or diverse stocks of fish.

Also, the state of Oregon has 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 Northwest Forest Plan, BLM and Forest Service projects in the Southwest Oregon Province, Rogue River Basin, included watershed restoration for anadromous fish totaling approximately $1.5 million in 1994. These restoration efforts 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.

Removal of SRD and the expected increase in anadromous fish to the Rogue River Basin would strongly compliment habitat restoration efforts. Increased escapement would mean more fish to effectively utilize restored habitat. The 1970's analysis of benefits completed by NMFS and FWS estimated that approximately 45 percent of the spawning population of anadromous fish occurred upstream of SRD, ranging from 100 percent for spring chinook to 11 percent for fall chinook. Since operation of the Lost Creek project in 1977 it appears that, in general, the upper basin is producing a greater portion of the basin's total production, especially since the lower basin tributaries have extremely depressed runs (ODFW, 1992). An increase in adult returns to the Rogue River of 22 percent of the runs as estimated by counts at Gold Ray Dam is a significant number of fish in any given year, ranging between 4,508 fish to 30,847 fish for the low and high years, and an average of 17,227 adults for the last 10 years of returns, 1985-1994 (Table 8, pg -). These fish would contribute significantly to increased production of wild fish in the basin, and support significant sport and commercial fisheries that occur in the ocean and in the river. For steelhead and coho, these represent increases to stocks that are at depressed levels and/or have been or may be proposed for listing under the Endangered Species Act.

The NMFS proposal to list the Klamath Mountain Province (KMP) steelhead as a threatened species has been challenged by the ODFW as inappropriate for the status of these steelhead in Oregon waters (ODFW, 1995). ODFW's evaluation of the NMFS proposal suggests that too much emphasis was placed on catch data, incorrect data were used in a model of natural return ratios, and in particular that Rogue River steelhead populations vary differently than other populations in the KMP. Trend analyses of overall wild steelhead production in the Rogue River Basin did not show a significant change during the period 1976 through 1994, but various run components showed different responses. Wild winter steelhead were stable during this period and the early-run wild summer steelhead increased while a late-run component of the wild summer steelhead decreased.

Regardless of whether the KMP steelhead are listed, substantial numbers of steelhead would benefit from improved passage conditions at SRD. Of the 26,700 fish estimated from the earlier benefits analysis, 9,000 were steelhead (or 34% of the total). Similar figures from the ODFW analysis for dam removal (Appendix A) are 8,801 steelhead (42% of the total) for the low range estimate, and 47,328 steelhead (51% of the total) for the high range estimate. The ODFW figures also include harvest so are larger than numbers that just consider escapement (spawning fish). ODFW estimates of wild fish as a percent of the total population for runs upstream of Gold Ray Dam are 33 to 77 percent for summer steelhead and 68 to 87 percent for winter steelhead. Accordingly, a substantial portion of the benefits will occur to wild fish, thus aiding the enhancement or recovery of these runs.

For purposes of economic analysis, benefits in increased adult returns were used to calculate dollar values based on catch escapement ratios for each species/race of fish and how they contribute to the fisheries. The total dollar values from the 1981 report (FWS, 1981) were based on figures developed by NMFS for the Columbia River. Later figures for the Rogue River (ODFW, 1988)

show a total value of $31.5 million annually based on a catch of 162,000 chinook salmon (sport and commercial) and 95,000 steelhead. Of the estimated 375,000 anadromous fish produced, this would leave an escapement of 118,000, or an average value of $267 per escaping adult. This compares to the value of $236 per escaping adult when considering all species from the 1981 report.

In the 1990 letter the FWS provided an updated list of figures (FWS, 1990) that could be used for an economic analysis based on Rogue Basin data where it was available, or from state-wide averages otherwise. The USFS, BLM, ODFW and Rogue Valley Council of Governments have undertaken an economic valuation study for the Rogue Basin that should be completed in the summer of 1995. To date, early information has been developed for summer steelhead and fall chinook inriver sport fisheries. Until such time as the study is complete, we believe that the 1995 information from the ODFW analysis (Appendix A - catch escapement ratios, etc.) is the most complete information and recommend it be used for economic analysis as shown in Table 10, page -). It should be noted that the economic information in this form is very dynamic and subject to a great deal of change from year to year. For example, the overall dollar value is based on the value of an escaping adult and the contribution that production makes to future catch, when, in fact, catch has been extremely restricted to help increase escapement for runs that are depressed (in fact, all ocean coho sport and commercial harvest in 1994 was prohibited with similar restrictions in 1995). The more important value of returning fish is the biological contribution they make to preservation of stocks and recognition of their diversity and genetic integrity.

Because of the substantial benefits to anadromous fish in the Rogue River Basin with the preferred plan, and the strong connection between this action and habitat restoration projects being implemented on both public and private lands in the basin, the resource agencies also recommend that the BR seek to implement this plan on an accelerated basis - possibly seeking action through a Congressional add-on appropriation. It is further recommended that the costs of implementing this plan be considered a Federal, nonreimbursable cost because benefits are almost exclusively for anadromous fish - species of high national interest, some stocks of which are at record low levels of escapement and may be placed on the Endangered Species list for protection. Early efforts now to reverse declines could be the first major steps to recovery for some stocks.

RECOMMENDATIONS

Based on the summary of information presented here, it is the recommendation of the Fish and Wildlife Service, Oregon Department of Fish and Wildlife, and the National Marine Fisheries Service, that:

1) The Bureau of Reclamation seek Congressional authorization to remove Savage Rapids Dam and replace it with pumping plants to permanently resolve long standing fish passage problems at the dam;

2) Implementation of these measures be sought on an accelerated time frame to expedite restoration efforts for declining stocks of anadromous fish in the Rogue River Basin;

3) Funding for this effort be a nonreimbursable Federal cost because of the substantial benefits to anadromous fish; and

4) The construction schedule for dam removal be coordinated closely with the FWS, ODFW and NMFS to coordinate the specifics of in-water work schedules and activities with fishery concerns.

Please let us know of your response to these recommendations and of any changes in project plans or details that would require new or additional analysis by the resource agencies.

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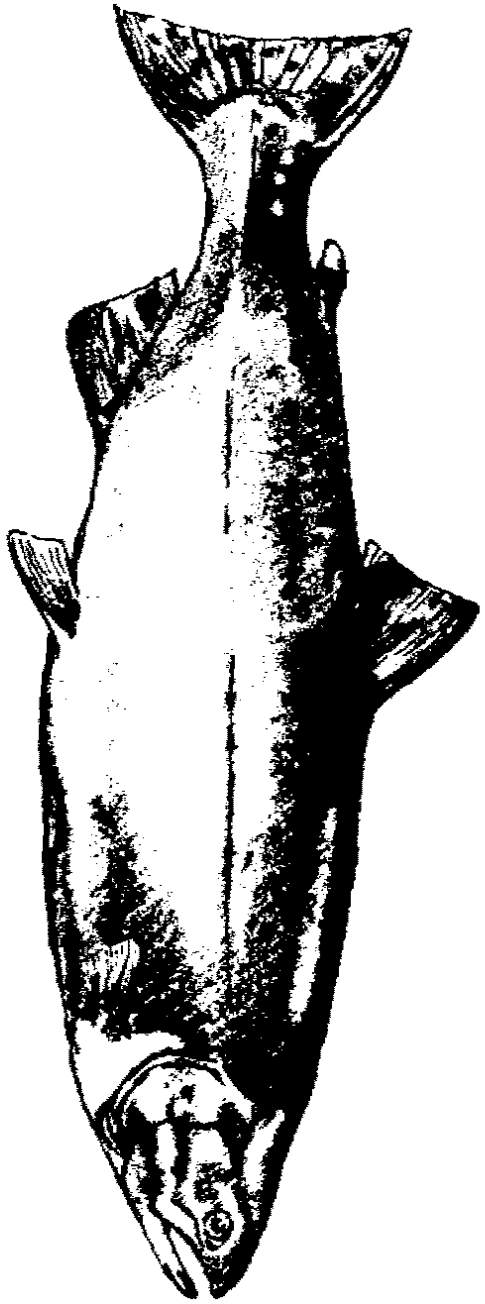
APPENDICES

Appendix A: Estimation of benefits for Savage Rapids Dam removal option, spread sheet analysis conducted by the ODFW, 1994.

Appendix B: Estimation of benefits for Savage Rapids Dam retention and improvement option, spread sheet analysis conducted by the ODFW, 1995.

Editor's Note: Appendix A and B of the USFWS Coordination Act Report are not duplicated here. These two documents along with the transmittal letters of the Oregon Department of Fish and Wildlife are included in Attachment D.



Attachment D—ODFW Documents

Oregon

DEPARTMENT OF
FISH AND
WILDLIFE

OFFICE OF THE
DIRECTOR

December 9, 1993

Mr. Dan Shepherd, Manager
Grants Pass Irrigation District
200 Fruitdale Drive
Grants Pass, Oregon 97527

Dear Mr. Shepherd:

Oregon Department of Fish and Wildlife (ODFW) has worked with Grants Pass Irrigation District (GPID) to find solutions to the long-standing fish passage problems at Savage Rapids Dam. The purpose of this letter is to inform GPID of ODFW's recommendations for resolving this issue. From a fish passage perspective, ODFW believes that the preferred alternative is dam removal. The second alternative, dam and fish passage structure replacement, would be acceptable provided that state-of-the-art fish passage structures were installed and properly maintained and operated. ODFW will not support any alternative that proposes to modify existing structures, because these structures have well outlived their useful lives and modifications would only be expected to result in temporary, partial improvements in fish survival. This letter describes the reasoning that has led ODFW to these conclusions.

The anadromous fish populations in the Rogue River are critically important to the State of Oregon. They provide both a nationally recognized sports fishery and support coastal and ocean commercial fisheries. The south coast of Oregon, including the Rogue River, has been identified by the Governor as a high priority area for restoring anadromous fish (primarily salmon and steelhead) populations. Southern Oregon is also a high priority focal area of the Federal agencies implementing Option 9 of President Clinton's Forest Ecosystem Management Assessment Team Report. ODFW is working to reduce fish losses from all sources, including losses associated with habitat degradation, hatchery practices, harvest practices, and passage at dams. Complete restoration will only occur when all of these problems have been addressed, including losses at Savage Rapids Dam.

ODFW has participated closely with GPID in the technical work group that directed and reviewed the studies conducted as part of a 1990 temporary water right permit issued to GPID by Water Resources Department. Although the major purpose of these studies was to evaluate water use efficiency and options for reducing water use, GPID was also directed to evaluate the following concerns related to fish survival at Savage Rapids Dam:

2501 SW First Avenue
PO Box 59
Portland, OR 97207
(503) 229-5406
FAX (503) 229-6134

"k. *Fish losses caused by Savage Rapids Dam and GPID canal system and the operation thereof. This consideration shall also include identification of options that will reduce or eliminate fish losses that may be associated with the GPID diversion and conveyance system.*

l. *Potential improvements and operational measures including removal of Savage Rapids Dam, which would improve fish passage and habitat and decrease fish losses. Identify the cost and benefits of such projects and measures."*

Water Resources Department, Permit 50957, issued April 19, 1990

Studies to evaluate these issues were conducted by the U.S. Bureau of Reclamation (Bureau), using both existing and new data. The Bureau's report concludes that the alternative which would result in the least impact to fish is the option in which Savage Rapids Dam would be removed and water supplied to GPID with pumping stations. A second alternative, which results in less benefits to fish, is the replacement option in which the dam would be refurbished, including installation of new fish ladders and screens and spillway. Both the Bureau's analysis and that of the consultant hired by GPID conclude that dam removal is the least cost alternative.

Conclusion

Based on ODFW's review of the subject studies and the long history of fish passage problems at Savage Rapids Dam, ODFW believes that dam removal is the preferred alternative. As stated above, fish passage structure replacement would be an acceptable alternative provided that state-of-the-art fish passage structures were installed and properly maintained and operated. Minor modifications to existing structures are not acceptable to ODFW. We have discussed this with the National Marine Fisheries Service and U.S. Fish and Wildlife Service and understand they also support this position and will document that in correspondence to you.

I understand that this is a very difficult decision for the GPID Board. I hope that this clarification of ODFW's perspective will help the Board in making its decision. I will commit to assist and support GPID in seeking federal funding for implementation of solutions to the fish passage problems at Savage Rapids Dam. In order to obtain this funding, it will be necessary for all involved agencies, districts, and interest groups to work together to acheive our individual and mutual goals. I look forward to this opportunity.

Sincerely,

Randy Fisher
Director

RF/sb

Oregon

DEPARTMENT OF
FISH AND
WILDLIFE

OFFICE OF THE
DIRECTOR

October 26, 1994

Dear Interested Public:

Enclosed is a technical report prepared by Oregon Department of Fish and Wildlife (ODFW) which provides estimates of the impacts of Savage Rapids Dam on salmon and steelhead populations in the Rogue River. In 1979 the National Marine Fisheries Service conducted an analysis which concluded that an additional 26,700 adult fish could be produced if the dam were removed. In response to questions regarding the current applicability of the NMFS estimates, ODFW staff biologists were asked to review current information and make an independent estimate of potential increases in salmon and steelhead populations if the effects of the dam were eliminated by addition of state-of-the-art fishways and screens or by dam removal.

The estimates in this study are based on the "dam removal" alternative. We are in the process of conducting a similar analysis that is based on the "dam retention" alternative, in which the facility would be retrofitted with state-of-the-art fishways, screens, and other modern-day technology to pass fish.

If you are interested in receiving ODFW's analysis of the "dam retention" alternative when it is completed, please request a copy from Stephanie Burchfield, ODFW, 2501 SW First Avenue, Portland, Oregon 97207, or by telephone at (503) 229-6967, extension 441.

Sincerely,

RUDOLPH A. ROSEN
Director

Attachment

2501 SW First Avenue
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ESTIMATION OF ROGUE RIVER SALMON AND STEELHEAD POPULATION INCREASES FOR THE SAVAGE RAPIDS "DAM REMOVAL" OPTION

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Background

This report presents estimates of potential Rogue River salmon and steelhead population increases that would be expected if Savage Rapids Dam were removed. These estimates are based upon Oregon Department of Fish and Wildlife's (ODFW) most recent effort to model fish mortality associated with the dam. The assessment incorporates updated information concerning the life history and abundance of anadromous fish species that migrate past the dam.

In 1979 the National Marine Fisheries Service (NMFS) conducted an analysis which concluded that upstream and downstream passage problems at Savage Rapids Dam, as well as loss of fall chinook spawning habitat by reservoir inundation, caused significant losses of Rogue Basin salmon and steelhead (NMFS 1979). The NMFS estimated that if these problems were corrected, the populations would increase annually by 26,700 adult fish as measured at the dam.

In the course of recent discussions concerning the conditions of a temporary water right for the Grants Pass Irrigation District, many people have stated that the NMFS fish loss estimates may be outdated and no longer applicable. Because of the controversy surrounding the NMFS estimate, ODFW staff biologists were asked to review current information and make an independent estimate of potential increases in salmon and steelhead populations if the effects of the dam were eliminated by addition of state-of-the-art fishways and screens or by dam removal.

The following analysis makes use of the best techniques for mathematically predicting population increases given changes at the dam site. These techniques allow rapid and accurate estimates of the population numbers we seek, but without the great expense of extended and time-consuming analysis. Project applicants often legitimately complain about the time and expense of environmental evaluations that frequently yield information only slightly more reliable than can be predicted by the mathematical techniques used in this study. By this technique ODFW biologists are able to compute the lowest possible level of fish loss caused by

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the facility, as well as the highest level reasonably possible. These high and low estimates are based on generally accepted averages for fish losses derived from studies at dams and water diversions of all possible configurations.

The high and low estimates are used to set the reasonable boundaries, within which the actual population number will lie. Biologists also computed an average estimate which falls within this range. However, because a number of factors influence this number from year to year, the actual population number will vary yearly, but this variation is expected to fall within the high and low boundaries discussed above.

In making a comparison with the NMFS estimate, this technique will tell whether the NMFS estimate was reasonable, because it falls within the estimated range, or will tell if the NMFS estimate was unreasonable, because it falls outside the range of reasonable possibility. For making general decisions, this technique offers quick and accurate results, as well as a wide range within which the actual population numbers will lie. This technique is particularly appropriate for making general estimates of numbers that tend to change from year to year, as do the fish populations at issue here, for example due to factors such as changing ocean and harvest conditions. While great expense and time could be expended to refine the estimate, this only would better home in on a number that would lie somewhere within the range of numbers already predicted by this study, and a number that can change from year to year anyway.

The estimates in this study are based on dam removal. We are in the process of conducting a similar analysis that is based on retrofitting the facility with state-of-the-art fishways, screens, and other modern-day technology to pass fish. While this analysis is not yet complete, such retrofit of the dam will yield somewhat less protection to fish than complete dam removal, because even the best designed fishway of today impedes fish passage to some degree. However, improvements in fish passage using modern technology will offer a significant advantage to fisheries over the current situation.

Approach

Upstream and downstream mortality estimates were assumed similar to generally accepted standards for such mortality as determined through experimental methodology at other dams. In making estimates for the Savage Rapids Dam, present design of the fishway, screens, and spillway and the operating condition of the facilities were taken into account (Franklin Young, July 1994; see attached memo). The fishways are old and designed to engineering standards no longer considered effective for fish passage. Fish facilities at this dam do not meet current design criteria used by ODFW, NMFS and the U.S. Fish and Wildlife Service (USFWS). Low, mid, and high estimates were made in order to bracket the likely range in juvenile and adult passage mortality at Savage Rapids Dam.

Our estimates state the results in terms of additional adult fish passing the dam site, plus contributions to downstream and ocean fisheries. Although the NMFS estimate of 26,700 fish did not include harvest impacts, a subsequent analysis by USFWS predicted that 87,900

additional fish could be harvested based on an increased escapement of 26,700 (USFWS 1990). Adding the NMFS and USFWS estimates results in a total of 114,600 additional fish. Our estimates are generally higher than the NMFS estimate yet lower than the total NMFS and USFWS estimates.

During low return cycles ocean and river harvests are heavily restricted, thus the ratio between the number of fish harvested and those fish escaping to spawn varies over the years. In general, Rogue salmon and steelhead fisheries have been curtailed in recent years to reduce harvest on specific populations in the lower river and in other coastal basins. Therefore, ODFW used lower harvest rates than the USFWS used in its assessments of harvest impacts in order to better reflect current conditions. This explains why ODFW's range of estimates is less than the total USFWS and NMFS estimates of 114,600 additional fish for harvest and escapement.

"Half-pounder" steelhead in the Rogue River are immature steelhead that typically enter the ocean in the spring, reside there three to five months, return to freshwater, and reside in the lower portions of the Rogue River for five to seven months, prior to returning to the ocean. This is a major component of Rogue River steelhead fisheries. While most "half-pounders" generally do not get as far upstream as Savage Rapids Dam, they make a significant contribution to downstream sport fisheries. Because juvenile steelhead production above Savage Rapids Dam contributes to this fishery, the potential increase in harvestable fish resulting from juvenile losses at the dam is accounted for in this assessment.

Details and calculations associated with ODFW's estimate are contained in the attached tables 1 through 19.

Results

Tables 1 through 5 show the assumptions and calculations that were made to estimate annual increases in harvest and spawning populations of spring chinook, fall chinook, summer steelhead, winter steelhead, and coho salmon. These increases, termed "mid range" estimates, use an average upstream fish mortality rate of 15% and an average downstream fish mortality rate of 15%. These estimates fall between the "low" and "high" estimates that will be discussed below. The numbers represent potential increased production of adult fish in the Rogue River if the following fish impacts at Savage Rapids Dam were eliminated: juvenile fish injury and mortality during the downstream migration, adult fish injury, mortality and delay during the upstream migration, and lost spawning opportunities associated with reservoir inundation of historic and potential habitat. The tables cite sources of data and assumptions used in the mathematical computations. The "Literature Cited" section provides full reference information for these sources.

Table 6 is a summary table that lists "mid range" estimates for each species. Based on the assumptions in this model, we estimate that an additional 43,620 salmon and steelhead would be produced annually if Savage Rapids Dam were removed.

Tables 7 through 11 represent "low range" estimates of additional salmon and steelhead production based on upstream and downstream mortality rates at Savage Rapids Dam of 10 and 5 percent, respectively. Table 12 summarizes the "low range" estimates for each species, and shows a combined "low range" estimate for all species of 20,865.

Tables 13 through 17 represent "high range" estimates of additional salmon and steelhead production attributable to Savage Rapids Dam. These tables use the same mathematical model as that shown in detail in tables 1 through 5; however, mortality rates at the dam represent the high end loss estimates of 30 percent for both juvenile and adult passage. Table 18 summarizes the "high range" estimates for each species, and shows a combined estimate of 93,542 for all species.

Table 19 summarizes previous tables and shows the range of additional production for each species. Figure 1 shows this information for each species in graphical form. For all species combined, our estimates range from a low of 20,865 to a high of 93,542, with a mid-range estimate of 43,620 as shown in Figure 2.

Conclusions

The range of numbers obtained, 20,865 to 93,542 fish annually, represents a reasonable range of estimates for expected salmon and steelhead population increases attributable to Savage Rapids Dam removal. As stated above, actual increases will vary yearly, and are highly dependent on run sizes and harvest rates. Coho salmon estimates are primarily based on hatchery fish numbers, and the effects on naturally produced coho are not considered. Potential listing of coho under the federal Endangered Species Act would make such a calculation meaningless, because when populations are listed as either threatened or endangered, the value of each individual fish to recovery efforts becomes significantly higher than its harvestable value.

Two alternatives to correct fish passage problems at the dam are under consideration: dam removal and dam retention with modifications. The calculations in the tables assume that the current loss rates would be reduced to virtually zero in order to produce the estimated fish benefits. These calculations are most representative of the "dam removal" option. The "dam retention" alternative, in which state-of-the-art fish passage facilities would be installed, would significantly reduce existing fish passage mortalities, although some losses of juvenile and adult fish would continue at the dam, and fall chinook salmon spawning habitat in the reservoir area would remain unavailable. We currently are making a series of computations that would provide a reasonable range of population increases expected with improvements at the dam.

The model that we developed predicts population increases in the same range as the NMFS' 1979 estimate of 26,700. As described above, the NMFS analysis estimated potential increased adult fish returns to the dam and did not include harvest increases. The USFWS' 1990 analysis concluded that an increased escapement potential of 26,700 adult fish passing Savage Rapids Dam represents an additional increase of 87,900 fish to commercial and sport harvest (USFWS 1990). Hence, using the NMFS and USFWS estimates, approximately

114,600 additional adult fish could be produced annually if Savage Rapids Dam were removed. This total estimate is greater than the high range estimate predicted in our model. The reason for this discrepancy is that run sizes and harvest rates were higher during the years in which USFWS based its analysis than they are today. If run sizes and harvest rates increase in future years, we would expect total fish population increases attributable to Savage Rapids Dam removal to more closely approximate the 114,600 estimate than our range of 20,865 to 93,542.

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Table 1. Estimated Spring Chinook Salmon Increases Resulting from Savage Rapids Dam Removal - Mid Range

Adult Production = Upper river (UR) returns + River harvest + Ocean harvest

Assumptions:

UR returns =	31,126	Source: Gold Ray Dam counts, 1942 - 93 average
Lower river harvest rate =	28%	Source: Cramer et al, 1985, p. 255 (1964-81); does not include jacks
Ocean harvest =	43,397	Source: Satterthwaite, 1987, p.27, Table 9; catch:escapement = 1:1

Calculations:

River harvest = 0.28(Total fish at mouth) = 0.28(UR return + River harvest) = 0.28 (UR return)/(1-0.28)

River harvest = 0.28(31,126)/0.72 = 12, 105

Upper R. Returns	+ River Harvest	+ Ocean Harvest	=	Adult Production
31,126	12,105	43,397		86,628

Upstream adult passage at dam

Assumptions:

SRD adult upstream mortality = 15%(Adults at base of SRD) Source: Young, 1994 (estimated range 10-30% adult passage loss)

Assume no loss between Savage Rapid (SRD) and Gold Ray (GRD) dams

Calculations:

Adults at base of SRD = GRD counts + SRD Upstream Loss = GRD counts + 0.15(Adults at base of SRD)

0.85(Adults at base of SRD) = GRD counts

Adults at base of SRD = GRD counts/0.85 = 31,126/0.85 = 36,619

Adults at base of SRD	x	SRD adult mortality rate	=	Adult increase due to eliminating SRD adult passage loss
36,619		15%		5,493

Downstream juvenile passage at dam

Assumptions:

SRD juvenile mortality = 15%(smolts migrating to SRD)	Source: Young, 1994 (estimated average 10-15%, and range 5-30%)
Hatchery smolts produced = 1,458,000	Source: ODFW, hatchery release data, 1986-94
Wild smolts produced = 1,410,000	Source: ODFW unpublished data, mean for 1976-90
Hatchery smolt-to-adult survival rate = 2%	Source: ODFW, hatchery data, includes harvest
Wild smolt-to-adult survival rate = 2%	Source: Satterthwaite, 1994, personal communication.

Calculations:

SRD juvenile loss (hatchery) = 15%(1,458,000) = 218,700

SRD juvenile loss (wild) = 15%(1,410,000) = 211,500

Adult equivalent increase due to eliminating SRD downstream loss = (SRD hatchery juvenile loss x hatchery smolt-to-adult survival rate) + (SRD wild juvenile loss x wild smolt-to-adult survival rate) = (218,700 x 0.02) + (211,500 x 0.02) = 8,604

Adult equivalent increase due to eliminating SRD downstream loss = 8,604

Total Spring Chinook Increase		Upstream Passage		Adult Equiv. Downstream Passage
14,097	=	5,493	+	8,604

Table 2. Estimated Fall Chinook Salmon Increases Resulting from Savage Rapids Dam Removal - Mid Range

Above Savage Rapids Adult Production = Upper river run at mouth + Ocean harvest of fish originating above SRD

Assumptions:

Upper river run at mouth = Spawning escapement + River harvest + lower river prespawning mortality

Spawning escapement = Gold Ray Dam counts + Spawning between SRD and GRD

Gold Ray Dam counts =	3,148	Source: Gold Ray Dam counts, 1942 - 93 average
Spawning between SRD and GRD =	9,350	Source: Satterthwaite, 1992 (500 fish/km)
River harvest =	9.5% (upper river run at mouth)	Source: ODFW, 1992, p.78, 1974-86 average
Prespawning mortality =	20%(upper river run at mouth)	Source: Satterthwaite, personal communication
Ocean harvest =	2(upper river run at mouth)	Source: Satterthwaite, personal communication, assume C:E = 2:1 for upper river fall chinook

Calculations:

Spawning escapement = 3,148 + 9,350 = 12,498

Upper river run at mouth = 12,498 + 0.095(upper run) + 0.20(upper run)

Upper run(1-0.095-0.20) = 12,498

Upper run = 12,498/0.70 = 17,728

River harvest = (0.095)(17,728) = 1,684

Prespawning mortality = (0.20)(17,728) = 3,546

Ocean harvest = 2(17,728) = 35,456

Above Savage Rapids Adult Production = 17,728 + 35,456 = 53,184

Adult spawning habitat increases

Loss of spawning potential = Potential adults that would spawn in channel inundated by SRD reservoir and below SRD

Assumptions:

Potential adults spawning in channel inundated by reservoir =	770	Source: Satterthwaite, 1992;
Potential adults spawning in channel downstream of SRD =	154	based on 1974-81 carcass surveys
Total potential SRD spawning adults =	924	adjusted for prespawning mortality

SRD potential spawners are harvested at same rates as upper river run fish:

River harvest = 9.5%(run at mouth)

Ocean harvest = 2(run at mouth)

SRD potential spawners at mouth = SRD spawning adults + River harvest

Total adult increases if inundated spawning habitat were restored = SRD spawning adults + (river harvest + ocean harvest of SRD spawning adults)

Calculations:

SRD run at mouth = 924 + 0.095(SRD run at mouth)

(SRD run at mouth)(1-0.095) = 924

SRD run at mouth = 924/(0.905) = 1,021

River harvest = 0.095(1021) = 97

Ocean harvest = 2(1021) = 2,042

Total adult increases if inundated spawning habitat were restored = 924 + 97 + 2,042 = 3,063

Total adult increases if inundated spawning habitat were restored = 3,063

Table 2, continued. Estimated Fall Chinook Salmon Increases Resulting from Savage Rapids Dam Removal - Mid Range

Upstream adult passage at dam

Assumptions:

SRD adult upstream mortality = 15%(Adults at base of SRD) Source: Young, 1994 (estimated range 10-30% adult passage loss)

Spawning escapement = Gold Ray Dam counts + Spawning between SRD and GRD = 12,498

Spawning escapement = 0.85(Adults at base of SRD)

Calculations:

Adults at base of SRD = Spawning escapement/(0.85) = 12,498/(0.85) = 14,703

SRD adult upstream mortality = 0.15(14,703) = 2,205

Adult increase due to eliminating SRD adult passage loss = 2,205

Downstream juvenile passage at dam

Assumptions:

SRD juvenile mortality = 15%(juveniles migrating to SRD) Source: Young, 1994 (estimated average 10-15%, range 5-30%)

Wild juvenile-to-adult survival rate = 2% Source: ODFW unpublished data, 1976-90 average

(Juveniles produced each year)(Juvenile-to-adult survival) = Upper river adult run at mouth

Ignore loss to juveniles of potential spawning fish in SRD reservoir

Adult equivalent potential increase = (SRD juvenile mortality)(Juvenile-to-adult survival)

Calculations:

Juveniles produced = Upper river adult run at mouth/juvenile-to-adult survival = 17,728/0.02

Juveniles produced = 886,400

SRD juvenile mortality = 0.15(886,400) = 132,960

Adult equivalent increase due to eliminating SRD downstream loss = (132,960)(0.02) = 2,659

Adult equivalent increase due to eliminating SRD downstream loss = 2,659

Total Fall Chinook Increase		Upstream Passage		Adult Equiv. Downstream Passage		Spawning Increase
7,927	=	2,205	+	2,659	+	3,063

Table 3. Estimated Summer Steelhead Increases Resulting from Savage Rapids Dam Removal - Mid Range

Upstream adult passage at dam

Assumptions:

SRD adult upstream mortality = 15%(Adults at base of SRD) — Source: Young, 1994 (estimated range 10-30% adult passage loss)

Gold Ray Dam counts = 6,016 — Source: Gold Ray Dam counts, 1942 - 93, average

Returns between Gold Ray and Savage Rapids dams = 3624 — Source: Satterthwaite, 1992

Upper river escapement = Gold Ray Dam Counts + Returns between Gold Ray and Savage Rapids

Upper river escapement = 0.85(Adults at base of SRD)

Calculations:

Upper river escapement = 6,016 + 3,624 = 9640

Adults at base of SRD = Upper river escapement/(0.85) = 9,640/(0.85) = 11,341

SRD adult upstream mortality = 0.15(11,341) = 1,701

Adult increase due to eliminating SRD adult passage loss = 1,701

Downstream juvenile passage at dam

Assumptions:

Most of river harvest is on half-pounders, produced above but harvested below SRD. — Source: ODFW, 1994, p.189

(Does not include adult returns from half-pounders to avoid double counting).

SRD juvenile mortality = 15%(juveniles migrating to SRD) — Source: Young, 1994 (estimated average 10-15%, range 5-30%)

Hatchery juvenile-to-half-pounder survival rate = 12% — Source: ODFW,1994, p.1, range = 3 - 28%, 1976-91 returns

Hatchery juveniles released = 144,523 — Source: ODFW,1994,p.134, 1974-91 average

(Current releases = 220,000) — Source: ODFW, hatchery release data, 1991-94

Juveniles migrating to SRD = 80%(Juveniles released each year) — Source: Evenson, personal communication, estimate

Half-pounder equivalent increase = (SRD juvenile mortality)(Juvenile-to-half-pounder survival)

Hatchery adults = 31% of total population passing Gold Ray Dam — Source: ODFW,1994, p.51, 1970-91 brood years

Hatchery adults = 0.31(6,016) = 1,865

Hatchery adults = (1,865)/(9,640) = 19.3% of total adults passing Savage Rapids Dam

Calculations:

Hatchery juveniles migrating to SRD = 0.80(144,523) = 115,618

SRD hatchery fish juvenile mortality = 0.15(115,168) = 17,343

Half-pounder equivalent increase of hatchery fish = (17,343)(0.12) = 2,081

Half-pounder equiv. increase wild + hatchery fish = half-pounder equiv. increase hatch. fish/percentage of hatchery adults of total passing SRD

Half-pounder equiv. increase wild + hatchery fish = (2081)/(0.193) = 10,782

Half-pounder equiv. increase wild fish = 10,782 - 2,081 = 8,701

Half-pounder equivalent increase due to eliminating SRD downstream loss = 8,701

Total Summer Steelhead Increase		Upstream Passage		Half-pounder Equiv. Downstream Passage
10,402	=	1,701	+	8,701

Table 4. Estimated Winter Steelhead Increases Resulting from Savage Rapids Dam Removal - Mid Range

Upstream adult passage at dam

Assumptions:

SRD adult upstream mortality = 15%(Adults at base of SRD) — Source: Young, 1994 (estimated range 10-30% adult passage loss)

Gold Ray Dam counts = 9,317 — Source: Gold Ray Dam counts, 1942 - 93, average

Returns between Gold Ray and Savage Rapids dams = 4056 — Source: Satterthwaite, 1992

Upper river escapement = Gold Ray Dam counts + Returns between Gold Ray and Savage Rapids

Upper river escapement = 9,317 + 4,056 = 13,373

Upper river escapement = 0.85(Adults at base of SRD)

Calculations:

Adults at base of SRD = Upper river escapement/(0.85) = 13,373/(0.85) = 15,733

SRD adult upstream mortality = 0.15(15,733) = 2,360

Adult increase due to eliminating SRD adult passage loss = 2,360

Downstream juvenile passage at dam

Assumptions:

Most of river harvest is on half-pounders, produced above but harvested below SRD. — Source: ODFW, 1994, p.189

(Does not include adult returns from half-pounders to avoid double counting).

SRD juvenile mortality = 15%(juveniles migrating to SRD) — Source: Young, 1994 (estimated average 10-15%, range 5-30%)

Hatchery juvenile-to-half-pounder survival rate = 12% — Source: ODFW, 1994

Hatchery juvenile-to-adult survival rate = 1.2% — Source: ODFW, hatchery data, (average, 1974-86 brood years)

Hatchery juveniles released = 121,000 — Source: ODFW,1990,p.68, 1976-86 average, Rogue stock only

(Current release target = 150,000) — Source: ODFW, hatchery release data, 1989-94

Juveniles migrating to SRD = 80%(Juveniles released each year) — Source: Evenson, personal communication, estimate

Adult equivalent increase = (SRD juvenile mortality)(Juvenile-to-adult survival)

Hatchery adults = 23% of total population passing Gold Ray Dam — Source: ODFW,1990, p.32, 1979-87 average

Hatchery adults = 0.23(9,317) = 2,143

Hatchery adults = (2,143)/(13,373) = 16% of total adults passing Savage Rapids Dam

Wild adults passing Savage Rapids Dam = Total upper river escapement - Hatchery adults = 13,373 - 2,143 = 11,230

Half-pounder return to river = 70% of total adult + half-pounder return — Source: ODFW, 1990,p.44, Angler catch, middle river, 1978/79 and 1979/80

Calculations:

Hatchery juveniles migrating to SRD = 0.80(121,000) = 96,800

SRD hatchery fish juvenile mortality = 0.15(96,800) = 14,520

Half-pounder equivalent increase of hatchery fish = 0.70 (14,520)(0.12) = 1,219

Half-pounder equiv. increase wild + hatchery fish = half-pounder equiv. increase hatch. fish/percentage of hatchery adults of total passing SRD

Half-pounder equiv. increase wild + hatchery fish = (1,219)/(0.16) = 7,619

Half-pounder equiv. increase wild fish = 7,619 - 1,219 = 6,400

Table 4, continued. Estimated Winter Steelhead Increases Resulting from Savage Rapids Dam Removal - Mid Range

Adult equivalent increase of hatchery fish = 0.30(14,520)(0.012) = 52
Adult equiv. increase of wild + hatchery fish = (52)/(0.16) = 325
Adult equiv. increase wild fish = 325 - 52 = 273
Total adult and half-pound equiv. increase of wild and hatchery fish = 7,619 + 325 = 7,944

	Adult and half-pounder equivalent increase due to eliminating downstream loss = 7,944		
Total Winter Steelhead Increase	Upstream Passage		Adult and Half-pounder Equiv. Downstream Passage
10,304 =	2,360	+	7,944

Table 5. Estimated Coho Salmon Increases Resulting from Savage Rapids Dam Removal - Mid Range

Upstream adult passage at dam

Assumptions:

SRD adult upstream mortality = 15%(Adults at base of SRD) — Source: Young, 1994 (estimated range 10-30% adult passage loss)
Gold Ray Dam counts = 1,981 — Source: Gold Ray Dam counts, 1942 - 93, average
Assume no wild fish spawning between Gold Ray and Savage Rapids dams
Upper river escapement = Gold Ray Dam counts = 0.85(Adults at base of SRD)

Calculations:

Adults at base of SRD = Upper river escapement/(0.85) = 1,981/(0.85) = 2,331
SRD adult upstream mortality = 0.15(2,331) = 350

Adult increase due to eliminating SRD adult passage loss = 350

Downstream juvenile passage at dam

Assumptions:

SRD juvenile mortality = 15%(juveniles migrating to SRD) — Source: Young, 1994 (estimated average 10-15%, range 5-30%)
Hatchery juvenile-to-adult survival rate = 2% — Source: Lewis, 1993 Average 1977-89 brood years,range 0.3-12%
Hatchery juveniles released = 200,000 — Source: ODFW, hatchery release data, 1985-94
(Juveniles produced each year)(Juvenile-to-adult survival) = Hatchery Adults produced (includes ocean harvest)
Juveniles migrating to SRD = 80%(Juveniles produced each year) — Source: Evenson, personal communication, estimate
Adult equivalent increase = (SRD juvenile mortality)(Juvenile-to-adult survival)

Calculations:

Juveniles migrating to SRD = 0.90(200,000) = 180,000
SRD juvenile mortality = 0.15(180,000) = 27,000
Adult equivalent increase = (27,000)(0.02) = 540

	Adult equivalent increase due to eliminating SRD downstream loss = 350		
Total Hatchery Coho Increase	Upstream Passage		Adult Equiv. Downstream Passage
890 =	350	+	540

Table 6. Estimated Salmon and Steelhead Increases Resulting from Savage Rapids Dam Removal - Mid Range

(Adults or adult equivalents contributing to ocean harvest, river harvest, and spawning)

Species	Upstream Passage	Downstream Passage	Spawning Habitat Increase	Total
Spring Chinook	5,493	8,604		14,097
Fall Chinook	2,205	2,659	3,063	7,927
Summer Steelhead	1,701	8,701		10,402
Winter Steelhead	2,360	7,944		10,304
Coho (hatchery fish only)	350	540		890
			Grand Total =	**43,620**

Table 7. Estimated Spring Chinook Salmon Increases Resulting from Savage Rapids Dam Removal - Low Range

Upstream adult passage at dam

GRD Counts	Loss SRD	Adults below SRD	SRD Upst. Increase
31,126	0.1	34,584	3,458

Downstream juvenile passage at dam

	# juvs	Loss SRD	Juv. loss	Surv to adult	Adult equiv increase
Hatchery	1,458,000	0.05	72,900	0.02	1,458
Wild	1,410,000	0.05	70,500	0.02	1,410
			Adult Equivalent Downstream Increase		2,868

Total Spring Chinook Increase 6,326		Upstream Passage		Adult Equiv. Downstream Passage
	=	3,458	+	2,868

Table 8. Estimated Fall Chinook Salmon Increases Resulting from Savage Rapids Dam Removal - Low Range

Above SRD Adult Production

GRD Count	SRD-GRD	Spawn Escapement	River harvest	Presp. mort	Ocean harv
3,148	9,350	12,498	0.095	0.2	2

Upper river run at mouth =	17,728
River harvest =	1,684
Prespawning mortality =	3,546
Ocean harvest =	35,455

Above Savage Rapids Adult Production = 53,183

Adult spawning habitat increases

SRD run at mouth =	1,021
River harvest =	97
Ocean harvest =	2,042
	3,063

= Total adult increases if spawning habitat were restored

Upstream adult passage at dam

Spawn Escapement	Loss SRD	Adults below SRD	SRD Upst. Increase
12,498	0.1	13,886	1,389

Downstream juvenile passage at dam

Surv.to adult	#juvs	Loss SRD	Juv loss	Adult equiv increase
0.02	886,383	0.05	44,319	886

Total Fall Chinook Increase 5,338	Upstream Passage		Adult Equiv. Downstream Passage		Spawning Population Increase
	1,389	+	886	+	3,063

Table 9. Estimated Summer Steelhead Increases Resulting from Savage Rapids Dam Removal - Low Range

Upstream adult passage at dam

GRD Count	SRD-GRD	Upper River Esc	Loss SRD	Ad.belowSRD	SRD Upst. Increase
6,016	3,624	9,640	0.1	10,711	1,071

Downstream juvenile passage at dam

Juv released	Surv to dam	Hatchery Juvs at SRD	Loss SRD	Hat. Juv. Increase
144,523	0.8	115,618	0.05	5,781

Half-pounder equiv. increase hatchery fish = 694

Half-pounder equiv. increase wild + hatchery fish = 3,594 = SRD Half-pounder Equiv Downstream Increase

Half-pounder equiv. increase wild fish = 2,901

Total Summer Steelhead Increase 4,665	=	Upstream Passage 1,071	+	Half-pounder Equiv. Downstream Passage 3,594

Table 10. Estimated Winter Steelhead Increases Resulting from Savage Rapids Dam Removal - Low Range

Upstream adult passage at dam

GRD Count	SRD-GRD	Upper River Esc	Loss SRD	Ad.belowSRD	SRD Upst. Increase
9,317	4,056	13,373	0.1	14,858	1,486

Downstream juvenile passage at dam

Juv releasd	Surv to dam	Hatchery Juvs at SRD	Loss SRD	Hat. Juv. Increase
121,000	0.8	96,800	0.05	4,840

Half-pounder equiv. increase hatchery fish = 407

Half-pounder equiv. increase wild + hatchery fish = 2,541 = SRD Half-pounder Equiv Downstream Increase

Half-pounder equiv. increase wild fish = 2,134

Adult equivalent increase of hatchery fish = 17

Adult equiv. increase of wild + hatchery fish = 109

Adult equiv. increase wild fish = 91

Total adult and half-pound equiv. increase of wild and hatchery fish = 2,650

Total Winter Steelhead Increase 4,136	=	Upstream Passage 1,486	+	Adult and Half-pounder Equiv. Downstream Passage 2,650

Table 11. Estimated Coho Salmon Increases Resulting from Savage Rapids Dam Removal - Low Range

Upstream adult passage at dam

GRD Count	Loss SRD	Adults below SRD	SRD Upst. Increase
1981	0.1	2,201	220

Downstream juvenile passage at dam

	# juvs	#juv at SRD	Loss SRD	Juv. loss	Surv to adult	Adult equiv increase
Hatchery	200,000	180,000	0.05	9,000	0.02	180

Total Hatchery Coho Increase		Upstream Passage		Adult Equiv. Downstream Passage
400	=	220	+	180

Table 12. Estimated Salmon and Steelhead Increases Resulting from Savage Rapids Dam Removal - Low Range

(Adults or adult equivalents contributing to ocean harvest, river harvest, and spawning)

Species	Upstream Passage	Downstream Passage	Spawning Habitat Increase	Total
Spring Chinook	3,458	2,868		6,326
Fall Chinook	1,389	886	3,063	5,338
Summer Steelhead	1,071	3,594		4,665
Winter Steelhead	1,486	2,650		4,136
Coho (hatchery fish only)	220	180		400
			Grand Total =	20,866

Table 13. Estimated Spring Chinook Salmon Increases Resulting from Savage Rapids Dam Removal - High Range

Upstream adult passage at dam

GRD Counts	Loss SRD	Adults below SRD	SRD Upst. Increase
31,126	0.3	44,465	13,340

Downstream juvenile passage at dam

	# juvs	Loss SRD	Juv. loss	Surv to adult	Adult equiv increase
Hatchery	1,458,000	0.3	437,400	0.02	8,748
Wild	1,410,000	0.3	423,000	0.02	8,460
			Adult Equivalent Downstream Increase		17,208

Total Spring Chinook Increase 30,548		Upstream Passage		Adult Equiv. Downstream Passage
	=	13,340	+	17,208

Table 14. Estimated Fall Chinook Salmon Increases Resulting from Savage Rapids Dam Removal - High Range

Above SRD Adult Production

GRD Count	SRD-GRD	Spawn Escapement	River harvest	Presp. mort	Ocean harvest
3,148	9,350	12,498	0.095	0.2	2

Upper river run at mouth =	17,728		
River harvest =	1,684		
Prespawning mortality =	3,546		
Ocean harvest =	35,455	Above Savage Rapids Adult Production =	53,183

Adult spawning habitat increases

SRD run at mouth =	1,021	
River harvest =	97	
Ocean harvest =	2,042	
	3,063	= Total adult increases if spawning habitat were restored

Upstream adult passage at dam

Spawn Escapement	Loss SRD	Adults below SRD	SRD Upst. Increase
12,498	0.3	17,854	5,356

Downstream juvenile passage at dam

Surv.to adult	#juvs	Loss SRD	Juv loss	Adult equiv increase
0.02	886,383	0.3	265,915	5,318

Total Fall Chinook Increase 13,737	Upstream Passage		Adult Equiv. Downstream Passage		Spawning Population Increase
	5,356	+	5,318	+	3,063

Table 15. Estimated Summer Steelhead Increases Resulting from Savage Rapids Dam Removal - High Range

Upstream adult passage at dam

GRD Count	SRD-GRD	Upper River Esc	Loss SRD	Ad.belowSRD	SRD Upst. Increase
6,016	3,624	9,640	0.3	13,771	4,131

Downstream juvenile passage at dam

Juv released	Surv to dam	Hatchery Juvs at SRD	Loss SRD	Hat. Juv. Loss
144,523	0.8	115,618	0.3	34,686

Half-pounder equiv.increase hatchery fish = 4,162

Half-pounder equiv. increase wild + hatchery fish = 21,566 = SRD Half-pounder Equiv Downstream Increase

Half-pounder equiv. increase wild fish = 17,404

Total Summer Steelhead Increase	25,697	=	Upstream Passage	+	Half-pounder Equiv. Downstream Passage
			4,131		21,566

Table 16. Estimated Winter Steelhead Increases Resulting from Savage Rapids Dam Removal - High Range

Upstream adult passage at dam

GRD Count	SRD-GRD	Upper River Esc	Loss SRD	Ad.belowSRD	SRD Upst. Increase
9,317	4,056	13,373	0.3	19,104	5,731

Downstream juvenile passage at dam

Juv released	Surv to dam	Hatchery Juvs at SRD	Loss SRD	Hat. Juv. Loss
121,000	0.8	96,800	0.3	29,040

Half-pounder equiv. increase hatchery fish = 2,439

Half-pounder equiv. increase wild + hatchery fish = 15,246 = SRD Half-pounder Equiv Downstream Increase

Half-pounder equiv. increase wild fish = 12,807

Adult equivalent increase of hatchery fish = 105

Adult equiv. increase of wild + hatchery fish = 653

Adult equiv. increase wild fish = 549

Total adult and half-pound equiv. increase of wild and hatchery fish = 15,899

Total Winter Steelhead Increase	21,631	=	Upstream Passage	+	Adult and Half-pounder Equiv. Downstream Passage
			5,731		15,899

Table 17. Estimated Coho Salmon Increases Resulting from Savage Rapids Dam Removal - High Range

Upstream adult passage at dam

GRD Count	Loss SRD	Adults below SRD	SRD Upst. Increase
1981	0.3	2,830	849

Downstream juvenile passage at dam

	# juvs	#juv at SRD	Loss SRD	Juv. loss	Surv to adult	Adult equiv increase
Hatchery	200,000	180,000	0.3	54,000	0.02	1,080

Total Hatchery Coho			Upstream Passage		Adult Equiv. Downstream Passage
Increase	1,929	=	849	+	1,080

Table 18. Estimated Salmon and Steelhead Increases Resulting from Savage Rapids Dam Removal - High Range

(Adults or adult equivalents contributing to ocean harvest, river harvest, and spawning)

Species	Upstream Passage	Downstream Passage	Spawning Habitat Increase	Total
Spring Chinook	13,340	17,208		30,548
Fall Chinook	5,356	5,318	3,063	13,737
Summer Steelhead	4,131	21,566		25,697
Winter Steelhead	5,731	15,899		21,631
Coho (hatchery fish only)	849	1,080		1,929
			Grand Total =	93,542

Table 19. Summary of Estimated Salmon and Steelhead Increases Resulting from Savage Rapids Dam Removal for Low, Mid, and High Range Values

(Adults or adult equivalents contributing to ocean harvest, river harvest, and spawning)

Species	Low Range	Mid Range	High Range
Spring Chinook	6,326	14,097	30,548
Fall Chinook	5,338	7,927	13,737
Summer Steelhead	4,665	10,402	25,697
Winter Steelhead	4,136	10,304	21,631
Coho (hatchery fish only)	400	890	1,929
Totals:	20,865	43,620	93,542

Figure 1. Potential Increased Salmon and Steelhead Returns for Harvest and Spawning resulting from Savage Rapids Dam Removal

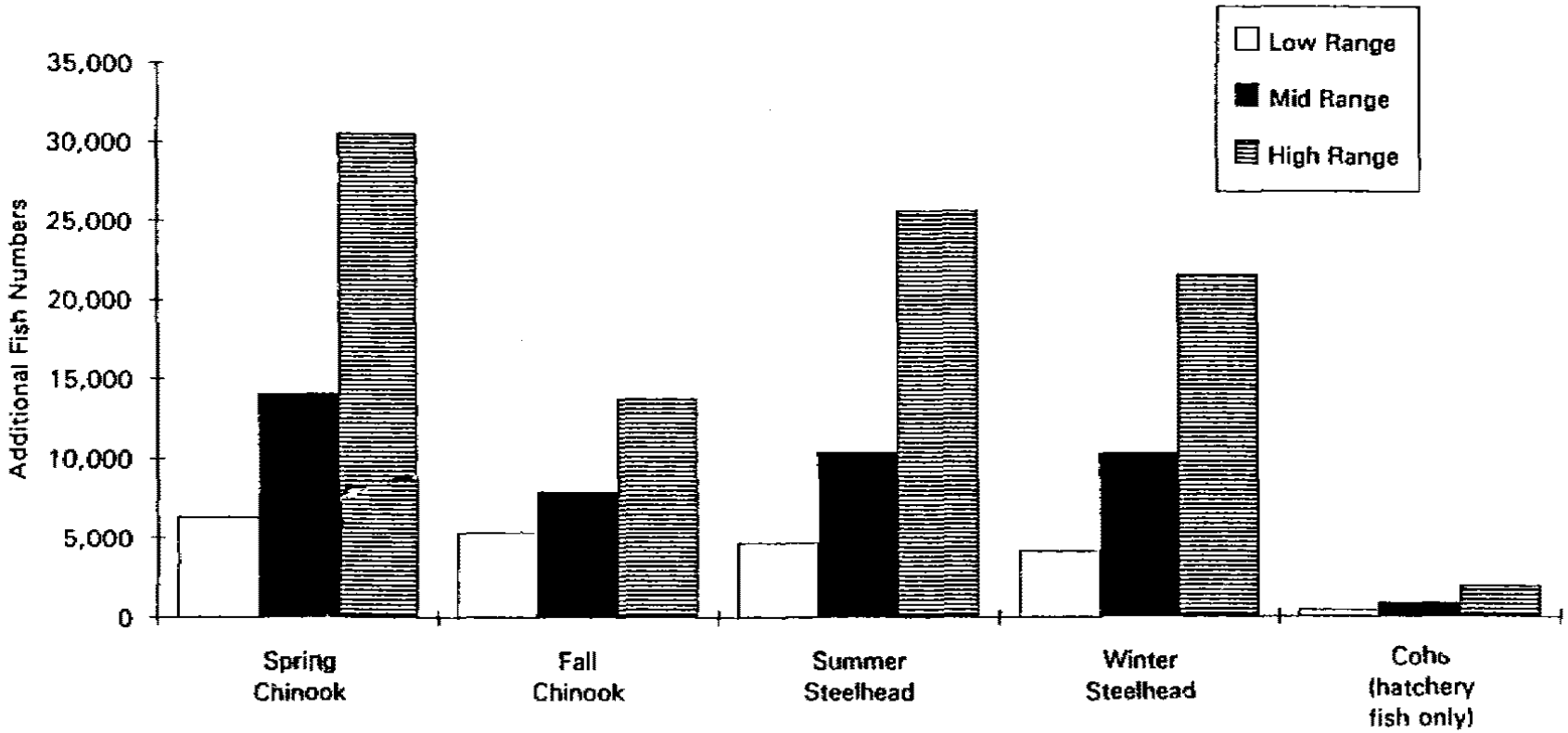
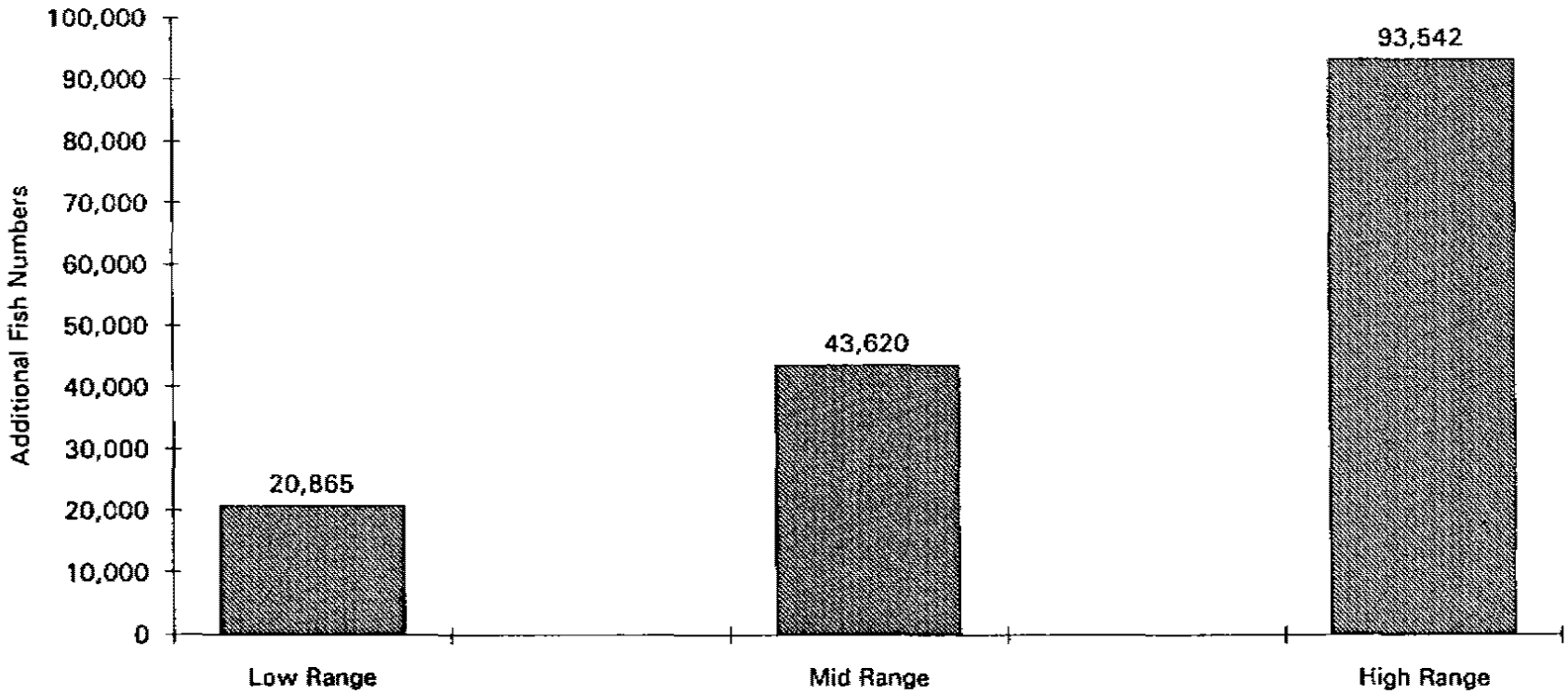


Figure 2. Total Potential Increased Salmon and Steelhead Returns for Harvest and Spawning resulting from Savage Rapids Dam Removal



Oregon

DEPARTMENT OF
FISH AND
WILDLIFE

MEMORANDUM

Date: July 15, 1994

To: Stephanie Burchfield

From: Frank Young

Subj: Site Visit to Savage Rapids Dam

I visited Savage Rapids Dam July 6-7, 1994 to become familiar with the project and its fish passage facilities. On the morning of July 7 Gerald Budziak, a Department employee with many years of experience working with the project fish passage facilities, provided a tour of the project and described how the various elements of the juvenile and adult fish passage facilities functioned.

In the past I have been involved in seeking solutions to fish passage problems at mainstem dams in the Snake and Columbia rivers for 27 of the 30 years that I was employed by ODFW. While most of my work focused on the mainstem dams, I also participated in design review and inspection of smaller juvenile and adult passage facilities throughout the basin including those in the Umatilla, Yakima, Wenatchee, Deschutes, Grande Ronde and Willamette basins.

Adult Passage

I found the adult fish ladders to be quite primitive compared to fish ladders in the Columbia Basin. The south shore ladder appeared to have three major problems. First, there is no automatic control section for adjusting the height of the weirs at the ladder exit to compensate for fluctuations in forebay level and there doesn't seem to be anyone assigned by the irrigation district to make timely adjustments when the forebay elevation changes. There was a drop of nearly

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2 feet from the exit weir (where there should have been only 1 foot) creating very turbulent conditions in the pool below. Secondly, the large pool in the middle of the ladder had water spilling into it from where a stoplog in the dam had been lifted about one foot to provide make-up water necessary to keep the lower half of the ladder fully watered. The plunge of about six feet created turbulence and a false attraction which could stimulate fish to jump and injure themselves on the rocks at the end of this pool. Thirdly, the ladder exit plunged nearly three feet to the tailrace (where a plunge of only one foot is desirable) causing considerable turbulence and filling the approach to the ladder entrance with bubbles. These bubbles reduce water density and make it more difficult for fish to jump the distance from the tailrace to the first pool. The most likely area for a fish to land when jumping to enter the ladder was on a rock apron off to one side of the ladder.

The north shore ladder suffered from the same lack of ability to be adjusted to compensate for the fluctuations in forebay elevation as the south ladder. In addition, attraction water for the ladder exit was augmented by piped water from the forebay plunging about six feet into the approach to the ladder entrance which produced great turbulence and bubbles at the ladder entrance.

It is my opinion that the cumulative effects of all of the adult passage problems mentioned above are likely resulting in a significant delay to adult fish in passing this area of the river. In both the Columbia and Willamette rivers we have found that any significant delay in upstream passage reduces the probability that delayed fish will spawn successfully.

Juvenile Passage

I believe that there are two potentially significant sources of mortality to juvenile salmonids associated with the project. First, the screen in the south bank canal does not meet criteria for approach velocity, increasing the likelihood of impingement of small fish when there is any debris buildup. Second, water velocity in the reservoir is greatly reduced from that of a river thereby increasing the amount of time juveniles are exposed to predation. The reservoir also increases average water depth, silhouetting juveniles, which travel primarily in the top 15 feet, and thereby making them more vulnerable to predators feeding from

below. In addition, since juvenile fish are passed primarily through spill over the dam into extremely turbulent conditions, there is the potential for substantial losses of disoriented juveniles through predation by northern squawfish and predaceous birds.

Conclusions

Under the much better passage facilities of the Columbia River, losses of adult salmonids average about 5-10% per dam. Losses of adult salmonids under the conditions at Savage Rapids Dam could be considerably higher depending upon the flow and ladder entrance and exit conditions at the time of peak passage. I believe that a range of 10-30% adult passage loss is possible based on my observation and experience.

Losses of juvenile fish from predation average about 10% per project for Columbia River dams. I would expect losses of a similar magnitude from predation at Savage Rapids Dam, depending on flow and temperature, with higher losses for juveniles which pass during lower flows and higher temperatures. Additional losses from impingement on the diversion screens could be substantial. At screen facilities where approach velocities meet ODFW standards of 0.8 ft/sec for yearling-sized fish and 0.4 ft/sec for subyearling fish, mortality ranges from 0-5%. When these approach velocities are not met, mortality rates are higher, primarily caused by impingement on the screens when fish can no longer maintain sustained swimming speeds and give up in exhaustion. Given that the approach velocity for the irrigation diversion screens at Savage Rapids Dam are 1.5 ft/sec on the north shore and 1.0 ft/sec on south shore, I believe that mortality rates ranging from 5-30% on diverted fish could be expected.

I believe that losses to juvenile fish from all causes at Savage Rapids Dam may average 10-15%, although actual losses could be much higher.

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Oregon

DEPARTMENT OF
FISH AND
WILDLIFE

OFFICE OF THE
DIRECTOR

March 13, 1995

Dear Interested Public:

Enclosed is the second report of a two-phased analysis of the impacts of Savage Rapids Dam on salmon and steelhead in the Rogue River. The U.S. Bureau of Reclamation recently released for public review its "Planning Report/Draft Environmental Statement of Fish Passage Improvement -- Savage Rapids Dam" (December, 1994). The report examines in detail two alternatives for improving fish passage conditions at the dam: 1) dam removal with installation of electric pumps to supply water to the irrigation district; and 2) dam retention with replacement of fishways and screens with state-of-the-art facilities. The fish benefits calculated in that report are based on analyses conducted by the National Marine Fisheries Service and the U.S. Fish and Wildlife Service in the 1970's and 1980's.

In response to questions regarding the current applicability of these earlier fish benefit analyses, Oregon Department of Fish and Wildlife (ODFW) staff biologists were asked to review current information and make independent estimates of potential increases in salmon and steelhead populations under both the "dam removal" and "dam retention and improvement" alternatives. The first analysis, presented in an October 1994 report by ODFW, considered the potential increases in adult fish harvest and spawning expected from the "dam removal" alternative. This second analysis utilizes the same methodology for estimating fish increases associated with the "dam retention and improvement" alternative. Increased salmon and steelhead populations would be expected if either of the two alternatives were implemented, although fewer additional fish would be expected with "dam retention and improvement" than with the "dam removal" alternative.

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If you have not yet received the first report, "Estimation of Rogue River Salmon and Steelhead Population Increases for the Savage Rapids 'Dam Removal' Option", and would like a copy, please contact Stephanie Burchfield, ODFW, 2501 SW First Avenue, Portland, Oregon 97207, or by telephone at (503) 229-6967, extension 441.

Sincerely,

RUDOLPH A. ROSEN
Director

Attachment

ESTIMATION OF ROGUE RIVER SALMON AND STEELHEAD POPULATION INCREASES FOR THE SAVAGE RAPIDS "DAM RETENTION AND IMPROVEMENT" OPTION

Oregon Department of Fish and Wildlife*
2501 SW First Avenue
Portland, OR 97207

March 1995

Background

This report presents the second part of an assessment by Oregon Department of Fish and Wildlife (ODFW) of the impacts of Savage Rapids Dam on Rogue River salmon and steelhead populations. The first report, "Estimation of Rogue River salmon and steelhead population increases for the the Savage Rapids 'Dam Removal' option" (October, 1994), presented results of a model analysis of population increases that would be expected if Savage Rapids Dam were removed. This assessment utilizes the same model to estimate expected population increases under a second alternative, dam retention and fish passage improvement.

The dam retention and improvement alternative is described in the U.S. Bureau of Reclamation's report, "Planning Report/Draft Environmental Statement of Fish Passage Improvement -- Savage Rapids Dam" (December, 1994). In addition to numerous modifications to improve dam safety and irrigation diversion structures, significant changes would be made to improve fish passage at the dam. All new facilities would be designed using state-of-the-art features to meet current design criteria. These include the following:

- Replacement of existing screens at the north bank pumping plant intake with vertical traveling screens
- Replacement of existing screens at the south bank gravity canal with rotating drum screens
- Replacement of north and south bank fish ladders with two vertical slot ladders
- Replacement of existing radial spill gates with new spillways and improved gate control system
- Construction of a plunge pool below the spillway to improve conditions for fish passing over the spillway
- Restructuring of the river channel below the dam to improve attraction flows to the fish ladders

As in the first report on the dam removal option, the following analysis makes use of modeling techniques for mathematically predicting population increases given improvements in fish

* Prepared by Stephanie Burchfield, Michael D. Evenson, Mark W. Chilcote, Franklin R. Young, Michael D. Jennings, and Barry P. McPherson

survival associated with changes at the dam site. These techniques allow rapid and credible estimates, but without the great expense of extended and time-consuming data collection and analysis. By this technique ODFW biologists are able to estimate the lowest probable level of fish increases expected from dam retention and improvement, as well as the highest probable level. These low and high estimates are based on field studies at other dams where similar fish screens and ladders have been installed and evaluated. The low and high estimates are used to set the reasonable boundaries, within which the actual population number will lie. Because a number of factors influence this number from year to year, the actual population number will vary yearly, but this variation is expected to fall within the low and high boundaries discussed above.

Approach

High and low values for upstream and downstream fish loss rates are assumed for the improved fish passage facilities that would be installed under the dam retention alternative. These ranges are based on field studies at other dams where similar, state-of-the-art fish passage facilities have been installed. The attached memorandum from Frank Young, ODFW, February 9, 1995, summarizes existing research and recommends appropriate ranges for this analysis. Young's memorandum assumes no juvenile or adult fish mortality associated with passage over the improved spillway. Acute losses caused by emergency shutdown or facility failure are not included in Young's estimates of expected fish losses. It also assumes that losses of juvenile fish to predation are the same for the alternatives of dam retention and dam removal. We make this assumption because we cannot predict whether Umpqua squawfish will colonize the area around Savage Rapids Dam.

Umpqua squawfish are not native to the Rogue River and have spread upstream since they entered the Rogue River at Grave Creek in 1979. Recent sampling has shown that squawfish prey on juvenile salmon and steelhead in areas downstream of Grants Pass, especially in late spring (ODFW unpublished data). Work on the Columbia River indicates that losses of juvenile salmon to predation by squawfish is greatest in areas near dams (Tabor et al. 1993; Petersen 1994) and that predation losses may be as high as 11 percent (Rieman et al. 1991). Thus, retention of Savage Rapids Dam may result in greater predation losses of juvenile salmon and steelhead than would be expected from the dam removal alternative.

Other than the parameters described above that characterize expected losses at improved fish passage facilities, this model utilizes the same calculations and parameter values as were used in the first report. This includes estimates of adult fish passing Gold Ray Dam, ocean and river harvests, hatchery releases, and smolt-to-adult survival rates. The dam removal alternative calculated fall chinook salmon production associated with increased spawning habitat in the area presently inundated by the reservoir. These calculations are omitted from the dam retention alternative, because with dam retention the reservoir will continue to inundate this habitat, making it unavailable for spawning.

The model estimates annual increases in harvest and spawning populations of salmon and steelhead based on the difference between estimated losses under present dam conditions and losses expected with the dam retention and improvement alternative. Improved fish passage facilities at the dam will result in net increases in salmon and steelhead production in the Rogue River as compared to current conditions.

Details and calculations associated with ODFW's estimate are contained in the attached tables 1 through 13.

Results

Tables 1 through 5 show the assumptions and calculations that were made to estimate "low range" annual increases in harvest and spawning populations of spring chinook, fall chinook, summer steelhead, winter steelhead, and coho salmon. The low range increases are based on the highest expected mortality rates for the proposed fish passage facilities and the lowest mortality rates assumed for the existing facilities. For the proposed facilities at Savage Rapids Dam, an upstream adult fish mortality rate of 3 percent and a downstream juvenile fish mortality rate of 5 percent are assumed (Young 1995). The tables cite sources of data and assumptions used in the mathematical computations. The "Literature Cited" section provides full reference information for these sources.

Table 6 is a summary table that lists "low range" estimates for each species. Based on the assumptions in this model, we estimate that an additional 5,515 salmon and steelhead would be available for harvest and spawning annually if the Savage Rapids Dam retention and improvement alternative were implemented.

Tables 7 through 11 represent "high range" estimates of annual salmon and steelhead increases based on the lowest expected mortality rates for the proposed facilities and the highest mortality rates assumed for the existing facilities. For the proposed facilities, upstream and downstream fish mortality rates of 0 percent are assumed (Young 1995). Table 12 summarizes the "high range" estimates for each species, and shows a combined "high range" estimate for all species of 90,358.

Table 13 summarizes previous tables and shows the range of additional fish available for harvest and spawning for each species. Figure 1 shows this information for each species in graphic form. For all species combined, our estimates range from a low of 5,515 to a high of 90,358.

Conclusions

The range of numbers obtained, 5,515 to 90,358 fish annually, represents a reasonable range of estimates for expected salmon and steelhead population increases attributable to the Savage Rapids Dam retention and improvement alternative. As stated above, actual increases will vary yearly, and are highly dependent on run sizes, harvest rates and proper operation and maintenance of fish passage facilities.

In our first report, ODFW estimated 20,865 to 93,542 additional fish would be expected under the dam removal alternative. Figure 2 shows the ranges of additional fish estimated for both the dam removal and the dam retention alternatives. The large difference in low range estimates reflects both the relatively high rates of fish loss possible at state-of-the-art fish passage facilities and the assumption that existing fish passage losses at the dam are low. For the high range estimates, this difference results primarily from the fact that fall chinook spawning habitat in the reservoir area will be made available with the dam removal option but not with the dam retention alternative. The high range estimates for both alternatives are very close because juvenile and adult fish mortality associated with dam passage is assumed to be zero under the dam retention alternative. This assumption is extremely optimistic, because it requires new facilities to be continuously operated in "like new" condition. Young (1995) states that the range of fish mortality rates he suggests for the dam retention alternative are what one would expect if the facilities are operated and maintained in prime condition. Moreover, this analysis does not account for fish losses that would likely be incurred under the dam retention alternative from acute incidents such as screen failure and ongoing losses caused by spillway passage and increased predation.

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Table 1. Estimated Spring Chinook Salmon Increases Resulting from Savage Rapids Dam Retention and Improvement Alternative - Low Range

Adult Production = Upper river (UR) returns + River harvest + Ocean harvest

Assumptions:

UR returns =	31,126	Source: Gold Ray Dam counts, 1942 - 93 average
Lower river harvest rate =	28%	Source: Cramer et al, 1985, p. 255 (1964-81); does not include jacks
Ocean harvest =	43,397	Source: Satterthwaite, 1987, p.27, Table 9; catch:escapement = 1:1

Calculations:

River harvest = 0.28(Total fish at mouth) = 0.28(UR return + River harvest) = 0.28 (UR return)/(1-0.28)

River harvest = 0.28(31,126)/0.72 = 12, 105

Upper R. Returns	+ River Harvest	+ Ocean Harvest	=	Adult Production
31,126	12,105	43,397		86,628

Upstream adult passage at dam

Assumptions:

SRD adult loss existing conditions (low range) = 3,458 — Source: Burchfield et al, 1994, Table 7

SRD adult loss with dam ret. alt. = 3%(Adults at base of SRD) — Source: Young, 1995 (estimated range 0-3% adult passage loss)

Assume no loss between Savage Rapids (SRD) and Gold Ray (GRD) dams

Calculations:

Adults at base of SRD = GRD counts + SRD Upstream Loss = GRD counts + 0.03(Adults at base of SRD)

0.97(Adults at base of SRD) = GRD counts

Adults at base of SRD = GRD counts/0.97 = 31,126/0.97 = 32,089

Adults at base of SRD	x	SRD adult loss rate	=	Adult loss with dam retention alternative
32,089		3%		963

Adult increase = Adult loss under existing conditions - adult loss expected with dam retention alternative

= 3,458 - 963 = 2,495 = Adult increase (upstream passage) with dam retention alternative

Downstream juvenile passage at dam

Assumptions:

SRD adult equivalent loss existing conditions (low range) = 2,868 — Source: Burchfield et al, 1994, Table 7

SRD juvenile mortality = 5%(smolts migrating to SRD) — Source: Young, 1995 (estimated range 0-5%)

Hatchery smolts produced = 1,458,000 — Source: ODFW, hatchery release data, 1986-94

Wild smolts produced = 1,410,000 — Source: ODFW unpublished data, mean for 1976-90

Hatchery smolt-to-adult survival rate = 2% — Source: ODFW, hatchery data, includes harvest

Wild smolt-to-adult survival rate = 2% — Source: Satterthwaite, 1994, personal communication.

Table 1, continued. Estimated Spring Chinook Salmon Increases Resulting from Savage Rapids Dam Retention and Improvement Alternative - Low Range

Downstream juvenile passage at dam, continued

Calculations:

SRD juvenile loss (hatchery) = 5%(1,458,000) = 72,900
SRD juvenile loss (wild) = 5%(1,410,000) = 70,500

Adult equivalent loss with dam ret. alt = (SRD hatchery juvenile loss x hatchery smolt-to-adult survival rate) + (SRD wild juvenile loss x wild smolt-to-adult survival rate) = (72,900 x 0.02) + (70,500 x 0.02) = 2,868

Adult equivalent increase = Adult equiv. loss existing conditions - adult equiv. loss with dam ret. alt.
= 2,868 - 2,868 = 0 = Adult equiv. increase (downstream passage) with dam retention alternative

Total Spring Chinook Increase		Upstream Passage		Adult Equiv. Downstream Passage
2,495	=	2,495	+	0

Table 2. Estimated Fall Chinook Salmon Increases Resulting from Savage Rapids Dam Retention and Improvement Alternative - Low Range

Above Savage Rapids Adult Production = Upper river run at mouth + Ocean harvest of fish originating above SRD

Assumptions:

Upper river run at mouth = Spawning escapement + River harvest + lower river prespawning mortality
Spawning escapement = Gold Ray Dam counts + Spawning between SRD and GRD
Gold Ray Dam counts = 3,148 Source: Gold Ray Dam counts, 1942 - 93 average
Spawning between SRD and GRD = 9,350 Source: Satterthwaite, 1992 (500 fish/km)
River harvest = 9.5% (upper river run at mouth) Source: ODFW, 1992, p.78, 1974-86 average
Prespawning mortality = 20%(upper river run at mouth) Source: Satterthwaite, personal communication
Ocean harvest = 2(upper river run at mouth) Source: Satterthwaite, personal communication, assume C:E = 2:1 for upper river fall chinook

Calculations:

Spawning escapement = 3,148 + 9,350 = 12,498
Upper river run at mouth = 12,498 + 0.095(upper run) + 0.20(upper run)
Upper run(1-0.095-0.20) = 12,498
Upper run = 12,498/0.70 = 17,728
River harvest = (0.095)(17,728) = 1,684
Prespawning mortality = (0.20)(17,728) = 3,546
Ocean harvest = 2(17,728) = 35,456
Above Savage Rapids Adult Production = 17,728 + 35,456 = 53,184

Table 2, continued. Estimated Fall Chinook Salmon Increases Resulting from Savage Rapids Dam Retention and Improvement Alternative - Low Range

Upstream adult passage at dam

Assumptions:

SRD adult passage loss existing conditions (low range) = 1,389 — Source: Burchfield et al, 1994, Table 8

SRD adult loss with dam ret. alt. = 3%(Adults at base of SRD) — Source: Young, 1995 (estimated range 0-3% adult passage loss)

Spawning escapement = Gold Ray Dam counts + Spawning between SRD and GRD = 12,498

Spawning escapement = 0.97(Adults at base of SRD)

Calculations:

Adults at base of SRD = Spawning escapement/(0.97) = 12,498/(0.97) = 12,884

SRD adult passage loss with dam ret. alt. = 0.03(12,884) = 387

Adult increase = Adult loss under existing conditions - adult loss expected with dam retention alternative

= 1,389 - 387 = 1,002 = Adult increase (upstream passage) with dam retention alternative

Downstream juvenile passage at dam

Assumptions:

SRD adult equivalent loss existing conditions (low range) = 886 — Source: Burchfield et al, 1994, Table 8

SRD juvenile mortality = 5%(juveniles migrating to SRD) — Source: Young, 1995 (estimated range 0-5%)

Wild juvenile-to-adult survival rate = 2% — Source: ODFW unpublished data, 1976-90 average

(Juveniles produced each year)(Juvenile-to-adult survival rate) = Upper river adult run at mouth

Adult equivalent loss with dam ret. alt. = (SRD juvenile mortality)(Juvenile-to-adult survival rate)

Calculations:

Juveniles produced = Upper river adult run at mouth/juvenile-to-adult survival rate = 17,728/0.02

Juveniles produced = 886,400

SRD juvenile mortality = 0.05(886,400) = 44,320

Adult equivalent loss with dam ret. alt. = (44,320)(0.02) = 886

Adult equivalent increase = Adult equiv. loss existing conditions - adult equiv. loss with dam ret. alt.

= 886 - 886 = 0 = Adult equiv. increase (downstream passage) with dam retention alternative

Total Fall Chinook Increase		Upstream Passage		Adult Equiv. Downstream Passage
1,002	=	1,002	+	0

Table 3. Estimated Summer Steelhead Increases Resulting from Savage Rapids Dam Retention and Improvement Alternative - Low Range

Upstream adult passage at dam

Assumptions:

SRD adult loss existing conditions (low range) = 1,071 — Source: Burchfield et al, 1994, Table 9

SRD adult loss with dam ret. alt. = 3%(Adults at base of SRD) — Source: Young, 1995 (estimated range 0-3% adult passage loss)

Gold Ray Dam counts = 6,016 — Source: Gold Ray Dam counts, 1942 - 93, average

Returns between Gold Ray and Savage Rapids dams = 3624 — Source: Satterthwaite, 1992

Upper river escapement = Gold Ray Dam Counts + Returns between Gold Ray and Savage Rapids

Upper river escapement = 0.97(Adults at base of SRD)

Calculations:

Upper river escapement = 6,016 + 3,624 = 9640

Adults at base of SRD = Upper river escapement/(0.97) = 9,640/(0.97) = 9,938

SRD adult passage loss with dam ret. alt. = 0.03(9,938) = 298

Adult increase = Adult loss under existing conditions - adult loss expected with dam retention alternative

= 1,071 - 298 = 773 = Adult increase (upstream passage) with dam retention alternative

Downstream juvenile passage at dam

Assumptions:

Most of river harvest is on half-pounders, produced above but harvested below SRD. — Source: ODFW, 1994, p.189

(Does not include adult returns from half-pounders to avoid double counting).

SRD half-pounder equivalent loss existing conditions (low range) = 3,594 — Source: Burchfield et al, 1994, Table 9

SRD juvenile mortality = 5%(juveniles migrating to SRD) — Source: Young, 1995 (estimated range 0-5%)

Hatchery juvenile-to-half-pounder survival rate = 12% — Source: ODFW,1994, p.1, range = 3 - 28%, 1976-91 returns

Hatchery juveniles released = 144,523 — Source: ODFW,1994,p.134, 1974-91 average

(Current releases = 220,000) — Source: ODFW, hatchery release data, 1991-94

Juveniles migrating to SRD = 80%(Juveniles released each year) — Source: Evenson, personal communication, estimate

Half-pounder equivalent loss with dam ret. alt = (SRD juvenile mortality)(Juvenile-to-half-pounder survival rate)

Hatchery adults = 31% of total population passing Gold Ray Dam — Source: ODFW,1994,p.51, 1970-91 brood years

Hatchery adults = 0.31(6,016) = 1,865

Hatchery adults = (1,865)/(9,640) = 19.3% of total adults passing Savage Rapids Dam

Table 3, continued. Estimated Summer Steelhead Increases Resulting from Savage Rapids Dam Retention and Improvement Alternative - Low Range

Calculations:

Hatchery juveniles migrating to SRD = 0.80(144,523) = 115,618

SRD hatchery fish juvenile mortality = 0.05(115,168) = 5,758

Half-pounder equivalent loss hatchery fish with dam ret. alt. = (5,758)(0.12) = 691

Half-pounder equiv. loss wild + hatchery fish = half-pounder equiv. loss hatch. fish/percentage of hatchery adults of total passing SRD

Half-pounder equiv. loss wild + hatchery fish = (691)/(0.193) = 3,580

Half-pounder equiv. loss wild fish = 3,580 - 691 = 2,889

Half-pounder equivalent increase = Half-pounder equiv. loss existing conditions - half-pounder equiv. loss with dam ret. alt.

= 3,594 - 3,580 = 14 =Half-pounder equiv. increase (downstream passage) with dam retention alternative

Total Summer Steelhead Increase		Upstream Passage		Half-pounder Equiv. Downstream Passage
787	=	773	+	14

Table 4. Estimated Winter Steelhead Increases Resulting from Savage Rapids Dam Retention and Improvement Alternative - Low Range

Upstream adult passage at dam

Assumptions:

SRD adult loss existing conditions (low range) = 1,486 — Source: Burchfield et al, 1994, Table 10

SRD adult loss with dam ret. alt. =3%(Adults at base of SRD) — Source: Young, 1995 (estimated range 0-3% adult passage loss)

Gold Ray Dam counts = 9,317 — Source: Gold Ray Dam counts, 1942 - 93, average

Returns between Gold Ray and Savage Rapids dams = 4056 — Source: Satterthwaite, 1992

Upper river escapement = Gold Ray Dam counts + Returns between Gold Ray and Savage Rapids

Upper river escapement = 9,317 + 4,056 = 13,373

Upper river escapement = 0.97(Adults at base of SRD)

Calculations:

Adults at base of SRD = Upper river escapement/(0.97) = 13,373/(0.97) = 13,787

SRD adult passage loss with dam ret. alt. = 0.03(13,787) = 414

Adult increase = Adult loss under existing conditions - adult loss expected with dam retention alternative

= 1,486 - 414 = 1,072 =Adult increase (upstream passage) with dam retention alternative

Table 4, continued Estimated Winter Steelhead Increases Resulting from Savage Rapids Dam Retention and Improvement Alternative - Low Range

Downstream juvenile passage at dam

Assumptions:

Most of river harvest is on half-pounders, produced above but harvested below SRD. Source: ODFW, 1994, p.189
(Does not include adult returns from half-pounders to avoid double counting).

SRD adult and half-pounder equivalent loss existing conditions (low range) =2,650 Source: Burchfield et al, 1994, Table 10

SRD juvenile mortality = 5%(juveniles migrating to SRD) Source: Young, 1995 (estimated range 0-5%)

Hatchery juvenile-to-half-pounder survival rate = 12% Source: ODFW, 1994

Hatchery juvenile-to-adult survival rate = 1.2% Source: ODFW, hatchery data, (average, 1974-86 brood years)

Hatchery juveniles released = 121,000 Source: ODFW,1990,p.68, 1976-86 average, Rogue stock only
(Current release target = 150,000) Source: ODFW, hatchery release data, 1989-94

Juveniles migrating to SRD = 80%(Juveniles released each year) Source: Evenson, personal communication, estimate

Hatchery adults = 23% of total population passing Gold Ray Dam Source: ODFW,1990, p.32, 1979-87 average

Hatchery adults = 0.23(9,317) = 2,143

Hatchery adults = (2,143)/(13,373) = 16% of total adults passing Savage Rapids Dam

Wild adults passing Savage Rapids Dam = Total upper river escapement - Hatchery adults = 13,373 - 2,143 = 11,230

Half-pounder return to river = 70% of total adult + half-pounder return Source: ODFW, 1990,p.44, Angler catch, middle river, 1978/79 and 1979/80
(Adult return = 30% of total returns)

Half-pounder equivalent loss with dam ret. alt. = 70%(SRD juvenile mortality)(Juvenile-to-half-pounder survival rate)

Adult equivalent loss with dam ret. alt. = 30%(SRD juvenile mortality)(Juvenile-to-adult survival rate)

Calculations:

Hatchery juveniles migrating to SRD = 0.80(121,000) = 96,800

SRD hatchery fish juvenile mortality = 0.05(96,800) = 4,840

Half-pounder equivalent loss hatchery fish with dam ret. alt. = 0.70 (4,840)(0.12) = 407

Half-pounder equiv. loss wild + hatchery fish = half-pounder equiv. loss hatch. fish/percentage of hatchery adults of total passing SRD

Half-pounder equiv. loss wild + hatchery fish = (407)/(0.16) = 2,544

Half-pounder equiv. loss wild fish = 2,544 - 407 = 2,137

Adult equivalent loss of hatchery fish = 0.30(4,840)(0.012) = 17

Adult equiv. loss of wild + hatchery fish = (17)/(0.16) = 106

Adult equiv. loss wild fish = 106 - 17 = 89

Total adult and half-pounder equiv. loss of wild and hatchery fish = 2,544 + 106 = 2,650

Adult and half-pounder equivalent increase = Adult and half-pounder equiv. loss existing conditions
- adult and half-pounder equiv. loss with dam ret. alt.

2,650 - 2,650 = 0 =Adult and half-pounder equiv. increase (downstream passage) with dam ret. alternative

Total Winter Steelhead Increase		Upstream Passage		Adult and Half-pounder Equiv. Downstream Passage
1,072	=	1,072	+	0

Table 5. Estimated Coho Salmon Increases Resulting from Savage Rapids Range Dam Retention and Improvement Alternative - Low Range

Upstream adult passage at dam

Assumptions:

SRD adult loss existing conditions (low range) = 220 — Source: Burchfield et al, 1994, Table 11

SRD adult loss with dam ret. alt. =3%(Adults at base of SRD) — Source: Young, 1995 (estimated range 0-3% adult passage loss)

Gold Ray Dam counts = 1,981 — Source: Gold Ray Dam counts, 1942 - 93, average

Assume no wild fish spawning between Gold Ray and Savage Rapids dams

Upper river escapement = Gold Ray Dam counts = 0.97(Adults at base of SRD)

Calculations:

Adults at base of SRD = Upper river escapement/(0.97) = 1,981/(0.97) = 2,042

SRD adult passage loss with dam ret. alt. = 0.03(2,042) = 61

Adult increase = Adult loss under existing conditions - adult loss expected with dam retention alternative

= 220 - 61 = 159 =Adult increase (upstream passage) with dam retention alternative

Downstream juvenile passage at dam

Assumptions:

SRD adult equivalent loss existing conditions (low range) = 160 — Source: Burchfield et al, 1994, Table 11

SRD juvenile mortality = 5%(juveniles migrating to SRD) — Source: Young, 1995 (estimated range 0-5%)

Hatchery juvenile-to-adult survival rate = 2% — Source: Lewis, 1993 Average 1977-89 brood years,range 0.3-12%

Hatchery juveniles released = 200,000 — Source: ODFW, hatchery release data, 1985-94

(Juveniles produced each year)(Juvenile-to-adult survival) = Hatchery Adults produced (includes ocean harvest)

Juveniles migrating to SRD = 80%(Juveniles produced each year) — Source: Evenson, personal communication, estimate

Adult equivalent loss with dam ret. alt. = (SRD juvenile mortality)(Juvenile-to-adult survival rate)

Calculations:

Juveniles migrating to SRD = 0.80(200,000) = 160,000

SRD juvenile mortality = 0.05(160,000) = 8,000

Adult equivalent loss with dam ret. alt. = (8,000)(0.02) = 160

Adult equivalent increase = Adult equiv. loss existing conditions - adult equiv. loss with dam ret. alt.

= 160 - 160 = 0 =Adult equiv. increase (downstream passage) with dam retention alternative

Total Hatchery Coho Increase		Upstream Passage		Adult Equiv. Downstream Passage
159	=	159	+	0

Table 6. Estimated Salmon and Steelhead Increases Resulting from Savage Rapids Dam Retention and Improvement Alternative - Low Range

(Adults or adult equivalents contributing to ocean harvest, river harvest, and spawning)

Species	Upstream Passage	Downstream Passage	Spawning Habitat Increase	Total
Spring Chinook	2,495	0	0	2,495
Fall Chinook	1,002	0	0	1,002
Summer Steelhead	773	14	0	787
Winter Steelhead	1,072	0	0	1,072
Coho (hatchery fish only)	159	0	0	159
			Grand Total =	**5,515**

Table 7. Estimated Spring Chinook Salmon Increases Resulting from Savage Rapids Dam Retention and Improvement Alternative - High Range

Adult Production = Upper river (UR) returns + River harvest + Ocean harvest

Assumptions:

UR returns =	31,126	Source: Gold Ray Dam counts, 1942 - 93 average
Lower river harvest rate =	28%	Source: Cramer et al, 1985, p. 255 (1964-81); does not include jacks
Ocean harvest =	43,397	Source: Satterthwaite, 1987, p.27, Table 9; catch:escapement = 1:1

Calculations:

River harvest = 0.28(Total fish at mouth) = 0.28(UR return + River harvest) = 0.28 (UR return)/(1-0.28)

River harvest = 0.28(31,126)/0.72 = 12, 105

Upper R. Returns	+ River Harvest	+ Ocean Harvest	= Adult Production
31,126	12,105	43,397	86,628

Upstream adult passage at dam

Assumptions:

SRD adult loss existing conditions (high range) = 13,340	Source: Burchfield et al, 1994, Table 13
SRD adult loss with dam ret. alt. = 0%(Adults at base of SRD)	Source: Young, 1995 (estimated range 0-3% adult passage loss)

Assume no loss between Savage Rapids (SRD) and Gold Ray (GRD) dams

Calculations:

Adults at base of SRD = GRD counts + SRD Upstream Loss = GRD counts + 0.00(Adults at base of SRD)

(Adults at base of SRD) = GRD counts

Adults at base of SRD = GRD counts = 31,126

Adults at base of SRD	x SRD adult loss rate	= Adult loss with dam retention alternative
31,126	0%	0

Adult increase = Adult loss under existing conditions - adult loss expected with dam retention alternative

= 13,340 - 0 = 13,340 = Adult increase (upstream passage) with dam retention alternative

Downstream juvenile passage at dam

Assumptions:

SRD adult equivalent loss existing conditions (high range) = 17,208	Source: Burchfield et al, 1994, Table 13
SRD juvenile mortality = 0%(smolts migrating to SRD)	Source: Young, 1995 (estimated range 0-5%)
Hatchery smolts produced = 1,458,000	Source: ODFW, hatchery release data, 1986-94
Wild smolts produced = 1,410,000	Source: ODFW unpublished data, mean for 1976-90
Hatchery smolt-to-adult survival rate = 2%	Source: ODFW, hatchery data, includes harvest
Wild smolt-to-adult survival rate = 2%	Source: Satterthwaite, 1994, personal communication.

Table 7, continued. Estimated Spring Chinook Salmon Increases Resulting from Savage Rapids Dam Retention and Improvement Alternative - High Range

Downstream juvenile passage at dam, continued

Calculations:

SRD juvenile loss (hatchery) = 0%(1,458,000) = 0

SRD juvenile loss (wild) = 0%(1,410,000) = 0

Adult equivalent loss with dam ret. alt = (SRD hatchery juvenile loss x hatchery smolt-to-adult survival rate) + (SRD wild juvenile loss x wild smolt-to-adult survival rate) = (0 x 0.02) + (0 x 0.02) = 0

Adult equivalent increase = Adult equiv. loss existing conditions - adult equiv. loss with dam ret. alt.

= 17,208 - 0 = 17,208 = Adult equiv. increase (downstream passage) with dam retention alternative

Total Spring Chinook Increase		Upstream Passage		Adult Equiv. Downstream Passage
30,548	=	13,340	+	17,208

Table 8. Estimated Fall Chinook Salmon Increases Resulting from Savage Rapids Dam Retention and Improvement Alternative - High Range

Above Savage Rapids Adult Production = Upper river run at mouth + Ocean harvest of fish originating above SRD

Assumptions:

Upper river run at mouth = Spawning escapement + River harvest + lower river prespawning mortality

Spawning escapement = Gold Ray Dam counts + Spawning between SRD and GRD

Gold Ray Dam counts = 3,148 Source: Gold Ray Dam counts, 1942 - 93 average

Spawning between SRD and GRD = 9,350 Source: Satterthwaite, 1992 (500 fish/km)

River harvest = 9.5% (upper river run at mouth) Source: ODFW, 1992, p.78, 1974-86 average

Prespawning mortality = 20%(upper river run at mouth) Source: Satterthwaite, personal communication

Ocean harvest = 2(upper river run at mouth) Source: Satterthwaite, personal communication, assume C:E = 2:1 for upper river fall chinook

Calculations:

Spawning escapement = 3,148 + 9,350 = 12,498

Upper river run at mouth = 12,498 + 0.095(upper run) +0.20(upper run)

Upper run(1-0.095-0.20) = 12,498

Upper run = 12,498/0.70 = 17,728

River harvest = (0.095)(17,728) = 1,684

Prespawning mortality = (0.20)(17,728) = 3,546

Ocean harvest = 2(17,728) = 35,456

Above Savage Rapids Adult Production = 17,728 + 35,456 = 53,184

Table 8, continued. Estimated Fall Chinook Salmon Increases Resulting from Savage Rapids Dam Retention and Improvement Alternative - High Range

Upstream adult passage at dam

Assumptions:

SRD adult passage loss existing conditions (high range) =5,356 Source: Burchfield et al, 1994, Table 14

SRD adult loss with dam ret. alt.=0%(Adults at base of SRD) Source: Young, 1995 (estimated range 0-3% adult passage loss)

Spawning escapement = Gold Ray Dam counts + Spawning between SRD and GRD = 12,498

Spawning escapement = Adults at base of SRD

Calculations:

Adults at base of SRD = Spawning escapement = 12,498

SRD adult passage loss with dam ret. alt. = 0.0(12,498) = 0

Adult increase = Adult loss under existing conditions - adult loss expected with dam retention alternative

= 5,356 - 0 = 5,356 =Adult increase (upstream passage) with dam retention alternative

Downstream juvenile passage at dam

Assumptions:

SRD adult equivalent loss existing conditions (high range) = 5,318 Source: Burchfield et al, 1994, Table 14

SRD juvenile mortality = 0%(juveniles migrating to SRD) Source: Young, 1995 (estimated range 0-5%)

Wild juvenile-to-adult survival rate = 2% Source: ODFW unpublished data, 1976-90 average

(Juveniles produced each year)(Juvenile-to-adult survival rate) = Upper river adult run at mouth

Adult equivalent loss with dam ret. alt. = (SRD juvenile mortality)(Juvenile-to-adult survival rate)

Calculations:

Juveniles produced = Upper river adult run at mouth/juvenile-to-adult survival rate = 17,728/0.02

Juveniles produced = 886,400

SRD juvenile mortality = 0.0(886,400) = 0

Adult equivalent loss with dam ret. alt. = (0)(0.02) = 0

Adult equivalent increase = Adult equiv. loss existing conditions - adult equiv. loss with dam ret. alt.

= 5,318 - 0 = 5,318 =Adult equiv. increase (downstream passage) with dam ret. alternative

Total Fall Chinook Increase		Upstream Passage		Adult Equiv. Downstream Passage
10,674	=	5,356	+	5,318

Table 9. Estimated Summer Steelhead Increases Resulting from Savage Rapids Dam Retention and Improvement Alternative - High Range

Upstream adult passage at dam

Assumptions:

SRD adult loss existing conditions (high range) = 4,131 — Source: Burchfield et al, 1994, Table 15

SRD adult loss with dam ret. alt. =0%(Adults at base of SRD) — Source: Young, 1995 (estimated range 0-3% adult passage loss)

Gold Ray Dam counts = 6,016 — Source: Gold Ray Dam counts, 1942 - 93, average

Returns between Gold Ray and Savage Rapids dams = 3624 — Source: Satterthwaite, 1992

Upper river escapement = Gold Ray Dam Counts + Returns between Gold Ray and Savage Rapids

Upper river escapement = Adults at base of SRD

Calculations:

Upper river escapement = 6,016 +3,624 = 9640

Adults at base of SRD = Upper river escapement = 9,640

SRD adult passage loss with dam ret. alt. = 0.0(9,640) = 0

Adult increase = Adult loss under existing conditions - adult loss expected with dam retention alternative

= 4,131 - 0 = 4,131 =Adult increase (upstream passage) with dam retention alternative

Downstream juvenile passage at dam

Assumptions:

Most of river harvest is on half-pounders, produced above but harvested below SRD. — Source: ODFW, 1994, p.189

(Does not include adult returns from half-pounders to avoid double counting).

SRD half-pounder equivalent loss existing conditions (high range) =21,566 — Source: Burchfield et al, 1994, Table 15

SRD juvenile mortality = 0%(juveniles migrating to SRD) — Source: Young, 1995 (estimated range 0-5%)

Hatchery juvenile-to-half-pounder survival rate = 12% — Source: ODFW,1994, p.1, range = 3 - 28%, 1976-91 returns

Hatchery juveniles released = 144,523 — Source: ODFW,1994,p.134, 1974-91 average

(Current releases = 220,000) — Source: ODFW, hatchery release data, 1991-94

Juveniles migrating to SRD = 80%(Juveniles released each year) — Source: Evenson, personal communication, estimate

Half-pounder equivalent loss with dam ret. alt = (SRD juvenile mortality)(Juvenile-to-half-pounder survival rate)

Hatchery adults = 31% of total population passing Gold Ray Dam — Source: ODFW,1994,p.51, 1970-91 brood years

Hatchery adults = 0.31(6,016) = 1,865

Hatchery adults = (1,865)/(9,640) = 19.3% of total adults passing Savage Rapids Dam

Table 9, continued. Estimated Summer Steelhead Increases Resulting from Savage Rapids Dam Retention and Improvement Alternative - High Range

Calculations:
Hatchery juveniles migrating to SRD = 0.80(144,523) = 115,618
SRD hatchery fish juvenile mortality = 0.0(115,168) = 0
Half-pounder equivalent loss hatchery fish with dam ret. alt. = (0)(0.12) = 0
Half-pounder equiv. loss wild + hatchery fish = half-pounder equiv. loss hatch. fish/percentage of hatchery adults of total passing SRD
Half-pounder equiv. loss wild + hatchery fish = (0)/(0.193) = 0
Half-pounder equiv. loss wild fish = 0 - 0 = 0
Half-pounder equivalent increase = Half-pounder equiv. loss existing conditions - half-pounder equiv. loss with dam ret. alt.
= 21,566 - 0 = 21,566 =Half-pounder equiv. increase (downstream passage) with dam retention alternative

Total Summer Steelhead Increase		Upstream Passage		Half-pounder Equiv. Downstream Passage
25,697	=	4,131	+	21,566

Table 10. Estimated Winter Steelhead Increases Resulting from Savage Rapids Dam Retention and Improvement Alternative - High Range

Upstream adult passage at dam

Assumptions:

SRD adult loss existing conditions (high range) =5,731	Source: Burchfield et al, 1994, Table 16
SRD adult loss with dam ret. alt.= 0%(Adults at base of SRD)	Source: Young, 1995 (estimated range 0-3% adult passage loss)
Gold Ray Dam counts = 9,317	Source: Gold Ray Dam counts, 1942 - 93, average
Returns between Gold Ray and Savage Rapids dams = 4056	Source: Satterthwaite, 1992

Upper river escapement = Gold Ray Dam counts + Returns between Gold Ray and Savage Rapids
Upper river escapement = 9,317 + 4,056 = 13,373
Upper river escapement = Adults at base of SRD

Calculations:
Adults at base of SRD = Upper river escapement = 13,373
SRD adult passage loss with dam ret. alt. = 0.0(13,373) = 0
Adult increase = Adult loss under existing conditions - adult loss expected with dam retention alternative
= 5,731 - 0 = 5,731 =Adult increase (upstream passage) with dam retention alternative

Table 10, continued. Estimated Winter Steelhead Increases Resulting from Savage Rapids Dam Retention and Improvement Alternative - High Range

Downstream juvenile passage at dam

Assumptions:

Most of river harvest is on half-pounders, produced above but harvested below SRD. Source: ODFW, 1994, p.189
(Does not include adult returns from half-pounders to avoid double counting).

SRD adult and half-pounder equivalent loss existing conditions (high range) = 15,899 Source: Burchfield et al, 1994, Table 16

SRD juvenile mortality = 0%(juveniles migrating to SRD) Source: Young, 1995 (estimated range 0-5%)

Hatchery juvenile-to-half-pounder survival rate = 12% Source: ODFW, 1994

Hatchery juvenile-to-adult survival rate = 1.2% Source: ODFW, hatchery data, (average, 1974-86 brood years)

Hatchery juveniles released = 121,000 Source: ODFW,1990,p.68, 1976-86 average, Rogue stock only
(Current release target = 150,000) Source: ODFW, hatchery release data, 1989-94

Juveniles migrating to SRD = 80%(Juveniles released each year) Source: Evenson, personal communication, estimate

Hatchery adults = 23% of total population passing Gold Ray Dam Source: ODFW,1990, p.32, 1979-87 average

Hatchery adults = 0.23(9,317) = 2,143

Hatchery adults = (2,143)/(13,373) = 16% of total adults passing Savage Rapids Dam

Wild adults passing Savage Rapids Dam = Total upper river escapement - Hatchery adults = 13,373 - 2,143 = 11,230

Half-pounder return to river = 70% of total adult + half-pounder return Source: ODFW, 1990,p.44, Angler catch, middle river, 1978/79 and 1979/80
(Adult return = 30% of total returns)

Half-pounder equivalent loss with dam ret. alt. = 70%(SRD juvenile mortality)(Juvenile-to-half-pounder survival rate)

Adult equivalent loss with dam ret. alt. = 30%(SRD juvenile mortality)(Juvenile-to-adult survival rate)

Calculations:

Hatchery juveniles migrating to SRD = 0.80(121,000) = 96,800

SRD hatchery fish juvenile mortality = 0.0(96,800) = 0

Half-pounder equivalent loss hatchery fish with dam ret. alt. = 0.70 (0)(0.12) = 0

Half-pounder equiv. loss wild + hatchery fish = half-pounder equiv. loss hatch. fish/percentage of hatchery adults of total passing SRD

Half-pounder equiv. loss wild + hatchery fish = (0)/(0.16) = 0

Half-pounder equiv. loss wild fish = 0 - 0 = 0

Adult equivalent loss of hatchery fish = 0.30(0)(0.012) = 0

Adult equiv. loss of wild + hatchery fish = (0)/(0.16) = 0

Adult equiv. loss wild fish = 0 - 0 = 0

Total adult and half-pounder equiv. loss of wild and hatchery fish = 0 + 0 = 0

Adult and half-pounder equivalent increase = Adult and half-pounder equiv. loss existing conditions
- adult and half-pounder equiv. loss with dam ret. alt.

15,899 - 0 = 15,899 = Adult and half-pounder equiv. increase (downstream passage) with dam ret. alternative

Total Winter Steelhead Increase		Upstream Passage		Adult and Half-pounder Equiv. Downstream Passage
21,630	=	5,731	+	15,899

Table 11. Estimated Coho Salmon Increases Resulting from Savage Rapids Range Dam Retention and Improvement Alternative - High Range

Upstream adult passage at dam

Assumptions:

SRD adult loss existing conditions (high range) = 849 — Source: Burchfield et al, 1994, Table 17

SRD adult loss with dam ret. alt. = 0%(Adults at base of SRD) — Source: Young, 1995 (estimated range 0-3% adult passage loss)

Gold Ray Dam counts = 1,981 — Source: Gold Ray Dam counts, 1942 - 93, average

Assume no wild fish spawning between Gold Ray and Savage Rapids dams

Upper river escapement = Gold Ray Dam counts = Adults at base of SRD

Calculations:

Adults at base of SRD = Upper river escapement = 1,981

SRD adult passage loss with dam ret. alt. = 0.0(1,981) = 0

Adult increase = Adult loss under existing conditions - adult loss expected with dam retention alternative

= 849 - 0 = 849 =Adult increase (upstream passage) with dam retention alternative

Downstream juvenile passage at dam

Assumptions:

SRD adult equivalent loss existing conditions (high range) = 960 — Source: Burchfield et al, 1994, Table 17

SRD juvenile mortality = 0%(juveniles migrating to SRD) — Source: Young, 1995 (estimated range 0-5%)

Hatchery juvenile-to-adult survival rate = 2% — Source: Lewis, 1993 Average 1977-89 brood years,range 0.3-12%

Hatchery juveniles released = 200,000 — Source: ODFW, hatchery release data, 1985-94

(Juveniles produced each year)(Juvenile-to-adult survival) = Hatchery Adults produced (includes ocean harvest)

Juveniles migrating to SRD = 80%(Juveniles produced each year) — Source: Evenson, personal communication, estimate

Adult equivalent loss with dam ret. alt. = (SRD juvenile mortality)(Juvenile-to-adult survival rate)

Calculations:

Juveniles migrating to SRD = 0.80(200,000) = 160,000

SRD juvenile mortality = 0.0(160,000) = 0

Adult equivalent loss with dam ret. alt. = (0)(0.02) = 0

Adult equivalent increase = Adult equiv. loss existing conditions - adult equiv. loss with dam ret. alt.

= 960 - 0 = 960 =Adult equiv. increase (downstream passage) with dam retention alternative

Total Hatchery Coho Increase		Upstream Passage		Adult Equiv. Downstream Passage
1,809	=	849	+	960

Table 12. Estimated Salmon and Steelhead Increases Resulting from Savage Rapids Dam Retention and Improvement Alternative - High Range

(Adults or adult equivalents contributing to ocean harvest, river harvest, and spawning)

Species	Upstream Passage	Downstream Passage	Spawning Habitat Increase	Total
Spring Chinook	13,340	17,208	0	30,548
Fall Chinook	5,356	5,318	0	10,674
Summer Steelhead	4,131	21,566	0	25,697
Winter Steelhead	5,731	15,899	0	21,630
Coho (hatchery fish only)	849	960	0	1,809
			Grand Total =	**90,358**

Table 13. Summary of Estimated Salmon and Steelhead Increases Resulting from Savage Rapids Dam Retention and Improvement Alternative

(Adults or adult equivalents contributing to ocean harvest, river harvest, and spawning)

Species	Low Range	High Range
Spring Chinook	2,495	30,548
Fall Chinook	1,002	10,674
Summer Steelhead	787	25,697
Winter Steelhead	1,072	21,630
Coho (hatchery fish only)	159	1,809
Totals:	5,515	90,358

Figure 1. Potential Increased Salmon and Steelhead Returns for Harvest and Spawning resulting from Savage Rapids Dam Retention and Improvement Alternative

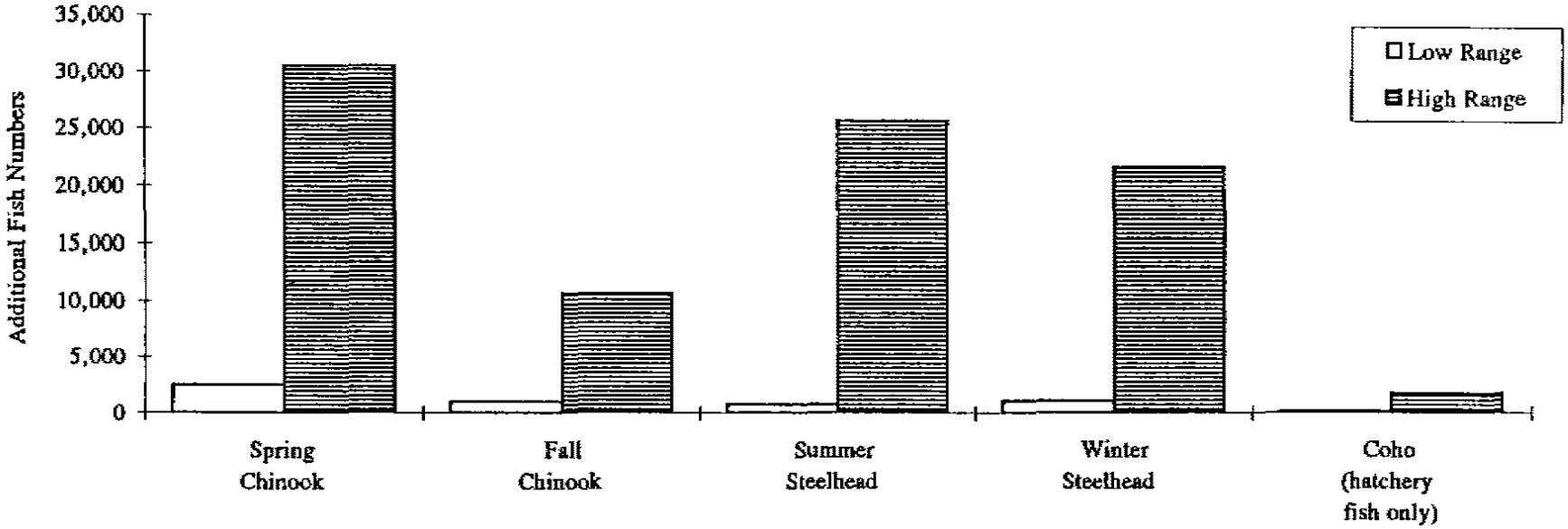
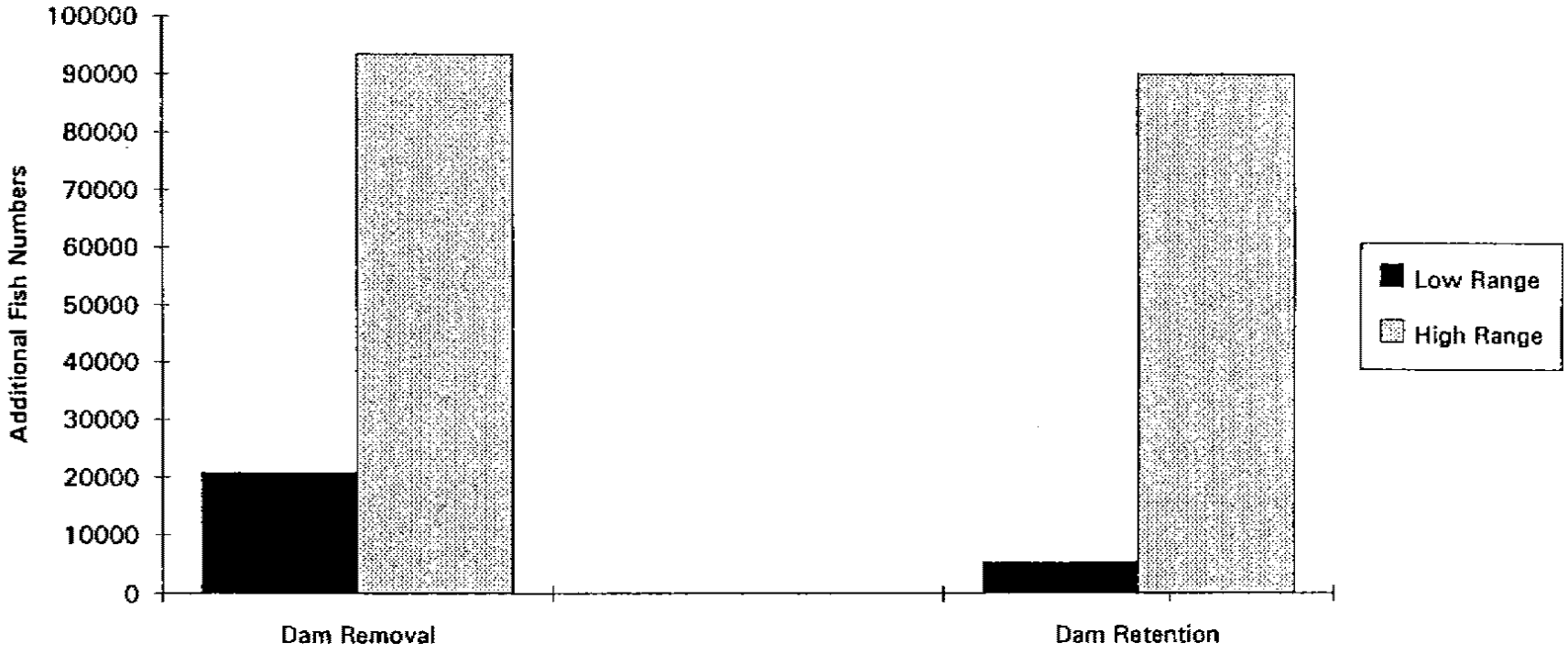


Figure 2. Total Potential Increased Salmon and Steelhead Returns for Harvest and Spawning Expected from Two Alternatives for Savage Rapids Dam: Dam Removal and Dam Alternative



Oregon

DEPARTMENT OF
FISH AND
WILDLIFE

MEMORANDUM

DATE: February 9, 1995

TO: Stephanie Burchfield, HCD

FROM: Frank Young, Fish Division FY

SUBJECT: Summary of Recent Research on Passage of Juvenile and Adult Salmonids at State-of-the-Art Fish Screen and Ladder Facilities, and Implications for Savage Rapids "Dam Retention" Alternative

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This memo is in response to your request that I examine results of existing research on state-of-the-art fish passage facilities and relate this information to expected survival rates of salmonids at Savage Rapids Dam under the "Dam Retention" alternative. My understanding is that with this alternative, state-of-the-art facilities would replace existing facilities and that monitoring, operations and maintenance would be continued following construction.

Juvenile Fish Passage at State-of-the-Art Rotating Drum Screen Facilities

Fisheries biologists and engineers in the Pacific Northwest generally agree that the safest and most reliable screen design for bypassing juvenile salmonids around a diversion intake is the rotating drum screen set at an angle to incoming flow. In the early 1980's, National Marine Fisheries Service (NMFS), Washington Department of Fisheries (WDF) and Oregon Department of Fish and Wildlife (ODFW) developed design criteria based on studies of fish swimming capabilities and evaluations of existing screens. For fry-sized fish (often called "zero-age"), these criteria included an approach velocity of no greater than 0.5 feet per second and a screen mesh size no greater than 0.125 inches in any direction. In the late 1980's, the agencies lowered the design approach velocity criterion to 0.4 fps for fry-sized fish based on evidence of impingement at the higher velocity. In the last year, the agencies have considered decreasing the criterion for mesh size to 3/32 or 0.0938 inches based on evaluations of screens built during the 1980's that showed fry-sized fish were able to pass through screens with mesh size equal to or greater than 0.125 inches. NMFS is expected to adopt revised criteria that include this decreased mesh size in early 1995. The study results summarized in this section were conducted at facilites designed to meet either the 0.5 or 0.4 feet per second approach velocity and 0.125 inches mesh size criteria.

Neitzel et al (1985) evaluated chinook salmon and steelhead smolts released above rotating drum screens at the Sunnyside Canal on the Yakima River in Washington. They concluded that these smolts were safely diverted to the Yakima River. Less than 2 percent of the chinook salmon smolts were descaled or dead following passage by the screens, and none of the steelhead smolts were descaled or dead.

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In 1986, Neitzel et al (1987) conducted similar evaluations at the Richland and Toppenish/Satus canal fish screening facilities, located on the Yakima River and Toppenish Creek, respectively. Spring chinook and steelhead smolts and fall chinook fry were tested in this study. No significant difference in injury was detected between test and control groups for all species. The authors concluded that both screens safely divert fish from the canals back to the river. Although the authors observed no increase in predation because of the screening facilities, they noted that predatory fish populations could increase in subsequent years and should be reevaluated after several years of continuous operation of the screening facilities.

The Richland and Wapato Canal rotating drum screens on the Yakima River were evaluated by Neitzel et al (1988) in spring, 1987. Descaling and injury rates for test groups of both steelhead and spring chinook smolts were not signficantly different from control groups. At the Richland screens, no loss of fall chinook fry was found resulting from either impingement or passage through the screens. At the Wapato screens, Neitzel estimated 3 to 4 percent of the fall chinook fry were lost from either impingement or passage through the screens or screen seals.

In spring, 1988, Neitzel et al (1990a) conducted evaluations of the rotating drum screens at Wapato, Sunnyside, and Toppenish Creek canals. The authors concluded that fish are neither descaled or killed during passage at the rotating drum screens. They also concluded that although screening facilities could exacerbate predation on juvenile salmonids because of stress, injury or delayed migration, they did not observe loss to predation at these three facilities.

Neitzel et al (1990b) conducted evaluations of the Westside Ditch and Wapato Canal rotating drum screening facilities in 1989. No significant difference in descaling and injury was detected between test and control groups of steelhead and chinook salmon smolts. At the Westside Ditch screens, however, 25 percent of the chinook fry, zero-age fish, passed through the screens. Design criteria for these screens followed the 0.5 feet per second approach velocity and 0.125 inches mesh size criteria recommended by the fisheries agencies in the early 1980's.

The Westside Ditch and Town Canal rotating drum screens on the Yakima River were evaluated by Neitzel et al (1990c) in spring 1990. The authors found no significant difference in descaling between test and control groups of steelhead smolts at the Town Canal. They concluded that 8.5 percent of the native zero-age chinook salmon fry at the Town Canal and 16.8 percent of the same species at the Westside Ditch were lost as a result of passage through the screens. These fish (presumably spring chinook salmon) were mostly less than 36 mm in length. Screen mesh size at both facilities was 0.125 inches.

In 1987 through 1989, Hosey and Associates (1990) evaluated angled rotating drum screens at the Columbia, Chandler, Roza and Easton facilities on the Yakima River in Washington. The authors estimated less than 1 percent of the smolt- and fry-sized spring chinook, fall chinook and steelhead were either descaled or killed as a result of bypass by the screens. Although there was no evidence of fish passing through the screens at Columbia, Chandler or Roza, some spring chinook fry and smolt-sized fish were lost at Easton. The authors attributed this loss to inadequate screen seals. Predation was not considered a major problem during the

study period. Avian predation (gulls) was observed at the Columbia facility. Squawfish predation at the Chandler facility was identified as a potential problem during periods of warm water temperatures. The screens at these four facilities were designed to meet design criteria of 0.5 feet per second approach velocity and 0.125 inches mesh size.

In the Umatilla River in Oregon, Hayes et al (1992) evaluated juvenile fish passage at a rotating drum screening facility in the West Extension Irrigation District Canal at Three Mile Falls Dam. The authors detected no significant difference in injury rates between test and control groups of spring chinook, fall chinook and summer steelhead smolts. Screen efficiency was estimated at 99.8 percent, which means that approximately 0.2 percent of the test fish passed through or over the screens into the canal. Screen mesh size was 0.125 inches and design approach velocity was 0.5 feet per second at this facility.

Similar studies were conducted at Furnish Canal on the Umatilla River in 1994. Highest screen efficiency rates were measured when gaps were sealed with foot and top wedges on drum screens and an improved bottom seal mount design was utilized (Cameron et al, 1995).

The need to keep rotating drum screening facilities in proper operating condition was stressed in several studies, including 1993 and 1994 evaluations of new facilities in the Umatilla River (Cameron et al, 1994 and 1995). Proper maintenance is also needed to keep facilities within design criteria.

Juvenile Fish Passage at Vertical Traveling Screen Facilities

Hydraulic design standards for vertical traveling screens are the same as for rotating drum screens. If vertical traveling screens are designed to these standards, including such important factors as uniform distribution of flow approaching the screens, adequate sweeping velocity across the screens, adequate bypass entrance velocity and large bypass entrances, there is no reason why fish survival at this type of screen would not be as high as that encountered at rotating drum screens (Rainey, personal communication). Rainey cautioned, however, that because there are more mechanical parts to vertical traveling screens than rotating drum screens, the likelihood of mechanical failure is greater, which would result in more instances of screen shutdown and potential acute fish mortalities.

Few vertical traveling screens have been installed in recent years that meet current design standards. In the Yakima River basin, where many rotating drum screens were installed in the 1980's, vertical traveling screens have also been installed as secondary screens at two facilities. Both the Chandler and Roza facilities have vertical traveling screens located in the juvenile bypass system after fish have passed the rotating drum screens to bleed off excess bypass flow and pump it back into the canals (Rainey, personal communication). These screens were designed for an approach velocity of 0.4 feet per second and screen mesh size of 0.125 inches. Hosey and Associates (1990) evaluated the vertical traveling screens as part of the entire screen facility survival study described above with reference to rotating drum screens. Overall mortality rates of less than 1 percent were calculated for juvenile fish diverted first by the rotating drum screens and then by the vertical traveling screens.

Vertical traveling screens have also been installed as secondary screens at the West Extension Irrigation District diversion at Three Mile Falls Dam on the Umatilla River (Cameron and Knapp, 1993). Fish impingement on these screens was determined to be a problem when velocities through the screen were too high. The authors concluded that placement of a restrictive orifice downstream of the traveling screen created unfavorable hydraulics at the traveling screen.

The Marmot Dam vertical traveling screens on the Sandy River were evaluated over a thirteen-year period from 1980 through 1993 by Portland General Electric (Cramer, 1993). Numerous modifications were made to the screen facility over the years to improve fish passage problems identified in evaluations. Screen mesh size is currently 0.125 inches. Approach velocity averages 1.1 feet per second, yet ranges from 0.5 to 1.9 due to uneven flow distribution across the screen. The screen is set perpendicular to the flow, and thus there is no sweeping velocity to guide fish to the bypass entrances. Instead, a spray wash system was installed to spray impinged fish off the screen and into a conveyance to the bypass pipe. Mortality of salmon and steelhead fry (35 mm to 50 mm in length) has been reduced as a result of the spray wash system, although mortality continues to be strongly affected by changes in spray wash pressure, direction of spray nozzles, and canal water surface elevation. PGE concluded that 95.4 percent of salmon and steelhead fry survive passage around the screens under average conditions. PGE noted that fry survival might be increased to 98 percent with additional modifications. Hatchery spring chinook and steelhead smolts survived at rates of 95 percent and 97.3 percent, respectively. Survival of wild smolts and other juvenile fish over 50 mm was estimated between 95 percent and 100 percent, but test fish numbers were too low for accurate estimation.

Adult Fish Passage at State-of-the-Art Vertical Slot Ladder Facilities

Few controlled survival studies have been conducted at vertical slot fishways. Most studies to evaluate vertical slot and other fishways have compared rates of fish passage under various operating scenarios, evaluated fallback of adult fish that successfully passed over a dam, identified pooling of fish below a dam or jumping of fish at spillways or other water sources, or evaluated fish delay associated with dam passage.

Fish passage rates and success are largely affected by the distribution of discharge from a dam and the effectiveness of the attraction flows at the fishway entrance (Bjornn and Peery, 1992). Bjornn noted that spill at dams should be shaped to avoid false attraction of adult fish to the spillway rather than to fish ladder entrances. Fishway entrances on both banks of the river, with added attraction flows at the entrances, provide good conditions for fish passage. Bjornn also discussed the location of fishway exits in relation to spillways. If exits are located too close to spillways, fish are more likely to fallback over the dam during high spill rates.

In 1991 and 1992, Hockersmith et al (1994) evaluated passage of adult spring chinook salmon in the Yakima River with radio telemetry equipment. They concluded that migration delays for radio-tagged spring chinook salmon at Yakima River basin dams were similar or less than passage times at Columbia and Snake River dams. Median passage times were less than one day at all of the dams equipped with state-of-the-art vertical slot ladders except at the upper

elevation dams where fish were probably holding during the prespawning period. Wapatox Dam on the Naches River, a tributary to the Yakima River, had not been retrofitted with vertical slot ladders. Its existing pool and weir fishway did not pass spring chinook salmon as quickly compared to the other dams. Median passage times were 3.5 days in 1991 and 4.2 days in 1992. Only 7 percent of the radio-tagged fish in 1991 died during the approximate 100 to 150 mile migration from Prosser Dam to spawning grounds in the upper basin. In 1992, mortality associated with migration was estimated at 3 percent. Since these fish passed over 4 to 6 dams in their migration to spawning grounds, it appears that fish ladder passage did not contribute significantly to mortality.

The Technical Advisory Committee (TAC) for U.S. v. Oregon management of anadromous fish harvest in the Columbia River has prepared models of fish survival through the Columbia River dams in its biological assessments of fish harvests under the Endangered Species Act. These models are based on current field studies, harvest information, and daily fish counts at the dams. In 1994, the TAC assumed adult fall chinook losses of 5 percent per dam for the dams from Bonneville to McNary on the Columbia River. The TAC's estimate of adult spring chinook losses in 1995 is 8 percent per dam from Bonneville to McNary on the Columbia River and 5 percent per dam through the four dams on the lower Snake River (Technical Advisory Committee, 1994 and 1995). Because these dams are much larger than Savage Rapids Dam, I would assume that adult fish mortality rates at state-of-the-art fish ladders at Savage Rapids would be even lower than those assumed for the Columbia and Snake River dams.

Recommendations for Modeling Anticipated Passage Success at Savage Rapids Dam under the "Dam Retention" Alternatiive

Rotating Drum Screens: The "Dam Retention" alternative at Savage Rapids Dam calls for a state-of-the-art angled, rotating drum screen facility to be constructed at the Gravity Canal diversion on the south bank of the river. At the time the initial conceptual designs for this facility were developed, design criteria of 0.4 feet per second approach velocity and 0.125 inches screen mesh were assumed. I recommend that, if this alternative is chosen, the most recent design criteria be used to ensure best possible fish protection. At this time, an approach velocity of 0.4 feet per second and screen mesh of 3/32 or 0.0938 inches are recommended design criteria by National Marine Fisheries Service where fry-sized salmonids are present. Given the results of recent research studies listed above and assuming that the new facilities will be operated and maintained in prime condition, I believe juvenile fish mortality for all species associated with the rotating drum screen facility should range from 0 to 5 percent.

Vertical Traveling Screens: The "Dam Retention" alternative also calls for installation of vertical traveling screens at the pump-turbine diversion on the north bank of the river. Conceptual design criteria call for 0.4 feet per second approach velocity and 0.125 inch screen mesh. As stated above regarding the rotating drum screens, I recommend that the most recent design criteria, notably screen mesh of 0.0938 inches, be utilized if this alternative is chosen. It is reasonable to assume that juvenile fish survival at the proposed screens would be greater than that measured at existing screens which do not meet "state-of-the-art" design criteria. Given the results of research studies listed above and considering improvements that the

proposed screens would exhibit that are lacking in screens at Marmot Dam, I believe juvenile fish mortality for all species associated with the vertical traveling screens should range from 0 to 5 percent. These screens must also be properly operated and maintained to ensure that fish mortality does not increase above the 0 to 5 percent range.

Fish Ladders: Both the north and south bank fishways would be replaced under the "Dam Retention" alternative with vertical slot ladders that meet current design standards. Based on both actual field studies in the Yakima River basin where state-of-the-art vertical slot fishways have been installed and on model calculations of fish survival through the Columbia and Snake river dams, I believe that adult fish losses and delay at Savage Rapids Dam with the new fishways would be greatly reduced from current conditions. It is my understanding that the dam retention alternative would include modifications to the river channel below the dam to eliminate false attraction flows that currently pose serious impediments to adult fish passage. I suggest using a range of 0 to 3 percent mortality for all adult salmon and steelhead species at the project.

Other Potential Sources of Fish Mortality: This memo does not summarize research results on other sources of mortality at dams, such as spillway mortality, predation and acute losses caused by emergency shutdown or screen failure.

- Spillway: Most studies of state-of-the-art spillways that include good plunge pools show insignificant fish mortality. When adequate plunge pools are provided, the only source of mortality has been associated with high levels of dissolved gases. This situation only occurs at high rates of spill over much higher dams than Savage Rapids and is usually limited to rivers with several dams in progression. Since none of these factors are present at Savage Rapids Dam, I would assume that spillway fish mortality would be essentially zero with the new facilities planned under the dam retention alternative.

- Predation: Studies have shown that predation on juvenile fish by other fish and birds is usually higher in the forebay and tailrace of a dam than in a normal riverine environment. However, my experience studying predation in the Columbia River has indicated that these predators are successful because inadequate hydraulic conditions exist at fish bypass entrances and outlets, resulting in juvenile fish that are easy prey for predators. If the fish facilities at Savage Rapids Dam under the dam retention alternative are designed to optimize hydraulic conditions for fish, predation should be minimized. Without site specific information about predation, I am unable to estimate a mortality rate associated with predation for the dam retention alternative.

- Emergency shutdown: Fish losses can be severe when facilities shutdown unexpectedly, especially if no one is stationed on-site on a 24-hour basis. If juvenile or adult fish are trapped in a holding pool and flow is cut off, dissolved oxygen can be quickly depleted and the fish will die. Other problems, such as debris buildup on screens, tears in screens or improperly fitted screen seals, can result in large numbers of fish diverted into irrigation canals before the screen failure is detected. With rotating drum screens, a spare drum can be kept on-site to replace one that needs maintenance. Vertical traveling screens, however, are not so simple to replace, and it may take days or even weeks to repair

or replace such screens. The key to reducing the probability of acute losses is to institute a comprehensive operation and maintenance plan, including regular inspections. Because I am unaware of the extent of maintenance planned for the dam retention alternative, I am unable to estimate a mortality rate associated with acute incidents.

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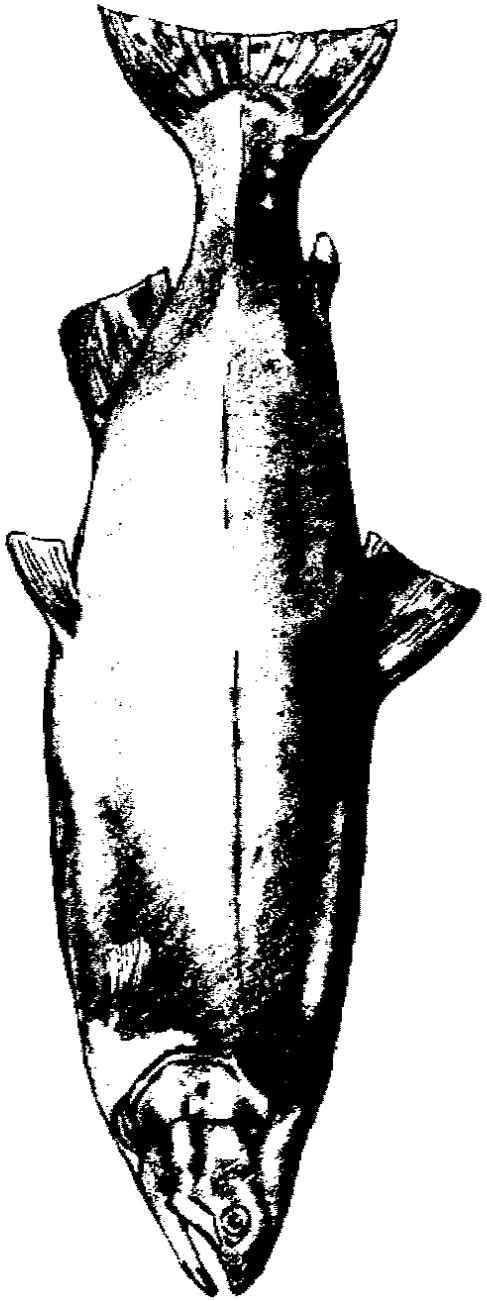


Attachment E—GPID Resolution

GRANTS PASS IRRIGATION DISTRICT
JANUARY 5, 1994

A special Board meeting was held after due publication of the Grants Pass Irrigation Board of Directors on January 5, 1994 at the District office at 200 Fruitdale Drive, Grants Pass, Oregon. A legal quorum of Directors was in attendance and the meeting was called to order by Chairman Bill Hiljus at 14:03 P.M.

Bill Hiljus	Director/Chairman
Roland Anderson	Director
Paul Altheide	Director
Don Greenwood (absent)	Director
Catherine Davis	Director
Jack Davis	Legal Council

Mr. Hiljus began the meeting establishing the agenda as follows: "The guidelines for the meeting today, each Board member will have six minutes to present any questions or concerns. Each member will have the floor in order of seniority, at the end of that time we have a committee, the people that want to save the dam can pick a spokesman and he will have six minutes to speak."

Ms. Davis has been the appointed Director for District 3 to finish Mr. Loveless' term. After advertising the position for the new term beginning 1994 no opposition came forth to run against Ms. Davis. Ms. Davis will be seated as Director of District 3.

Mr. Davis administered the oath of office to Ms. Davis and Mrs. Webster notarized the signatures. A copy is included in the Board Book.

The next order of business before the Board is to elect a Chairman of the Board for 1994. Ms. Davis nominated Bill Hiljus for the position of Board Chairman, second by Mr. Anderson. No other nominations. The legal quorum of the Board voted unanimously on the nomination of Mr. Hiljus as Chairman of the Board for 1994.

BOARD DISCUSSION RE: DAM REMOVAL OR RETENTION:

Paul Altheide: "I feel that I'd like to see the dam stay, but I don't know if we loose the water by fighting for the dam, I don't want to loose the water under any condition. That's the only thing that I have on the dam, I'd like to see the dam stay, but the way them guys put it to me that if we keep the dam we're going to loose the water, I mean, that's the way it looks to me. But if we could save the

dam, even if we get most the money I still don't know if we can keep the water. That's the only thing that I've got."

Andy Anderson: "Well I guess I've got to say the same thing. We're in the middle of a position where environmental groups are very strong, have money, if we elect to take the dam out I see they'll probably almost help us. If we elect to keep it I'm sure there'll be a lot of lobbying in Salem and Washington D.C. both. I can't see them sending us any money and we can't do anything without some money, and the only place we're going to get any money if the Federal government, if we get any. I don't think we're in any position to go out and borrow 10, 12, 15 million dollars. I don't think our patrons would take care of it. We have to face the fact that if we don't get out water rights, or get them extended or something this year, we're going to be out of business. If we raise the price to the customers very much, we're going to be out of business. Now we've fired another thing, if the decision is made that we have the dam removed then we're going to have a lot of court cases brought against us from some of the concerned people here in the audience. And I'm not saying that I'd like to see the dam go, I guess what I'd like to do is I'd like to see everybody just go away and leave us alone. They're not going to do that obviously, so I don't know, I guess I feel we're probably going to have to make a decision and tell the Bureau, the Department of the Interior, something here pretty soon, and I'm afraid we've really only got one bottom line choice that we probably can make because our main deal has got to be, "what is good for the irrigation district". Our patrons even don't seem to want to support this saving of the dam very well, a few do, but we didn't get any real good response to save it. I'd like to see everything stay the way it is, but things are going to change and there's not much we can do about it. But we're going to have our obligation, I feel as a member of the Board, is to provide irrigation water to our patrons, and I guess if that's the way we got to do it, that's the way we've got to do it.'

Mr. Hiljus asked Ms. Davis to speak and gave her his six minutes to add to her own.

Catherine Davis: "I have a very detailed report that I've prepared for everybody, and I'll hand it out after I've summarize it in my remarks. It sounds to me like we are all very much in agreement that we would like to be able to resolve all the issues facing the District, and at the same time preserve the dam. The dam has been there for many, many years and there a lot of people who have lots of memories of water skiing on the lake or watching the fish jump up the ladders, whatever. I remember as a young tyke, my grandfather taking me and my brother out to the fish ladders and watching the fish jump up there. Those are the

kind of images that tug at our hearts and our emotions, but when we're thinking and analyzing the issues that are facing the District we've got to put aside the emotional images and get down to the basics. Where we have to start is asking ourselves "what is the role of the Irrigation District". We have a mission statement that I have up on the board here that says "The Grants Pass Irrigation District is created to provide adequate irrigation water for lands in the Rogue Valley. The District is dedicated to operated and maintain a distribution system which economically and environmentally enhances the community". But going beyond our own mission statement, Oregon State law says that this Board of Directors is responsible for the District's water right. So what all this means to me is that the District exists solely to provide water to our patrons at a reasonable cost and we the Board are responsible for securing adequate water to do so. The Board doesn't exist, and the District doesn't exist to provide a recreational facility, although that has been a benefit that's been enjoyed for many years by many people, but it cannot be a concern at all, really, when we get down to talking about the business of the District. Now the situation with our water right is, we have a permanent water right for 97 cfs and we all know that's not sufficient water to run through our system. The State Water Commission has given us a temporary supplemental water right for another 90 cfs that will expire on October 1, 1994. Unless we get additional water to run the District, we're flat out of business. And at the same time that we have questions concerning supplemental water right and fish passage. We also had issues concerning the safety of the structure, there have been some human safety issues raised that also have to be addressed. So the Board is now faced with two alternatives, basically, they are either to keep the dam, fix the ladders, fix the safety issues out at the dam at a cost of about 17 million dollars, or to remove the dam and replace with pumping stations at a cost of about 11 million dollars. Now being the conscientious Board members that we are, and concerned about what our patrons have to say about things, we recently sent out 7,700 questionnaires, one to each of our District patrons. As of December 31, 1993, we had received 2,305 responses. A breakout of those responses are being put up on the board. About 30 % of our patrons asked us to do everything possible to save the dam and they would be willing to pay for it. About 40 % of our patrons said, "gee, it would be nice to have the dam, but we are not willing to pay any more for it". Thirty-one percent of the patrons said they don't care about the dam, they just need their water at a reasonable cost. So the question now becomes, what is the best alternative for us to approach. Keeping in mind our mission statement, our legal responsibility for the water right and our District patron's desires."

"With regard to the dam retention alternative, we have to keep in mind again our paramount responsibility, that is to provide adequate irrigation water to our patrons. It's been strongly suggested to us by interested bureaucrats that should the Board decide to save the dam, it's going to be very difficult for the irrigation district to get the supplemental water right that we need, and that our temporary permit probably won't be extended beyond, maybe, one more year. In other words, the GPID may not have sufficient water to serve our patrons, and on that basis alone, Bill and I don't see that we really have any choice at all. Let's continue with the analysis anyway."

"If the Boards decision is to retain the dam, we may loose our temporary water right, or we may be granted a permanent supplemental water right in an amount that's not sufficient to run our business, and we may have to sue the Department of Water Resources to get it back. First we'd have to seek an injunction to stop them from turning our water off, and then we'd have to obtain a writ to secure a permanent grant. I can guarantee you that we would be opposed on that effort by the Department of Water Resources, by the Water Resources Commission, by the State Department of Fish and Wildlife, by the US Department of Fish and Wildlife, by the Bureau of Reclamation, by Waterwatch and any other host of well intentioned and well funded environmentalist group. We'd be out there all alone, with no support morally or financially, of any significance against extremely well funded private interest groups, and the prevailing political establishment. The GPID might win a temporary restraining order, but the chances of ultimately prevailing on our water right issue might be pretty slim. Let's face it, we don't have the financial resources at hand to fight any kind of a long, extended, expensive legal campaign. But let's assume for a moment that we do get our water right, then we have to think about who's going to pay. The only cost estimate is from the Bureau of Reclamation, lacking any other authoritative estimates for the purpose of this analysis, we have to assume that number is close to accurate. We've been assured on any number of occasions that if we elect to save the dam, there's going to be no Federal money available to pay that 17 million dollars. That means that 100% of the funds necessary to save the dam are going to have to come from somewhere else. The only other source that we can look to are our District patrons. Others have said that "we'll raise the money", but I haven't seen any concrete plan, projection or course of action taken yet that we can rely on, and that's no withstanding that dam removal has been talked about, generally speaking, for the last twenty years at least, and more significantly in the last five years. Furthermore, the results of our District patron opinion poll clearly show that the GPID patrons are not willing to pay substantial increase in fees that would be necessary to save the dam. Seventy-one percent have said that we need to

provide them with their water at a reasonable cost, which is exactly what our mission statement and the State law requires us to do. If our patrons aren't willing to pay substantially higher fees, or if they can't afford the higher fees, we'll not only experience a higher rate of buy outs but we might also coincidentally put some of our patrons out of business. Of Course, we have fewer and fewer patrons to pay higher and higher fees, the ultimate result of course would be the demise of the Grants Pass Irrigation District. The loss of the dam, anyway, and the loss of the very water system that environmentally enhances our community and makes this valley the green and beautiful place that it is. So Bill and I believe that if the Board ignores the facts and disregards the majority opinion of our patrons by opting to save the dam, we will in fact fail in our mission statement and our legal responsibility."

"With regard to the dam removal alternative, again with regard to our foremost responsibility of providing water, we've been told by people on the State Water Resources Commission and in the State Water Resources Department, that if we can put together a coalition of interested parties, that it will be much easier for the State Water Commission to grant our water right. What kind of a coalition can we expect under this kind of an alternative? Well, we've already been told that this alternative will satisfy the Bureau of Reclamation, the National Marine and Fisheries Service, the US Fish and Wildlife Service, the Oregon Department of Fish and Wildlife Department, and the political environment. We've also been told that we can count on the support of Waterwatch, and I noticed that Mr. Bob Hunter is here now and can let us know in a few minutes if that's true or not. I think we can also reasonably expect the support of other environmental groups as well. Now, if the Board can bring together these factions and work together to craft an acceptable dam removal scenario we won't have to litigate our water right or defend suites brought about by well financed interest groups. We've been told, and I'm sure that some in the audience today will confirm, that we can expect some law suites from people above the dam. But quite frankly, unless their are District patrons, I question whether they have any standing to sue. But even if they are District patrons, as long as the Board is acting in good faith and in furtherance of our mission statement, and our legal responsibility, not to mention in accord with seventy-one percent of our District patrons, I believe that those law suites won't have much chance of success. So if the Board adopts this alternative, and I would suggest a number of very strict conditions go along with it, not only will we have our water but we'll also have the full support of various government entities and interest groups, and there is every likelihood that outside funding will be available to foot the bill."

"We will have eliminated any fish passage problems and rid ourselves of the human safety issue, with a potential for huge legal liability. We will have met our legal obligation to our patrons at little or no additional cost to them, consistent with their desires as reflected in our opinion poll, and we will have placed GPID in a very strong financial position which will insure it's continued vitality into the foreseeable future. We will have fully performed our mission statement and our legal responsibility, and met our responsibility for the District's water right. I think what we all have to remember her is that what's really at stake is the Irrigation District itself and the quality of life that our water brings to the valley. So with that in mind, Bill and I urge the Board to acknowledge what may be a painful truth but it is far better for the GPID to and our patrons that we move towards removal of Savage Rapids Dam, and thus insure to the greatest extent possible the longevity of the GPID for the benefit of our patrons. This is not the decision that our hearts want us to make, but it's the decision that our intellect requires of us. I now urge us to work together with the interested parties, form a coalition, see what we can come up in terms and conditions to satisfy the needs of our patrons. This action, I want to make this clear, does not foreclose the efforts of others who may want to seek other ways to fund retention of the dam such as a special County tax. I don't think our decision becomes final for the next eighteen months and in the next eighteen months, those efforts by the group above the dam or any other community group result in a special tax assessment that generate sufficient funds to save the dam, well God Bless Them. I think that at this point in time, we have to make the responsible business decision and move foreword with the dam removal alternative."

Mr. Anderson responded "well, I think what we've got to do is we have to let the Bureau of Reclamation get started on something, and we have that obligation to do that, and I think we need that obligation to do it now. To tell them to go after the money to save it, or go after the money to remove it."

Ms. Davis continued: "the conditions that I'm suggesting, I'm not saying lets take the dam out and be done with it, I'm saying lets make sure that if we agree to the dam removal alternative, the District is adequately protected. We've got to maintain a viable entity so we can continue supplying water to our patrons. The conditions that I'm suggesting are first:
That a permanent water right must be granted by the State for supplemental water in an amount of at least 53 cfs, which I understand from Dan is the minimum amount of water we need to operate."

"The next one, that instream water flow at the pump must be sufficient to draw the water that we need. The reason why the dam is there is to form a reservoir from which we can pull the 180 or whatever the amount of water that we are using. If the dam isn't there we have to make awful sure, we actually have to be guaranteed that there's going to be sufficient instream water for us to pull the 150 cfs."

"Third, total Federal or other source funding must be provided to remove the dam; to install the pumps; to acquire any necessary additional property that might be needed for the pump stations; and to revegetate the river banks above the dam to help mother nature along a little bit."

"Next that total Federal or other source funding must be provided to install a small power turbine to generate power which we can then turn around and sell."

"The next, Grants Pass Irrigation District must be given adequate time to make any necessary corrections or repairs to the irrigation canals."

"The Department of Water Resources, State Fish and Wildlife, US Fish and Wildlife, State and Federal Representatives, Bureau of Reclamation, Waterwatch and other interested environmental groups must guarantee support of this removal project and guarantee future non-interference. If we negotiate and decide to remove the dam, they've got to agree that they are going to work with us and not come back at us later and say "well now that we've got the dam out and the pumping stations, we now want the pumping station out". That's not going to be acceptable. Either they guarantee that they'll support this removal project or we may reconsider our options here."

Mr. Anderson stated, "well, I guess we can kick that around for awhile because the political climate could change at any time and the people that we're dealing with now including the environmental groups and stuff may not even be involved in three years or five years from now or so. I don't know what kind of a guarantee, maybe our lawyer could give us some idea."

Mr. Hiljus asked that Ms. Davis be allowed to continue at this time and go back to discuss any points of concern later.

Ms. Davis continued; "we recognize that because we're going to need to buy power, we need a trust fund set aside to pay for the annual energy costs to be funded by outside sources. We also need an adequate legal defense fund to be raised by outside sources, and I would also suggest that we seek from Waterwatch or other groups, satisfactory to the District

Board a harmless agreement because we know we're going to be hit with law suits and we need some help to defend those."

"Current debt for construction of the dam must be forgiven."

"Outside funding must be provided for maintenance and operation of Savage Rapids Park."

"Outside funding must be provided for the construction of a public boat ramp."

"These two items Bill and I discussed putting in here, the recreational opportunities at Savage Rapids Park are going to be different. We'd like to enhance them to the greatest extent possible. There may not be a flat water lake there, but we'd like to put a boat ramp in there, just replace one recreational opportunity with another."

"Finally, if within 18 months after the Boards decision to proceed with the dam removal alternative local community efforts result in sufficient funding to perform the necessary modifications to the fish ladders and repairs to the dam, then the Board reserves the right to reconsider its options at that time. That gives the people above the dam and other community groups 18 months to come up with the necessary funds."

Mr. Hiljus stated that concluded his and Ms. Davis' presentation and then asked Mr. Shepard for his input.

Mr. Shepard stated; "I guess my role in this is to try to get some of the facts and help the Board make the decision, I get the easy out, I don't vote on this. Some of the facts are; first Don Greenwood ask me to go to the meeting with the Commissioners before New Year about something about putting this on a ballot. One of those deals, it wasn't a commitment by the Board or myself because I don't have the authority to go to the meeting without the Board. One of the things that was said was that the only way the District can put anything on the thing is it's only within the District boundaries, you can't go to the County and have them do it County wide or Jackson County. We don't have that authority. The Commissioners, by law, have some things they can do, but they said at that time they're not going to have a County vote on things like this come this spring. It would have to be basically done by a private initiative."

Mr. Shepard continued, "the save the dam committee wrote a letter to the Northwest Regional Director of OSHA, to Mr. Beard, the head of the Bureau of Reclamation, to Martha Pagel, and to the State insinuating that OSHA was a pawn in the political scheme of things down here. There is problems at the dam, evidently the person that wrote it thought they were helping. It's kind of like advertising that you've got

the chicken in the hen house and you're going to town and opening up door, and inviting them to come down and see what you've got. This is this year's report from the Department of the Interior that has the deficiencies at the dam. Now these aren't all OSHA, these are just maintenance things. We've never talked about any other ones because it's something you don't want to talk about in public, but since the cat's out of the bag about that. I think they hurt themselves because once the ball gets rolling certain things happen. One thing also we found out was that whether people realize it or not, we have a permit to generate power that was issued to us in 1918 to run the turbines at the dam, and it's for 800 cfs. Doing some research and in talking to some people, I was talking to the gal that's the manager of the Eagle Point Irrigation District, and one of the problems of perusing that on the Rogue River is that, my understanding, there is a State law that says you can't have hydroelectric plants on the Rogue River. In talking with her, my understanding was that up in Eagle Point Irrigation District, her District was what was considered a cold irrigation district, in other words, there was a law that said you couldn't have an electric plant on Big Butte Creek. They went to the State Legislature and got the law changed for Eagle Point Irrigation District to allow it, they bought a small hydroelectric plant that's projected to produce between two and three hundred thousand dollars a year in electricity, using roughly 100 cfs. My thinking was that we're half way there. We have the permit for the turbine, if the dam was to go out. The only thing we're arguing about is when the fish go up river he doesn't know the difference between a turbine and a pump, we're already there for the turbine with a shaft coming out and now we're going to talk about whether there's a pump hooked to the shaft or there's a generator and then on to the pump. I think it's taken for granted that there would be problems with the size of one, I don't think we'd have one up there for the existing 800 cfs, there'd have to be some give and take on that. We don't even know if it can be engineered, whether there's enough fall through there. But because they (Eagle Point) got it and we're already half way there, I think it's a legitimate thing that we can look into, and that's one of the biggest problems and some of the objections that people have about the pumping system is the electricity cost. This may be a way of solving that and what's probably the most important thing about Catherine's proposal is, I guess I'm kind of a funny guy, is that I actually made my living in agriculture, my sole source of income. I'm a member of the Farm Bureau, I've been a member of the Jackson County Cattlemans Association, I've been a member of the Oregon Cattlemans Association, my dues have lapsed behind in the Cattlemans Association, but I've gone to a lot of meetings and one of the things that they all say is if things change you've got to work. Or you know, the old willow tree you know you bend it a little bit or it's going to snap. Since you've been in

agriculture for a profit, in other words, when I buy cattle I'm probably a little different than a lot of people in the District, they do it because it looks cute to have a cow out there. I do it to make a buck. My bottom line is the dollars and cents and how much it's going to cost me as a patron, also from running the District. And looking at it strictly at the business approach, with these contingencies, if a person could get them, it makes the District totally out of debt which is kind of unique for a lot of government things. It also makes the District have some coalition without the State on our back; it also has a coalition that some of the environmentalists would back off; it also sets us up with the flexibility that there has been talk of and innuendos about what would the shape of the District be in five, ten, fifteen years when private water or city water comes out into the Urban Growth Area. Will we still be there or will we not. That is something we won't know until the day comes. One of the things that's part of the Board's responsibility is planning and having the flexibility to be here ten, fifteen, twenty years from now. If some of those things would come about the Urban Growth Area, if there's pumps there's availability of moving them down stream, upstream, where they may be more advantageous and less costly to the patrons. There is also, once the dam and the debt is whipped off from the dam, we have some money that is set aside by law, as people buy out we can draw the interest off it to help maintain the District. We'll probably have to have a legal opinion on it. The Board, we've talked that once we're totally out of debt, totally out of debt, we own everything, and we have money in the bank it would also free up a pretty large chunk that we could use for our conservation program to fix some of the ditches and then you go into the next seventy years probably in the best financial shape that a business can be in."

"I passed out to the Board, a concerned patron came in from one of the people above the dam and left me with a letter, I didn't stop and talk so I don't know what he wanted to do with it, but I made copies and everybody can read it at their leisure."

"Catherine gave me a letter from a gentleman too that we'll pass around to look at."

"I think the "out of debt" is probably, from the Manager's standpoint, in other words in theory, the rates could stabilize or actually go down because of the money. One of the things that is probably the most important things with this article that was in there, they said a "modest increase", that the rates would go up to the patrons. I think that what's really important is that these conditions are met. And it needs to be made very clear to the public that first of all they're not coming tomorrow to tear the dam down. There's a whole process of environmental impact

statements, there's a whole lot of stuff that's still involved. This basically gives, I think, gives the best of two worlds. One that gives us what we're talking about, money. It also gives the people that are above the dam and want to keep the dam the ability to still, if they can come up with the money, to do it. The door has not been slammed in their face. We're still working with the State, we've got to go foreword, we can't just sit here and vegetate and wonder what we're going to do next."

Mr. Hiljus continued at this time. "Alright, we'll get back to re-open the discussion, I should get through the rest of the functions, I have some things I'd like to say and come back to it."

"May we go to Jack's report?"

Mr. Davis stated; "I've looked at the issue of whether or not the action of the Board, if the Board decides the dam removal alternative is the one that they want, whether or not that would open up the District to liability by law suits from individuals that own property on the lake. And I guess whether we discuss that in open session or executive session is something you all can decide. It is appropriate to discuss such legal matters in closed session, if you wish, if you don't I'll plug ahead and tell you what I found, so I thing that is the first question that you need to decide is whether or not you have any problem with me talking about this issue."

Ms. Davis spoke up; "I would prefer that such matters be discussed in executive session."

Mr. Shepard stated; "What we can do is make a motion that we move for an executive session and then basically everybody has to clear out temporarily except for the press, and then we'll discuss what we have to discuss and then we'll come back in."

Mr. Davis interjected; " Let me just say that I'm just going to give you what I found in a summary of what the law is."

Mr. Hiljus..."We don't want to hide anything."

Mr. Anderson..."We've got nothing to hide, if it's going to be, it's going to be."

Mr. Davis continued; "Ok, if that's the feeling let me plug ahead. The only theory that I can think of that would allow for a lawsuit against the District would be what is called inverse condemnation, it is akin to the situation where a government comes in and puts in a street through your back yard and takes away your property for the public good, if you will, and the law allows that kind of thing. Then when

that happens, government has to pay the person for taking their property. That argument can be put forth in this case and the theory would be this; that because the District decides to opt to remove the dam, you then have the lake disappearing and this property right, you'd have to categorize the rights of the owners on property on the lake have as a property right, and that is a big question of whether that is or isn't. But I guess it would be the right to have a pretty lake to look at, an esthetic right if you will, or another way to look at it would be the loss of some use of their property because they can't look out on the lake or sit on their dock and watch the water go by. So, that's the theory that because of this government action, and you are a governmental entity for this purpose, your're a municipal corporation so you fit that category. If they establish that right that they have is a property right then they can make a claim against the District for the money that they lost in diminution and value of the property because the lake is no longer there. My opinion is that it is not a taking of a property right, and if you want to talk about that I can go into more detail but for right now just let me conclude with that and also say that even if it was a property right, there's a real issue as to whether or not the folks have been damaged or not. What is the diminution and value of their property before and after the taking out of the lake, if you will. We have some information that there wouldn't be any difference in value, so that's a real question too. I think it's a real stretch to say that the loss of this esthetic right is a taking of property, and for that reason I don't think their cases would be successful. That's not to say that you will not get sued, you may, and then I should also point out that it is conceivable that someone could make that stick in some jurisdiction. I'm not the judge that's going to make this decision, so my opinion isn't going to carry the day, you're going to have somebody else looking at the matter and it's conceivable but unlikely that they could make that stick."

Mr. Davis informed the Board that "I think Mr. Bob Hunter is here, he has shared with me Waterwatches' research on this same issue and I think he concludes basically the same thing as well."

Mr. Hiljus..."I'd like to make a comment, I believe on item "L", as an alternative, this gives the committee to save the dam eighteen months to review and do it's study which is one of the big issues; figure out a way to raise money by taxes; or to raise funds by the park; or any other means possible. But it gives you an avenue, definite open avenue to raise the funds necessary to maintain the dam. I wanted to really bring that up as a strong point. It's in there for that purpose, it was the avenue that I understand to make the comity to save the dam to ask what do we need to do. There it is, and I would suggest the first thing would be engineer

study to prove or disprove the figures and then go from that point."

Mr. Shepard interjected; "Also on that, I think when you're discussing the amount of money, or the cost, it seems like some people have directed at me, "who has the right to say what needed to fixed at the dam". I believe the Oregon Department of Fish and Wildlife would have that authority. In other words, when you're talking about fixing it, one of the entities that they need to talk to is the Department of Fish and Wildlife, one of the things that they've relayed to me is personally their preferred alternative is dam removal. They are somewhat, right now, neutral. They have to be neutral right now because by law we do have the right to fix the dam. But one of the things they said they would be very vocal on is how it is fixed and to what standards, that they would not deter from what they believe is industry standards. There's no quick fixes, so when you're talking about the amount of money the first thing is dealing with, it wouldn't be I don't think coming through the irrigation District or the Board asking what it is, or the amount because we don't have the final say. I think correct because, I believe myself, and Jack correct me, that we own the dam and if went to court, in other words if the Department of Fish and Wildlife or any group took us to court for upgrade of that dam, the court would go to the Department of Fish and Wildlife and ask their opinion because they are the people in that field of what are the necessary repairs, and so that's why I think it's really important, if that is going to be the route of some people is not to kid themselves in thinking there's going to be a quick fix. I think you should be honest about that, I could be wrong because I'm not a lawyer on whether they have that authority but I would tend think they probably do."

Mr. Hunter stated that " there has been some talk that Waterwatches position may have changed from what we originally represented to the Board in terms of what we were willing to do and our position has not changed, anyway, Waterwatch speaks for Waterwatch and I don't know who else might be saying something. But just looking at your conditions here I cam maybe quickly go through and at least tell you where I know we are distant. If the District does select dam removal alternative, we have indicated and we will then work with the District and your engineers to come up with a conservation plan that's workable for you folks that meets your requirements, because that's worth time and is not unreasonably expensive to tie that to a water right, we haven't made the decision whether it would be permanent or temporary, so that's that thing. But we stand by our commitment to help you get the water you need to continue to operate based on a conservation plan contingent, of course, on condition one dam removal. So we're right there. Certainly we will not want to go to a pump if there are not

in stream flows available and I would agree that needs to be and would be something we would support, that it needs to work. We also would be supportive of and work for you at the Federal level for total funding for removal and tied to that the releasing your current debt. Those would be things that we can work for as part of this project for dam removal and we would do that. In terms of the concept of the turbine, Dan had mentioned that to me before, we don't know enough about that, but we have an idea we would try to solve that power cost problem. This might be one way we have to look at the design and see if it work and be environmentally safe. Does it pose any additional hazard to fishery or is no different than the pump. We just don't know those things, so I don't know where we are on that yet. We don't want to set you up so you go into pumps and then we say we don't like those too, so I think that's fair to ask for some commitment from us on that."

"Hold harmless on the suit attempt, I'm sure I'd say we'd be willing to do a strict hold harmless, but I can say that we certainly would be willing to give assistance and help. We've got four staff attorneys at Waterwatch that would be willing to do some research in help in a suit. We'd probably want to intervene if you wanted us to, we might want to intervene even if you didn't want us to defend any action. So we would have an interest if any suit was brought to put our resources behind defending of this as well. As far as the boat ramp at the park, we don't have any financial regard, but if that could occur we would be supportive of it in there. And the decision to have your eighteen month right to cancellation, that's your decision to do with what you will there, we would want to tie anything dealing with the water right based on dam removals we'd be back up in the air a little bit depending how that went, but that's your decision."

Mr. Hiljus...."At this time there is there a spokesman for the committee above the dam? Has anyone been appointed to speak?"

Mr. Kirtley spoke up..."Nobody has been appointed to speak, but it looks like to me that there's been something in there for someone to speak. If nobody else wants to speak, I'd like to say a few words. In the first place, I think you're all bowing down to blackmail as far as I'm concerned. This is all it amounts to, we could get the water if we do what they want, we'd get plenty of it, they'd even help us get it. But if we don't do what they want to do, why, they're going to try to cut us off all together, or not enough to even irrigate the District. As far as the fish ladders, I was up couple of months ago and just above Shady Cove you could have practically walked across the river there on the backs of the fish spawning. And I have a friend that has a home right on the deal, and his deck runs right down to the

river, and his was the one that told me that, and he don't even know nothing about we're having the problems of the fish. And, to me, I thought we elected officials to do what we want them to do, not what somebody in Montana or Medford or Salem wanted us to do. We've got to deal of this whole valley and we live here. I've lived here for thirty-three years, and I've been on the dam for thirty-two years. And I've lived other parts in this State for another fifteen years and I can't see where someone else can come in here and tell us what to do with our valley and everyone there has said "oh well, we got to bow down to what they want". It isn't what they want, we elect them to do what we want, and I don't see why that you can't see that the people of this District, I left a sheet, I've got seven of them signed to save the dam. They must have thousands, nobody has brought that up, how many names that was turned in here all mad to save the dam. Well I turned in about six pages myself, it was nothing to get it filled out. But, I know everyone that I've talked to above the dam out there is for saving the dam, and some of them, you talk about the property rights. I would loose, I can bet you a thousand dollars right today and lay the money on the line that I would loose one hundred thousand dollars on the price of my property, and that would be considering that really low it they take that dam out. I bought that there thirty-two years ago because I liked the dam and I liked the water. It's just what he says, if you take it away I've got my property will go in half. I'm not just talking of mine, I'm talking about everybody up and down there. People have come in here and put in three and four hundred thousand dollar homes and fixed up the banks so that there won't be no deal. And then you talk about the logging deal, they're talking about the logging ruined the river, now they want to put the timber back in there to protect the fish. So what do they want? They don't even know what they want. But I'm sorry if I took up anybody else's time, but that's they way I feel."

Mr. Hiljus..."That's fine, we appreciate your input. Again, I believe there's a couple of these that have gone out to you that item "L" provides the opportunity to saving the dam and give us the alternatives to work with. Again we're here for the irrigation District, because on the bottom line we're here to save it and the other part is I want you here. We all came on the Board, there's no one here who doesn't sit here with the attitude to save the dam. But we got down to the issues, the facts of irrigation, we believe, at least Catherine Davis and myself believe this is the best option for irrigation. But the alternative "L" gives you the opportunity to get together, work with us, we're willing to help, we're all for it, and maybe we can make it work that way."

Mr. Kirtley..."Well one thing that she brought out, she read the article. In economics, she's talking about the dam, she wasn't talking about the hundreds of thousands of dollars that bring in every year up and down that dam there for people to come in. You can't just take the environmental point of view because the environmentalists don't live here. Very dad gum few of them live here that is against taking the dam out. So if you get back to the economy of the deal, then you better take a notice of what is going to happen to the economy of that whole area between Rogue River and the dam. I'm talking about the City of Rogue River, that's in Jackson County but there isn't a person over there that doesn't want the dam to stay in because if you was here when that eighty some odd year old man talked, before the dam was in there you could walk across where the bridge is without getting your feet wet a lot of the time so you're going to have to worry about where you're going to get all this water to run your pumps and things like that."

Ms. Davis..." The gentleman has a very good point about the accountability of officials, of government officials, and as our lawyer pointed out we are considered a municipal corporation and so we're sitting in the same seat as elected officials. We're elected Board members here. Seventy-one percent of our patrons have said they are not willing to pay to save the dam, or they don't care about the dam, and I think we're accountable to our patrons in the same way that you think and believe, and we all believe, that our elected government officials are accountable to us. The numbers are right there, that's what all these cards are about."

Mr. Kirtley..."But you listen to the people in Portland that's the head of the fish and the water deal and they're all setting in Portland or Salem trying to tell us how to run the valley down here, and they should listen to what the input of the people is here."

Ms. Davis..."And I don't disagree; I agree with you, I agree with you and you this a heavy hammer or you can call this blackmail, you can call it anything you want, but what it really is, is political reality and we have to do the best we can within our mission statement and Oregon law to provide water to our patrons, which is what we're all about. And we're really struggling to do that, and at the same time give you eighteen months under this, under what we've proposed to raise the money. I mean, that's, hopefully that's enough time for you to do something. We'd like you to do it, there's not a single person sitting here that wouldn't like to keep that dam."

Mr. Roller..."And we'd like for all of your help."

Ms. Davis..."And we're here to help, but in the mean time we have to make what we consider to be a responsible business decision."

Mr. Ellis..."Why didn't you mention all these costs and everything, about the quarter of a million dollars in power bills is going to cost to pump there? Waterwatch is going to pay for that?"

Ms. Davis..."Well, there are a couple of things in here, we've got to be funded by some outside source for the energy.."

Mr. Gross interrupted loudly...."You cannot generate without a head of water. You can't stick a generator out there in that river and provide two hundred thousand dollars worth of power, I don't care what kind of a generator you have."

Mr. Shepard questioned..."How much fall do you got to have?"

Mr. Gross..."Depends on the flow of water."

Mr. Shepard responded..."Well, one of the things that's going to be done, in other words, these are contingencies, if these contingencies aren't met it's back to the drawing board"

Mr. Gross again interrupted..."If you want to generate power you're going to have to keep that dam in."

Mr. Shepard responded..."No, one of the things that will happen is we'll go up and look at Eagle Point's and have some concrete information if we're blowing smoke."

Mr. Gross..."They're on an irrigation ditch with a high head of water."

Mr. Shepard..."No, they're on Big Butte Creek. They just got this last year. This is a whole new can of worms."

Multiple people began speaking at once with no decipherable conservation.

An unidentified patron spoke..."Well, there's another thing I'd like to ask too 'cause I'm a patron, and I thing this has been swept right under the table and staying there. I haven't heard anybody say how much it's going to cost when you get you electric bill for pumping these pumps and these holding tanks and all that for your water, is it going to cost more than it does with using the dam?"

Ms. Davis..."We're saying, with this contingency, no, it will be less."

Mr. Hiljus concurred..."It will be less if the contingencies are met."

Unidentified speaker..."It will be less than what I'm paying here now?"

Mr. Hiljus..."Yes it will, from all the information we have now."

Unidentified speaker..."Yea, right, thank you."

Mr. Hiljus..."We've got to get through our Board meeting. Again all these are the contingencies, we believe if they're met it will be less."

"I'd like to get back to the Board members, we'll get around it one more time with discussion and questions or any motions. Paul do you have anything you'd like to bring up now?"

Mr. Alethide..."I think everything's been covered."

Mr. Hiljus..."Any comments or statement?"

Mr. Altheide..."Well the only thing, I, like I say, I'm for saving the dam but I fell that in order to get water, we're going to have to forget the dam. I think that's the way it looks to me, unless something can be changed or something, I don't see what other choice we have."

Mr. Hiljus..."So in other words, this package would work allowing eighteen months for the committee to come up with a different..."

Mr. Altheide..."Yea, I was always proposal, I mean, I think that's the only way to go if we could get that, but otherwise, I don't know."

Mr. Hiljus..."Thank you. Andy?"

Mr. Anderson..."Well again, we're going to have to make a decision and we're going to have to make it soon, or at least tell the Department of the Interior something. We have an obligation to be by our deal to tell them in January this year what's the preferred alternative, and we've been kicking it around now for, what, I don't know, I've been kicking it around, I've been on the Board been kicking it around for about four or five years now. And I can't see, you know, you kind of put off everything that you don't want to happen as long as you can, but I guess the Board is going to have to make a decision and I guess I'm going to make a motion that we remove the dam."

Mr. Hiljus..."And a second?"

Ms. Davis..."Well I'd like to make that motion subject to all of the various contingencies, in fact, I've written up that whole list in motion form, so if you'd like to make this motion?"

Mr. Anderson...."Do we need to read all of this? Why don't you read it. You make a motion."

Mr. Hiljus..."Catherine Davis for our motion."

Ms. Davis..."I move that the Board work together with the various interested federal and state agencies and elected officials, and with WaterWatch and other interested environmental groups to implement removal of Savage Rapids Dam and installation in its place of a system of pumps to provide diversion of adequate water to serve the patrons of the Grants Pass Irrigation District. At a minimum, each and every one of the following conditions must be satisfied (or suitably guaranteed) before the Board will consent to the removal of any portion of Savage Rapids Dam:"

Ms. Davis continued by reading the eleven contingencies of the motion. A copy of the motion read at the January 5, 1994 Board meeting is included in the Board Book.

A discussion about contingency number two and the amount of water right requested resulting in the re-wording of that contingency. The agreed upon wordage is hand written on the motion with the old wordage crossed out.

Mr. Shepard..."I have only one comment, if I may? Would you like to do as condition twelve, I think it's important that the Board makes a public statement that they are in support of Elk Creek and Lost Creek Dams 110 %. That should be very clear that the two types of dams,"

Ms. Davis informed Mr. Shepard this was included as a footnote in the Memorandum but was not part of the motion.

Mr. Shepard continued..."I just wanted to get the two cents in there that for some reason I don't want people to thinking that we're against dams or something. The reason for the two dams is totally different, and Elk Creek and Lost Creek is very important to the salvation of Grants Pass Irrigation District."

Ms. Davis..."Well, I don't think anybody should make the mistake of thinking we are dam removal advocates, because we are not. Just the circumstances in this particular case are forcing us to make this decision."

Mr. Hiljus..."Can I have a second on the motion?"

Mr. Anderson..."I second it."

Mr. Hiljus..."All in favor?"

Ms. Davis..."Aye." Mr. Anderson..."Aye." Mr. Altheide..."Aye."

Mr. Hiljus..."Motion passed."

Mr. Anderson..."Good luck to the people that are trying to save it. Some of the people here talk about suing us if we remove the dam, I figure there's a couple two or three was that we could be put out of business. One of them, we don't get enough water; two, we have to charge our patrons too much money; and three if we get sued by the people living above the dam for too much money we'd probably have to sell the Irrigation District, go bankrupt and go out of business."

Mr. Hiljus..."We can still have a discussion, we're going to close the meeting and then we can discuss. So it's now 3:12 P.M. and the meeting is adjourned."

ATTEST:

Daniel G. Shepard Secretary/Manager	Bill Hiljus Director/Chairman
Roland Anderson/Director	Paul Altheide/Director
Don Greenwood/Director (absent)	Catherine Davis/Director

MOTION

I move that the Board work together with the various interested federal and state agencies and elected officials, and with WaterWatch and other interested environmental groups to implement removal of Savage Rapids Dam and installation in its place of a system of pumps to provide diversion of adequate water to serve the patrons of the Grants Pass Irrigation District. At a minimum, each and every one of the following conditions must be satisfied (or suitably guaranteed) before the Board will consent to the removal of any portion of Savage Rapids Dam:

1. A permanent water permit must be granted to GPID for minimum additional 53 cfs; AND

2. In-stream water flow at the pump stations must be sufficient to ~~draw 750 cfs~~ Meet water plant needs; AND

3. Total federal (or other source) funding must be provided to remove the dam, install pumps, acquire any necessary land for pump stations, revegetate the riparian area above the dam, etc.; AND

4. Total federal (or other source) funding must be provided to install a small power turbine to generate power which can in turn be sold to defray pump operational expenses; AND

5. Oregon Department of Water Resources, State Fish & Wildlife, US Fish & Wildlife, our State and federal representatives, Bureau of Reclamation, WaterWatch and other interested environmental groups, must guarantee support of the dam removal project and future non-interference; AND

6. A "trust fund" to pay for annual energy costs must be funded by outside sources; AND

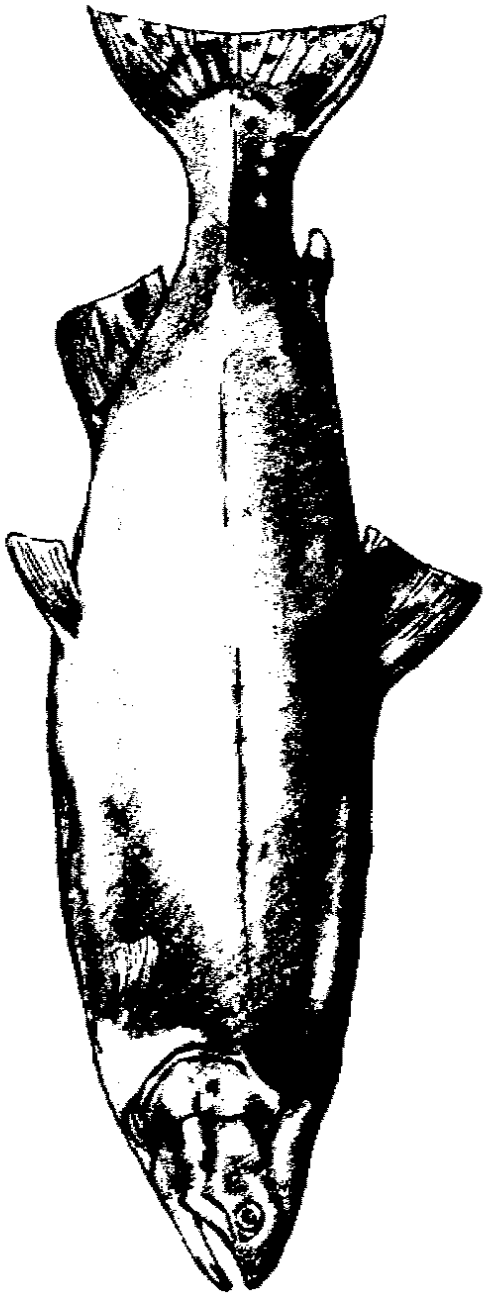
7. GPID outstanding debt for construction of Savage Rapids Dam must be forgiven; AND

8. An adequate legal defense fund must be raised by outside sources and WaterWatch (or other interested environmental group or groups satisfactory to GPID) must hold GPID harmless from any and all claims made by property owners above Savage Rapids Dam which are filed as a result of this action; AND

9. Funding for maintenance and operation of Savage Rapids Park must be provided by outside sources; AND

10. Funding for construction of a public boat ramp must be provided by outside sources; AND

11. If within 18 months from the Board's adoption of this motion local community efforts generate sufficient funding to perform the necessary modifications to the fish ladders and repairs to the dam, then the Board reserves the right to reconsider its options at that time.



Attachment F—Environmental Commitments

Environmental commitments are actions that Reclamation would take, in the event the project is implemented, to protect values identified through the environmental statement process.

Fisheries

Final design of fish passage and protective facilities will be coordinated with USFWS, NMFS, and ODFW.

Instream work will be coordinated with the Corps, USFWS, NMFS, and ODFW to assure that adverse effects to anadromous fish will be minimized. To date, ODFW has determined that the period of June through mid-September would be the least disruptive to migrating fish. Construction of coffer dams would be completed during this period but construction within the area protected by coffer dams would extend beyond this period.

Left and right bank facilities (pumping plants of the Preferred Alternative and new fish ladders of the Dam Retention Alternative) would be constructed in sequence so that a channel would always be open to fish migration.

Under the Preferred Alternative, Savage Rapids Dam would be demolished in a manner that does not block anadromous fish passage and does not cause excessive turbidity and rapid release of trapped sediments.

Water Quality

Before discharging any wastewater or other pollutants, contractors would obtain permits as required under the National Pollutant Discharge Elimination System. Section 404 permits, which are required before discharging any dredged or fill materials, and Section 402 permits would be obtained from the Corps before initiating construction.

A removal-fill permit would be obtained from the Oregon Division of State Lands as applicable. Water quality certification would be requested from the Oregon Department of Environmental Quality.

Contractors would be required to comply with Federal, State, and local laws and regulations regarding the control and abatement of water pollution. Construction methods would be used that protect against the entrance of accidental spillage of solid waste, contaminants, debris, etc. into the Rogue River.

Vegetation

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

Air Quality

Construction specifications would require that contractors comply with applicable Federal, State, and local air quality standards and emission limitations. During construction, contractors would be required to use methods to reduce excessive dust and to limit discharge of dust into the atmosphere.

Noise

Construction specifications would require that contractors comply with Federal, State, and local regulations concerning the control of noise levels. Demolition of Savage Rapids Dam in the Preferred Alternative will be of particular concern and may require discussion with a variety of agencies and nearby residents to find appropriate resolution.

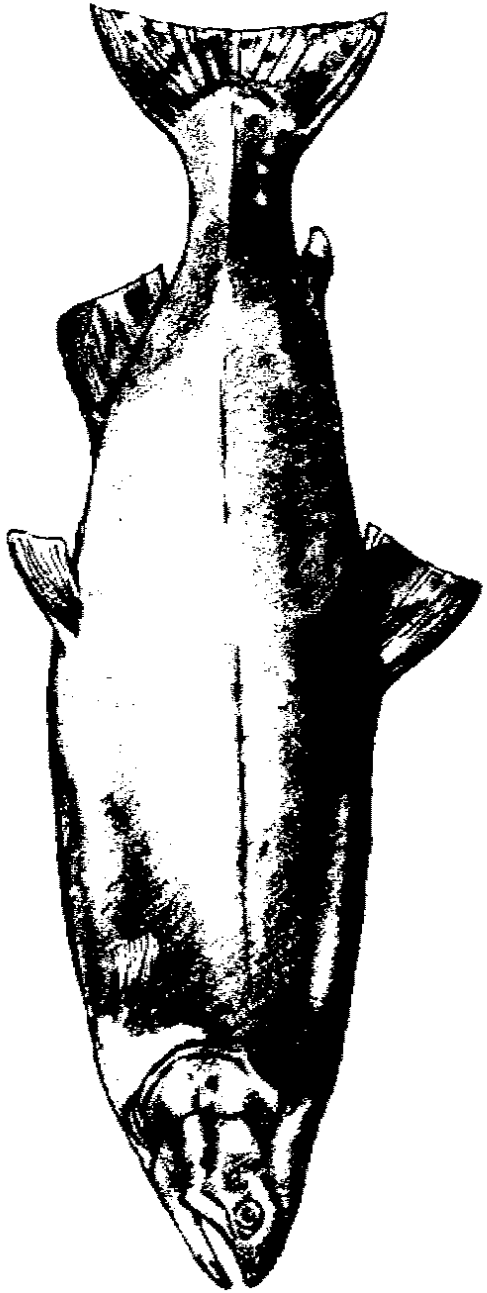
Noise abatement walls around the pumping plants of the Preferred Alternative would focus sound upward, reducing the perceived sound level of operating pumps.

Cultural Resources

It is not anticipated that any cultural resources will be found at the construction site. However, construction specifications would require contractors to take appropriate actions and to 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 in accordance with state, county, and local regulations and ordinances. Hazardous materials will be disposed of in accordance with applicable Federal and State regulations.



Attachment G—Oregon Water Resources Commission Order

BEFORE THE WATER RESOURCES COMMISSION
OF THE
STATE OF OREGON

IN THE MATTER OF APPLICATION FOR EXTENSION OF TIME IN WHICH TO BEGIN AND COMPLETE CONSTRUCTION WORK AND MAKE COMPLETE APPLICATION OF WATER UNDER PERMIT NUMBER 50957	)))))	ORDER

AUTHORITY

1. The Grants Pass Irrigation District is the holder of water use permit number 50957 issued by the Water Resources Director which expires on October 31, 1994. The district has submitted an application for a five-year extension of the time limits within which to complete construction work and make complete application of water to beneficial use under the permit.

2. The Water Resources Commission is authorized under the provisions of ORS 537.230 to grant extensions of time for good cause shown, within which to complete work to perfect a water right under a permit.

3. Under the terms and conditions of permit number 50957, the Commission may grant extensions of time to complete the project provided that the Commission finds that the permittee has exercised due diligence in complying with the conditions of this permit and with the conditions of any plan adopted and that it would not impair or be detrimental to the public interest to extend the permit.

FINDINGS

1. The permittee has exercised due diligence in complying with the conditions of the permit. The district has completed the following tasks as required under the permit:

   A. Preparation and submittal of a water management study which includes consideration of a range of options to reduce water use and improve efficiency, provide water service through a municipal or another type of purveyor, and resolve fish passage problems at Savage Rapids Dam;

   B. Consultation with an advisory committee which included representatives of the City of Grants Pass, Josephine County, Oregon Department of Fish and Wildlife, National Marine Fisheries Service, Bureau of Reclamation, Soil Conservation Service, and WaterWatch of Oregon;

   C. Continued implementation of its ongoing conservation and maintenance program;

   D. Submittal of annual progress reports detailing the efforts of the permittee in gathering the required information and preparing the required plan and options; and

   E. Submittal of a recommended plan and implementation schedule for improvements in the district.

2. The conservation plan recommended by the district includes improved communication among district staff to coordinate conservation actions, flow reductions at the beginning and end of the irrigation season, increased use of irrigation scheduling, reduced operational spills within the distribution system, education of patrons and district staff, assistance for on-farm improvements, and continued improvements and maintenance of the conveyance system. These measures are described in Chapter 7, Elements of the Conservation Plan and Chapter 11, Implementation Schedule of Recommended Alternatives, Grants Pass Irrigation District Water Management Study, March, 1994. Implementation of the measures is expected to reduce the peak rate of diversion to 149.26 cfs and total annual water use to 46,585 acre-feet.

3. During the previous four years, the district has taken action to improve water management and to begin implementation of many of the conservation measures in the recommended conservation plan. These actions include installation of measuring devices, development of

planning management areas, and appointment of a water manager to coordinate and facilitate implementation of the conservation measures. In addition, the district has accelerated its canal maintenance program.

4. The fish passage plan recommended by the district includes installation of pumping plants and removal of Savage Rapids Dam. The district's decision to recommend removal of the dam was based on specific conditions including the receipt of water rights sufficient to meet the district's needs, resolution of funding issues, and the opportunity for reconsideration of the decision if sufficient funding is identified to adequately repair the dam and fish passage facilities. The recommended plan would resolve the problems caused by inadequate ladders which delay up-stream migration. The plan also would resolve problems of juvenile fish mortality caused by impingement on screens and losses through pumps and turbines and into district canals. Finally, the plan would provide the district with the necessary capability to manage and control its diversions of water. The district anticipates obtaining federal funds for the construction of pumping plants, fish screens, transmission lines, and other facilities. The plan and schedule for installation of pumping plants and removal of Savage Rapids Dam are in Chapter 8, Fish Passage Improvement Alternatives and Chapter 11, Implementation Schedule of Recommended Alternatives, Grants Pass Irrigation District Water Management Study, March, 1994.

5. The permit which was issued in 1990 provided a process to evaluate whether the water use practices of the Grants Pass Irrigation District are consistent with the statutory prohibition of wasteful, uneconomic, impracticable or unreasonable uses and to reduce the quantities of water historically diverted by the district. The permit also provided a process to resolve fish passage problems at Savage Rapids Dam. The permit allows the use of water from the Rogue River for irrigation which is an allowable use of the waters. A 5-year extension of the permit to allow the district to implement the conservation and fish passage plans described above would not impair or be detrimental to the public interest. This order provides time for implementation of the approved plans.

6. A portion of the Rogue River below the district is designated as a state Scenic Waterway. In addition, the Rogue River provides an important anadromous fishery. The development of the permit, consistent with its terms and conditions as amended by this order is consistent with the policies of the Scenic Waterway Act (ORS 390.803 to 390.925).

ORDER

NOW, THEREFORE, it hereby is ORDERED that the conservation and fish passage plans and respective implementation schedules recommended by the Grants Pass Irrigation District are adopted and incorporated as conditions in permit number 50957, and the time for completion of work under permit number 50957 is extended until October 15, 1999. All of the terms and conditions of permit number 50957, except the name and address of the permittee, the source of water and purpose of the permit, the date of priority, and the description of the proposed place of use, are replaced with the following:

1. The amount of water allowed herein shall be limited to a diversion of not to exceed 71.79 CUBIC FEET PER SECOND or its equivalent in case of rotation, measured at the point of diversion. The right to use water under this permit is in addition to that described by Certificate recorded at page 50650, State Record of Water Right Certificates. The amount of water used for irrigation under this permit, together with the amount secured under any other right existing for the same lands, is limited to a diversion of ONE FORTY-SIXTH (1/46) of one cubic foot per second (or its equivalent) and 7.0 acre-feet for each acre irrigated during the irrigation season of each year from live flow and storage.

2. When the district has completed development of this permit, and after determining that the terms and conditions of this permit have been met, pursuant to ORS 537.250, the Commission shall issue a certificate of water right allowing a diversion of not to exceed 52.32 CUBIC FEET PER SECOND provided that the amount of water used for irrigation under the right, together with the amount secured under any other right existing for the same lands, shall be limited to a diversion of ONE FIFTY-SECOND (1/52) of one cubic foot per second (or its equivalent) and 6.0 acre-feet for each acre irrigated during the irrigation season of each year from live flow and storage.

3. This permit shall expire on October 15, 1999, unless extended by the Water Resources Commission, or unless earlier canceled for failure to comply with the conditions of the permit including, but not limited to, failure to exercise due diligence in implementing the approved conservation and fish passage plans.

4. The district shall implement the conservation plan and the plan to resolve fish passage problems, including removal of Savage Rapids Dam, as described in Chapters 7, 8 and 11, Grants Pass Irrigation District Water Management Study, March, 1994, in accordance with the schedule provided therein. However, at the request of the permittee, the Commission may approve modifications in the plans or implementation schedules.

5. By February 1 of each year, the permittee shall submit to the Water Resources Commission a report detailing the efforts of the permittee in implementing the plans and the effectiveness of the plan. The report shall provide a detailed description of the actions the permittee has taken to implement the plans, identify any impediments or delays in implementing the plans according to the approved schedules and, if appropriate, include a request for modification of the implementation schedules. If the Commission finds that the permittee has failed to exercise due diligence toward implementation of the plans, the Commission may take action as provided under condition 9.

6. The permittee or any other person or party may object to any modification to the plans or the implementation schedules, or to any extension of time for completion of work under this permit. Any objection to an extension or modification shall be on the basis that the modification or extension impairs or is detrimental to the public interest under ORS 537.170 or is prohibited by law. However, objections to extensions of time which are based on public interest may only be made if the time allowed for completion of work under the permit would be extended beyond October 15, 2002. Upon objection thereto, a contested case hearing shall be offered under ORS 183.310 to 183.550 in order to determine whether or not the modification or extension would impair or be detrimental to the public interest under ORS 537.170 or otherwise prohibited by law. Any objections to any modifications to the plan or to any extensions of time for completion of work under this permit must be made within 60 days of the time of approval of the modification or extension.

7. This permit is for the appropriation of natural flow, not stored water. Use of stored water must be by separate permit and contract with the appropriate agency.

8. The use shall conform to such reasonable rotation system as may be ordered by the proper state officer.

9. Failure to comply with any of the provisions of this permit, including the exercise of due diligence as described in condition 5, may result in action including, but not limited to restrictions on the use, civil penalties, or modification or cancellation of the permit.

10. By law, the land use associated with this water use must be in compliance with statewide land-use goals and any local acknowledged land-use plan.

11. The use of water allowed herein may be made only at times when sufficient water is available to satisfy prior rights, including rights for maintaining instream flows.

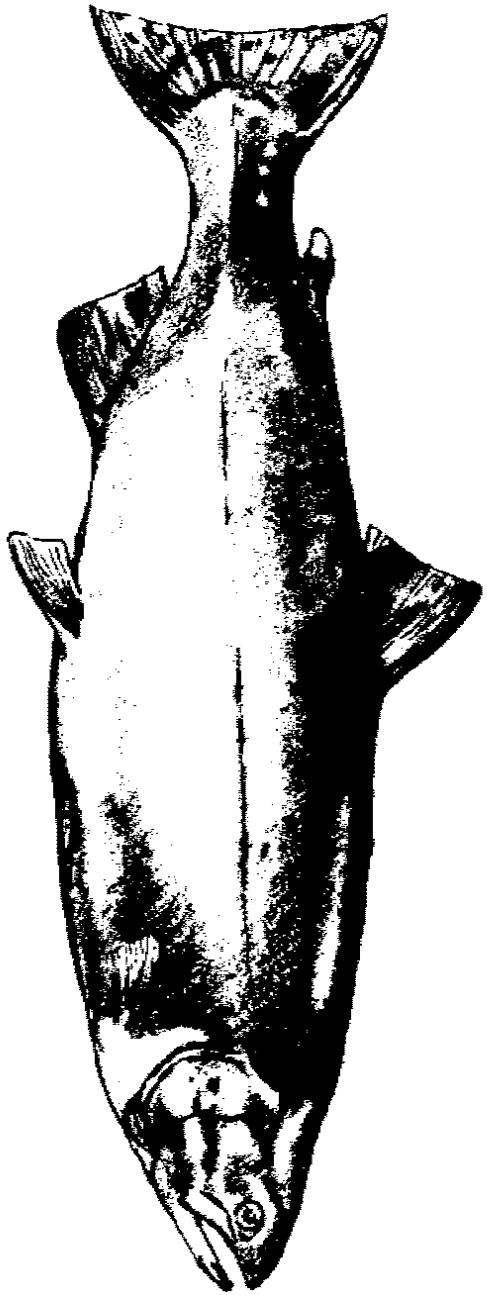
12. In addition to the terms and conditions specified herein, the use of water under this permit shall be subject to any regulation by the watermaster necessary to eliminate waste, compliance with any efficiency standards or conservation requirements which may be imposed by statute or administrative rule, and any other requirements of statute or rule.

OBJECTIONS

Any objection to this order and request for a contested case on the objection must be filed with the Commission within 60 days of the date of approval of this order. If an objection and request for a contested case is filed, the contested case shall be conducted pursuant to ORS 183.310 to 183.550.

Dated at Medford, Oregon this 28th day of October, 1994.

Cliff Bentz
Acting Chairman
Water Resources Commission



Attachment H—Oregon State Historic Preservation Officer Letter

ORIGINAL

Parks and Recreation Department

STATE HISTORIC PRESERVATION OFFICE

525 TRADE STREET SE, SALEM, OREGON 97310 PHONE (503) 378-5001 FAX (503) 378-6447

August 1, 1990

Lynne MacDonald
Bureau of Reclamation
Federal Bldg. and US Courthouse
Box 043-550 Fort St.
Boise, ID 83724-0043

RE: Savage Rapids Dam
Josephine County

Elisabeth Potter, of our staff, reviewed the materials you sent on the above-referenced project. After review of the material the SHPO office concurs that the dam is not eligible for the National Register of Historic Places. Therefore, we feel your proposed project would have "No Effect" on sites on, or eligible for inclusion on, the National Register of Historic Places. If you have any questions you can contact Dr. Leland Gilsen at 378-5023.

Sincerely,

James Hamrick

James M. Hamrick, Acting
Deputy SHPO

JMH:LG:jn
MACDONAL.LTR

PN 705

MAY 25 1990

Mr. David G. Talbot
State Historic Preservation Officer
State Parks and Recreation
525 Trade Street SE.
Salem OR 97310

Subject: Section 106 Consultation on Savage Rapids Dam -- Josephine County Water Management Improvement Study, Oregon (Historical Cultural Study, Project Investigation)

Dear Mr. Talbot:

The Bureau of Reclamation (Reclamation) is participating with the Grants Pass Irrigation District (GPID) and others in the Josephine County Water Management Improvement Study. One facet of this study is resolution of fish passage problems at Savage Rapids Dam, which is located on the Rogue River at the Jackson/Josephine County line (see enclosed figure 1). Due to inadequate fish ladders and screens, the dam impedes the upstream and downstream migration of anadromous fish, resulting in fish losses.

Plans for three different options have been identified: (1) removal of the dam, (2) replacement of the existing passage facilities at the dam, and (3) no action.

Under option 1, the dam would be removed and the dam site/reservoir area would be returned to its natural state, a free-flowing river. In addition, pumping facilities would be constructed at points along the river to supply water to GPID for continued irrigation operations.

Under option 2, the dam would remain in place, new fish ladders designed to current technical standards would be constructed for each side of the dam, new fish screens would be constructed, and other dam modifications would be performed as necessary to promote safe and efficient fish passage.

Option 3, which would not affect the dam, is unacceptable to the entities involved in the study.

Pursuant to 36 CFR § 800.4, Reclamation requests consultation with your office on the eligibility of the Savage Rapids Dam. We ask that you review the

documentation provided in this letter and concur in Reclamation's determination that the Savage Rapids Dam is not eligible for inclusion in the National Register of Historic Places.

Physical Description of Savage Rapids Dam

The Savage Rapids Dam is located on the Rogue River at river mile 107 in Josephine and Jackson Counties about five miles east of the city of Grants Pass.

Built to divert water for irrigation from the Rogue River, 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 (see enclosed figures 2 & 3). The crest is divided into 16 bays. The first seven at the north (right) 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.

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 cfs. The gates are used to dewater 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. Two hydraucone turbines operating under a 29-foot head power the 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 remaining diversion from the dam is the gravity diversion into the Gravity Canal (also known as the South Canal) at the south (left) 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.

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 (see enclosed figure 4). 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.

Other fishery facilities at the dam include a traveling fish screen structure adjacent to and just upstream from the pump and turbine intakes at the north abutment. The structure includes a trashrack, traveling screens, and a fish bypass system to protect downstream migrants. Four metal sluice gates located under the turbine structure are used to flush sediment deposited in front of the screen structure so that it will not build up to an elevation where it will enter the screen structure.

Alterations to Savage Rapids Dam

Since its completion in 1921 (see enclosed figure 5), the dam has undergone a series of changes which have significantly altered its original appearance. Only the major changes will be described here. As originally constructed, the dam did not include the south fish ladder. This was added in 1934 by the Oregon State Game Commission. Historic photographs taken during construction of the dam show a wooden walkway with railings mounted on top of the spillway section. Photographs dating from the late 1930's show the walkway being removed.

The most substantial alterations to the dam occurred during the 1950's. Investigations conducted showed that the dam was in poor condition and that rehabilitation was urgently needed. Operation of the structure had become difficult and although the dam was actively used by GPID, the deteriorated condition of the original spillway-gate system was dangerous to the lives of operating personnel. In 1953, the rehabilitation of Savage Rapids Dam was authorized by Congress in the Department of the Interior Appropriation Act of 1953. Construction began in March 1953, and was completed in February 1955.

The greatest alteration to the dam involved the removal of the original 16 wooden-faced radial gates that provided spillway control. Due to difficulty in raising and lowering the gates, many of them had become inoperable. All of the gates were taken out and guides were installed in the concrete piers for the metal stoplogs that are now used to control the height of the spillway. The cableway towers at either end of the dam were erected to facilitate removal and placement of the stoplogs. At the same time, 7 of the 17 concrete piers that divide the bays were lowered to provide larger openings for the passage of debris during the non-irrigation season. The center two bays of the dam were removed to allow for the creation of river outlet sections, including the two radial gates. Other improvements included the repair of eroded concrete on the downstream face, the foundation, and the sluiceway. In addition, the river channel upstream and downstream from the dam was excavated to improve flow conditions.

Further changes were undertaken in 1957-58 to provide "fish protective facilities" at the dam. Heavy losses of downstream fish occurred because the pump and turbine intakes were not screened. Funds in the amount of $208,000 were set aside in the fiscal year 1957 Public Works Appropriation Act for Reclamation to complete the needed construction. The existing fish screen structure was added to the dam just upstream from the pump-turbine structure.

Fish passage problems continued to exist at the dam, and in 1974 fish passage improvements were authorized by the Reclamation Development Act of 1974. Pursuant to this, modifications to the south fish ladder were undertaken, as well as replacement of the traveling fish screens.

History of Savage Rapids Dam and the Grants Pass Irrigation District

Although the Rogue River Valley was known to white men as early as the 1820's, settlement in the area took off following the discovery of gold near the present city of Grants Pass in 1851. Large numbers of miners flocked to the area to seek their fortunes. Along with the miners came farmers who attempted to raise feed for livestock in the hot, dry summers. The average annual rainfall of 29 inches made irrigation essential for many crops. Early efforts to irrigate fields were limited to individual efforts and consisted mainly of simple stream diversions. As the population continued to grow, the available water supplies were appropriated and further development was beyond the means of individual resources. The need for an organized effort to distribute water increased, especially following the completion of a railroad line in the late 1880's. This event created possibilities for commercial fruit-growing and stock-raising. However, another 30 years passed before an effort to organize water users in the Rogue River Valley was successful. An attempt in the early 1900's failed when the Gold Drift or Ament Dam, completed in 1904, was damaged beyond repair in a 1912 flood.

By 1915 there was a great deal of interest in an organized irrigation district. An organizational meeting was held on December 9, 1916, and on January 17, 1917, an election resulted in the formation of GPID as a municipal corporation under the laws of the State of Oregon. For the first time, water users in the area would be provided with a reliable and consistent source of irrigation water.

Initially, plans had called for extending the Gravity Canal of the Gold Hill Irrigation District, which was located further upstream on the Rogue River and was being organized at the same time. This proved to be too costly, so the plan was abandoned and the present GPID system was designed.

As laid out, GPID included lands along both sides of the Rogue River from the town of Rogue River to below the city of Grants Pass, as well as along Evans Creek. Land within the city limits of Grants Pass was also within GPID. Water for irrigation would be diverted at the Savage Rapids Dam and distributed through a series of canals and laterals. Pumping units installed at the dam would pump some of the water to canals located on higher ground.

Contracts for construction of the project, which was financed through a series of bond issues, were awarded on June 28, 1920. Work on the dam itself began early in July. The Shattuck Construction Company of Los Angeles and San Francisco was retained to undertake the construction, and Jerome H. Fertig held the position of project engineer.

Dedication ceremonies for the dam were held on November 5, 1921, amid great celebration. An article written by Jerome Fertig describing the features of

the dam appeared that day in the Grants Pass Daily Courier. Fertig described the unique features of the dam as follows:

> "The design is peculiar to itself in the use of a multiple arch type with down stream apron of odd shape necessitated by the gate mechanism. The gate control is new in its method of operation, and means of control, [sic] require an entirely new design in hydraulic machinery. The power and pumping machinery is a new design, this being the first installation of the new hydraucone turbine and direct connected pumping equipment. The dam is provided with the latest type fish ladder extending below the powerhouse to the reservoir above."

Upon completion of the entire project in 1922, GPID included 19,532 acres of which 12,815 were identified as irrigable. The anticipated benefits of the project were never fully realized, however. During the depression, irrigation of many areas within the district was found to be economically unfeasible due to the high cost of pumping and extensive water loss through seepage. In addition, the service area of GPID gradually changed from being predominantly agricultural to urban/suburban. Land taken up by roads has also reduced the acreage served by GPID. As a result of all of this, the amount of land under assessment has gradually decreased. As of March 1990, GPID was serving over 7,750 acres. This still includes lands along both sides of the Rogue River and within the city of Grants Pass.

Today, in addition to the Savage Rapids Dam, GPID's distribution system consists of about 60 miles of major trunk canals, 100 miles of minor canals and laterals, several stream crossings and control structures, four relift pumping plants, and five measuring devices. These ancillary features will not be affected by the proposed options and so their history and integrity are not addressed herein.

The information contained in this letter was obtained from numerous sources. Records consulted were located at GPID's office, the Grants Pass Public Library, the Josephine County Historical Society, the Josephine County Planning Office, the Jackson County Planning Office, and Reclamation's Pacific Northwest Regional Office. The research was conducted and this letter report prepared by Christine Pfaff, an Architectural Historian from Reclamation's Denver Office.

Eligibility of Savage Rapids Dam

It is the opinion of Reclamation that Savage Rapids Dam is not eligible for the National Register of Historic Places. Although the dam is significant locally as the sole diversion point of water supply throughout GPID, the structure no longer retains sufficient original physical characteristics to convey its historic appearance. Integrity of design, materials, and workmanship have been substantially compromised. Major features of the dam that contributed to significance under Criterion C have been altered, removed, or replaced. This includes the original 16 wooden-faced radial gates, the concrete piers, the center two bays, and the wooden walkway.

Savage Rapids Dam was identified during a cultural resource survey of Josephine County conducted by Kay Atwood in 1984. The dam was rated as having secondary importance.

When an alternative is selected following the completion of the subject study, additional cultural resource work will probably be required. Either the rehabilitation of the fish ladders or the removal of the dam and installation of new pumping plants along the river could involve earth disturbance activities that would require an archeological survey. It is also possible that other historic resources could be impacted. All necessary surveys and site evaluation investigations will be conducted once impact areas are defined. At that time, additional consultations as required by 36 CFR § 800 will be conducted.

If you have any questions about the evaluation of the Savage Rapids Dam, please contact Christine Pfaff at (303) 236-8742. Please contact Lynne MacDonald, Regional Archeologist, at (208) 334-9478 if you have any questions regarding further investigative activities. Thank you for your assistance.

Sincerely,

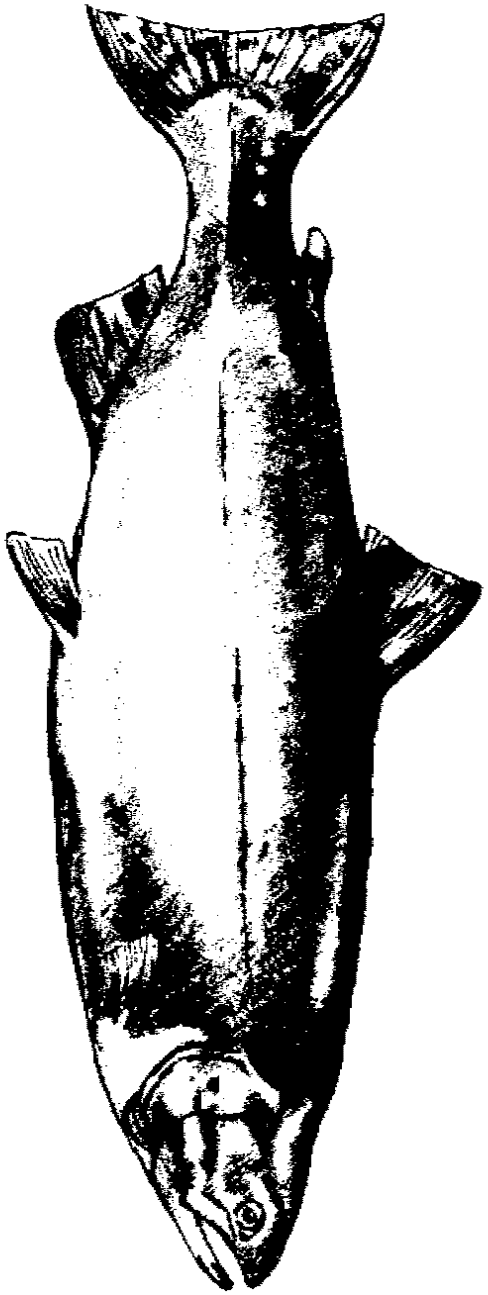
KE[illegible] R. REDDE

Regional Director

Enclosures

bc: Assistant Commissioner - Resources Management
Attention: D-5530 (Pfaff), D-5910 (Jensen)
Regional Supervisor Water, Power and Lands
Attention: PN 416
Bruce G. Buckmaster
Grants Pass Irrigation District
200 Fruitdale Drive
Grants Pass OR 97526
(w/enclosure to each)

RHamilton:jlf:5/23/90:SSSHPO.DOC



Attachment I—Comments and Responses

COMMENTS AND RESPONSES

Public Hearing

A public hearing was held in Grants Pass, Oregon, on February 16, 1995, at the Josephine County Fairgrounds. The hearing record was held open until February 27, 1995, to accept written testimony from those who could not attend the hearing or wished to add to their oral remarks. A Transcript of Public Testimony is available for examination at local libraries, the GPID office in Grants Pass, Oregon, and the Bureau of Reclamation Regional Office in Boise, Idaho. Reclamation thanks all who participated in this public hearing.

The following individuals presented oral testimony at the hearing. Agency or organization affiliation are shown where indicated by the individual in the hearing record.

Gordon S. Anderson, Mayor of Grants Pass, Grants Pass OR
Dennis Becklin, Grants Pass OR
Burton Blackwell, Grants Pass OR
Billy Boyce, Curry Guides Association, Grants Pass OR
Forest Bradfield, Grants Pass OR
Paul Brandon, Grants Pass OR
Gerald Briggs, Oregon Guides and Packers Assn., Grants Pass OR
E. Kendall Clarke, Ashland OR
Royal Deland, Mayor of Rogue River, Rogue River OR
Robert W. Dolson, Grants Pass OR
Walter Doucett Sr., Rogue River OR
Myra Erwin, Ashland OR
Ruth Feirich, Grants Pass OR
Mary C. Galwas, Grants Pass OR
Ron Garst, USFWS, Portland OR
Lloyd Gilbert, Grants Pass OR
Don Greenwood, Grants Pass OR
Robert Gross, Grants Pass OR
Harold Haugen, Josephine County Commissioner, Grants Pass OR
Elvin E. Hawkins, Rogue River OR
Claire Heil, Grants Pass OR
Randy Hinke, Grants Pass OR
Frank Hirst, Ashland OR
Don Huberty, Grants Pass OR
Bob Hunter, WaterWatch, Portland OR
Mike Jewett, OWRC, Ashland OR
Bob Jones, Merlin OR
L.H. Kirtley, Grants Pass OR
Vivian Kirtley, Grants Pass OR
John MacDiarmid, Medford OR
Douglas M. McGeary, Medford OR

Tom McMurray, GPID, Grants Pass OR
Homer D. Meeds, Jacksonville OR
Bernard S. Moore, Medford OR
Geneva Oran, Grants Pass OR
Gene Reedy, Grants Pass OR
Hank Rogers, Ashland OR
Emerson Roller, Grants Pass OR
Jean Shaffer, Sierra Club, Oregon Chapter, Monmouth OR
John J. Shaw, Grants Pass OR
Iris Shores, Grants Pass OR
Gloria D. Smith, Portland OR
Dale M. Smith, Grants Pass OR
Eric Smith, Jacksonville OR
Bob Staal, Ashland OR
Eric Staal, Ashland OR
Willis Stichl, Rogue River OR
Mark Swisher, Ashland OR
John Tefteller, Grants Pass OR
Irv Uric, Medford OR
Diane Valantine, Oregon Natural Resources Council, Portland OR
Bob Watts, Grants Pass OR
Kathleen Whisonant, Grants Pass OR
Lyle Woodcock, Josephine County Farm Bureau, Grants Pass OR

Thirteen of the speakers supplemented their oral comments with written statements. Twenty-eight additional letters of comment were received from the following:

Esther Bristol, Grants Pass OR
Michael-Marie Chaldu, Grants Pass OR
Jack and Bonnie Cromer, Grants Pass OR
Donald K. Denman, Medford OR
Phil Friesen, Grants Pass OR
Louise Ramsey Fuller, Grants Pass OR
Ken and Krystal Garrison, Grants Pass OR
Larry Griffin, Gold Hill OR
Mr and Mrs. Vernon Kirkbride, Cave Junction OR
Lillian F. Law, plus 17 signatories, Grants Pass OR
Arnold C. Law, Grants Pass OR
Alice Mangil , Unknown
Sandy Millard, Grants Pass OR
James F. Moore Jr., Ashland OR
Dorris Newman, Grants Pass OR
Jean Nightingale, Grants Pass OR
Annette Olson, Grants Pass OR
Andy Olson, Grants Pass OR
Bruce W. Peddicord, Grants Pass OR
Bob Rafalovich, Rouge River Wilderness, Inc., Grants Pass OR

Gene Reedy, Grants Pass OR
Jack D. and Clarabell D. Russell, Grants Pass OR
Hal Schmoll, Grants Pass OR
Charles Stevens, Grants Pass OR
Robert Taylor, Grants Pass OR
Pella Taylor, Grants Pass OR
Dick Twogood, Grants Pass OR
Don and Nancy Vogel, Grants Pass OR
Larry and Repita Webb, Williams OR

Hearing Comments and Responses

More than 150 people attended the public hearing and 54 made oral statements. Twenty-three speakers expressed support for the Preferred Alternative, and 31 speakers expressed support for retaining the dam, but not necessarily the Dam Retention Alternative. During the period open for written comment, February 16 until March 17, a total of 65 individuals provided written statements; several statements were coauthored by 2 people and one letter of comment includes statements by 18 individuals. Only seven of those individuals who provided written comments supported the Preferred Alternative. About one-third of the written statements were provided by speakers at the hearing.

Much of the oral and written testimony centered on the current status of the anadromous fishery. Those who supported the Preferred Alternative believe that it is a viable alternative that would permit agriculture to continue while correcting fish passage problems and would mesh with other restoration efforts in the upper Rogue River Basin. They generally accepted the data presented in the PR/DES and expressed no concerns except for the need to improve the salmon population.

Those who support retaining the dam generally disputed the validity of studies and the accuracy of the data on loss of fish and the cause of fish declines that are presented in the PR/DES. Some indicated a disbelief that there has been a decline in anadromous fish populations or that there are fish passage problems at Savage Rapids Dam. Many indicated a belief that factors other than Savage Rapids Dam have a greater impact on the anadromous fishery and should be addressed first. Some were concerned that removal of the dam would result in a loss of irrigation in the valley and a change in the way of life.

Some of those who support retaining the dam indicated a belief that the economic data presented in the PR/DES are incorrect and that the operating costs of the Preferred Alternative are so high that there would be severe economic impacts. They also believe that fish passage improvements at the existing dam could be done for much less than the cost presented in the PR/DES.

Although most of the public comments were primarily expressions of support or opposition, some of the comment required a response of clarification or a change in the PF/FES. These comments and responses are itemized below. In many cases, the reader is referred to the letters of comment where.the same question is more fully developed and Reclamation's response covers the subject in more detail.

Randy Hinke:

Concern: The gravel bar at the head of the lake will move downstream and scour the river.

Response: See American Fisheries letter and response.

Concern: The river bank in the temporary pool area will erode and vegetation will change if the dam is removed.

Response: See American Fisheries letter and response and Randy Hinke letter and response.

Royal Deland:

Statement: Coyote Evans and Fleming Park are within the lake area, not above the lake as stated in the report.

Response: The text has been revised to indicate that the two parks are located at the upper end of the seasonal lake.

Statement: Rainbow trout are released weekly into the lake, in contrast to the draft report statement that fish are not released into the lake.

Response: The ODFW responds that between 1989 and 1993, there were 21,000 to 28,000 catchable-size trout planted in the reach from Gold Ray Dam to Coyote Evans Park. Plantings were made weekly from Memorial Day to Labor Day in a manner that spread fish evenly over the reach. To avoid conflicts with wild fish, ODFW stopped the plantings in 1994. The report has been revised to clarify this point.

Lyle Woodcock:

Question: Please provide information on drought, seals, high-tech ocean fishing, and other factors that affect fishing.

Response: The objective of this study is to identify and evaluate acceptable means of improving fish passage at Savage Rapids Dam. Evaluation of other factors that may contribute to the decline in the Rogue River salmon and steelhead populations is beyond the scope of this study.

Question: What is the effect of loss of the lake on migratory birds?

Response: The effects of the alternatives on wildlife are discussed in chapter VI.

Harold Haugen:

Statement: The issue of Savage Rapids Dam eligibility for listing on the National Register of Historic Places has not been addressed.

Response: Savage Rapids Dam is not eligible for listing on the National Register of Historic Places as discussed under "Cultural Resources" in chapter VI. We have added attachment H that includes a copy of the 1990 letter that indicates the State Historic Preservation Officer concurs in this assessment.

Statement: Reclamation has not conferred with the Josephine Board of County Commissioners and requests that a meeting be held.

Response: Reclamation initiated the current study in response to a request from Josephine County and the GPID. During most of the study Reclamation worked with the Commission through the County staff and the Commission member who was a member of the Permit Oversight Committee. Reclamation is certainly willing to meet at the invitation of the County Commissioners.

Statement: Wetland issues are not addressed.

Response: There is a brief statement under "Executive Order 11990" of the "Regulatory Compliance" section in chapter VII that states there are no permanent wetlands and none of the alternatives would have a measurable effect on wetlands. We have added a statement in Chapter VI under "Vegetation" that there are no permanent wetlands and the Preferred Alternative would have no effect on wetlands.

Geneva Oran

Statement: The U.S. Corps of Engineers will not let land owners do anything in floodplain or floodway area when the dam is removed.

Response: Construction and land management activities within floodways and elsewhere are subject to local, county, and State ordinances. Federal regulations in this area are generally limited to those associated with flood insurance.

Louise Ramsey Fuller

Question: Who prefers the Preferred Plan?

Response: The Pumping Alternative is the Federal Preferred Alternative as discussed under the "Preferred Alternative" section of the Summary. Under Federal regulations, Reclamation must pick the alternative that maximizes net national economic benefits.

Written Comments on the PR/DES

The period open for comment on the PR/DES extended from December 15, 1994, to March 20, 1995. Reclamation thanks all of those who provided comments.

Letters of comment received as a result of the review of the PR/DES and Reclamation's response to specific comments are included in this section. The first part of this section includes those letters which included comments that required a response from Reclamation, and the second part includes letters that did not require a response under the NEPA. Newspaper clippings and other attachments to letters of comment are not included in the reproductions on the following pages.

Letters Requiring a Response

Page

Federal Agencies:

National Marine Fisheries Service, Portland OR I-9
National Park Service, Seattle WA I-13
U.S. Fish and Wildlife Service, Portland OR I-14

State Agencies:

Oregon Department of Fish and Wildlife, Portland OR I-18

Organizations:

American Fisheries Society, Oregon Chapter, Corvallis OR I-24
Northwest Environmental Defense Center, Portland OR I-27
Oregon Natural Resources Council, Portland I-31
Three Rivers Watershed Council, Inc., Rogue River OR I-32

Individuals:

James W. Ayling, Grants Pass OR I-33
Dennis M. Becklin, Grants Pass OR I-34
William H. Brecount, Rogue River OR I-38
Signe M. Carlson, Grants Pass OR I-41
John Frewing, Portland OR I-42
Donald R. Greenwood, Grants Pass OR I-44
David M. Handley, Grants Pass OR I-47
Eric W. Hartmann, Portland OR I-48
Randy Hinke, Grants Pass OR (2) I-50
Jerry Kl---- (could not decypher name), No address
(letter identical to Charles Weaver letter) I-56
Elaine Lake, Rogue River OR (letter identical to Charles Weaver letter) I-57
James Lamp, Jr., Central Point OR I-58
Geneva Oran, Grants Pass OR I-59
Juanita Pickett, Grants Pass OR I-60
Mark H. Smith, Tigard OR I-63
Hank Vann, Grants Pass OR I-65
Charles Weaver, Grants Pass OR I-67

Letters not Requiring a Response

Page

Federal:

U.S. Environmental Protection Agency, Seattle WA I-68

State:

Oregon Parks and Recreation Department, Salem OR I-69
Oregon Water Resources Department, Salem OR I-70

Organizations:

American Rivers, Washington DC (2 letters) I-70
Center for International Environmental Law, Washington DC I-72
International Rivers Network, Berkeley CA I-73
Izaak Walton League of America, Inc., Oregon Division, Portland OR I-74
Kalmiopsis Audubon Society of Curry County, Port Orford OR I-75
Morrison's Rogue River Lodge, Merlin OR I-76
Pacific States Marine Fisheries Commission, Gladstone OR I-77
Cosigners of this letter include the following:
Curry Anadromous Fishermen, Gold Beach OR
Curry Guides Association, Gold Beach OR
Fisheries Committee, Port of Brookings Harbor, Brookings OR
Fishermen Involved in Saving Habitat, Shaw Island WA
Nautilus Northwest Charters, Portland OR
Northwest Commercial Fishermen's Wives Association, Astoria OR
Northwest Sportfishing Industry Association, Oregon City OR
Oregon Fisheries Congress, Newport OR
Oregon Fishing Club, Oregon Anglers, Albany OR
Oregon Guides and Packers, Gold Beach OR
Oregon Outdoors Association, Eugene OR
Oregon South Coast Fishermen, Inc., Harbor OR
Pacific Coast Commercial Fishermen's Wives Association, Clatskanie OR
Pacific Coast Federation of Fishermen's Associations, Sausalito CA
Pacific Coast Federation of Fishermen's Associations, Eugene OR
River Trips Unlimited Inc., Medford OR
Salmon For All, Astoria OR
Tom Posey Co., Beaverton OR
Trout Unlimited of Oregon, Portland OR
Umpqua Commercial Fishermen's Wives Association, Winchester Bay OR
White Water Warehouse, Corvallis OR
Piazza & Piazza, Medford OR I-79
Randy Nelson's Lower Rogue Canyon Outfitters, Central Point OR I-79
River Trips Unlimited, Medford OR I-80
Rogue Flyfishers, Medford OR I-80

Page

Rogue River Guides Association, Inc., Medford OR I-81
WaterWatch, Portland OR I-81

Individuals:

Lucy Bennett, Grants Pass OR I-84
Lynn and Della Berntson, Rogue River OR I-84
Helen E. Brown, Medford OR I-85
Clint Brumitt, Central Point OR I-86
Robin B. Carey, Gold Beach OR I-86
Sandrya Danehy, Medford OR I-87
David Dedrick, Medford OR I-87
Dennis Dedrick, Medford OR I-88
Glenn M. Gray, Gold Hill OR I-88
Stephen G. Haskell, Ashland OR I-89
Mary Hepler, Merlin OR I-89
Perry A. Higgins, Medford OR I-90
Robert McElroy, Grants Pass OR I-90
Douglas M. McGeary, Medford OR I-91
Ronald Marrington, Gold Hill OR I-92
T.E. Mechem, Medford OR I-93
Edith Newby, Grants Pass OR (2 letters) I-93
Chris Orsinger, Eugene OR I-94
Stephen K. Parsons, Dallas OR I-95
Jon Pearson, Talent OR I-95
Kathy Peckham, Grants Pass OR I-96
Alice L. Petty, Grants Pass OR I-96
Steven Tichenor, Grants Pass OR I-97
Kelley Webb, Portland OR I-98
Sarah M. Willson, Wolf Creek OR I-98

UNITED STATES DEPARTMENT OF COMMERCE
Office of the Under Secretary for
Oceans and Atmosphere
Washington, D.C. 20230

April 11, 1995

BUREAU OF RECLAMATION OFFICIAL FILE COPY
APR 14 1995

TO	INIT	DATE
6400		4/17
6510		4/17
6519		5/1
6309		2 May
FILE		

ACTION MADE BY

Mr. John W. Keys, III
Regional Director
Bureau of Reclamation
1150 North Curtis Road
Boise, ID 83706-1234

Dear Mr. Keys:

Enclosed are comments on the Planning Report and Draft Environmental Impact Statement for Fish Passage Improvements at Savage Rapids Dam. We hope our comments will assist you. Thank you for giving us an opportunity to review the document.

Sincerely,

Donna S. Wieting
Acting Director
Ecology and Conservation Office

Enclosure

Response (National Marine Fisheries Service Letter)

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
ENVIRONMENTAL & TECHNICAL SERVICES DIVISION
525 NE Oregon Street
PORTLAND, OREGON 97232-2737
503/230-5400 FAX 503/230-5435

F/NW03

Mr. John W. Keys, III
Regional Director
Bureau of Reclamation
Attention: PN-6309
1150 North Curtis Road
Boise, Idaho 83706-1234

RE: Comments on the Planning Report and Draft Environmental Statement for Fish Passage Improvements at Savage Rapids Dam (DEIS).

Dear Mr. Keys:

This responds to your December 13, 1994, request for comments on the Planning Report and Draft Environmental Statement for Fish Passage Improvements at Savage Rapids Dam (DEIS). The National Marine Fisheries Service (NMFS) supports the Bureau of Reclamation's selection of dam removal as the preferred alternative for the most cost-effective method of achieving acceptable fish passage at this site. NMFS supports the findings of the Oregon Department of Fish & Wildlife's (ODFW) analyses of the impacts of Savage Rapids Dam (SRD) on salmon and steelhead populations in the Rogue River (ODFW 1994, 1995). NMFS concurs with the U.S. Fish & Wildlife Service's (USFWS) Fish & Wildlife Coordination Act Report for SRD (Attachment C of DEIS) and with the USFWS's comments on the DEIS. The best economic and ecological solution to resolving fish passage problems at SRD is clearly dam removal.

On March 16, 1995, NMFS proposed the "Klamath Mountains Province Steelhead" (all steelhead stocks between Cape Blanco, OR, and Cape Mendocino, CA) for listing as threatened under the Endangered Species Act (60 FR 14253-14261). This proposal to
1 list includes all steelhead runs in the Rogue River. Federal agencies are required to confer with the appropriate regulatory agency (NMFS or U.S. Fish and Wildlife Service) on any action which is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat. The conferencing may be done like a formal consultation, and an opinion issued at the conclusion of the conferencing may be conditionally adopted as the biological opinion when the species is listed or critical habitat is designated (50 CFR 402.10). We encourage you to initiate conferencing with us on your proposed action at SRD.

1. Through discussions with Mr. Lance Smith on 5/25/95, it was determined that conferencing would not be necessary for any alternative because both action alternatives would improve anadromous fish passage.

Conferencing can be initiated by sending us a letter and referring to the preferred alternative in the DEIS (as the proposed action) that you have already provided us.

Questions concerning our comments should be directed to Lance Smith, of my staff, at (503) 231-2307.

Sincerely,

Elizabeth Holmes Gaar
for
Jacqueline V. Wyland
Division Chief

cc: USFWS - Ron Garst
ODFW - Stephanie Burchfield
GPID - Dan Shephard
Donald R. Greenwood

References

Oregon Department of Fish & Wildlife, 1994. Estimation of Rogue River salmon and steelhead population increases for the Savage Rapids "dam removal" option. ODFW, 2501 SW First Ave., Portland, OR. 97207.

Oregon Department of Fish & Wildlife, 1995. Estimation of Rogue River salmon and steelhead population increases for the Savage Rapids "dam retention and improvement" option. ODFW, 2501 SW First Ave., Portland, OR. 97207.

United States Department of the Interior

NATIONAL PARK SERVICE
Pacific Northwest Region
909 First Avenue
Seattle, Washington 98104-1060

BUREAU OF RECLAMATION OFFICIAL FILE COPY
MAR 16 1995

TO	INIT	DATE
6309		
FILE		

L7619 (PNR-RE)
DES 94/51

Memorandum

To: Regional Director, Bureau of Reclamation
Attention: PN-6309
1150 North Curtis Road
Boise, Idaho 83706-1234

From: Associate Regional Director, Recreation Resources and Professional Services, Pacific Northwest Region

Subject: Review and comment on Planning Report/draft Environmental Impact Statement (PR/DES) of Fish Passage Improvement--Savage Rapids Dam

We have reviewed the subject document and our comments follow for your consideration.

On page VII-36, and again on page VII-6 it is mentioned that the SHPO has concurred that the Savage Rapids Dam is not eligible for listing in the National Register of Historic Places. We recommend that a copy of that 1 letter be included in the final report as proof of consultation. The reference on page VII-6 incorrectly refers to the National "Record", which 2 of course should be the National "Register".

Thank you for the opportunity to comment on this report.

Richard L. Winters
for

1. The determination by the Oregon State Historic Preservation Officer that Savage Rapids Dam is not eligible for listing on the National Register of Historic Places has been added as attachment H.

2. The correction has been made.

Response (U.S. Fish and Wildlife Service Letter)

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Portland Field Office
2600 S.E. 98th Avenue, Suite 100
Portland, Oregon 97266
(503) 231-6179 Fax: (503)-231-6195

BUREAU OF RECLAMATION OFFICIAL FILE COPY
APR 11 1995

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6309	RJH	11 Apr
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ACTION MADE BY

April 6, 1995

To: Regional Director, Pacific Northwest Region, U.S. Bureau of Reclamation, Boise, Idaho (Attn: PN-6309)

From: State Supervisor/Deputy State Supervisor, Oregon State Office, Portland, Oregon

Subject: Draft Planning Report and Environmental Impact Statement (PR/DEIS) Fish Passage Improvements - Savage Rapids Dam

The Oregon State Office of the U.S. Fish and Wildlife Service (Service) has reviewed the subject PR/DEIS for Savage Rapids Dam fish passage improvements and is pleased to provide our comments. These comments are in addition to the general comments for the record that were provided at the public hearing in Grants Pass, Oregon on February 16, 1995; and in correspondence dated January 26, 1995 to the Regional Environmental Officer regarding informal consultation under the Endangered Species Act (reference 1-7-95-I-105).

The Service's involvement in fish passage issues at Savage Rapids Dam (SRD) go back at least 30 years. Between 1964 and 1968, both the Oregon Department of Fish and Wildlife (ODFW) and the Service reported on continuing problems with the fish screens at the hydraulic turbins, for two vertical traveling screens installed in 1958 (previously these intakes had been unscreened). A special joint report between the Service and Bureau of Reclamation (Reclamation)(March, 1974) identified continuing, overall concerns for fish passage conditions at SRD and resulted in Congressional authorization for construction of interim fish passage improvements. Some interim improvements in the late 70's and early 80's were completed but concern continued for the fish passage conditions at SRD and the need for a complete fix.

More recently, the Service has provided input to the Reclamation's Josephine County Water Management Improvement Study initiated in the late 80's; and participated in an overnight committee formed by the Grants Pass Irrigation District (GPID) as part of its temporary water permit issued by the Water Resources Commission. Throughout this period, the Service has provided input on issues related to fish passage at SRD, including a Planning Aid Memorandum (April, 1990) and the draft Fish and Wildlife Coordination Act Report (May, 1994). A final

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Coordination Act Report is being completed for the final EIS. The information the Service has provided to date on fish passage is the biological basis of the PR/DEIS.

The Service concurs with the PR/DEIS selected plan and the report's conclusions. The recommended plan provides the GPID with provisions for a dependable, measurable water supply and the best option for dealing with the ongoing, long-standing fish passage problems that have existed at SRD (dam removal). Importantly, this plan is also the best economic plan of the alternatives studied that address the full study needs. The PR/DEIS does a good job in describing existing fish and wildlife resources in the study area and incorporating information from the Coordination Act Report on the effects of SRD on anadromous fish. Because the Service will be providing updated information in the Final Coordination Act Report, and the continued close coordination with the Reclamation on this project, our comments on the PR/DEIS are limited.

Threatened and Endangered Species

On March 16, 1995, the National Marine Fisheries Service (NMFS) proposed that steelhead in the Rogue River Basin be listed as threatened under the Endangered Species Act. This proposal is the result of a petition for the Illinois River (lower tributary to the Rogue) winter steelhead filed in May of 1992, but the NMFS finding for that population was that it was not a distinct life history pattern (evolutionary significant unit [ESU]). Subsequently, Klamath Mountain Province steelhead were found to constitute an ESU, including all runs of steelhead (summer, fall and winter) in the Rogue River, and some other coastal streams in Southern Oregon and Northern California. The proposal to list this distinct population of steelhead means that NMFS will solicit and analyze additional scientific data, ongoing and proposed conservation measures, and comments from the public before any listing decision is finalized within the next year. Part of this input should be a conferencing between NMFS and Reclamation to determine the affects of the proposed action on the population. The final EIS should describe the updated status of these
1 steelhead, their presence in the Rogue River Basin and at SRD, and the potential of the project plans to support recovery and conservation efforts for this population. The final Coordination Act Report will also discuss some of this information.

Updated Analysis of Fish Benefits with Passage Improvements

The ODFW has recently completed a separate analysis of potential fish benefits associated with the two alternatives for fish passage evaluated in the PR/DEIS. These reports (October, 1994 and March, 1995) update the earlier work by NMFS and the Service on estimating fish losses that occur at SRD and how benefits would occur with passage improvements. It is anticipated that ODFW will recommend that this analysis also be incorporated in the Final Coordination Act Report.

This recent work by ODFW has several advantages over the earlier work because: 1) it updates all information and assumptions using the most recent information available for the Rogue Basin

1. The appropriate sections of the "Summary" and "Need for Action" chapter have been updated.

Response (U.S. Fish and Wildlife Service Letter)

3

fisheries; 2) it references each assumption or data point used in the methodology; 3) it provides a range of benefits assuming either a low, moderate or high level of benefits; and 4) it provides a more detailed analysis of the dam retention alternative versus the simplifying assumption that benefits of that alternative are a function (percentage) of the benefits with the dam removal alternative. These factors mean the overall methodology is repeatable, verifiable based on the references, easy to update by using the latest information at any data entry point, and acknowledges the variability in conditions that affect fish passage.

Results of the ODFW work show that the earlier analysis and benefits displayed in the draft Coordination Act Report fall within the range of benefits as developed by this updated work. However, because of the advantages of this updated analysis it is anticipated that the final Coordination Act Report will be modified to reflect the findings of the ODFW reports. This is particularly true of the information on catch/escapement ratios and sport and commercial harvest, as they relate to the economic analysis. The Service recommends that the final PR/DEIS also
2 incorporate the results of the ODFW fish benefits analysis.

The following specific comments are also provided:

Summary Pg. 4 & Chapter III, Pg. 7 Construction Schedule It is unclear why the overall construction schedule will take 5 years, including a 2-year preconstruction period and a 3-year construction time frame. Would it be possible to schedule overlap between preconstruction and
3 construction time frames for the separate actions (pumping plant and dam removal) and then complete each item in one year's time? It will be important to minimize the disturbance of construction activities to both fish use of the river and people living nearby and traveling in the area. We recommend the final EIS present and evaluate a scenario where construction activities are completed as soon as is possible.

Chapter VI, Pg. 32, Public Facilities

This section includes a discussion regarding Savage Rapids Park and public facilities just upstream of the dam, and acknowledges there is about 5 acres of land that is undeveloped and belongs to GPID, with future development and operation uncertain. Because some fish viewing opportunity would be lost with dam removal, the nearby park offers the opportunity to replace this with an information education, interpretive display, and possible fish viewing opportunities (fall chinook spawning) as part of the park facilities. This could be coordinated with the ODFW,
4 GPID, NMFS, Service, and whomever is managing the park. The final EIS should mention this as a possible opportunity to address local public recreation and use of facilities for the public's interest in fish and fish issues in the Rogue River and at SRD.

2. The new ODFW data is incorporated into the report.

3. Reclamation would endeavor to keep the construction period as short as possible. Until site-specific geology and other studies are completed as part of preconstruction activities, it will not be possible to make a more accurate estimate of the construction period. See also response 7 to the ODFW letter of comment..

4. The future of Savage Rapids Park is uncertain at this time. Potential development would be reviewed during preconstruction; however, a cost-share partner would need to be identified.

Chapter VI, Pg. 34 Effect on Recreation

This section acknowledges there may be some new use of jet boat tours (commercial operations), presently operating upstream or downstream of the Savage Rapids reach, through this new section to scenic areas as part of new tours. The final EIS should discuss how this use could
5 effect resources in the Savage Rapids reach, and how management could be used to avoid problems (i.e., jet boat tours in shallow water disturbing spawning fall chinook).

In summary, the Service is pleased to provide our comments and support for completion of the PR/EIS, and hopes to continue to work closely with Reclamation as we seek ways to implement the project. If you have any questions about these comments, please contact Ron Garst at (503) 231-6179.

RLG/ae

Carol S Shuler

Response (U.S. Fish and Wildlife Service Letter)

5. The "Effects of the Alternatives on Recreation" section in chapter VI has been modified to indicate that some control over jet boat use in the reach above Savage Rapids may be necessary to protect fish spawning. We would expect the Oregon State Marine Board to regulate usage according to recommendations of fish and wildlife agencies.

Response (Oregon Department of Fish and Wildlife Letter)

Oregon

DEPARTMENT OF
FISH AND
WILDLIFE

BUREAU OF RECLAMATION
MAR 31 1995

March 27, 1995

Mr. John W. Keys, III, Regional Director
Bureau of Reclamation, Attn.: PN-6309
1150 N. Curtis Road
Boise, ID 83706-1234

Subject: Planning Report/Draft Environmental Statement (Draft ES) of Fish Passage Improvement -- Savage Rapids Dam

Dear Mr. Keys:

Oregon Department of Fish and Wildlife (ODFW) has reviewed the subject draft report and concurs with the report's conclusions. Although both alternatives will result in significant improvements in fish passage at Savage Rapids Dam, the preferred alternative, dam removal, provides greater assurance of long term improvements than the dam retention alternative, which requires an intensive operation and maintenance program in order to ensure safe fish passage over the years.

ODFW has closely participated in identification of fish passage issues at Savage Rapids Dam for several decades. Most recently, ODFW provided information to the Bureau of Reclamation (BOR) in the 1980's when the Josephine County Water Management Improvement Study was initiated. In 1990, as a condition of a temporary water right issued by the Oregon Water Resources Commission, Grants Pass Irrigation District formed the Permit Oversight Committee, on which ODFW served as a member. ODFW also participated in development and review of a Planning Aid Memorandum (April 1990) and Fish and Wildlife Coordination Act Report (draft, 1994; final expected early 1995) prepared by U.S. Fish and Wildlife Service (USFWS). Finally, ODFW has conducted an independent analysis of expected anadromous fish benefits resulting from both the dam removal and dam retention alternatives. This analysis is attached (December 1994 and March 1995).

The Draft ES accurately describes existing fish and wildlife resources of the Rogue River and identifies present effects of Savage Rapids Dam on anadromous fish. It assesses environmental benefits and impacts of both alternatives. Because ODFW

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participated closely with BOR in the development of the Draft ES, our comments are few and aimed primarily at updating the Draft ES to incorporate recently completed analyses and information.

ODFW Analysis of Fish Passage Improvements

Attached to this letter are two reports prepared by ODFW staff (December 1994 and March 1995) which present results of a model analysis of anadromous salmon and steelhead population increases expected with either of the two alternatives considered in the Draft ES. This analysis incorporates recent information regarding fish hatchery releases and sport and commercial harvest. While this new analysis confirms that both alternatives will result in significant fish population increases, ODFW does not believe it is necessary for BOR to revise its estimates of fish benefits in the Draft ES. However, the Draft ES should reference this analysis and acknowledge that the range of population increases estimated from this analysis 1 encompasses the point estimates identified in the Draft ES.

Operation and Maintenance: ODFW's analysis is based on field and laboratory studies of fish survival at dams in the Pacific Northwest, including passage through or around fish ladders, screens, and spillways. For the dam retention alternative, relatively high fish survival was assumed, based on study results at state-of-the-art fish passage facilities installed at other locations. It is important to note that these field studies were conducted soon after installation of new facilities and careful attention was paid to ensuring that the facilities were in peak operating condition. The Draft ES correctly includes long term operation and maintenance costs of state-of-the-art fish passage facilities in its economic evaluation of the dam retention alternative. Chapter VI of the Draft ES, however, should specifically state that fish benefits 2 estimated for the dam retention alternative assume fish passage facilities are operated and maintained in peak condition throughout the life of the project. It should also be noted that this assumption increases the risk that the dam retention alternative fish benefits may not be as high as estimated.

Range of Benefits versus Point Estimates: ODFW's analysis provides a range of estimated fish benefits expected from each alternative. This approach recognizes the inherent variability in benefits expected when fish populations and harvest levels vary significantly between years and when fish passage survival at screens, ladders and spillways varies within and between years. Although it is easier to compare the two alternatives using point estimates of costs and 3 benefits, ODFW suggests that BOR consider identifying ranges of estimated benefits, which present a more realistic picture than point estimates.

1. The ODFW analysis has been added to attachment D and is referenced or summarized in appropriate sections of the report.

2. The discussion under "Effects of the Alternatives on Fish" has been revised to indicate that fishery benefits are based on maintaining facilities in peak conditions and that the chance of decreased benefits due to poor maintenance is much greater with the Dam Retention Alternative.

3. The range of changes in fish populations has been included. A range of monetary benefits would be illuminating in the benefit-cost analysis but would be unlikely to result in any decision changes. We concur with your earlier statement in this letter of comment that a revision of fishery benefits is not necessary.

Response (Oregon Department of Fish and Wildlife Letter)

John W. Keys, III
March 27, 1995
Page Three

Benefits to Sensitive Fish Populations: Similar to earlier analyses by USFWS and National Marine Fisheries Service (NMFS), ODFW's analysis shows that those populations which are largest will accrue the greatest benefits from improvements at Savage Rapids Dam. BOR's economic analysis of fish benefits applies this same concept: dollar benefits are higher as numbers of fish increase. Unfortunately, this type of analysis, while straightforward and simple to understand, fails to acknowledge the greater value to society of protecting sensitive fish populations from further declines. For some populations, this may mean stemming a gradual decline and preventing the population from being listed under state or federal Endangered Species Acts. The savings that accrue to society by not having to list a species have probably not been calculated, although there is ample evidence that species listing and recovery efforts incur substantial costs to both public and private sectors. If any of the salmon or steelhead populations that pass Savage Rapids Dam are eventually listed as either threatened or endangered, the value of fish passage improvements in terms of species recovery should
4 also be considered. Clearly, the value of increasing a listed species population by, for instance, 100 or 1000 fish per year, should be as high or higher than increasing a robust population at a proportionally equivalent rate.

Non-use values: In addition to benefits resulting from increased populations of sensitive or
5 listed species, the economic analysis in the Draft ES does not discuss other values, such as non-consumptive uses (viewing spawning fish), existence and passive use values resulting from increases in all species affected by the dam. Although ODFW does not believe it necessary for BOR to derive economic benefits for these types of values, we recommend that the Draft ES acknowledge the other, non-economic benefits of increased fish populations in the Rogue River.

Threatened and Endangered Species

Since the Draft ES was released, NMFS has proposed to list Klamath Mountain Province steelhead under the federal Endangered Species Act. The wild summer and winter steelhead of the Rogue River are considered by NMFS to be a part of this population. In the next year, NMFS will solicit and analyze comments and additional scientific data to decide whether or not to list this population. ODFW recommends that the Draft ES clearly describe NMFS'
6 most recent action, proposed process for further review, and how the proposed fish passage improvements at Savage Rapids Dam could aid in recovery efforts. ODFW is especially concerned that the proposed listing not be used as reason to delay implementation of the preferred alternative. Whether or not Rogue River steelhead are listed, fish passage improvements at Savage Rapids Dam will benefit these and other fish populations.

4. Reclamation is unaware of any current methodologies for evaluating monetary benefits for enhancement of an ESA listed species.

5. Monetary benefits for non-consumptive use are difficult to identify, would be minor, and are unnecessary for a decision among alternatives. The report has been revised to more clearly indicate that each of the action alternatives would also produce non-consumptive use benefits that have not been identified.

6. Appropriate sections of the "Summary" and the "Need for Action" chapter have been expanded to document recent actions of NMFS.

Dam Removal Alternative

Chapter III of the Draft ES describes this alternative. BOR assumes a construction period of 5 years, including 2 years preconstruction activities and 3 years of actual construction. ODFW agrees with the BOR's plan to schedule construction to avoid peak fish migration periods and to ensure that construction activity will not entirely block migration. However, ODFW questions the need for this protracted construction schedule. Is it not possible to complete
7 preconstruction activities for the pumping plants in one year, and in the second year, complete preconstruction activities for dam removal at the same time that pumping plant construction takes place? Additionally, why should it take two years to remove the dam? Although ODFW recognizes that the Draft ES is not the appropriate forum for completing detailed construction scheduling, this report should acknowledge that a less conservative schedule is indeed feasible.

Dam Retention Alternative

In describing this alternative in Chapter IV, the Draft ES indicates that conceptual designs of fish passage facilities are based on drawings and design criteria provided by USFWS and NMFS. BOR estimated facility costs based on experience designing and constructing similar facilities in the Yakima and Umatilla river basins. The Draft ES should be revised to
8 acknowledge that NMFS design criteria have been recently modified for fry-sized fish. Final design should incorporate these new, stricter criteria, which are based on recent studies. The resultant costs of fish passage facilities would thus be higher than those estimated in the Draft ES.

Affected Environment and Environmental Consequences

Effects of the Alternatives on Fish: Preferred Alternative: Chapter VI describes environmental resources that could potentially be affected by the two alternatives for improving fish passage at Savage Rapids Dam. The Draft ES states on page VI-23 that dam removal will result in only minor improvements to aquatic habitat in the existing reservoir area. ODFW disagrees with this conclusion. With restoration of this reach to a riverine environment and flushing of silt and fine sediments as water velocities are increased, spawning habitat will become available for fall chinook salmon. In our October 1994 analysis of fish benefits expected with the dam removal alternative, ODFW predicted 3,063 additional adult fall chinook would be available for spawning and harvest if spawning habitat were made
9 available in the reservoir reach. We recommend that the Draft ES be revised to include this additional benefit of the dam removal alternative.

7. The construction period estimate is a best analysis. Preconstruction includes many activities such as site geology, final designs, specifications, and construction bids. Preconstruction activities for the pumping plant are likely to be more lengthy than the preconstruction activities for removal of the dam. However, shortening the preconstruction and construction periods to some extent may be possible.

8. Final designs will be done in cooperation with NMFS, USFWS, and ODFW to the standards that are current at that time. Cost would not be expected to change appreciably.

9. Appropriate sections of the report have been revised to reflect this comment.

10 This section also fails to recognize expected benefits of both alternatives on resident fish. Resident fish move within river systems to meet many of their needs, such as spawning in specific habitats (e.g., cool springs or tributaries), moving out of high velocity water during peak flow events, and seeking seasonally available habitats that provide food and cover. Both upstream and downstream fish passage at obstructions is important to ensure resident fish are able to reach specific habitats during specific life stages and seasons. Additionally, human-made barriers can split populations, potentially resulting in populations that are no longer sustainable. Although little information is available on the specific habitat and migrational requirements of resident fish in the Rogue River and its tributaries, benefits of improved passage conditions at Savage Rapids Dam will accrue to these fish as well as to anadromous species. The design criteria which would be utilized for state-of-the-art fish passage facilities under the dam retention alternative would be suitable for most species of resident fish present in the Rogue River.

Conclusion

ODFW appreciates this opportunity to comment on the Draft ES and recommends that BOR move forward as quickly as possible to secure funding to correct fish passage problems at Savage Rapids Dam. If you have any questions about these comments or ODFW's analysis of fish benefits, please feel free to call me at (503) 229-6967, ext. 441.

Sincerely,

Stephanie Burchfield

Stephanie Burchfield
Water Resources Program Manager
Habitat Conservation Division

Attachments

c: Ron Garst, USFWS - Portland
Dan Shepard, GPID
Doug Parrow, OWRD
Jeff Curtis/Bob Hunter, WaterWatch (Public Information Request)

Response (Oregon Department of Fish and Wildlife Letter)

10. The discussion under Effects of the Alternatives on Fish in chapter VI has been modified to indicate that both action alternatives would provide benefits to resident fish.

bc: Derald Walker, Admin
Bob Mullen, Roseburg
Mike Evenson, Central Point
Tom Satterthwaite, Grants Pass Research
Ray Temple, Fish Division
Jill Zarnowitz, HCD
HCD File: BOR Project Studies/Savage Rapids Dam

diskfile: sb/gpidbor.doc

Response (American Fisheries Society Letter)

American Fisheries Society

Oregon Chapter
P.O. Box 722
Corvallis, Oregon 97339

BUREAU OF RECLAMATION
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15 March 1995

MR. JOHN W. KEYS, III, REGIONAL DIRECTOR
BUREAU OF RECLAMATION
ATTENTION: PN-6309
1150 NORTH CURTIS ROAD
BOISE, ID 83706-1234

RE: Planning Report and Draft Environmental Statement of Fish Passage Improvements at Savage Rapids Dam

Dear Mr. Keys:

The Oregon Chapter of the American Fisheries Society, which represents nearly 500 fisheries and aquatic science professionals, is interested in the protection, rehabilitation, and enhancement of Oregon's fishery and aquatic resources.

The Oregon Chapter concurs with the preferred alternative to remove the existing dam and provide public funding for new electric pumping facilities with appropriately maintained fish screens.

Salmonid declines during the past 100 years throughout North America resulted largely from human caused alterations of the aquatic environments. In some cases, such as with Savage Rapids Dam, these alterations can be reversed with benefits for the salmon and the public. Savage Rapids Dam has outlived its usefulness. Originally built in 1921 to provide water to irrigate cropland, it now mostly provides water for residential lands. For 73 years federal, state, and local governments have failed to adequately protect fish and fish habitat from the operation of Savage Rapids Dam. Immediate dam removal provides a rare opportunity to restore important salmon spawning habitat and permanently remove an unnecessary source of salmon mortality. The scientific community unanimously agrees that dam removal would be extremely beneficial to salmon and the Rogue River ecosystem.

The dam retention alternative is unacceptable for the following reasons:

1) Operation of the dam impounds water for three miles upstream, making spawning for chinook salmon and steelhead unsuitable there until the dam's removal (p. VI-18).

2) Even with proposed modifications, significant mortalities of adult and juvenile salmon will continue to occur (p. VI-24).

3) Dam retention costs 4.3 million more than dam removal (Summary 10). Since the dam will eventually have to be removed, dam retention has a hidden cost of dam removal at some time in the future. Dam removal has the advantage of a one time cost.

Further studies comparing dam removal and dam retention are unwarranted because:

1) Dam removal was found technically, ecologically, and economically preferable to dam retention.

2) Removal of Savage Rapids Dam has been studied by both the U.S. Fish and Wildlife Service and the National Marine Fisheries Service since the early 1980's.

3) Further study delays the timely removal of the dam, results in continued fish mortality, and increases removal costs.

Based on information provided in the planning report and environmental statement, we do recommend additional mitigation and monitoring to protect and assess salmon spawning.

Due to erosion in the upper basin (Evans Creek, Bear Creek and others), spawning gravels below the dam may be below desired quality. Also, the 516,000 cubic yards of fine sediment (p. VI-13) that will be mobilized after dam removal may affect egg-to-fry survival of fall chinook salmon that currently spawn below the dam. Movement of such a volume of sediment following dam removal could be particularly harmful because even small increases in percent fine sediment can have large effects on egg-to-fry survival. The dam removal alternative should consider 1 removing and stabilizing some portion of the 516,000 cubic yards of fine sediment stored behind the dam as a mitigating measure. Perhaps it would be possible to decrease the effects of mobilized sediment by removing at least the material immediately behind the structure and upriver in the thalweg area. The objective is to blunt the effect of the initial pulse of sediment moving down the Rogue River during the first few large flood events. Contact Brian Winter (NPS, Port Angeles, WA, (206) 452-0302) about sediment issues related to the Elwha Dam removal from Olympic National Park. Bank stabilization should be done with natural vegetation so that a riparian buffer of large trees and brush becomes established. This buffer can then provide shade and wood debris to the river and act as a filter for diffuse pollutants from the immediate uplands.

Fine sediment content, or better yet, intergravel dissolved oxygen, in chinook salmon redds 2 should be monitored. Spawning beds below and above the reservoir should be monitored for two to three years before removal of the dam and two to three years after removal. The freeze-core technique described by Rood and Church (North American Journal of Fisheries Management 14:852-861) is recommended for sediment studies. See the literature cited in the Oregon Department of Environmental Quality's dissolved oxygen issue paper for possible methods to

1. See discussion "Effects of the Alternatives on Water" in chapter VI. Hydrologists estimate that virtually all of the finer sediment would be transported downstream and remain in suspension through the lower river. Sand size materials would move slower, be deposited in slower flowing areas, and moving further downstream during flood events. The process is expected to mimic natural erosion process. ODFW has indicated that natural dispersal of the sediment would have negligible impacts; this view is also held by the BLM and USFS.

   Bank stabilization is not considered necessary as much of the river bank is rocky.

2. We agree that this type of research could further understanding of sediment movement. However, fishery agencies have not requested this type of monitoring, and under current economic conditions, such monitoring is unlikely.

monitor intergravel dissolved oxygen and spawning success. Verification of predicted insignificant impact (p. VI-13) would provide scientific knowledge useful for future dam removals and provide information about the behavior of fine sediment. Important baseline data about the quality of Rogue River spawning gravels would be useful for trend studies.

3 Dam removal should be done so that only natural whitewater boating obstacles remain in the vicinity. These should not necessarily be considered hazards unless they are substantially greater than other natural obstacles to boating the Rogue. They may simply increase the value for whitewater boaters.

4 Finally, the Bureau should consider the likelihood that Congress will choose to spend tax dollars on other issues and programs. That is, what are the consequences (costs and benefits) of neither removing the dam, installing pumps, nor modifying the existing structures?

Please notify me of your decision and do not hesitate to call on us, if the Oregon Chapter of the American Fisheries Society can be of further assistance in this matter or with related aquatic ecosystem and fishery issues.

Sincerely yours,

R. Hughes

Robert M. Hughes, President
for the Executive Committee.

c: Senator Mark Hatfield
Senator Bob Packwood
Representative Peter DeFazio
Representative Wes Cooley
Governor John Kitzhaber
Representative Beverly Clarno
Senator Gordon Smith
Lydia Taylor, Oregon Dept. of Enviromental Quality
Bob Baumgartner, Oregon Dept. of Environmental Quality
Rudy Rosen, Oregon Dept. of Fish and Wildlife
M. Evensen, Oregon Dept. of Fish and Wildlife
S. Burchfield, Oregon Dept. of Fish and Wildlife
Paul Brouha, AFS Parent Society
C. Burger, AFS Western Division
R. Nawa, AFS, Oregon Chapter

3. The intent is to leave a normal river channel after dam removal. Final designs would be completed during preconstruction.

4. If the Congress chooses to not authorize an action alternative, the No Action Alternative described in chapter V would be in place. For this study it was assumed that current conditions could last for as long as 20 years and that is reflected in the impact analysis in chapter VI. Action that the State of Oregon may take with respect to GPID water rights or fish passage requirements could have serious consequences for the GPID and the future of the irrigation system.

Northwest Environmental Defense Center
10015 S.W. Terwilliger Blvd., Portland, Oregon 97219
(503) 768-6673 Fax - (503) 768-6671

BY FAX AND REGULAR MAIL

March 19, 1995

Bureau of Reclamation
ATTN: Robert Hamilton
1150 North Curtis Road
Boise, Idaho 83706-1234

RE: Draft Environmental Impact Statement for the Savage Rapids Dam Fish Passage Improvements Plan (1994)

Dear Mr. Hamilton:

The letter constitutes the comments of the Northwest Environmental Defense Center (NEDC) on the Draft Environmental Impact Statement for the Savage Rapids Dam Fish Passage Improvements Plan. NEDC strongly supports the Preferred Alternative of dam removal. This alternative would eliminate the anadromous fish passage problems at Savage Rapids, completely removing one of the most significant factors in fish mortality on the Rogue river. Removal also eliminates a significant legal problem, the current dam's failure to comply with numerous federal and state environmental statutes.

NEDC was founded in 1969 to protect the environment of the Pacific Northwest. NEDC also provides legal support services to individuals and public interest organizations to litigate environmental issues. Its membership includes law students, lawyers, scientists, planners, engineers, and activists involved in protecting the environment of the Pacific Northwest. As such, we are very concerned about the plight of wild anadromous fish throughout the region.

NEDC strongly supports the Bureau of Reclamation's Preferred Alternative of dam removal. We fully support the overall goal of improving fish passage at the site. We submit these comments in the hope that an adequate, legally defensible Final Environmental Impact Statement

(FEIS) will result. To ensure that the FEIS is legally defensible and fully complies with NEPA, we make the following comments and recommendations.

1. Additional Alternatives.

The Bureau concluded that only two viable alternatives to No Action exist: dam removal (Pumping Alternative) and Dam Retention. While the DEIS addresses these alternatives, it fails to make clear why these are the only alternatives.

The DEIS notes that other alternatives were studied, but that the two that the DEIS discusses were found to be the only reasonable ones. Although this may be the case, NEPA regulations require that agencies should "[r]igorously explore and objectively evaluate all reasonable alternatives...." 40 C.F.R. 1502.14 (a). The importance of this mandate cannot be down played; under NEPA a rigorous review of alternatives is "the heart of the environmental impact statement." 40 C.F.R. 1502. 14. This means that the FEIS should not simply state that dam removal, Dam Retention, and No Action are the only reasonable alternatives. Instead, the FEIS should outline why other possibilities were not analyzed in depth.
1 NEDC suggests that the FEIS summarize the studies conducted in the 1970s, to show how the Bureau has thoroughly explored all the possible alternatives.

For example, it is unclear why the Dam Retention Alternative does not explore alternatives to fish ladders. The design work for these ladders was done in the 1970s. Since that time, state-of-the-art fishways,
2 retrofitting, screens, and other technology have been developed. Such alternatives are not mentioned.

The fact that the design work and cost estimates for the Dam
3 Retention Alternative were conducted twenty years ago is of concern. Even though the 1970s data is still basically valid, the FEIS should make clear why new design work and cost estimates are not needed.

Finally, the FEIS should consider less expensive dam retrofitting and explain why such retroffiting would be undesirable.
4 Although NEDC in no way supports retrofitting alternatives for the Savage Rapids Dam, we do believe NEPA requires a thorough evaluation of all alternatives.

1. Reclamation is unaware of any other potentials or alternatives that would address the fish passage problem. Upstream passage can be improved only by removal of the dam or construction of acceptable fish ladders. Downstream fish passage can be improved only by adequate screening of the water diversion whether the dam is retained or removed. See discussion under Formulation Concerns in Chapter VIII.

2. Reclamation is unaware of any acceptable alternative to fish ladders for passage of adult fish over a dam of the height of Savage Rapids Dam.

3. Design work adequate to support authorization of the Dam Retention Alternative, which includes many measures, was done during the course of this study which was initiated in 1989. The fish ladder measures are based on 1970's designs only for cost estimating purposes (see discussion under "Fish Ladders" in chapter IV). Final designs for all measures including the fish ladders would be completed during preconstruction in consultation with Federal and State fish and wildlife agencies. A statement has been added in the "Facilities" section of the Preferred Alternative and the Dam Retention Alternative to clarify design considerations.

4. Fisheries agencies have indicated that modification of current fish passage and protective facilities is not acceptable (see "Formulation Concerns" in chapter VIII and ODFW Recommendations in Attachment D). As a result, a viable alternative with retrofitting cannot be identified.

2. The FEIS Should More Clearly Discuss The Methodologies And Reasoning As Well As Current Scientific Knowledge.

NEPA requires that agencies "insure the professional integrity, including scientific integrity, of discussions and analyses in environmental impact statements. They shall identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions relied upon in the statement...." 40 C.F.R. 1502.24. The DEIS does not adequately meet this requirement.

NEDC suggests that the FEIS make clear the reasoning behind its conclusions. There are at times conclusory statements in the DEIS. For example, the choice of alternatives was made solely on the basis of "studies
5 conducted in the 70s." The EIS should illuminate these studies and the decisions to rely on them.

In addition, mention is made of the possibility that hazardous
6 materials may be removed from the site after dam removal. This is simply an inadequate explanation of a potentially problematic situation.

Finally, the analysis of power options and availability is rather conclusory. It is unclear who is going to pay the annual, increasing, costs
7 for the pumping of water from the river. This should be discussed even if the Bureau cannot resolve the issue.

There also is current scientific data to supplement the old data that the DEIS uses. By providing more up-to-date scientific knowledge on the state of the anadromous fish populations in the river, the FEIS would be more defensible. The Oregon Department of Fish and Wildlife (ODFW) recently completed an analysis of the anadromous fish returns for the Rogue River. In October of 1994, ODFW released its "Estimation of Rogue River Salmon and Steelhead Population Increase For The Savage Rapids 'Dam Removal' Option." The study's numbers range from 20,865 to 93,542 anadromous fish annually. These numbers are lower than the 120,500
8 offered in the DEIS. The ODFW study should be referenced with the Draft data, because the study results reinforce the need to remove the fish passage problems at the site while a stable population of anadromous fish still exists in the river.

Anything that can be done to increase the health and size of the anadromous fish population should be done. Dam removal would eliminate the largest factor in fish mortality in the Rogue River, the Savage Rapids

5. Earlier work was reviewed, but conclusions and recommendations are based on the work completed during this study. (see also Responses #1 and #3)

6. Hazardous materials, which could include gasoline and oils used in operation of dam equipment, would be identified and removed to the extent possible before the dam is demolished. As stated under the "Disposal of Excavated and Other Materials" section in chapter III, hazardous materials will be handled in accordance with Federal, State, and local laws. The intent of this statement is to assure that precautions will be taken to identify any such materials and dispose of them appropriately.

7. Operation, maintenance, replacement, and power costs are identified for each action alternative. OMR&P costs are the responsibility of GPID whether payed directly or through a secondary funding source. A statement to this effect has been added to the "Funding" section of chapter III; a statement that all OMR&P, except for the juvenile trap facility, would be paid by GPID already exists in the "Funding" section of chapter IV.

8. ODFW has recently furnished Reclamation with an analysis of a range of fishery benefits for each action alternative. This is included in Attachment D and discussed in the appropriate sections of the report.

Dam. NEDC suggests that more recent scientific data be integrated into the Final EIS.

In addition, the Final EIS should address local concerns in changes in
9 recreation after dam removal. For example, the removal of the dam may increase rafting and fishing at Savage Rapids. Also, the FEIS should discuss whether there will be destruction of on site water fowl habitat or other effects. NEDC suggests that the FEIS address these issues.

Finally, any contradictory data or studies regarding fisheries, the
10 economics of the two alternatives or No Action, land use, and recreation should be acknowledged and addressed in the FEIS.

Conclusion

NEDC strongly supports the Bureau's Preferred Alternative of Dam Removal. We wish to express our willingness to help achieve the Preferred Alternative of Dam Removal in any way that we can. Our goal in this process is to achieve a legally defensible, valid FEIS so that the Preferred Alternative can proceed. Please contact NEDC at (503) 768-6673 if you have any questions regarding these comments or any other issues.

Sincerely,

Phillip Bender & Gloria D. Smith
for Northwest Environmental Defense
Center

9. Potential effects of the alternatives on recreation and wildlife are discussed in chapter VI. Elimination of the seasonal reservoir would cause some waterfowl to be displaced by wildlife associated with more riverine conditions. Data on recreation use of the reservoir area are limited. Although types of recreation are expected to change, overall recreation use is not expected to change significantly.

10. Reclamation is unaware of any scientific studies of the fisheries that contradict the data presented in the report.

OREGON NATURAL RESOURCES COUNCIL

Protecting Oregon's lands, waters and natural resources

BUREAU OF RECLAMATION OFFICE
MAR 2 1995
TO 630 1 ON 24 FILE

March 20, 1995

Robert J. Hamilton
Bureau of Reclamation
1150 North Curtis Road
Boise, Idaho 83706-1234

RE: Planning Report/DEIS—Fish Passage Improvement Savage Rapids Dam

I am writing on behalf of Oregon Natural Resources Council to strongly support the preferred alternative of dam removal and encourage the Bureau of Reclamation to seek the necessary funding. Removing Savage Rapids Dam is a classic win-win situation. It will benefit fish, the local economy, *and* the Grants Pass Irrigation District (GPID).

No-Action Alternative
The no action alternative is clearly unacceptable and, in fact, illegal. Savage Rapids Dam is killing more than 100,000 fish per year, even while some of those fish edge closer to endangered species status. (Steelhead in southern Oregon and northern California have been proposed for listing as threatened by the National Marine Fisheries Service, and coho coast wide are overdue for a proposal.) Even without these listings, the irrigation district is bound by law to provide adequate fish passage, and will eventually be forced to take corrective measures it is ill-equipped to afford, on top of the money needed for deferred maintenance. In addition, GPID's diversion of excess water violates Oregon's State Scenic Waterway "Diack" flows for the Wild and Scenic section of the Rogue River. The Water Resources Commission has allowed this excess diversion to continue only if dam removal is pursued. Otherwise, the district may be forced back to its certified right of 97 cubic feet per second, inadequate to serve its customers given its current inefficient system.

Dam Retention Alternative
Nor is installing fish passage improvements in order to "save the dam" a reasonable alternative in this case. Even disregarding the value of increased fisheries, economics alone argues for dam removal ($11.2 million for dam removal, $17.6 million to fix the dam). In addition, federal funding would not be available for the irrigation component of the dam retention alternative, making dam removal cheaper for GPID's customers (a 1 point that needs to be stated more clearly in the DEIS). Removing the dam and installing pumps will give the district a new lease on life, without which bankruptcy is a serious possibility. In addition, if the dam remains, the full benefit to the fishery will not be realized. The dam sits in an otherwise prime spawning area, so would continue to have a detrimental impact on fish even with improved passage. Predation and temperature problems exacerbated by the dam would still exist. And ladders and screens might soon become ineffective due to lack of maintenance by the financially stressed irrigation district. These, and other problems with the dam retention alternative should be discussed in more detail in the DEIS.

Preferred Alternative
The Bureau has correctly identified removal of Savage Rapids Dam as its prefered alternative. Dam removal is also advocated by the National Marine Fisheries Service, the US Fish and Wildlife Service and the Oregon Department of Fish and Wildlife. Even the Grants Pass Irrigation District has succumbed to logic and voted in favor of dam removal. Oregon Natural Resources Council is happy to lend its support to this alternative as well.

Sincerely,

Diane Valantine
Salmon and Rivers Program Leader

1. The forth paragraph on Summary-7 and the "Cost Allocation and Repayment" and "Funding" sections of chapter IV point out that costs of $2,848,000 would be assigned to irrigation and that GPID would be responsible for repayment of these costs. Clarity on this point has been increased by modifying appropriate sections of the report.

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THREE RIVERS WATERSHED COUNCIL, INC.
P.O. Box 880 • Rogue River, OR 97537

BUREAU OF RECLAMATION OFFICIAL FILE COPY
MAR 27 1995

Comment to be included in the final environmental statement

March 17, 1995

Since World War II, the impression persists that dams are responsible for salmon decline.

The government has been addressing it with increasing cost and decreasing success. Instead of looking closely at commercial exploitation, which closely tracks with salmon decline. As Richard Hill pointed out in the Oregonian on February 10, 1995, Dams aren't the culprits.

In 1971 the government recommended a study of fish passage at the Savage Rapids dam. Although no actual, on site, study was done, the perception contined that dams were responsible for fish losses, so Savage Rapids dam had to be suspect.

Not only is the premise that dams are primarily responsible, misdirected, the solution to the problem of Savage Rapids dam, could actually be part of the cause of fish decline.

1 The government solution to the problem is to replace the natural water driven dam with huge electrical pumps, which would emit electropollution into the environment.

The government (EPA) has refused to look at the problem of electropollution. In 1973,15 years of naval research on ELF effects,as well as other pertinent work were ignored, even though they pointed out several dangers to human health. Later in 1985, Dr. Robert Becker told us about a Soviet Woodpecker signal emiting electropollution directed at the west coast. In his book The Body Electric, he wrote "Since the 1970's there has been a dramatic increase in flooding, drought, and attendant hardships due to inconsistant, anomalous weather patterns. It appears likely that these have been caused in part by electropollution and perhaps enhanced, whether deliberately or not, by the Soviet woodpecker signal." (p. 326)

This coincides with the shift in California currents in the mid 1970's that caused generally less desirable upwelling and sea surface temperatures for coho in the ocean since 1976. Extreme low ocean survivals of coho in 1983 and 1984 were directly attributable to the El Nino event in the ocean.(Pearcy 1992), and the same should be expected from the 1993 El Nino. Yet, the government still continues the same failed policies. (Ref. Status of Oregon's Coastal Coho and Measures for Population Rebuilding. Final report May 1994, submitted to National Marine Fisheries Service by Steven Cramer.

Dr. Becker and others, have warned us that even if we survive the chemical and atomic threats to our existence, there's a strong possibility that increasing electropollution, could set in motion irreversible changes, leading to our extinction, before we're even aware of them.

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.

In your report (p. VI-41) you have two adverse effects of dam removal, loss of the lake and an increase in power consumption, but that neither are considered significant.

Replacing the dam with electrical pumps, would emit dangerous electropollution into the environment, as well as, cause economic hardship to our area.

Sincerely,
Claire Heil
Secretary

Response (Three Rivers Watershed Council, Inc. Letter)

1. Reclamation is not aware of any scientific research that indicates that electromagnetic radiation from the operation of electric motors in the range of 100 to 350 horsepower causes harm to any biological organisms.

18 March 1995

FILE

C/O Robert J. Hamilton
Bureau of Reclamation
1150 N. Curtis Road
Boise, Id 83706-1234

Dear Mr. Hamilton,

Would you please explain to me how removing Savage Rapids Dam would help the environment from an energy conservative viewpoint.

1 I am told that the dam generates its own electricity to run the pumps to pump the water up to the canals. If the dam is removed, electricity will have to be purchased to run the pumps. Where will this energy come from? Other Dams? From coal fired power plants or fossil fueled power plants: These all have their own consideration for adding to the degradation of the environment. Are we just transferring the problem to somebody else's neighborhood? It is clearly making us more dependent on other people. ie: The Federal Government. If we have to buy electricity, what will it cost for one years operation of these new pumps? For ten years.?

2 The new pump will need a sump to pump the water out of to the canals. How big will this sump have to be? How will we keep the fish out of the sump?

3 Could you please supply me with the dollar amount for fixing just the fish ladder and for removal of the dam. Considering fish ladders, do they work on the dams on which they are installed on the Columbia River: If they work on those dams they should work on Savage Rapids Dam. If they don't work, maybe we should be taking out the dams on the Columbia River. If they do, maybe we should be working to install them on dams that don't have them to save the fish.

Is it possible to obtain the report that says it costs eleven million to take out the dam and seventeen million to fix the fish ladder?

Thank you for reading this. I hope you can supply me with some answers to my questions.

Sincerely,

James W. Ayling

Response (James Ayling Letter)

1. There are no electric generating facilities at the dam. The diversion pumps are operated by direct mechanical connection to hydraulic (water-powered) turbines. Electricity to power the new pumps would be obtained from the Pacific Northwest Power grid, probably from Pacific Power and Light Company (see "Costs" section on page III-9)

2. The size of facilities is shown in Drawings 1313-D-1 and 1313-D-2 and discussed in the "Facilities" discussion for the Preferred Alternative.

3. A general itemization of construction costs is shown in table III-3 for the Preferred Alternative and in table IV-1 for the Dam Retention Alternative.

A copy of the report was sent.

Response (Dennis M. Becklin Letter)

Dennis M. Becklin
3576 Rogue River Hwy.
P.O. Box 188
Grants Pass, Oregon 97526

BUREAU OF RECLAMATION
NATIONAL FILE COPY
1995
6309 RJH

February 17, 1995

Mr. Robert Hamilton
US Bureau of Reclamation
PN-6309
1150 North Curtis Road
Boise, Idaho 83706-1234

FAX: (208) 378-5066

Reference: Savage Rapids Dam
Draft Environmental Statement

Dear Mr. Hamilton:

I have attended the February 16, 1995, public hearing in Grants Pass, Oregon, regarding the Draft Environmental Statement on Savage Rapids Dam. I am aware of the preferred alternative, which would result in the removal of the dam and the subsequent pumping of water into irrigation canals which serve the patrons of the Grants Pass Irrigation District. I am a patron of GPID.

My review of the Draft Environmental Statement has identified four serious deficiencies that must be addressed prior to implementing the removal of Savage Rapids Dam. These deficiencies show considerable laxity in addressing the current condition of fish stocks in the Rogue River and of the consequential impacts that would result if the dam is removed.

1. **FAILURE TO STUDY ACTUAL FISH LOSSES AT SAVAGE RAPIDS DAM:**

1 The Draft Environmental Statement makes no pretension that any effort has been made to collect and analyze actual fish loss data at the dam. This omission is a serious breach of scientific method, and leaves the remainder of the Draft Environmental Statement on an inadequate foundation of proof that a fish loss problem exists. This omission has been acknowledged by speakers from Oregon Water Watch, who along with the Bureau of Reclamation appear content to draw their conclusions by "extrapolation" from data which has been collected at locations other than the dam in question

1. See ODFW letter of comment and attachment D..

2. **FAILURE TO STUDY WEATHER CORRECTED FISH POPULATION DATA:**

2 The Draft Environmental Statement has failed to examine a considerable body of data that can relate populations of migratory fish to the changing patterns of weather-related water conditions in the Rogue River. Daily data has been collected at Grants Pass for many years. This daily data, of which the writer is personally acquainted, includes water

2. This report is concerned with only the successful passage of fish at Savage Rapids Dam and the effect on the salmon and steelhead populations.

February 17, 1995
Mr. Robert Hamilton
US Bureau of Reclamation
Boise, Idaho 83706-1234
Reference: Savage Rapids Dam
Draft Environmental Statement

flow, water temperature, water terpidity and rainfall. Fish count data at Gold Ray Dam has likewise been collected for many years, and that data is readily available. Using portions of both types of data which have been secured from local authorities, the writer has made some comparative studies of fish counts versus water flow for the purpose of tracking migratory patterns of anadromous fish on the Rogue River. These studies were conducted to satisfy my curiosity and to assist in my personal understanding of the best times to fly fish on the Rogue River.

Failure of the Bureau of Reclamation to thoroughly examine available data on water flows and conditions versus known fish counts should result in rejection of the conclusions the Bureau has made concerning the condition of anadromous fish populations on the Rogue River. If available data shows a clear relationship between weather-related water conditions and the populations of fish in the Rogue River, then that data must revise the conclusions that have been reached in the Draft Environmental Statement.

Neither the Bureau nor any other governmental body will be capable of legislating nor administratively dictating future weather and its impact on water conditions in the Rogue River. Therefore, past weather related impacts on fish populations is a necessary variable that must be considered before implementing the preferred option of dam removal and water pumping.

3. **FAILURE TO STUDY INCREASED POWER BOAT USE ON THE ROGUE RIVER AFTER REMOVAL OF SAVAGE RAPIDS DAM:**

The Draft Environmental Statement has grievously failed to
3 identify or study changes in power boat usage that will result from removal of Savage Rapids Dam.

Tourist/commercial users of the Rogue River have raised a storm of controversy for their use of the Rogue River between Grants Pass and Grave Creek in Josephine. One tourist/commercial user operates from the town of Rogue River upstream to the bottom of Powerhouse Rapids in Jackson County. There are an as-yet-unknown number of power boat users who operate in the waters between Grants Pass and Savage Rapids Dam.

3. Without knowing the configuration of Savage Rapids after the dam is removed, it would be difficult to estimate powerboat passage. If power boat use increases and is found to be adverse to fish populations, the State can implement regulations or construct barriers to powerboats.

Response (Dennis M. Becklin Letter)

February 17, 1995
Mr. Robert Hamilton
US Bureau of Reclamation
Boise, Idaho 83706-1234
Reference: Savage Rapids Dam
Draft Environmental Statement
Page 3 of 4

The Draft Environmental Statement has ignored the probability of substantially greater power boat usage on the Rogue River from Grants Pass upstream to Powerhouse Rapids. Those usages will include substantial increases by recreational and fishing boats and devices which rely on gasoline powered motors for upstream navigation. Opening the river from Grants Pass to Powerhouse Rapids will also create a corridor for increased tourist/commercial use of that section of the river.

The impact of power boat usage on fish habitat and on the populations of anadromous fish populations in the Rogue River has not been scientifically ascertained. Such knowledge is crucial and should be mandatory to any decision-making process that may result in removal of Savage Rapids Dam.

4. **FAILURE TO STUDY THE RESIDENT FISHERY WHICH EXISTS BELOW SAVAGE RAPIDS DAM AND IMPACTS ON THAT FISHERY WHICH WOULD RESULT FROM THE DAM'S REMOVAL:**

There are many examples of fisheries which are dependent on water conditions and food sources that were created by and are dependent on the presence of dams. Of these, the writer is personally familiar with the fabulous trout fisheries which exist below Lost Creek Reservoir on the Rogue River, in Oregon, and below Hauser Dam on the Missouri River, in Montana.

4 The Bureau of Reclamation has made a serious error of omission in its Draft Environmental Statement by failing to study the resident fish population that exists below Savage Rapids Dam and which is dependent on the water conditions and food sources created by that dam. Further, the Bureau has failed to study the impact on that resident fish population which would result from removal of Savage Rapids Dam.

Before the Environmental Impact Statement on Savage Rapids Dam will be capable of withstanding a bevy of legal challenges, the Bureau of Reclamation must correct several serious deficiencies which exist in its draft form

4. Although no quantitative analysis has been made, removal of the dam would improve the resident fishery overall due to improved passage upstream and downstream. The amount of fish at specific sites would change. The population of fish in the reach just downstream from the dam would decrease, as fish trapped in this area by the dam would be free to move upstream. (Also see ODFW comments)

February 17, 1995
Mr. Robert Hamilton
US Bureau of Reclamation
Boise, Idaho 83706-1234
Reference: Savage Rapids Dam
Draft Environmental Statement
Page 4 of 4

Please confirm the receipt of this letter. I also ask that my name be included on all future mailing lists and meeting notifications which relate to this subject.

Very truly yours,

Dennis M. Becklin

DMB:tmf

cc: Senator Brady Adams
Oregon State Senate

Representative Bob Repine
Oregon State Legislature

Response (William H. Brecount Letter)

page 1 of 3

William H. Brecount
514 West Crane Cr. Rd.
Rogue River Ore. 97537
March 10, 1995

BUREAU OF RECLAMATION OFFICIAL FILE COPY
MAR 21 1995
TO | INIT | DATE
4309 | BJL | 21 Mar

Bureau of Reclamation
1150 N Curtis Rd.
Boise Id. 83706

R.E. PN6309 (Savage Rapids Dam)

Dear Sir:
I have lived on or near the Rogue River close to the Savage Dam since 1947. This is the very heart and show case of the Rogue River Valley to any traveler, with the I-5 freeway on one side and hwy 99 on the other side of the River. The lake backs up 4 miles and is used extensively for boating, skying and fishing. Hundreds of residents and tourists enjoy this beautifull lake daily.
I am one of 8,000 Grants Pass Irrigation District land owners irrigating land with the water from Savage Dam. The open irrigation canals on this system support a tremendous variety of bird and wild life. Without the G.P.I.D. the Rogue Valley might be named the Gobi Valley.

WILLIAM H. BRECOUNT
P.O. BOX 1220
ROGUE RIVER, OR 97537

1 Without this canals, hundreds of domestic water wells would dry up.
If the Savage Dam were destroyed, all of the afore mentioned would be lost, and the land owners of this area will have worked for the past 74 years for nothing.
I've read the alternative plan with the electric pumps, which I don't think is feasable at all. Electric pumps would
2 still have to have a dam to gather water and the electric bill would be prohibative, which would cause the slow but sure destruction of the G.P.I.D.
I've watched the fish run over Savage Dam since 1947 (the old original fish ladders) and
3 they have done quite well. I have never seen any part of the 26,700 anadromous fish that are supposedly killed by the dam each year. I have counted 100 fish per hour going over the ladder on the south at times.
If anyone wants to know why we have a shortfall of anadromous fish in the north west and Rogue River, you should read Oregon State U. study of 2 years ago on the subject. This study shows about 95% of the problem is out in the saltwater.

Response (William H. Brecount Letter)

1. None of the alternatives would have any effect on the GPID distribution system.

2. A dam is not part of the Preferred Alternative, water is pumped from a sump. The annual cost for pumping is estimated at $192,600.

3. The 26,700 is the estimated difference in the number of adult returning spawners with current conditions and with the Preferred Alternative. (See attachment D for the ODFW range of estimated increases for the action alternatives.)

WILLIAM H. BRECOUNT
P.O. BOX 1220
ROGUE RIVER, OR 97537

Page 3

Over fishing in the ocean (Japanese and Russian drift nets), an over population of preditors in the ocean (seals), logging and mining combined is less than 1½% of the problem. When you hear someone shouting the loudest about the dam down they are always a resident of some other state or far away city. We get kind of tired of some strangers coming here and telling us how to regulate the river, the irrigation system and our livelyhood. The people who want to destroy the dam keep refering to the studies that prove 26,700 anadromous fish are killed yearly. I haven't seen this study and I don't think they have. If any one in your organization can tell me where to find this study please advise. I would also like to see the names of the engineering firm or construction Co. who came up with the multi million dollar figure on destroy the dam and up grade the dam.

It probably isn't hard to tell that my vote, the other 8,000 G.P.I.D. customers and 99% of the local residents are in favor of keeping the dam in place.

W. H. Brecount

Response (William H. Brecount Letter)

4. See #3 above and Greenwood response #6

5. All of the cost analyses were made by the Bureau of Reclamation.

BUREAU OF RECLAMATION OFFICIAL FILE COPY
FEB 23 1995

TO	INIT	DATE
6300	RJN	23 Feb
FILE		

4214 Midway Avenue
Grants Pass, OR 97527-9542
February 21, 1995

Bureau of Reclamation
Attention: PN-6309
1150 N. Curtis Rd.
Boise, ID 83706-1234

RE: FISH PASSAGE IMPROVEMENTS: SAVAGE RAPIDS DAM

Gentlemen:

To those of us who are concerned about the environment in the Grants Pass area of Oregon it is apparent that outsiders have attempted to demand compliance with their not too well-informed opinions and verdicts upon our local resources. The outsiders include appointed members of commissions, councils, etc. with no direct responsibility or accountability to the people either of the state or of this particular area. Outsiders also include appointed officials from out of the state, as well as hosts of so-called environmentalists, both state and national. None of those above would have to live with the consequences of their ill-advised recommendations.

It was repeatedly reported that few copies of your bureau's draft environmental statement were requested by local residents, although many were
1 requested from all over the nation. When I read about availability of the report/statement about three days before the hearing, it was too late to send for a copy. The word must have gotten out to environmentalists everywhere in plenty of time! How come?

When a hearing was held in Medford last fall, the same thing happened. Environmentalists from all around, especially from Ashland, Oregon, were not only present in great numbers, but were prepared with written presentations. Since Medford is not Grants Pass, where the Savage Rapids Dam is located, our numbers were puny in comparison and we had no inkling of coming prepared with speeches. We were under the impression that the Water Resources Board was going to give a report which would be up for discussion.

Actual counts of fish, such as the December 31, 1994 count of coho salmon at the Gold Ray Dam, the highest in the history of the count, and the
2 count of fall chinook, the second highest on record, and the count of summer steelhead in the mid-range of the count on record there, do not indicate any failure on the part of the Savage Rapids Dam. The summer steelhead count could have been higher, if a completed Elk Creek Dam had been in place to supplement cold water released from Lost Creek Dam. Since Gold Ray is upstream from Savage Rapids, the fish successfully scaled ladders now in place, which, incidentally, were built according to specifications of the Oregon Fish and Wildlife.

Where is an ideal fish ladder in place? We have not been successful in getting an answer to that question. However, the alternative of leaving the
3 much-needed dam in place and making improvements is certainly the most reasonable and practical solution and one that will have the most beneficial effect on the Grants Pass environment, which includes people, livestock, attractive green surroundings and fish.

Perhaps the environmentalists can zero in on the many years of drought, the overfishing in the ocean, the overly protected sea lions at the coast, the excessive numbers of jet boats disturbing spawning grounds upstream from Gold Beach, as well as in the Grants Pass area, and help us get Elk Creek Dam completed, so more cold water will be available for release in the summer. We would appreciate that kind of help.

Sincerely,

Signe M. Carlson

Signe M. Carlson

Response (Signe M. Carlson Letter)

1. A Bureau of Reclamation News Release dated December 14 was provided to all major media in the area and included information on how to obtain a copy of the Planning Report/Draft Environmental Statement. Copies of the report were sent to all libraries in the area, media, and many individual and organizations (see "Distribution List" in chapter VII) and copies for distribution were available from the GPID throughout the review period.

2. See response to Don Greenwood letter. The high counts of salmon are probably due to curtailment of salmon fishing in 1994.

3. The design of fish passage facilities is continuing to advance. The reader may wish to contact NMFS for examples of state-of-the-art fish passage facilities (see NMFS letter for address).

Regional Director, Bureau of Reclamation
Attention: PN-6309
1150 North Curtis Road
Boise ID 83706-1234

Gentlemen:

I have reviewed your "Planning Report and Draft Environmental Statement' for removal/modification of the Savage Rapids Dam in Josephine County, Oregon distributed on December 13, 1994 and have the following comments based on attending a public meeting in Grants Pass, Oregon on February 16, 1995 and reading of your document and various references:

1 1) Your report is materially wrong in that it relies on information which is old and likely to have changed. I do not have problems with referencing older geologic studies, when none newer exist, but the fisheries impact data is very old and likely to have changed and the information on operation of the GPID is dated and likely to have changed. I understand that there is a rule/guide for reports of this sort which requires that data be at least current within five years. This is not the case here. Additional data collection should take place to present a reasonably accurate statement of the problem(s) and thus to disclose the environmental impact of alternative federal action.

2 2) Your report together with its references do not evaluate the ability of the GPID to repay any federal investment at Savage Rapids Dam. The GPID has lost assessed acreage over the past years and may lose more with rate hikes associated with local share costs of continued operation of the system under several of your studied alternatives. If the loss of customer revenue requires further rate hikes to meet fixed or operating costs, the GPID may shrink further in a death spiral. The environmental study should assess the ability of the GPID to pay local share capital and operating costs; otherwise, we may see the expenditure of federal monies without the calculated environmental benefits.

3 3) Your report does not recognize that a direct reading of the applicable law indicates that the GPID cannot receive water from the Rogue in excess of its calculated duty in its old permit. This is so because the recent Diack Law in Oregon prohibits any further appropriation of surface water above state Scenic Waterways when the minimum flow defined for the Scenic Waterway is not met. The minimum flow for the Rogue is not met over much of the irrigation season. The implication of this is that the GPID must increase its conveyance efficiency in order to irrigate its assessed customers and stay within its calculated duty. This additional cost must contribute to the death spiral mentioned in comment 2) above. Failure to recognize existing laws which protect the environment is a deficiency in the report. I have not completed an analysis of the federal Wild and Scenic Rivers

Response (John Frewing Letter)

1. The data used in fish passage and benefits analysis are considered adequate by the involved fisheries agencies (see comments by, NMFS, ODFW and the USFWS). ODFW has provided new estimates on fishery benefits (see attachment D)

2. These concerns were identified during plan formulation and are discussed in chapter VIII under "Formulation Concerns."

3. The Oregon Water Resources Commission approved the GPID's temporary permit and process for renewal or change in the permit (see Attachment B). Newton provides a discussion of water rights and the availability of water for diversion at Savage Rapids Dam with respect to Diack (DNA 1994). Reclamation's assessment with respect to Wild and Scenic Rivers is discussed in chapter VI.

law and regulations; the report should explicitly state how the proposed project meets its requirements.

4) The report fails to assess the extent to which current operations of the GPID contribute to ground water in the Rogue Valley (see writeup on page VI-12). With the forces described
4 above creating a death spiral for GPID, loss of the conveyance leakage could create a hardship or economic cost to many well users in the area. The report should describe the environmental effect of `no action' in this regard.

5) The economics of irrigated agriculture in this part of the Rogue Valley should be documented. If done, it will show that
5 there are very few commercially viable farms. It is my opinion that the federal expense of the proposed action cannot be justified based on commercial returns of these farms. The authority of the Bureau to provide irrigation water to the remaining urban areas should be stated.

The result of the above deficiencies is twofold:

> You have reached the wrong draft conclusion regarding the cost/benefit evaluation of federal investment at the Savage Rapids Dam.
>
> The draft decision favoring federal funding is left subject to a variety of legitimate challenges.

I hope you can more accurately evaluate the subject project in your final analysis.

Sincerely,

3/8/95

John Frewing
7932 SE Reed College Place
Portland, OR 97202

4. The distribution system of the GPID and potential changes in that system are not subjects of this report as the system would remain the same for all alternatives; i.e., none of the alternatives would have a significantly effect on ground-water. However, even if there were effects, the State has determined that bolstering ground-water levels is not a beneficial use of the GPID water right and therefore cannot be a consideration.

5. The alternatives described in this report are related to fish passage not irrigation. The State, not the Federal Government, determines water rights. Authority to implement either of the action alternatives rests with the Congress which may or may not authorize construction and provide funding.

Response (Donald R. Greenwood Letter)

FEB 3 3 1995

COMMENTS ON PLANNING REPORT/DRAFT ENVIRONMENTAL STATEMENT

FISH PASSAGE IMPROVEMENT SAVAGE RAPIDS DAM

16 FEBRUARY 1995

No definitive study, scientific or otherwise, has ever been conducted to evaluate the effects of fish passage facilities on migratory fish at Savage Rapids Dam. All of the figures quoted are either estimates or extrapolations of fish passage facilities and mortalities in other river basins and have no relevance to the fish passage conditions at Savage Rapids Dam.

Not only is the referent document loaded with information that is not germane to environmental considerations, it is replete with data that cannot be supported. It is, by and large, a rehash of information contained in earlier reports, and is less than accurate in many of its claims and contentions.

1 **On page summary 1, the statement that detailed fish studies were completed in the 1970's is in error. No such studies were ever conducted.**

2 **On page summary 2, paragraph 4 cannot be supported by any available data.**

3 **On page summary-8 paragraph seven, Fish: earlier reports quoted the difference in fish mortality--again an estimate--with or without the dam of between one and two percent rather than the five percent now being quoted.**

1. An evaluation of fish passage problems at Savage Rapids Dam was done in the early 1970's by the Bureau of Reclamation, the Bureau of Sport Fisheries and Wildlife (now the USFWS), Oregon State Game Commission, Fish Commission of Oregon, Oregon State Water Resources Board, GPID, and the National Marine Fisheries Service.

2. The statement on the capability and lifespan of the existing diversion facilities is based on evaluation by Reclamation Engineers.

3. ODFW has recently provided an analysis of a range of fishery benefits for the two action alternatives. This analysis is included in attachment D and referred to or summarized in appropriate sections of the report.

On page summary 9, first paragraph: Another statement that cannot be supported. Recent surveys of usage at the three parks along the SRD impoundment clearly show that between 150 and 200 thousand residents use the flat water recreation area during the irrigation season. No such usage will occur if the dam is removed.

4. Reclamation is unaware of any data that indicates such intense use of the pool behind Savage Rapids Dam.

On page summary 9, paragraph five: With recent and anticipated costs for electricity, annual pumping costs will exceed $250 thousand and inevitably rise to higher annual levels during the projected life of the GPID. Power company sources advise a budget increase of three percent annually. This energy use represents that of 380 households but, according the report, is not considered significant! This energy can only come from fossil fuels which means that the energy consumption byproducts of that many residences are introduced into the air we all breathe.

If all such irrigation diversion dams on rivers that enjoy migratory fish runs in the Pacific northwest were to be removed and replaced by pumping systems, the energy demands would be enormous. No fossil derived or other electrical energy is required to operate the water driven system at SRD.

On page III-1, under accomplishments: Instead of "minor" changes, removal of the dam would result in "major" changes in wildlife habitat, vegetation, especially recreation, and social and economic considerations.

According to the Oregon Department of Fish and Wildlife figures for Coho salmon, more of this species were counted at Gold Ray Dam in 1994 than for any year of record. It should be noted that a majority of Coho salmon spawn in tributaries and the Rogue river below Gold Rey Dam. (Trout Unlimited, page seven, as of 12-31-94, 10,685 Coho salmon and 11,530 fall Chinook salmon—fourth highest count since 1942—were recorded at the Gold Rey Dam counting station) Press and other reports also highlight the fact that the fall Chinook run was one of the highest, in terms of fish count, in recent memory.

5. Fish counts at Gold Ray Dam are included in the USFWS Coordination Act Report in Attachment C. The count of coho salmon was the highest on record, and the count for fall chinook was the highest since 1966. These high counts are not surprising as all salmon fishing off the coasts of Washington and Northern Oregon and all fishing for coho were banned in 1994

Referring to chapter IX, Bibliography, there is not a single document listed that deals with any study of fish passage problems and fish mortality at Savage Rapids Dam.

6. The 1981, 1990, 1994, and 1995 USFWS references as well as most of the ODFW references either include data or references to fish passage problems. The 1974, 1976 and 1979 Bureau of Reclamation references summarize some of the passage problems.

Page VIII-5, Dam Retention: This paragraph is absolutely inaccurate.
7 **Very few patrons cannot receive irrigation water from GPID. There is a waiting list at present for those who live along the distribution system and who desire water.**

Page VIII-4, Paragraph 4: There are many documents of record which clearly state that if the fish passage facilities at Savage Rapids Dam were
8 **improved to current state-of-the-art specifications, they would be acceptable to ODFW, NMFS, and USF&W.**

It is abundantly clear than elimination of the north fish ladder, the juvenile fish trap facility, repair as opposed to replacement of the radial gates, modification and enlargement of the south fish ladder, reduction in the number of gravity canal fish screens from five to two, and a realistic allowance for contingencies from some 67 percent to an industry average of some 20 to 30 percent would enable the improvement in fish passage facilities at far less cost than the current estimate derived by the Bureau of Reclamation.

Donald R. Greenwood

Donald R. Greenwood, Chairman
Three Rivers Watershed Council
Member, Permit 50957 Oversight Committee
Patron, GPID

Response (Donald R. Greenwood Letter)

7. GPID records show that in 1993, 130 accounts that received water bought out and 138 accounts that had no water right or access to water bought out of the district. In 1994, 21 accounts that received water bought out and 40 accounts with no water right or access to water bought out of the irrigation district. Currently, there is a list of 36 people being assessed but with no water right who are waiting to get a water right.

8. The fishery agencies have indicated that state of the art fish passage facilities would be acceptable but that modification of the existing facilities would not be acceptable (see ODFW Recommendations in attachment D). That means that the current facilities would have to be replaced.

BUREAU OF RECLAMATION
OFFICIAL FILE COPY
DEC 27 1994
6309

Grants Pass, OR 97526
December 23, 1944 1994?

Regional Director
Bureau of Reclamation
1150 North Curtis Road
Boise, ID 83706-1234

Attention: PN-6309

Gentlemen:

When the first report of the proposed removal of the Savage Rapids Dam opened, I wrote a letter to the Editor to protest this stupidity. My feeling is the same -- the airheads who propose to replace the dam with pumps need only to contact Glenn County in California to gain knowledge that the pumps don't perform. The fish end up in the canals and serve no purpose, and the cost for the electrical power to run the pumps is totally ridiculous. The turbines we now have to pump water cost nothing but minor maintenance.

The 3.5 mile lake is an asset that is of inestimable value, and it certainly contributes to the area attraction. It makes "10 Country" a great place to live!

I am not an engineer but it is easy to see that repairing the fish ladders would solve the migration problem at a reasonable cost. The fact that the dam has been in place for 70-plus years, and until recently we had plenty of fish should tell you something.

We sent Wes Cooley to Congress, and he has his head on right! He said the big reason for fewer fish is the foreign fishing close to our shores with their seven mile nets. SOMEONE WITH SMARTS SHOULD LISTEN TO HIM.

Sincerely,

David M. Handley

David M. Handley
462 Red Mountain Drive
Grants Pass, OR 97526

(503) 474-3867

1. Fish screens designed to NMFS standards would be provided at the diversion pumps.

SENT BY: 3-20-95 ; 14:47 ;KINKO'S 221 SW ALDER→ 2083785066;# 2/ 3

Response (Eric W. Hartmann Letter)

Eric W. Hartmann
13015 SW 61st Ave.
Portland, OR 97219

March 20, 1994

Robert J. Hamilton
Bureau of Reclamation
1150 North Curtis Road
Boise, ID 83706-1234

Re: Savage Rapids Dam Planning Report/Draft Environmental Statement

Dear Mr. Hamilton,

I am a concerned citizen who has enjoyed wild rivers and wild fish for many years. Therefore, it was heartening to learn that all federal and state agencies, and even the Grants Pass Irrigation District (GPID) all agree that dam removal is the preferred alternative for the Savage Rapids Dam. I concur in this conclusion. As commendable as this conclusion is, however, the reasoning for justifying this preferred alternative, as well as the details for undertaking this alternative, leaves something to be desired. Recognizing that perfection is always striven for, but rarely attained, please accept the following comments on the Savage Rapids Dam Planning Report/Draft Environmental Statement (Draft) in the spirit of constructive criticism with which they are offered.

First and foremost, retiring the debt owed by the Grants Pass Irrigation District to the federal government on the current dam is absurd. This dam has impeded fish passage on the Rogue River ever since it was completed in 1921. Despite several lame attempts to add fish passage, Savage Rapids Dam continues to exact a terrible toll on fish. Thus, the GPID has reaped benefits from the dam but has never adequately mitigated the harms to the fisheries. Money *cannot* make up for the loss of fish runs, but it *stands* to reason that an entity which has prospered at the expense of these fish runs should at the very least pay its own way. To do *otherwise* is tantamount to condoning the damage already done. Retiring the debt is also fiscally unreasonable. As a taxpayer, I resent the astronomical debt the federal government has incurred, and exacerbating this debt by retiring debts owed to the government willy-nilly is even more galling. Subsidizing the ruin of fisheries does not make any sense. In short, retiring the debt owed sets a poor precedent.

Second, the cost-benefit analysis underestimates the value of an enhanced fishery. The values attached to fisheries were outdated and do not properly reflect the high value in purely monetary terms of a more prolific fishery. Indeed, the latest values for sports
1 fishing are from 1978 and for commercial fishing are 1982. Draft at p. III-2. In addition, when weighing the alternatives, the value of not having a prolific fishery should be incorporated as a cost because it is a benefit foregone. Thus, the cost-benefit analysis is weaker than it ought to be in proving that the removal of Savage Rapids Dam is the most expedient course of action.

Third, the Draft implies that property owners along the erstwhile impounded lake would be most adamantly opposed to the preferred alternative. If this is so, that would be sad, if not disingenuous, because these property owners are likely to enjoy a water body which will likely experience fewer fluctuations in bank location in its free-flowing state than in its former state as a seasonal irrigation reservoir. Moreover, as the Draft states, property values will not be adversely affected.

1. The monetary values used in the analysis were the latest available and are considered adequate for this evaluation and to propose Federal action.

Last, the draft is a bit weak when it comes to detailing how Savage Rapids Dam will be removed. For example, where will the bulk of the present dam be disposed of. As a suggestion, the possibility of leaving some of the big blocks of concrete in the river may want to be considered. While perhaps not aesthetically appealing, such blocks could
2 provide valuable fish habitat and avoid the necessity of transporting a significant part of the dam, thereby reducing the overall cost.

I appreciate the opportunity to comment on the Savage Rapids Dam Planning Report/Draft Environmental Statement and look forward to receiving an even better final decision.

Very truly yours,

Eric W. Hartmann

Eric W. Hartmann

Response (Eric W. Hartman Letter)

2. Specific sites for disposal of concrete would be developed during preconstruction activities. For this analysis, it is adequate to note that there are available sites within a reasonable distance of the dam.

12-20-94

Att. PN 6309
Comment
Savage Rapids Dam.

BUREAU OF RECLAMATION
OFFICIAL FILE
DEC 2
ISI
6309 PN 28 Dec
FILE

Fact #1 The Russians still have nucs. pointed at us.
Fact #2. 40 miles N.E. of Moscow 2 I.C.B.Ms with M.I.R.V.s warheads are pointed at the Heart of Portland
Fact 3 one SS19 I.C.B.M. has 4-20 megaton Bombs and the other SS21 has 8-20 megaton Bombs.
Fact 4 Savage Rapids Dam has a turbine
1 That pumps water and could be adapted to generate electricity.
Fact 5. 240,000 survivors and casualties are stated for evacuation to S.W. Oregon
Fact 6 The power grid will be distroyed
Question How will we power our Medical services with out a generating source for electrical power if we are ever hit by these bombs?
please reply

Randy Hinke
304 Woodlake Dr
Grants Pass OR 97527

Response (Randy Hinke 12/20 Letter)

1. Using the existing turbines to generate electricity would require expensive and extensive modification to the existing structure, would require a change in State law, and would preclude using the turbines to pump irrigation water.

   Based on 800 cfs falling through a 40 foot head with the facilities on line 95 percent of the year, about 22,000 MWh would be produced annually.

2-12-95

Proposal

I propose that the B.g Rec. Table any and all activities concerning Savage Rapids dam until ~~such~~ such time that the threat from the Russians and there nuc. ~~weapons~~ weapons have been elementated

Randy Hinke

Subject National + internal security threat from the removal of Savage Rapids Dam and pumping or generating system, using the unstability of the Russian Gov. as a basis.

Randy Hinke
304 Woodlake Dr
Grants Pass OR 97527

2-12-95

Recomendation for fish passage improvement

Use native ~~bol~~ boulders to build a set of jump ponds that come up low to the base of the stop logs.

start approx 100 feet down stream. creat a natural water fall, while keeping the tail race open and at its present grade.

1 I give this same comment every time the issue of fish passage comes up.

Randy Hinke

304 Woodlake Dr

Grants Pass OR. 97527

Response (Randy Hinke 2/12/95 Letter)

1. The fish ladder design used in the cost estimate includes 28 pools or cells. It can be assumed that about the same number of jump ponds constructed of boulders would be needed. The amount of material needed would be very large and would extend far downstream.

mmei

2-12-95

Chapter 1

Page 1-1 authority PL 92-199, 85 Statute 664 enacted December 15, 1971

1 This requires a economic impact statement.

2 Stream continuum in context of Riparian Vegetation and how ~~out~~ this will effect Stream chemistry

3 Riparian Microclimates and the effect

4. What are the Factors affecting type and extent of Riparian Vegetation present now around the lake, and how will the evolution from a lake side Riparian Microclimate to a river canyon Riparian microclimate effect the current residing Mycorrhizal relationships and their hosts

2

Response (Randy Hinke 2/12/95 Letter)

2. If the streambanks in the lake area were to remain undisturbed, the area could be expected to revert over time to a riverine environment similar to that upstream and downstream from Savage Rapids Dam. However, the land around the lake is essentially all privately owned and the vegetational responses to removal of the dam would vary with the actions of individual land owners.

Response (Randy Hinke 2/12/95 Letter)

Bug Rec. 2-12-95

Projections for The recovery ~~of~~ ~~to~~ From a Nuclear attack with a low Direct effects Risk Factor (Ref FEMA 1990) for The United States.

Full capacity as we know it now 5 years

Minimum Services Power Metropolitan 21 week

Urban 36 weeks 9 mo.

Rural 3 years

Transportation Truck 1 year

rail minimum 1 year

Randy Hinke
304 Woodlake Dr
Grants Pass OR 97527

2-12-95

Refer to Or Division of St Lands
and Oregon Water Resources Institute

Subject Salmon Habitat study Gravel Removal

Date Oct 1994

Section 3 Page 46 Thru 76

Subject Stream processes - Hydrology and
~~Hydrolic~~ Hydraulic

3 Removal of the dam will increase the grade of the river above the lake by approx. 10 feet per mile over the distance from the dam to Gold Hill. This will cause the river above the dam to produce chronic sediment and gravel ~~protection~~ transit. causing deposement of ~~Depositing~~ approx ½ million cubic yards of material to move down river between the dam and Gold hill. ~~Corps of Engineers study on Grand Coulee dam 1936 (approx date) for approx yardage displaced~~

Justify this action and its harm to in River life forms

Randy Hinke
304 Wood Lake Dr
Grants Pass OR. 97527

3. See response to American Fisheries Society letter.

Bureau of Reclamation
Attention PN-6309
1150 N. Curtis Rd.
Boise, ID 83706-1234

MAR 13 1995

6309 PN

Dear Bureau of Reclamation,

Please allow me to voice my concerns about the removal of the Savage Rapids Dam.

In the 50's the city of Rogue River had two saw mills in operation, now we only have one. We are attempting to make up for the loss of timber related jobs by encouraging tourists to visit the local area.

Without the lake, behind the dam we would lose this great resource. The tourists that come yearly to enjoy the Lake for water skiing, jet skiing, boating, etc. would have no reason to vacation in our area. The park at Savage Creek is filled with families enjoying the lake all summer. Also important, it takes all the summer recreation away from our local residents.

The impoundment area proved to be an invaluable asset, during the Evans Creek and Hull Mountain fires, by retaining sufficient water for the Helicopters. Thus allowing for quicker turn around time and lessening greater fire loss.

The homes along the lake portion will no longer have nice river frontage, during the summer. When it was made known about the dam, property values dropped 50% The main concerns of buyers is the retention of the dam. Without a guarantee that it will stay they don't want it. Granted it will still be river front property, but during the summer the river will look more like a dry gulch.

As for the amount of fish it is supposed to be killing., I have been to several meetings and read all I can find about it. The only thing I know is that:

1. Millions of gallons of raw sewage that is accidentally dumped in the river annually.
2. The extreme droughts we have been experiencing, causing the fish to fall victim to diseases resulting from warmer water.
3. The ever increasing armada of sea lions and seals at the mouth of the river. Consuming many tons of roe ladened salmon annually. They are now following the migrating fish up the river several miles.
4. The continual increase of anglers.
5. The massive increase of the Squaw fish population. One adult is known to consume up to 30 young salmon a day.

The spring Chinook run in 1993 was the highest since 1989, a record run. The annual run of Coho Salmon that ended Jan. 30, 1995 is the largest number ever recorded crossing Gold Ray Dam. . It seems that if the dam was killing as many fish, as the environmentalist predict, it would have effected the Chinook and Coho salmon.

The removal of the Dam has nothing to do with the killing fish. It is outsiders trying to tell us what to do. It is a frivolous waste of tax money that could be well spent in helping the economy in the Rogue Valley not hampering it. Please do not allow the dam to be removed.

Respectfully,

Jerry K[illegible]

Response (Jerry Kl---- Letter)

See response to Charles Weaver Letter.

Bureau of Reclamation
Attention PN-6309
1150 N. Curtis Rd.
Boise, ID 83706-1234

6309 RH 14 Mar

Dear Bureau of Reclamation,

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Respectfully, Elaine Lake
6592 Rogue River Hwy
Grants Pass, Or 97527

Response (Elaine Lake Letter)

See Response to Charles Weaver Letter.

Bureau of Reclam.
1150 N. Curtis Rd.
Boise, Idaho 83706-

2-27-95

6307 PN

Re: PN-6309
Savage Rapids Dam

Dear Sir & Sirettes:

1 Why are you people involved in our Dam?
Why is government involved, all Bureaus, Depts, etc etc?

2 Do you people have any idea what the impact will be if the dam is removed? Have you done an impact study? Economy study?
The people are the endangered species here, not the fish. People come all over to use the lake behind the dam. What do we do if the lake goes? I for one, use it to water ski.

Repair the dam

Thank you
James Lamp Jr.
P.O. Box 3448
Central Point, Ore. 97502

Response (James Lamp Jr. Letter)

1. The Josephine County Water Management Improvement Study was initiated by Bureau of Reclamation at the request of Josephine County and the GPID, which owns the Savage Rapids Dam (see chapter I for an overview and authority for the study).

2. The Planning Report/Draft Environmental Statement was released to the public in December 1994.

BUREAU OF RECLAMATION OFFICIAL FILE COPY
JAN 30 1995
TO | INIT | DATE
6309 | GN | 24 Jan
FILE

January 18, 1995

Regional Director
Bureau of Reclamation
Attn: PM -6309
1150 North Curtis Rd.
Boise, Idaho 83706-1234

Gentlemen:

I am writing regarding Savage Rapids Dam and what I believe about the figures that it would take to renovate it.

I live on the Lake portion above the Dam. We built our home there because of the recreation in the Summer. We are definately interested in renovating the fish ladders and keeping the Dam. The value of our property and home depends on keeping the Dam.

At one of the GPID meetings I attended the figures were reported for fixing the Dam at 17 Million Dollars. Now, no one has reported what this 17 Million Dollars is for.

Please read the report in detail. I don't believe we need
1 paved parking, bathrooms, and observation decks to watch the Salmon. This report was padded with more than just fixing the fish ladders.

This Dam offers so much for the residents of Josephine & Jackson Counties. Water skiing, boating, fishing, swiming, water storage for firefighting, water fowl galore.

I believe taking out the Dam would be the wrong thing to do. The ladders can be repaired and I believe we need to get bids from the right parties and stop giving the 17 Million Dollar figure.

We cannot get back what we destroy, but we can repair this structure and enjoy the fish also.

I am very glad to hear the future meetings will be in Grants Pass. The average citizen works in the daytime and needs to be heard in the evening hours at a local location.

Thank you for hearing my opinion.

Geneva Oran

Geneva Oran
6606 Rogue River Hwy.
Grants Pass, Ore. 97527

503-582-2695

1. See chapter IV for details of the Dam Retention Alternative. See chapter VIII for general planning criteria. An alternative that partially addresses the problems would not be viable.

Response (Juanita Pickett Letter)

March 13, 1995

To the Bureau of Reclamation,

These are my fact sheets. I have prepared this selection of pictures along with my comments, to instill and magnify how desperately important it is to keep the Savage Rapids Dam.

There has been a death penalty put upon it, but it's only "crime' consists of killing fish. Is it not innocent until proven guilty? Is it not the responsibility of the accusers to prove beyond the shadow of a doubt, the accusations ? Where is the absolute proof , and the piles of fish ,lying at the foot of the dam? Is it not unfair to blame so strongly, the dam for killing fish when overfishing ,sea lions, and other factors have taken their toll,before reaching the dam?

It was requested that comments be factual and I pray that my presentation will help to show the possitive side of keeping the dam in place.

The BIGGEST FACT ,is,that those of us living in this area,are being invaded by powerful forces, who don't live or work here. They care not what we think or feel,just so long as they get their way and can push through their agenda.This is none of their business.

It's hard not to get emotional about this. This is plumb scarey for us when these groups are being allowed to dictate and overrule our opinions,of the valuable asset ,the dam is to our community and the land.

(2)

A dam that has withstood 74 years of high water and flood times, is ONE STOUT STRUCTURE. (Made things to last, in the good old days.)

1 Priorities need to be set straight. There is much more at stake here, than the fish. It's location is the best for helicopters to put out forest fires close by. Fish in the water, have a better chance of surviving a fire, than the land animals do.

Too much emphasis is being placed on the fish, only. The wildlife that are, and would be saved, by the water from the dam, during forest fires, are being completely left out of the picture.

ARE THEY NOT JUST AS IMPORTANT ?

They would be denied a chance of survival, if the dam is torn down. Our officials need to take this aspect and realise the full impact of this, before making their decision. Also needed to take into consideration is the several years of drought conditions, and our many, manyforest fires each year, which, in my opinion, is harder on the fish, in the small streams, than the dam's existance.

For how can fish survive, anywhere, if the land is burning up ? ? ?

By being able to use the irrigation water here, we are able to keep our trees, bushes, etc., green, which, in turn, attracts the birds, such as robins, sparrows, jays, finches, hummingbirds, woodpeckers, quail, and other wildlife. It would be a great injustice to withdraw this water from them.

Response (Juanita Pickett Letter)

1. The Preferred Alternative would eliminate the large pool convenient for filling buckets used by helicopters to fight fires; however, natural pools would remain that could be used in the same manner.

(3)

3/11/95 Grants Pass Courier states, Fishermen getting 12 million in economic assistance, because of salmon decline.

This tells me that huge amounts of fish are being taken from the ocean, therefore, less are able to come up river to spawn.

The dam should be acquitted from it's "crime" on this count alone.

According to the T V news recently, it was stated that computers have been used to estimate how many more fish would be saved, if the dam were torn down. Maybe more fish would be saved, but that's only an "if". for there are other elements that could prove those numbers wrong. Estimates are not proof.

I believe it's wrong and decietful to the public to use computers this way.

Thank you.

Sincerely,
Mrs. Juanita Pickett

BUREAU OF RECLAMATION
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FEB 27 1995
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6309 | PH | 1Mar

Mr. John W. Keys III
Regional Director
Bureau of Reclamation
Attention: PN-6309
1150 North Curtis Road
Boise, Idaho 83706-1234

February 22, 1995

Dear Mr. Keys:

I would like to comment on the "Need for Action" at Savage Rapids Dam on the Rogue River, near Grants Pass, Oregon. My name is Mark Smith. I'm currently living in Tigard, Oregon, but was born and raised in Grants Pass. I support the "Preferred Alternative" and complete removal of the dam.

The first 23 years of my life in Grants Pass gave me the privilege of experiencing a quality of life that most people in our country will only dream about, or maybe get a brief glimpse of in passing while on a vacation. Most of the best memories of my childhood and growing up, are from time spent on the Rogue River. I've spent thousands of hours on the river, and caught hundreds of Salmon and Steelhead. One of my most vivid memories of Savage Rapids Dam, is from a visit my dad and I made to the dam when I was 11 or 12 years old (about 1970). It was during the month of May and the Spring Chinook were passing through the "fish ladders". The only problem was that about every fourth or fifth salmon attempting to jump the ladders would end up out of the ladder, on the rocks. Several were severely injured, or died as a result of inadequate passage facilities. This seemed un-acceptable to me at the time, so I wrote a letter to the Oregon Department of Fish and Wildlife, with no response. Now, about 25 years later, I'm writing again. Although this time, after reading your draft report on the Savage Rapids Dam "problem", there is at last some positive news for the Rogue River fishery.

This appears to be a very simple problem to solve, and I think your report does a great job of exposing the issues. The "need for action" as stated in the report states that the Rogue River salmon and steelhead fisheries are nationally renown for diversity and productivity, and that the Rogue River supports the largest wild population of the anadromous salmonids in Oregon. We are all aware of the crisis that is facing the salmon and steelhead populations throughout the west coast of North America. We cannot allow this to *knowingly* continue on one the most productive streams on the west coast. Considering the hundreds of millions of dollars the Bonneville Power Administration will be spending *per year*, to finance fish recovery programs in the Columbia Basin, the expenses associated with the preferred alternative at Savage Rapids dam are relatively insignificant, but will provide a solid investment in the future of the Rogue River fishery. The fishery on the

Rogue, and the quality of habitat the river provides, is a critical element of Southern Oregon's desirability and economic foundation. With all of the devastation of Salmon and Steelhead populations going on today, we should make every possible effort to preserve and enhance the remaining viable fisheries wherever practical.

The pond above Savage Rapids dam will be lost with the Preferred Alternative. However, if the riverbanks are properly restored, those businesses will continue and property values will be maintained or possibly improved. Recreational opportunities will be available all year, especially if the river is accessible.

Water diverted at the dam will continue to be provided to the customers of GPID under the "Preferred Alternative". However, I strongly disagree with the Bureau's proposal of
1 delivering 150 CFS. The GPID has water rights for 90 CFS. GPID has few, if any customers whose livelihood depends on irrigation water from the GPID system. 90 CFS should be reduced to the demand sufficient to satisfy only the most legitimate users. Do NOT increase the withdrawal to 150 CFS. Most of the water will continue to be wasted, put onto a pasture, onto a household yard or garden, and/or subsequently return to the river, warm, polluted and un-fit.

The out-dated concept of water rights does not apply to the majority of GPID water users. The water is more valuable to society IN THE RIVER, not in a pasture or garden. Pumping 150 CFS is wasteful and not in the best interest or consistent with multiple use objectives.

Pressures on the fish populations in the Rogue include logging, mining, illegal irrigation diversions/withdrawals, over-allocation of water rights, pollution, off-shore fishing, and drought. The Rogue has withstood considerable odds up to this point, but is clearly suffering. As responsible stewards of the environment we live in and love to enjoy, we owe to the river the right decision and immediate action.

The Preferred Alternative is a very "practical" option for protecting the fishery, and for preserving the quality of the Rogue River. Savage Rapids dam is a KNOWN hazard to fish, and must be removed. In simple terms, it's a wasteful menace to the river.

Sincerely,

Mark H. Smith
13668 SW Michelle Ct.
Tigard, OR 97223

Response (Mark H. Smith Letter)

1. Water rights and the amount of water diverted by GPID are a State function and are only peripherally a subject of the JCWMIS study on fish passage improvements. David J. Newton Associates, Inc., which prepared plans for improving the GPID delivery system estimates that 150 cfs is necessary. Reclamation used that estimate for sizing facilities.

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FEB 10 1995
TO | INIT | DATE
FILE

Mr. Robert J. Hamilton
Bureau of Reclamation,
1150 North Curtis Road,
Boise, ID 83706-1234

Dear Bob,

Allow me to introduce myself. My name is Hank Vann. My family and I are a six year residents of Rogue River, Oregon. My wife Dixie and I purchased our business, Circle W RV Park, in 1989. The park is located on the "Lake" portion of the Rogue River, two and a half miles upstream of Savage Rapids Dam. We have made many improvements to the property. In 1989 we invested $46,000 for a second dock. While it cost less than some of our neighbors docks, it represents a significant investment to us.

Circle W was originally established in 1968. Our customer/guest base comes from all around the United States, Canada, and Mexico. They come for very basic reasons, the beauty of the lakefront in the spring, summer, and early fall, the recreational boating facilities, the fishing and swimming when the dam is up and the current slow.

Property taxes reflect the value of "lakefront land that we own. The same three acre property "off water" would have cost less than a third of what it was purchased for. Property tax would be a third of the current assessment. When our taxes were doubled three years ago we were told it was because we live on the lake.

For the Bureau of Reclamation, Bob Hunter of Water Watch, or Dan Ross the Jackson County Tax Assessor, to suggest loss of the "lake" wouldn't have a dramatic impact on property or business values is a lie to achieve their ends or the assessments are false. Either way it's insulting our intelligence. The Preferred Alternative should include compensation to the property owners on the "Lake". Real estate brokers in the area have suggested that values could drop as much as fifty percent.

As past president and current secretary of the Rogue River Chamber of Commerce, I can tell you that the local population is appalled at the stance of the "Bureau". To suggest that public opinion was solicited and considered is a falsehood.

Your report fails to address some very important issues particularly above the dam, wetlands, riperian vegetation, ground water recharge, etc.

I have taken the liberty of writing my version of the summary to your "Planning Report and Draft Environmental Statement", and hope you will give some consideration to my viewpoint. I haven't included the
1 attachments with this copy but they will be available at the February 16th meeting at the Grants Pass Fairgrounds. You are probably familiar with most of them anyway.

Before moving to Oregon from Southern California, I spent thirty years in industry, building things. I started as a engineering planner, became a cost analyst, later an operations manager, project engineer, and program manager. My largest project was a five year program budgeted at one hundred and fifty million dollars.

Our neighbors on the "Lake" include the Brotherton's of Brotherton Pipeline Construction, the Artoff's of Artoff Heavy Construction, "Robco" which does work for GPID, and several retired civil engineers.

My neighbors and I know what it costs to move dirt and rock, fab steel, pour concrete, do pumps and pipe. The estimates provided by the "Bureau", whether it was your work or not, are atrocious. I would have been 'fired' at any point of my career for such a submission.

More importantly, we live on the "Lake" year around. My children learned to fish, swim, ski, and canoe on the lake. If the dam were to go all that would remain is canoeing and there are many better areas of the Rogue for canoeing or kayaking on.

We see the salmon run. When the smolt run, we know because of the reaction of the wildlife. We see the river as a trickle, we "button up" for the floods. No biologist, ecthiologist, politician, or bureaucrat can begin to understand the area unless they live here. I invite you to spend a few days with us this summer and winter to get a real 'feel' for the environment. Perhaps then you will begin to understand our resistance to the destruction of our livelihood and lifestyle.

Sincerely Yours,

Hank Vann

Hank Vann
8110 Rogue River Hwy.
Grants Pass, OR 97527

Response (Hank Vann Letter)

1. Thank you for providing your view. However, much of the information provided is contrary to the technical data Reclamation received during the course of the study. In addition, we have not received the referenced attachments and are unable to respond to those concerns.

Bureau of Reclamation
Attention PN-6309
1150 N. Curtis Rd.
Boise, ID 83706-1234

Dear Bureau of Reclamation,

Please allow me to voice my concerns about the removal of the Savage Rapids Dam.

In the 50's the city of Rogue River had two saw mills in operation, now we only have one. We are attempting to make up for the loss of timber related jobs by encouraging tourists to visit the local area.

Without the lake, behind the dam we would lose this great resource. The tourists that come yearly to enjoy the Lake for water skiing, jet skiing, boating, etc. would have no reason to vacation in our area. The park at Savage Creek is filled with families enjoying the lake all summer. Also important, it takes all the summer recreation away from our local residents.

The impoundment area proved to be an invaluable asset, during the Evans Creek and Hull Mountain fires, by retaining sufficient water for the Helicopters. Thus allowing for quicker turn around time and lessening greater fire loss.

The homes along the lake portion will no longer have nice river frontage, during the summer. When it was made known about the dam, property values dropped 50% The main concerns of buyers is the retention of the dam. Without a guarantee that it will stay they don't want it. Granted it will still be river front property, but during the summer the river will look more like a dry gulch.

As for the amount of fish it is supposed to be killing., I have been to several meetings and read all I can find about it. The only thing I know is that:

1. Millions of gallons of raw sewage that is accidentally dumped in the river annually.
2. The extreme droughts we have been experiencing, causing the fish to fall victim to diseases resulting from warmer water.
3. The ever increasing armada of sea lions and seals at the mouth of the river. Consuming many tons of roe ladened salmon annually. They are now following the migrating fish up the river several miles.
4. The continual increase of anglers.
5. The massive increase of the Squaw fish population. One adult is known to consume up to 30 young salmon a day.

The spring Chinook run in 1993 was the highest since 1989, a record run. The annual run of Coho Salmon
1 that ended Jan. 30, 1995 is the largest number ever recorded crossing Gold Ray Dam. . It seems that if the dam was killing as many fish, as the environmentalist predict, it would have effected the Chinook and Coho salmon.

The removal of the Dam has nothing to do with the killing fish. It is outsiders trying to tell us what to do. It is a frivolous waste of tax money that could be well spent in helping the economy in the Rogue Valley not hampering it. Please do not allow the dam to be removed.

Respectfully,

Charles Weaver

Charles Weaver
7365 Rogue River Hwy
Grants Pass, OR 97527

Response (Charles Weaver Letter)

1. See attachment C--Coordination Act Report for fish counts at Gold Ray Dam. Also, see response to Don Greenwood letter.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

BUREAU OF RECLAMATION OFFICIAL FILE COPY
MAY 10 1995
TO
6309
6312
6519

Reply to Attn: WD-126

May 4, 1995

Robert J. Hamilton
Bureau of Reclamation
North Curtis Road
Boise, Idaho 83706-1234

Dear Mr. Hamilton:

The Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (EIS) for the **Fish Passage Improvement, Savage Rapids Dam**. Our review was conducted under the National Environmental Policy Act and Section 309 of the Clean Air Act, which directs EPA to review and comment on all federal EISs.

Following our review, EPA has found no significant statutory or jurisdictional issues from its perspective. We are rating this draft EIS LO (Lack of Objections). An explanation of the EPA rating system is enclosed for your reference. This rating will be published in the Federal Register.

EPA supports the preferred alternative, which is removal and demolition of the dam and construction of two electric powered pumping plants. This would increase salmon and steelhead escapement at the site by about 22 percent.

Thank you for the opportunity to review this draft EIS. We appreciate your consideration of our comments at this stage in the process. If you have any questions regarding our review, please contact John Bregar, in our Environmental Review Section at (206)553-1984.

Sincerely,

Joan Cabreza, Chief
Environmental Review Section

Enclosure: Rating System Summary

Printed on Recycled Paper

SUMMARY OF THE EPA RATING SYSTEM
FOR DRAFT ENVIRONMENTAL IMPACT STATEMENTS:
DEFINITIONS AND FOLLOW-UP ACTION *

Environmental Impact of the Action

LO--Lack of Objections

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC--Environmental Concerns

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA intends to work with the lead agency to reduce these impacts.

EO--Environmental Objections

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no-action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU--Environmentally Unsatisfactory

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

Adequacy of the Impact Statement

Category 1--Adequate

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis of data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2--Insufficient Information

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3--Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

* From EPA Manual 1640 Policy and Procedures for the Review of Federal Actions Impacting the Environment

February, 1987

BUREAU OF RECLAMATION
OFFICE OF THE SECRETARY
APR 3 - 1995
6309 RJH
ACTION MADE BY

Oregon

PARKS AND RECREATION DEPARTMENT

March 28, 1995

Robert J. Hamilton
Bureau of Reclamation
1150 North Curtis Road
Boise, Idaho 83706-1234

RE: Fish Passage Improvements Savage Rapids Dam Planning Report and Draft Environmental Statement (DES)

Dear Bob:

Thank you for soliciting our department's comments about this report. We are responding as the state agency responsible for managing and enhancing the values of the state scenic waterway program. Our department also is responsible for producing the statewide outdoor recreation plan. We have reviewed the report and DES and from an outdoor recreation and scenic waterway perspective, we can support either of the watershed improvement alternatives. We also recognize that the cost differences between the two alternatives represent a significant issue for the taxpayer that should be carefully assessed in your decision making. The preferred alternative offers the least impact on the taxpayer and the greatest chance of achieving the project objectives.

As noted on page VI-30, "the Rogue River is nationally and internationally recognized for its diverse recreation opportunities." To that end, this river bears designation as both a State Scenic Waterway and a National Wild and Scenic River downstream from this project. Fisheries and recreation are important values recognized under both state and federal designations. In general, water quality improvements resulting from dam removal in a non-designated reach will enhance fish and recreation resources in the State Scenic Waterway and federal Wild and Scenic sections of the river.

The 1994-1999 State Comprehensive Outdoor Recreation Plan (SCORP) survey shows that there is high statewide participation in non-pool swimming, boating, bank and dock fishing, tent camping and nature study. The percentage of households where no one participated but would like to revealed that the top desired activity was non-motorized boating. This was followed closely by horseback riding on trails, hiking, backpacking on trails and nature study and wildlife viewing. Except for scenic driving, the emphasis of both those activities participated in and

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Salem, OR 97310-1001
(503) 378-6305
FAX (503) 378-6447

those desired for participation, is on activities occurring in the natural environment with minimal development. We have enclosed a copy of the draft 1994-1999 SCORP for your use.

The 1993 Legislature identified the south coast basin, including the Rogue River system, as one of two high priority regions in the state needing major restorative efforts for the benefit of threatened and endangered fish runs and other species. Known as the Watershed Health Initiative, the program was allocated $10 million for the 1993-95 biennium to begin effecting improvements in watershed health. The support of federal agencies in this endeavor is greatly appreciated.

Thank you for keeping our department informed of your progress. If you have further questions about the SCORP data, please contact Kathy Straton at 503-378-6378 x235.

Sincerely,

Nan Evans

Nan Evans/Manager
Policy and Planning

Enclosure

c: Dept staff
Stephanie Burchfield/ODFW

Oregon

WATER
RESOURCES
DEPARTMENT

February 14, 1995

John W. Keys, Regional Director
Bureau of Reclamation
1150 North Curtis Road
Boise, ID 83706-1234

Attention: PN-6309

Dear Mr. Keys:

Thank you for the opportunity to review and comment on the Planning Report/Draft Environmental Statement of Fish Passage Improvement at Savage Rapids Dam.

The Water Resources Commission and Department have worked closely with the Grants Pass Irrigation District and Bureau staff during the evaluation of alternatives to resolve fish passage problems at the dam. We concur in the conclusion that the most cost effective method for resolving fish passage problems at Savage Rapids Dam is through replacement of the dam with electric pumping plants.

The Rogue River provides an anadromous fishery of national importance. During recent years, however, petitions have been filed proposing listing of the basin's coho salmon and winter steelhead as threatened or endangered species. The State of Oregon is working to resolve the problems which have caused the declines in fish populations through the investment of watershed restoration funds. Because of the condition of the fish populations which spawn upstream of Savage Rapids Dam, the proposal to replace the dam with electric pumping plants is a critical element of recovery efforts.

In October 1994, the Commission approved an extension of the water use permit held by the district. The Commission also approved the conservation and fish passage plans proposed by the district. Under the approved fish passage plan, the district would replace Savage Rapids Dam with electric pumping plans. The district's plan anticipates the completion of this project in 2001, but identifies federal assistance as critical to implementation of the project.

We believe that the proposed project is important to the protection and restoration of a national resource and we urge the Bureau of Reclamation to proceed in an expeditious manner.

Sincerely,

Martha O. Pagel
Director

Commerce Building
158 12th Street NE
Salem, OR 97310-0210
(503) 378-3739
FAX (503) 378-8130

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American Rivers

March 7, 1995

Robert J. Hamilton
Bureau of Reclamation
1150 North Curtis Road
Boise, Idaho 83706-1234

RE: Savage Rapids Dam/Rogue River, Oregon

Dear Mr. Hamilton:

I am writing in response to the Planning Report and Draft Environmental Statement prepared by the Bureau of Reclamation regarding the Savage Rapids Dam on the Rogue River in Oregon, owned by the Grants Pass Irrigation District. American Rivers strongly endorses this report's preferred alternative of dam removal and replacement with water pumps.

Removal of the Savage Rapids Dam is a win-win situation for the Rogue River, the Grants Pass Irrigation District, the salmon and steelhead, and for the people who enjoy the river. The Bureau of Reclamation correctly concludes that the dam removal/pumping alternative has two times more net benefits than the dam retention/fish ladder alternative. These benefits include the following:

* It will cost $6.4 million less to remove the dam and replace it with water pumps than to repair the dam.

* Removal of the dam is estimated to increase the run of salmon and steelhead in the Rogue by approximately 114,600 fish annually, with an estimated annual benefit of $5 million.

* State-of-the-art fish ladders and screens would provide significantly fewer benefits to the fishery than dam removal due to migration delays, injuries and increased predation. Fish ladders would also result in annual operations and maintenance costs.

* Removing the dam and installing pumps will provide a boost to the economy of Southern Oregon, not only due to increased recreation income as a result of the improved fishery, but also from funds spent during the construction phase.

Dams on rivers often meet important needs. But when those needs can be met by less environmentally damaging alternatives, we must be prepared to remove the dams to restore the natural functions of rivers. Just because a dam is in place does not mean that

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Washington, DC 20003
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a member of EarthShare

it should remain forever. The Bureau of Reclamation and the Grants Pass Irrigation District have taken an important first step in recognizing the need to remove the Savage Rapids Dam.

American Rivers is a national conservation organization with over 15,000 members and a mission of preserving and restoring America's river systems, and fostering a river stewardship ethic.

Sincerely yours,

Margaret B. Bowman
Director of Hydropower Programs

American Rivers

March 14, 1995

Mr. Robert J. Hamilton
Bureau of Reclamation
1150 North Curtis Road
Boise, Idaho 83706-1234

Dear Mr. Hamilton:

The Northwest Regional Office of American Rivers writes to support the Bureau of Reclamation's recent DEIS recommending the dam removal/pumping alternative for the Savage Rapids Dam on the Rogue River in Oregon. Through the efforts of our national organization, the Rogue River was among the first to receive National Wild and Scenic River status. Yet for the past two years, unfortunately, we identified the Rogue/Illinois River System in Oregon as one of North America's Most Threatened Rivers. Our concern for the fate of the Rogue River could not be greater.

American Rivers' Northwest Regional Office, through its Endangered Salmon Project, focuses on the improvement of in-river conditions for salmon spawning, rearing and migration. The disastrous effects of dams and water diversions and withdrawals are at the center of our work. Savage Rapids Dam causes more harm to fish than any other single factor on the Rogue River, resulting in an annual loss of approximately $5 million to the economy. The dam removal/pumping alternative is the only one which achieves the greatest benefits for fish, while costing $6.4 million **less** than building fish passage facilities. The Bureau correctly concludes that the dam removal/pumping alternative has significantly more benefits than the dam retention/ladders and the screen alternative.

Implementation of state-of-the-art fish ladders and screens would still result in delays in fish migration, injuries, and increased predation over natural conditions. In addition, ladders and screens require ongoing maintenance and repair, for which the Grants Pass Irrigation District does not have the financial resources. On the other hand, the dam removal scenario would give a needed boost to the economy of Southern Oregon due to the funds that would be spent during the construction phase, and the direct and indirect economic benefits associated with an increased fishery.

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It is rare to find a dam removal scenario with the unanimous support of all of the stakeholders. The Grants Pass Irrigation District, the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, the Oregon Department of Fish and Wildlife, and the regional environmental community all agree that the dam should come out.

American Rivers' Northwest Office fully supports the Bureau's preferred alternative.

Sincerely,

Jennifer Wilkie

cc: Senator Mark Hatfield
Senator Bob Packwood
Representative Peter DeFazio
Representative Wes Cooley
Governor John Kitzhaber

CIEL.

CENTER FOR INTERNATIONAL ENVIRONMENTAL LAW

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APR - 3 1995
TO | INIT | DATE
6309 | | 5 Apr
ACTION MADE BY

March 27, 1995

Robert J. Hamilton
Bureau of Reclamation
1150 North Curtis Road
Boise, Idaho 83706-1234

RE: Savage Rapids Dam, Rogue River, Oregon

Dear Mr. Hamilton:

I am writing in response to the Planning Report and Draft Environmental Statement prepared by the Bureau of Reclamation regarding the Savage Rapids Dam on the Rogue River in Oregon, owned by the Grants Pass Irrigation District. The Center for International Environmental Law (CIEL) strongly endorses this report's preferred alternative of dam removal and replacement with water pumps.

Removal of the Savage Rapids Dam is a win-win situation for the Rogue River, the Grants Pass Irrigation District, the salmon and steelhead, and for the people who enjoy the river. The Bureau of Reclamation correctly concludes that the dam removal/pumping alternative has two times more net benefits than the dam retention fish ladder alternative. These benefits include the following:

* It will cost $6.4 million less to remove the dam and replace it with water pumps than to repair the dam.

* Removal of the dam is estimated to increase the run of salmon and steelhead in the Rogue River by approximately 114,600 fish annually, with an estimated annual benefit of $5 million.

* State-of-the-art fish ladders and screens would provide significantly fewer benefits to the fishery than dam removal due to migration delays, injuries and increased predation. Fish ladders would also result in annual operations and maintenance costs.

* Removing the dam and installing the pumps will provide a boost to the economy of Southern Oregon, not only due to increased recreation income as a result of the improved fishery, but also from funds spent during the construction phase.

Mr. Hamilton
March 27, 1995
page two

CIEL is a U.S. non-profit organization dedicated to protecting the global environment. The Rogue River's salmon and steelhead fishery is of international concern, as perhaps the greatest remaining river for wild fish in the continental U.S. Under the Law of the Sea Convention and customary international law, the U.S. is responsible for the conservation and management of its anadromous fisheries. Removing Savage Rapids dam is an important step in that process.

Sincerely yours,

David Hunter
Senior Attorney

cc: Sen. Mark Hatfield
Sen. Bob Packwood
WaterWatch of Oregon

INTERNATIONAL RIVERS NETWORK

MAR 9 - 1995
6309 RN

Robert J. Hamilton
Bureau of Reclamation
1150 North
Curtis Road
Boise
Idaho, 83706-1234.

March 7, 1995

Dear Mr Hamilton

International Rivers Network is a non-profit organization which supports the work of local groups around the world which are promoting the wise use of the planet's rivers and fresh water. IRN works to halt investment in destructive river development and to encourage strategies that are environmentally, socially and economically sound.

IRN believes that the Savage Rapids Dam on Oregon's Rogue River must be removed if the river's salmon fishery is to be restored. Savage Rapids Dam causes more fish passage damage than any other single factor on the Rogue River. Because of the dam, the numbers of salmon and steelhead found in the Rogue River is reduced by some 116,000. The annual monetary value lost is estimated to be approximately $5 million. We therefore urge the federal government to make the funding available to remove Savage Rapids Dam.

Of the three alternatives studied in BuRec's December 15, 1994, draft environmental statement on fish passage improvements at Savage Rapids Dam, removing the dam and replacing it with pumps is by far the best option on both ecological and economic grounds. The cost to remove the dam and replace with brand new pumps is about $11.2 million versus $17.6 million to install fish ladders and screens.

Removing the dam is also superior to the fish passage option as it would eliminate delays in fish passage with the consequent predation risks which this entails, and would increase spawning habitat in the area upstream and downstream of the current dam site. Dam removal also eliminates possible detrimental temperature impacts because of the reservoir pool created by the dam; losses due to draw-downs during periods of dam maintenance; and would eliminate the risk of losses due to accidents.

The National Marine Fisheries Service, U.S. Fish and Wildlife Service, and the Oregon Department of Fish and Wildlife all support dam removal as the best and most viable solution for solving the fish passage problems at Savage Rapids Dam.

1847 Berkeley Way, Berkeley, California 94703 USA
Tel: (510) 848-1155 / Fax: (510) 848-1008 / E-mail: irn@igc.apc.org

Trying to fix Savage Rapids Dam with ladders and screens is not a permanent solution. It is very likely that such an investment would be lost due to improper maintenance and repair, and if Grants Pass Irrigation District should go out of business in the future, the dam would then have to be removed and additional funds spent. Trying to keep the dam and fix it is a bad investment.

Removing the dam and providing the district with brand new pumps is a major benefit to the irrigation district. The dam is very old and has a lot of deferred maintenance, and the pump turbine system eventually would have to be replaced. The district cannot afford to make the repairs necessary to maintain the dam. By providing the district with brand new pumps, the district increases the life of its irrigation diversion system.

GPID is currently under order from the Water Resources Commission to remove the dam, and failure to do so could result in the loss of additional water it needs to continue to survive. GPID has a legal responsibility to provide adequate fish passage at the dam and cannot afford to do so without federal assistance.

Finally, implementing the dam removal and pumping project would be good for the local economy because of the funds that would be spent during the construction phase and because of the fish benefits that would be provided after completion.

I hope you will give consideration to these points.

Yours sincerely

Patrick McCully
Campaigns Director

cc Senator Mark Hatfield, 711 Hart Senate Office Building, Washington, DC 20510;
Senator Bob Packwood, 259 Russell Senate Office Building, Washington, DC 20510;
Representative Peter DeFazio, 2134 House Rayburn Office Building, Washington, DC 20510;
Representative Wes Cooley, 1609 Longworth House Office Building, Washington, DC 20515;
Governor John Kitzhaber, 254 State Capitol, Salem, OR 97310.

OREGON DIVISION

Izaak Walton League of America, Inc.

DEFENDER OF SOIL, WOODS, WATERS AND WILDLIFE

RECEIVED OREGON FIELD OFFICE
MAR 07 1995
6309 RJN

February 27, 1995

John W Keyes, III
Regional Director
Bureau of Reclamation
Attention: PN-6309
1150 N. Curtis Rd.
Boise, Idaho 83706-1234

Dear Mr: Keyes:

The Oregon Division, Izaak Walton League of America (League) has a long standing concern with the fish passage problems associated with Savage Rapids Dam. The north bank fish ladder has been considered inadequate for anadromous fish with its narrow width, steep gradient, and short pools with shallow water depths. The south fishway has been described as a hodgepodge of walls and weirs and could easily meet the criteria as a maze.

During the period 1952-56, the League assisted in convincing Congress the importance of the Rogue River Fishery and for the funding to purchase and install the first fish screens for the turbines at the dam. These were installed in 1958.

In 1979, the League appointed a special committee Chaired by Dr. David B. Charlton, to review the fish passage facilities. Mr. Bob Barbo, formerly with the Bureau, met with the committee in Grants Pass, Oregon on several occasions. He also accompanied them during some of the tours of the facilities at Savage Rapids Dam. A Committee Report was submitted dated January 31, 1981 (copy furnished your office). It is interesting to note, that some of the recommendations contained in the report are similar to the Alternatives contained in the Bureau's Draft Environmental Statement. They are, (1) dam removal and using pumps to furnish necessary water for irrigation; (2) dam retention with needed fish passage improvements; (3) no action.

The League was enthused when it learned the Bureau was initiating the Josephine County Water Management Improvement Study in 1989. As you are aware, we expressed our interest in a letter to you requesting that the fish passage, both upstream and downstream be addressed. We were assured that a main objective was to identify a permanent solution to the fish passage problems at Savage Rapids Dam and help resolve conflicts over water uses in Josephine County.

Page 2, Comments - Attention: PN-6309

The League is in agreement with the Preferred Alternative (Pumping Alternative) contained in the Draft Environmental Statement. We are also pleased that the Board of Grants Pass Irrigation District (GPID) voted in favor of this alternative. It is realized that it may have been a reluctant move on their part. However, a necessary one to gain approval from the Oregon Water Resources Commission for the additional amount of irrigation water required for operational purposes.

We commend the Bureau for its time and effort expended to-date with this study and thank you for this opportunity to comment. If the League can be of any assistance, please let us know.

Sincerely,

Bryan M. Johnson
President
Oregon Division
110 NW Orchard Dr.
Portland, Oregon 97229

Kalmiopsis Audubon Society
of Curry County
P.O. Box 1265
Port Orford, Oregon 97465

Bureau of Reclamation
Robert J. Hamilton
1150 North Curtis Road
Boise, Idaho 83706

March 13, 1995

Robert J. Hamilton,

Kalmiopsis Audubon Society is fully supportive of the removal of the Savage Rapids Dam. The dam removal/pumping alternative should be supported.

The Grants Pass Irrigation District will benefit from the use of new pumps and the Irrigation District Board, itself, is in support of the dam removal.

The National Marine Fisheries Service, U.S. Fish & Wildlife Service and the Oregon Department of Fish & Wildlife are all supporting the removal of the dam.

By removal of the dam the fish populations of salmon and steelhead will increase greatly. and,

The cost of removing the dam and replacing it with new pumps is $6.4 million less than trying to fix the dam.

We urge the Bureau of Reclamation to remove the dam.

Sincerely,

Ellen Warring

Ellen Warring, Conservation Chairman
Kalmiopsis Audubon Society

Morrison's
ROGUE RIVER LODGE
8500 GALICE ROAD
MERLIN, OREGON 97532
Phone (503) 476-3825

BUREAU OF RECLAMATION OFFICIAL FILE COPY
FEB 22 1995
FILE

February 15, 1995

Bureau of Reclamation
PN-6309
1150 N. Curtis Road
Boise, Idaho 83706

Subject: Written Statement on Savage Rapids Dam

Dear Mr. Hamilton:

In the decision for the removal of Savage Rapids Dam, I am sure it would appear that local sentiment favors retaining the old structure. I do not believe that is true. There are many, like myself, who favor removal of the structure completely, as the only reasonable action to take.

First of all, my qualifications for my opinion. This will be the 32nd season I have operated the above business. During that time, fishing has been a major portion of our income. Hence, I have taken more than a laymens interest in the river and its fisheries. I have sweated through each one of those 31 fishing seasons, day by day. I am aware of the effect of Savage Rapids Dam from both the standpoint of continual attrition (fingerlings, smolt, etc. going over the dam) and accidental problems (malfunction of the fish screens, turbines etc.). It would seem that at least the accidental problems should have been chronicled by both the irrigation company, and the Oregon Department of Fish and Wildlife. I really doubt that to be true. I can recall times that fish went down the canals, ending up as volunteer fish rescue actions. Perhaps these instances are recorded, at least in later years by someone like the Northwest Steelheaders, but I would doubt the Irrigation District would have a true picture for you. Continued attrition on the fisheries by injury in the ladders, over the dam, etc. has really only been recognized in the last few years, and again I would doubt the effect is really known to its full extent. The Dam is without doubt a fish killer, and depending on the incident, can be a major impediment to the Rogue migratory fisheries.

Hue and cry for "Saving The Dam", has been a complete amazement to me, and is, in my opinion, due to the vigorous efforts of a few people. This coalition of a very few interestes, (water skiing, property owners behind the dam, realty interests) somehow by timeing and luck, turned the whole issue into one of local patriotism. Local politics was effected to the point that anyone running for office was forced to "save the dam" no matter how they really felt in order to be and stay elected.

Morrison's
ROGUE RIVER LODGE
8500 GALICE ROAD
MERLIN, OREGON 97532
Phone (503) 476-3825

BUREAU OF RECLAMATION OFFICIAL FILE COPY

I believe the people who live behind the dam, would be better off in the long run without the dam, as well as recreation both commercial and private. The river would again be free flowing for use between Gold Hill, Rogue River, to Grants Pass and Grave Creek both for floaters and "tour" boating. The only true loss I can see for recreation would be water skiing. I have no excuse or solution for that except to go to nearby impoundments, which is an inconvenience to some people.

The economic value of agriculture (thus irrigation) to the lower Rogue valley is far less now than earlier periods. The unwillingness of the district to even consider purchasing more water for their dire needs (50,000 acre feet available from Lost Creek) show me, they truly cannot afford it. They cannot afford it simply because there are very few remaining true agriculture operations left in the county. Forty acres, five horses, two cows and a pig, simply cannot be more than hobby farming. I have a great deal of sympathy for agriculture, as I was brought up in it, and still own over a section of land used purely for agriculture. The proposal for removing Savage Rapids, and replacing it with pumping stations, and a larger volume water right, is without doubt the best thing that could happen to agriculture in this county.

Please do not be dissuaded by a selfish minority of local people. Make your decision on what is right for the fisheries and the River. Remove Savage Rapids Dam.

Sincerely,

B. A. Hanten

B. A. Hanten

March 17, 1995

John W. Keys, III
Regional Director,
Bureau of Reclamation
Attention: PN-6309
1150 North Curtis Road
Boise, Idaho 83706-1234

Re: Support For Removal Alternative of Savage Rapids Dam

Dear Mr. Keys:

The undersigned representatives and organizations of the West Coast commercial and recreational fishing industries support the preferred alternative for the "Planning Report/Draft Environmental Statement of the Fish Passage Improvement--Savage Rapids Dam."

We feel that it is in the public interest of the citizens of this state and in the economic interests of the fishing industry that the Savage Rapids dam be removed for the following reasons:

* **COSTS:** According to the Planning Report/Draft Environmental Statement, the amount of money required for removing the dam and replacing it with pumps is reportedly $11.2 million. This amount is less than the $17.6 million required to keep the dam. We feel that obtaining the $11.2 million in state and federal funds for dam removal and pump installation is possible, and that we should work together to obtain it.

* **ECONOMIC BENEFITS**: The U.S. Fish and Wildlife Service estimates that $5 million per year would be generated indefinitely in commercial and sport fishing revenues if the dam were removed. The cost of dam removal, on the other hand, is a one time cost. At the end of three years, more money will be generated by additional commercial and sportfishing revenues than the cost of removal. The net benefits of removing the dam are in fact more than are generated by the dam itself.

* **FISH RESTORATION AIDS THE SALMON INDUSTRY:** The West Coast salmon industry is in a state of collapse. Last year salmon harvest closures off the coasts of Oregon, California, and Washington cost coastal communities tens of millions of dollars in lost revenue. These closures are so severe that coastal fishing communities and fishermen in Northern California, Washington and Oregon qualified for federal disaster relief.

Fish managers tell us that the 1995 salmon season will not be much better than 1994, and that we can expect to see widespread closures once again.

With scores of salmon and steelhead stocks in California, Washington, Oregon and Idaho being in such grievous condition, all of us who depend on salmon are actively pursuing all reasonable salmon restoration solutions. We feel that the case for Savage Rapids dam removal is especially attractive because:

- it is economically feasible;
- water deliveries could be accomplished through alternative means; and,
- a net economic gain of millions of dollars would be realized through salmon and steelhead restoration.

* **TIMING:** We feel that now is the time to move forward and seek federal funds for dam removal as decision makers in the region and in Washington D.C. are well aware of the crisis facing the salmon of the Pacific Northwest. As we have stated in the past, we are willing to work together in a coalition with the members of Grants Pass Agriculture and water community to obtain the federal and state funds for dam removal, as well as for upgrading the Grants Pass Irrigation District water delivery system.

In closing, our only hope lies in cooperation among all users of Oregon's resources. To ensure that the citizens of the Northwest continue to have the opportunity to harvest salmon for food, for pleasure, a way of life, and/or for religious reasons, we must address the salmon's habitat problems where sensible solutions can be found. We feel that the removal of Savage Rapids dam is not only economically feasible, but in the short term would impart extensive economic benefits to the ocean, estuary and river fishery economies (including the Grants Pass area).

Therefore, we urge that you adopt the Preferred Alternative of removing Savage Rapids Dam and request that you employ all means necessary to fund dam removal and construction of new pumping plants.

Sincerely,

RANDY FISHER, EXECUTIVE DIRECTOR, **PACIFIC STATES MARINE FISHERIES COMMISSION**, GLADSTONE, OREGON

TOM WOLF, CHAIRMAN, **TROUT UNLIMITED** OREGON COUNCIL, FOR THE FOLLOWING CHAPTERS: TUALATIN VALLEY, SANDY RIVER, BLUE MOUNTAIN, NORTHEAST, OCHOCO, DESCHUTES, AND KLAMATH

JIM WELTER, CHAIRMAN, **OREGON SOUTH COAST FISHERMEN, INC.**, HARBOR, OREGON

LIZ HAMILTON, EXECUTIVE DIRECTOR, **NORTHWEST SPORTFISHING INDUSTRY ASSOCIATION**, OREGON CITY, OREGON

IRV URIE, **RIVER TRIPS UNLIMITED INC.**, MEDFORD, OREGON

GLEN SPAIN, NORTHWEST DIRECTOR, **PACIFIC COAST FEDERATION OF FISHERMEN'S ASSOCIATIONS**, EUGENE, OREGON

TOM POSEY, PRESIDENT, **TOM POSEY CO.**, BEAVERTON, OREGON

BOB ZAGORIN, EXECUTIVE DIRECTOR, **OREGON OUTDOORS ASSOCIATION**, EUGENE, OREGON

TOM SHAFER, **OREGON FISHERIES CONGRESS**, NEWPORT, OREGON

DAVE JOBE, VICE-PRESIDENT, **WHITE WATER WAREHOUSE**, CORVALLIS, OREGON

DAWN FOWLER, SECRETARY, **PACIFIC COAST COMMERCIAL FISHERMEN'S WIVES ASSOCIATION**, CLATSKANIE, OREGON

BILL BOICE, **PRESIDENT, CURRY GUIDES ASSOCIATION**, GOLD BEACH,OREGON

MILT WALKER, PRESIDENT, **CURRY ANADROMOUS FISHERMEN**, GOLD BEACH OREGON

GUY THORNBURGH, CHAIRMAN, **FISHERMEN INVOLVED IN SAVING HABITAT (F.I.S.H.)**, SHAW ISLAND, WASHINGTON

HARRIET ENGBLOM, **NORTHWEST COMMERCIAL FISHERMEN'S WIVES ASSOCIATION**, ASTORIA, OREGON

BRUCE HARPOLE, PRESIDENT, **OREGON FISHING CLUB, OREGON ANGLERS**, ALBANY, OREGON

PORT OF BROOKINGS HARBOR **FISHERIES COMMITTEE**, BROOKINGS, OREGON

STEVE BEYERLIN, VICE-PRESIDENT REGION 3, **OREGON GUIDES AND PACKERS**, GOLD BEACH, OREGON

JACKIE JACOBSEN, PRESIDENT, **UMPQUA COMMERCIAL FISHERMEN'S WIVES ASSOCIATION**, WINCHESTER BAY, OREGON

FRANK WARRENS, PRESIDENT, **NAUTILUS NORTHWEST CHARTERS**, PORTLAND, OREGON

BOB EATON, EXECUTIVE DIRECTOR, **SALMON FOR ALL**, ASTORIA, OREGON

ZEKE GRADER, EXECUTIVE DIRECTOR, **PACIFIC COAST OF FEDERATION FISHERMEN'S ASSOCIATIONS**, SAUSALITO, CALIFORNIA

LAW OFFICES OF
PIAZZA & PIAZZA
221 WEST MAIN STREET, SUITE 1
MEDFORD, OREGON 97501
TELEPHONE (503) 772-3299

A. E. (GENE) PIAZZA
EUGENE F. PIAZZA

HELEN M. FAUST
CERTIFIED LEGAL ASSISTANT

March 1, 1995

Mr. Robert J. Hamilton
Bureau of Reclamation
1150 North Curtis Road
Boise ID 83706-1234

RE: Savage Rapids Dam Removal

Dear Mr. Hamilton:

As a third generation Oregonian, lifetime resident and concerned citizen, I urge you to secure whatever funding is necessary to remove the Savage Rapids Dam as quickly as possible. I have personally witnessed the damage to the Rogue River Fishery caused by this dam. The alternative in retaining the dam would not provide a solution to the problem and the cost of such alternative, together with the ongoing expense to monitor and solve inevitable future problems, far outweigh any advantage.

The tragic situation in the Columbia River system which utilized the alternative solution should be ample evidence against its use.

Sincerely,

A. E. Piazza

AEP/hf
CC: Senator Mark Hatfield
Senator Robert Packwood
Representative Peter DeFazio
Representative Wes Cooley
Governor John Kitzhaber

Randy Nelson's
LOWER ROGUE CANYON OUTFITTERS
Southern Oregon's Premiere Guided Rafting and Fishing Trip Company

Bureau of Reclamation,

I would like to express my feelings on the "Savage Rapids Dam" Planning Report. Being secretary of the Rogue River Guides Assoc. and being a full time guide of over 18 yrs and see what the dam has done to the fishery and the huge amount of waste through the irrigation district I'm very much in favor of blasting the whole thing out and pumping water to those it was intended to and let the fish have a chance and the farmers get what they deserve.

Please take my knowledge into concideration on this issue.

Randy Nelson

3207 Randall Avenue • Central Point, Oregon 97502 • (503) 826-3198

river trips unlimited

IRV URIE

Irvine L. & Patti L. Urie
GUIDE and OUTFITTER
4140 Dry Creek Road
Medford, OR 97504-9253
Phone 80[illegible]-3865
Fax (503) [illegible]-2798

BUREAU OF RECLAMATION
OFFICIAL FILE COPY
MAR 20 1995

TO	INIT	DATE
6309		21 Mar
FILE		

March 16, 1995

Mr. Robert J. Hamilton
% Bureau of Reclamation
1150 North Curtis Rd.,
Boise, ID 83706-1234
Phone: 208-378-5087

Dear Mr. Hamilton,

Re: Savage Rapids Dam on the Rogue River in Oregon.

I could go over all the facts after reading the Planning Report/Draft Environmental Statement to remove Savage Rapids Dam, but you already have all of them, so will keep this short.

I have fished below Savage Rapids Dam for almost 40 years, with taking pictures (I believe we also have a video) of dead fish (Salmon and Steelhead), steelhead eggs all over the rocks because of them jumping out or missing the South Fish Ladder, and also organized work parties through the Rogue River Guides Association on the South Fish Ladder. With all the work done on these fish ladders there still seems to be many problems in fish passage at the dam and believe that it is a much larger fish killer then in your report.

I completely support the Bureau of Reclamation preferred alternative of the removal of Savage Rapids Dam, with the construction of two electric powered pumping plants, one on each side of the river near the site of the existing dam, with the total capacity of 150 cfs and the demolition of the existing dam and related facilities, primarily by mechanical means, and disposal of the waste.

I would also request that the Bureau of Reclamation ask for the funds to implement this perferred alternative.

Sincerely,

Irvine L. Urie
Past State President - Oregon Guides & Packers, Inc.

Salmon and Steelhead Specialist—Go with a Pro

AMERICA OUTDOORS

OREGON GUIDES & PACKERS

ROGUE FLYFISHERS

P.O. BOX 4637, MEDFORD, OREGON 97501

February 27, 1995

TO 6309 ON
FILE

Robert J. Hamilton
Bureau of Reclamation
1150 North Curtis Road
Boise, Idaho 83706-1234

Dear Mr. Hamilton,

Re: Savage Rapids Dam.

The Rogue Flyfishers is an organization of nearly two hundred sportsmen/women residing in the Ashland-Medford-Grants Pass, Oregon area. The organization's primary aims are the conservation, preservation, and enhancement of fishery resources, habitat, and environment.

We have reviewed the Bureau of Reclamation's draft environmental impact statement on fish passage improvements at Savage Rapids Dam on the Rogue River. We strongly support the preferred alternative of removing the dam and replacing it with pumps. This alternative is clearly superior from the standpoint of immediate cost ($11.2 million versus $17.6 million to attempt to repair the dam) as well as long-range net benefits. The economic gains which will accrue to the Rogue valley from unobstructed fish passage through that area far outweigh any benefit resulting from the existing lake. Although water skiing on the lake will undoubtedly end, the scenic value of the river itself and the resulting riparian zone should increase local real estate values over current valuations.

We urge adoption of the preferred alternative and active support for funding its implementation.

Yours truly,

Daniel Z. Boyd
President

cc: Senator Mark Hatfield
Senator Bob Packwood
Representative Wes Cooley
Representative Peter DeFazio
Governor John Kitzhaber

JACKSON COUNTY OREGON JOSEPHINE COUNTY

ROGUE RIVER GUIDES ASSOCIATION, INC.

P. O. BOX 792 • MEDFORD, OREGON 97501

BUREAU OF RECLAMATION OFFICIAL FILE COPY
FEB 23 1995

February 15, 1995

Mr. Robert J. Hamilton
% Bureau of Reclamation
1150 North Curtis Rd.
Boise, ID 83706-1234
Phone: 208-378-5087

Dear Mr. Hamilton

Re: Savage Rapids Dam on the Rogue River in Oregon.

As an organization that has worked on Savage Rapids Dam Fish Ladders at different times to try to improve the fish passage over the dam, with man power, materials, etc., we have seen some of the many problems with this obsolete structure over the course of many years.

Our organization completely supports the Bureau of Reclamation preferred alternative of the removal of Savage Rapids Dam, with the construction of two electric powered pumping plants, one on each side of the river near the site of the existing dam, with the total capacity of 150 cfs and the demoliton of the existing dam and related facilities, primarily by mechanical means, and disposal of the waste.

We request that the Bureau of Reclamation ask for the funds to implement this perferred alternative.

Sincerely,

Willie Illingworth
President
Rogue River Guides Assoc., Inc.

BUREAU OF RECLAMATION OFFICIAL FILE COPY
FEB 27 1995

WATERWATCH COMMENTS ON BUREAU OF RECLAMATION PLANNING REPORT/DRAFT ENVIRONMENTAL STATEMENT CONCERNING FISH PASSAGE IMPROVEMENTS AT SAVAGE RAPIDS DAM

WaterWatch strongly supports the dam removal/pumping alternative as the preferred alternative.

The no-action alternative is totally unacceptable for the following reasons:

1. If no action is taken, the tremendous fish losses currently caused by the dam would continue. As long as the dam is in place, the full productive potential of the Rogue River System to produce salmon and steelhead is greatly diminished. It is estimated that because of the adverse impacts of the dam, the Rogue River produces some 116,000 less salmon and steelhead annually, the annual monetary value of which is estimated to be approximately five million dollars. In essence, while Oregon and California's coastal communities have had to limit their commercial and sports harvest because of limited fish numbers, Savage Rapids Dam is still allowed to harvest a tremendous number of fish, which harvest does not bring any economic benefit.

2. The Grants Pass Irrigation District (GPID) has the legal responsibility to provide adequate fish passage at the Dam but does not have the financial wherewithal to carry out its responsibility. Some definite action will eventually be required under State law.

3. The continued survival of the Grants Pass Irrigation District requires that some immediate action be taken. GPID's continued right to use water in excess of its certified right of 97 cubic feet per second has been conditioned by the State of Oregon Water Resources Commission on dam removal. If the dam is not removed, then GPID could lose the right to divert the additional water with the result that GPID would probably go out of business. If GPID went out of business, the dam would ultimately have to be removed and the people in this area would no longer have either the dam or the District.

4. The granting by the State of additional water to GPID violates the State of Oregon's Scenic Waterway "DIACK" flows set for the wild and scenic section of the Rogue

River. The State of Oregon Water Resources Commission contended that "DIACK" flows could be violated because of the benefits that can be obtained from dam removal. If the dam is not removed then there is no longer any justification to violate "DIACK" flows and GPID could again be forced back to their certified right.

5. The dam is very old and has a lot of deferred maintenance. The existing pump turbine system will eventually have to be replaced. GPID is looking at a cost of approximately $2,848,000 to correct these deficiencies. GPID probably cannot afford to make the repairs necessary to maintain the dam. By providing GPID with brand new pumps GPID would increase the life of its irrigation diversion system and would have a greater likelihood of being able to survive into the future.

6. It is very likely that the coho salmon in the Rogue River may be listed as threatened or endangered. If this should occur then GPID would most likely be legally obligated either to remove the dam or fix it. Some definite action would be required.

7. It should also be noted in the EIS that if some action is taken to improve fish passage at Savage Rapids Dam, it will be a positive benefit to the wild and scenic section of the Rogue River. Salmon and steelhead fisheries have been identified as values to be protected by the wild and scenic designation of the lower Rogue River. Any action taken to improve fish passage at Savage Rapids Dam would have a positive impact on the wild and scenic values downstream.

As between the dam removal/pumping alternative and the dam retention/ladders and screens alternative, the dam removal/pumping alternative is the preferred alternative and the only reasonable alternative for the following reasons:

1. The cost to remove the dam and replace it with brand new pumps is cheaper than trying to fix the dam. (11.2 million dollars v. 17.6 million dollars)

2. The cost to a GPID patron for the patron's water would be cheaper under the dam removal/pumping alternative than the dam retention/ladders and screens alternative as the Federal Government would not be picking up the Irrigation component of the dam

retention alternative. Adding in this additional cost would increase the overall cost to a district patron. This should be highlighted more in the draft environmental impact statement so that this point is made clear. WaterWatch supports the cancellation of GPID's bonded indebtedness to the Federal Government in order to make the dam removal/pumping alternative a more viable option to GPID. It should also be noted that the power cost will go down if GPID continues to be successful in its conservation efforts. Other means to reduce power costs should also be explored.

3. The greatest benefits can only be achieved with dam removal. With dam removal, there would be no delays in fish passage. In addition, there are other benefits and advantages that the dam removal alternative has over the dam retention alternative, some of which are as follows:

A. Even with improved ladders and screens there would still be a high level of predation at the dam site because fish are concentrated and delayed at the dam site during upstream and downstream migration and because fish are more susceptible to predation after going through ladders and bypass systems.

B. With the dam retention alternative there would still be lost spawning upstream and downstream of the dam because of lack of gravel recruitment downstream and because of siltation in the reservoir pool upstream of the dam. The dam is located in the heart of the fall chinook spawning area in the Rogue System and it is estimated that dam removal would provide additional spawning habitat in the vicinity of the dam that could support up to an additional 4,000 fall chinook spawners.

C. Ladders and screens only function with proper and diligent maintenance and repair. GPID would be responsible for ongoing maintenance and repair and may not have the financial ability to meet the repair and maintenance obligations of a sophisticated ladder and screen system. Even with the best maintenance and repair there are still accidents that will occur and there is definitely a lag time before identifying and correcting problems that arise.

D. There will still be losses at the dam site due to draw downs during periods of dam maintenance and repair.

E. There are possible detrimental temperature impacts because of the reservoir pool created by the dam.

These points should be more thoroughly discussed in the Environmental Impact Statement.

4. The Bureau of Reclamation estimates the dam removal/pumping alternative has two times more net benefits than the dam retention/ladders and screens alternative. (The cost benefit ratio of the preferred alternative is 3.2:1 while that for the dam retention alternative is 1.7:1.)

5. The only permanent and certain solution to the fish passage problems at Savage Rapids Dam is its removal. Trying to keep the dam and fix it is a bad investment. Such an investment could be lost due to improper maintenance and repair and if GPID (a very financially distressed district) should go out of business in the future, the dam would then have to be removed and additional funds spent. There is no reason to pay twice for benefits that can be achieved with a single solution.

6. There are more uncertainties with the dam retention/ladders and screens alternative as there are so many more variables affecting that alternative.

7. The National Marine Fisheries Service, US Fish and Wildlife Service and Oregon Department of Fish and Wildlife all support dam removal as the best and most viable solution to solving the fish passage problems at Savage Rapids Dam.

8. The dam removal/pumping alternative is the only one that would allow GPID to comply with the existing State of Oregon Water Resources Commission order to remove the dam. Failure to remove the dam could result in the loss of additional water that GPID needs to survive. The pumps also give GPID greater flexibility in responding to future conditions.

9. If the coho salmon are listed in the Rogue System, the dam retention/ladders and screens alternative may not be acceptable because of the losses that would still occur.

Removing Savage Rapids Dam is a win-win solution that is good for the Rogue River Fishery, good for GPID and good for the State of Oregon. Implementing the dam removal/pumping project would be good for the local economy. It would give a needed boost to the economy in Southern Oregon because of the funds that would be spent during the construction phase and it would also help Southern Oregon and the coastal communities of Oregon and Northern California because of the fish benefits that would be provided after completion. It is good for GPID because the increase in the life of its diversion system would put them on a more economically sound footing; would give them more flexibility in the future as the new pumps can be moved to different locations and are a more salable asset than the existing dam structure; and it would assist GPID in coming into compliance with the Oregon Water Resources Commission and in fulfilling their legal responsibility as to provide adequate fish passage at the dam. GPID can probably not survive without federal assistance in implementing the dam removal/pumping alternative.

WaterWatch respectfully requests the Bureau of Reclamation to seek funding for implementation of the dam removal/pumping alternative.

Sincerely,

ROBERT G. HUNTER
Vice President, WaterWatch

6309 AH 6 Mar

1330 East Park
Grants Pass, Or 97527
February 25, 1995

Mr. Robert J. Hamilton
BUREAU OF RECLAMATION
1150 N. Curtis Road
Boise, ID 93706-1234

RE: SAVAGE RAPIDS DAM & WATER POLLUTION, ROGUE RIVER

Dear Mr. Hamilton:

For 81 years I have lived in Grants Pass, and during my teen age years, most of the teenagers spent the summer days at the Riverside Park, swimming. There was a City bath house and the water temperature was posted daily. This is where you could find the teenagers during the summer. Good, clean fun, diving for white rocks, swimming out to the big raft, or the little raft, or to the log anchored in the river .

For 40 years I have lived at the above address on the banks of the Rogue River, about one mile up river from Riverside Park in Grants Pass. I used to wade and fish during the summer, but in the past several years the pollution is constant, and I would not think of wading in it, even if I could.

Sometimes these white chunks are bigger than basketballs; other times they are small, but always there, day after day, every day. What is it? It appears to be detergent. I wonder if this is part of the trouble with fewer fish.

Several times over the years I have telephoned the Environmental Quality Dept in Medford. They say they don't have a boat so cannot look for the area where it enters the river.

If fewer fish are coming up the river, in my opinion the problem is not Savage Rapids dam. And, as you know, the Rogue is not the only river where the fish are fewer.

I think the dam should be left right where it is, and the fish ladders repaired. And in the meantime, we along the river here would like to know what this pollution is, and from where it is coming.

Sincerely,

Lucy Bennett

6309 AH 28 Dec

FILE

December 9, 1994

Regional Director
Bureau of Reclamation
Attn: DN-6309
1150 North Curtis Road
Boise, Idaho 83707

Dear Sirs:

Regarding our local "dams", particularly the Savage Rapids Dam, our local newspaper states that your office would appreciate comments from us "locals" before final decisions are being made. I appreciate this opportunity.

Unless you live in the area it would be difficult to appreciate what this dam has meant to us. Water conservation of course is extremely critical in that we have experienced a ten year drought. Our few dams, Lost Creek, Applegate and Savage Rapids have allowed us to make it through the summer. The ability to control the flow and water temperature allows fish to survive until the winter rains come. We need to expand this kind of water conservation...not decrease it. Unless you live here it is difficult to appreciate how critical this is.

Also, lakes resulting from these dams have been part of our environment for half a century in many cases. They are a source of beauty, recreation, fishing, and parks that cannot be reproduced in any other way. My family are white water canoe "fanatics" and do enjoy this activity....the "lakes" certainly are not a problem in allowing us this recreation .contrary to a small group. It is a simple matter of a balanced use of our water resource.

Fish..growing up in this area I know as a child fish runs were great or not so great depending on many factors. Certainly the dam is one factor however it was never a dominant problem. The many reviews I have read from credible sources cite many other problems, particularly the drift nets and other massive losses in the ocean. We have had a drought problem and certainly more people using the river leaving garbage in the water...more fishermen. The dams are only one of many problems.

Talking to several contractors I'm disturbed that a distorted picture is being presented to us in respect to "fixing" the dam....15-17 million dollars? The "anti-dam" people of course have pushed these distorted numbers.. however typical of government projects.

Lynn and Della Berntsen
113 Ash Drive Rogue River, Oregon 97537 503 582-4014

We would like to see good estimates from local contractors to "fix" the fish ladders and other necessary improvements. We would also like to see the Elk Creek Dam completed in view of our need for more water conservation and flow/temperature control.

Our largest complaint is that this is where we live. The forces wanting to change our environment do not live here..could care less what kind of environment we wish to enjoy.. My irrigation water rate has increased five times, not to improve the facilities but to spend on yet another "study". These "studies" have not produced any information that allows us to see in detail what the problem is or what the cost would really be.

Please leave our dams alone and allow us to work with local contractors to "fix" the problem. We can do this.

Respectfully,

Lynn Bernton

Lynn and Della Bernton

Feb 18, 1995

U.S. Bureau of Rec
Attn: PN-6309
1150 N. Curtis Rd
Boise, Id. 83706-1234

RECLAMATION
OFFICIAL FILE COPY
FEB 21
6309 AH
DATE
13 Feb

Re: Savage Rapids Dam

I was born in Medford, Or & have lived here all my life - 69+ years.

Without Savage Rapids dam in the years of heavy rainfall Grants Pass and many residents below the dam would be faced with severe flooding.

As for the decline in salmon I believe there are several reasons other than dams

#1- an increase in population meaning more fishermen

#2- the increase in commercial fishing both local and foreign

#3 predators such as sea lions at the mouths of rivers

#4 the warmer water because of years of lower rainfall.

So please let us retain Savage Rapids dam & also finish the Elk Creek dam that could be releasing water in summer months to aid stream flows

Thanks.

Helen E. Rieman
3555 S. Pacific Hwy #46
Medford, Or 97501

BUREAU OF RECLAMATION OFFICIAL FILE COPY
MAR 13 1995

TO	INIT	DATE
6309	RJH	MOW
FILE		

[illegible]
[illegible]
[illegible] Oregon 97502
March [illegible], 1995

[illegible]
Bureau of Reclamation
1359 North Curtis Road
Boise, Idaho 83706-1234

Dear Mr. Hamilton:

I wish to go on record in support of the removal of Savage Rapids Dam and the installation of pumps to allow the Grants Pass Irrigation District to continue to serve its [illegible].

It appears the state and federal agencies have done their homework and set the stage for every affected party to be a winner. It was had been a long downhill slide for both the Fishery and the Irrigation district.

[illegible] years, I have been aware of situations where the [illegible] needed to de-water the ladders for emergency maintenance, and that migrating salmon would continue to attempt swim into a velocity barrier. The fish would be washed back onto the rocks below. As I see it, any other option where the financially stressed district would have to contend with possible damage to fisheries in the future that are being considered as sensitive or threatened, would cause [illegible] and permanent financial disaster. So many problems of the past can be prevented by your proposed actions. Yes for it and everyone is a winner.

Sincerely yours,

Chuck Brunett

Chuck Brunett

[illegible] Mark Hatfield
[illegible] Wyden
[illegible] Smith
[illegible] Walden
[illegible] Furse
[illegible] Bellmon

BUREAU OF RECLAMATION OFFICIAL FILE COPY
MAR 22 1995

TO	INIT	DATE
6309	RJH	22 Mar
FILE		

Bureau of Reclamation
Re: Savage Rapids Dam

To whom It Concerns:

I and my family live in Gold Beach, Oregon, at the mouth of The Rogue. All the dam hearings are upstream, near Grants Pass, as though that area were the only area affected. But we in Gold Beach have a big stake in the fish runs of the Rogue. In my view the economic benefits to our area of a healthy number of fish runs far outweighs the water-skiing and scenic property issues of those living beside the reservoir. I urge that Savage Rapids Dam be removed.

Sincerely,
Robin O'Cary
Gold Beach, OR.

BUREAU OF RECLAMATION OFFICIAL FILE COPY
FEB 28 1995

TO	INIT	DATE
6309	RJH	6309

SANDRYA DANEHY
1075 PEACHWOOD COURT
MEDFORD OR 97501

Dear Sirs,

Savage Rapids Dam is too old and entire to repair and keep. Irrigation can be handled efficently by pumping. We don't need the dam.

There are many nearby lakes for recreation. We don't need the dam.

We do need to have fish in numbers be able to get up the river to spawn.

Remove the dam.

Sincerely,

Sandrya Danehy

BUREAU OF RECLAMATION OFFICIAL FILE COPY
MAR 13 1995

TO	INIT	DATE
6309	RJH	

Robert J. Hamilton
Bureau of Reclamation
1150 North Curtis Rd
Boise, Idaho, 83706-1234

Dear Robert,

I support the Bureau of Reclamation's preferred alternative to remove Savage Rapids Dam on the Rogue River in Oregon. I strongly advocate federal funding for removal of the dam and supplying pumps to provide the irrigation district with water.

My reasons are:

1. West Coast Salmon and Steelhead runs are in jeopardy and this dam is a well known fish killer!
2. Coastal Oregon communities are hard hit due to shortened salmon seasons, because tourism is down.
3. Commercial fishermen are in desperate financial need of more salmon to harvest.
4. The retention of the dam will only benefit those who water ski, jet ski or the property owners on the shore of the reservoir. Where as the commercial fishermen, sports fishermen, and river guides depend on a healthy Rogue River system. This one dam is a detriment to the entire river system.
5. As salmon and steelhead trout stocks continue to decline, there is the possibility that they would be declared a threatened or endangered species. Should this happen, everyone would suffer financial loss.

We need to do what is logical and right. Let us take the steps to ensure wildlife and fish for future generations. Let not the decision be made to benefit only the local water sports enthusiasts, rather make the correct decision for the health of a beautiful river system and the financial benefits of those who make their living off of a healthy river.

David Dedrick
837 Marshall
Medford, OR 97501

BUREAU OF RECLAMATION OFFICIAL FILE COPY
MAR 7 - 1995
6309 RN

Robert J. Hamilton
Bureau of Reclamation
1150 North Curtis Rd.
Boise, Idaho, 83706-1234

Dear Robert,

I support the Bureau of Reclamation's preferred alternative to remove Savage Rapids Dam on the Rogue River in Oregon. I strongly advocate federal funding for removal of the dam and supplying pumps to provide the irrigation district with water.

My reasons are:

1. West Coast Salmon and Steelhead runs are in jeopardy and this dam is a well known fish killer!
2. Coastal Oregon communities are hard hit due to shortened salmon seasons, because tourism is down.
3. Commercial fishermen are in desperate financial need of more salmon to harvest.
4. The retention of the dam will only benefit those who water ski, jet ski or the property owners on the shore of the reservoir. Where as the commercial fishermen, sports fishermen, and river guides depend on a healthy Rogue River system. This one dam is a detriment to the entire river system.
5. As salmon and steelhead trout stocks continue to decline, there is the possibility that they would be declared a threatened or endangered species. Should this happen, everyone would suffer financial loss.

We need to do what is logical and right. Let us take the steps to ensure wildlife and fish for future generations. Let not the decision be made to benefit only the local water sports enthusiasts, rather make the correct decision for the health of a beautiful river system and the financial benefits of those who make their living off of a healthy river.

Sincerely,

Dennis Dedrick

Dennis Dedrick
837 Shafer Ln
Medford, OR 97501

Glenn M. Gray
2185 Foots Creek Road
Gold Hill, OR 97525
(503)-582-0639

BUREAU OF RECLAMATION OFFICIAL FILE COPY
FEB 2 1 1995
6309 RN 4 Feb
FILE

February 21, 1995
REF: PN-6309

Robert J. Hamilton
Bureau of Reclamation
1150 North Curtis Road
Boise, ID 83706-1234

Mr. Hamilton;

Regarding the Savage Rapids Dam operated by the Grants Pass Irrigation District (GPID)

1. I support removal of the dam.
2. The lake behind the dam benefits few at the expense of many.
3. Perhaps a better question would be if the GPID should even continue to exist.
4. The GPID has few parcels over 40 acres using its water.

Glenn M Gray

BUREAU OF RECLAMATION OFFICIAL FILE COPY
MAR 20 1995
TO | INIT | DATE
6309 | RN | 20 Mar

13 March 1995

Dear Mr. Hamilton,

Please accept this letter as a strong endorsement for the preferred alternative on removal of Savage Rapids dam on the Rogue river. This alternative provides the most benefit for anadromous fish at the least cost while still allowing the Grants Pass Irrigation District (GPID) to withdraw water by way of pumps.

The studies done by the Bureau and other agencies provide objective data on the extent of fish loss and the obstacles to modifying this 74 year old dam. In addition to loss both upstream and downstream at the ladders, the dam has a screened opening considerably below the water's surface that allows water to pass through to turbines that provide power to existing pumps. Small fish (fry and smolts) get forced against this screen and cannot escape due to the high water velocity.

In a time when the cost benefit of decisions of this type are being highlighted, I find your analysis of the benefit for the removal alternative of $3.20 per dollar versus $1.70 per dollar for the modification alternative compelling. Furthermore, the National Marine Fisheries Society just proposed listing steelhead runs in the Klamath Management Zone, which includes the Rogue river, as a threatened species.

It appears to me that those wishing to keep the dam as is or with minor facelifting make their case by invoking local rights,arguing it's a matter of either protect people or protect fish,or denying that the data reported on by scientists is accurate. By contrast I see the the decision about the dam as a regional, state and national matter. The future of state water rights for GPID depends on dam removal. The future of anadromous stocks of Rogue river fish will be impacted favorably by dam removal. With strong public support and decisive political leadership the funding necessary to remove the dam can be obtained and both people and fish can win.

Stephen C Hashell

BUREAU OF RECLAMATION OFFICIAL FILE COPY
MAR 30 1995
TO | INIT | DATE
6309 | RN | 30 Mar

Merlin, Or.
March 27, 1995

Good Morning Mr Hamilton:

I do hope you can take time to read my letter and to glance at the clippings, I have highlighted, in yellow, the main points that I would like to make.

Savage Rapids Dam has been there for 72 years, as you know. For over 40 years and maybe a little longer, the fish have had no trouble making their way up the ladders or for that matter a lot jumped the whole open flow.

Common sense tells one that it is something else. You will see by the clippings that by Fish and Games' own statements and other agencies that for a number of years and very much so in the past 3 or 4 years such as 10,000 spring little Chinook salmon one year died of disease, another year almost the whole hatch was lost due to a virus, another year a lot were lost because of to warm water and low water caused mostly by the drought that we have had for so long. IF THE LITTLE FISH COULDN'T OR DIDN'T GET OUT OF THE RIVER TO THE OCEAN, they sure couldn't come back. Then summer of 1993 or maybe it was 1994 a good share of the fish coming up the river TO SPAWN died of warm water 20 miles or so down river from our dam.

When man upsets natures balance we usually pay for it somehow. At the mouth of the Rouge River, there seems to be maybe an overpopulation of the sea lions that have been maybe overprotected (have you ever seen them feeding? they take one bite out of the stomach of the salmon and then grab another. and one sea lion can eat an awful lot of fish. then there are the merganser ducks that can devastate the schools of small fish going out.

Then there are the LONG LINE FISHERMEN mostly from other countries I might add, in one of the clippings it is stated that the fishing was curtailed to help all the runs up and down the whole west coast.

I have tried very hard to touch on a lot of reasons for fish decline and show why we do need the dam without taking up too much of your time. The little lake provides an awful lot of recreation to a lot of people who can come in the evenings after work and on weekends. It's quite aways to any other water area.

I thank you very much for your time and I hope you can see what I am saying and perhaps agree with US, AND THERE truly;u many of us here. I realize it is hard for someone to come and a day or two see all the ramifications the loss of the dam would have on this area.

PLEASE HELP US TO SAVE SAVAGE RAPIDS DAM!

Very Sincerely

Mary Hepler

Mary Hepler P.O.Box 51, Merlin, Or. 97532
503--476-3103

February 16, 1995

BUREAU OF RECLAMATION OFFICIAL FILE COPY
FEB 22 1995

TO	INIT	DATE
6300	RJH	23 Feb
FILE		

Robert J. Hamilton
Bureau of Reclamation
1150 North Curtis Road
Boise, Idaho 83706-1234

Dear Mr. Hamilton,

I am writing to you to encourage the Bureau of Reclamation to request the appropriate funding for the removal of Savage Rapids Dam. The dam is an unnecessary hindrance to the migration of the fish of the Rogue River. At this point in time when the salmon stocks are so depleted and there is concern along the entire west coast for survival of the various salmon species it seems that the removal of a dam that has outlived its usefulness should not be hard to justify. The dam was constructed when the family farm was a very necessary part of American production. Agriculture has progressed a great deal since then. The family farm is no longer a viable means of economic self sufficiency in the Grants Pass area. The only users of the water diverted from the Rogue River at Savage Rapids dam are hobby farmers. They grow small lots of hay, row or vegetable crops and keep a few animals as pets simply as a hobby. In order to support their hobby they require water that is being diverted at the expense of the other residents of the entire Rogue valley. This is selfish and very unnecessary. Far more people would benefit if the dam were removed and fish could migrate as the were intended. The option to pump water to the current users does not limit their ability to continue pursuing their chosen hobby and at the same time it will provide more fish for the whole population of southwest Oregon.

Several years ago I volunteered to work with the Oregon Department of Fish and Wildlife to improve the fish ladders at Savage Rapids dam so that more fish could find the ladders and pass by this obstacle. It was a lot of hard work and most satisfying when completed. We that participated would like to believe that it made a difference in the number of fish that were able to migrate upstream. Only the experts can make that judgment. I do know that as we worked on the project and even afterwards we witnessed fish attempting to jump the various obstructions and eventually killing themselves before they could find their way around this structure. I don't believe we can continue to waste these kind of irreplaceable resources when there are better alternatives available. Constructing this dam was viewed as great progress in its day. Now the day has come for further progress. Please move forward with the plan to secure funding for the removal of Savage Rapids dam. I want my children to be able to witness the migration of the salmon on the Rogue River just as I have. Your careful consideration will be greatly appreciated by them and me.

Sincerely,

Perry A. Higgins

BUREAU OF RECLAMATION OFFICIAL FILE COPY
JAN - 9 1995

TO	INIT	DATE
6300	RJH	9 Jan
FILE		

January 8, 1995

Robert J Hamilton
Bureau of Reclamation,
1150 N. Curtis Road,
Boise, Idaho 83706 1234

Re: Savage Rapids Dam

Dear Mr Hamilton:

Leave the Savage Rapids dam and the GPID in place. This dam is a valuable resource to the welfare and economy of Southern Oregon and particularly the Rogue Valley. The dam , during the summer months forms a 3.5 mile lake that is used by over 50,000 people a season for boating,water skiers,swimming and other water sports. It also provides irrigation for 7 to 8 thousand farmers and ranchers. In addition its leaky flumes replenish the aquifer under the Grants Pass basin.

This will become more important as the population of Southern Oregon grows and water becomes more dear. This is also a reason for completing the Elk Creek dam.

The dam has been in place for 74+ years. During this time there have been major fish runs, indeed record runs. The dam is not the major cause of fish loss. None of the studies, as you admit, are specific to the Savage Rapids dam , but are based on studies of other dams. The dam as a "fish killer" is the chant of the " radical " environmentalist. These people have stated that they want to remove all the dams in the Northwest, if not the western United States. This overreaching by the non-compromising environmentalist has resulted in a negative reaction to even reasonable environmental efforts. See enclosed article.

Once the dam is removed it could never be replaced i.e. the difficulty in completing the Elk Creek dam. Helping the fish should start with steps that are reversible; such as reducing the Seal/Sea Lion population, restrict fishing, especially, commercial fishing using nets. Last year, at Agness Orgeon , nine miles from the mouth of the Rogue River I watched Sea Lions decimate the Spring Salmon run. They were not just feeding but killing . As you know these darlings are protected.

There are , of course, other forces working against the fish ; El Nino, which has disrupted the fish's food supply for almost six years. Then there is the draught which has reduced water flow for almost nine years. There is little man can do about these conditions except to wait until the conditions improve. In the meantime, these conditions should not be used as an excuse for destroying a useful facility.

The radical environmentalist have used the convergence of the above problems to pursue their goal of dam removal. They have used the tactic of separating the issues; i.e. the dam is only a source of irrigation for a declining number of irrigators, currently 7 to 8

thousand. They ignore the use of the lake behind the dam as a recreation facility, a source of water for fire protection (used extensively to fight the two major fires we have had in the last two years) water table replenishment and the loss of property values (which affect the tax base of Jackson County), the loss of business for those small businesses that are located on the lake portion of the river.

In regards to the costs that have been bandied about; they are as suspect as the fish kill numbers. The 17 million dollars includes the most expensive fish ladders ($11,000,000 for fish ladders), a fish viewing platform, a parking lot and down stream rock removal etc. On the other hand, there have been other estimates as low as $5,000,000 for an adequate alternative. this is half the cost of removing the dam. Some of the other numbers quoted are equally absurd for example; Removing the dam would save 27,000 fish allowing 90,000 to return (assuming they are not netted or eaten by Sea Lions) the value to the economy of Southern Oregon would be $5,000,000 or $55.56 per fish, really? Also, they claim that "650,000" smolts die going over the dam. Smolts,as you know, move from late May to early October or about 6,000 per day. With that many dead fish in the river, the smell would be noticable. It isn't

Frankly as an overtaxed citizen, I am not willing to pay for such nonsense. I will continue to politically support those representatives who will fight to save the dam and cut the funding or eliminate agencies that are biased toward the view of the radical environmentalist. Some compromise and thought must be given to human needs as well as the fish and fowl. The water rights and usage of the Klamath River are being addressed in a more sensitive and intelligent manner. If you are not familiar with the Klamath river approach, get a transcript of the "Klamath River" a series of interviews prepared and broadcast over Jefferson Public Radio, Ashland Oregon

Sincerely Yours:
Robert McElroy
195 Rogue Blvd
Grants Pass, Or. 97526

*"Radical environmentalist; we are all environmentalist, and for the protection of the environment, but not to the exclusion of compromise and thought to human needs.

March 17, 1995

Douglas M. McGean
210 Renault Av.
Medford, Or 97501
503-776-7011

MAR 23 1995
TO
FILE

Mr. Robert Hamilton
% Bureau of Reclamation
1150 North Curtis Rd.
Boise, ID 83706-1234

RE: Support of Removal Alternative of Savage Rapid Dam

Dear Mr. Hamilton:

I support your agency's preferred alternative to remove Savage Rapid Dam on the Rogue River in southern Oregon. The strongest justifications for dam removal are the most obvious in that they rationally address economic, financial, environmental, and timeliness issues. Below, I have briefly outlined the reasons that I believe best support removal of the dam.

According to BOR estimates, fixing the dam is more costly than removing the dam. The amount of difference between the alternative costs will always be debated. The strength of the argument is not how much of a difference there will be but that there will be a difference and that economies favors dam removal.

The real lure appears to be the no action alternative in today's political climate. However, that scenario leads to long term dam/irrigation maintenance costs and possibly permanent losses to commercial and recreational fishing and associated secondary industries related to the Rogue fishery affected by the dam. As the west coast salmon industry nears a state of collapse, the "do nothing" approach is irresponsible economics.

As for the financial aspects of BOR's three alternatives, the sheer costs of investing in this old dam is prohibitive. Not only would it be throwing good money after bad, I question the irrigation district and the state of Oregon's ability to afford the finances needed to do necessary repairs and continued maintenance. Most likely, the shrinking district, counties and state government will eventually be seeking federal assistance for ever after to keep an old dam safe and maintained.

Environmentally, the preferred alternative is a permanent solution that places the river closest to its natural state. The arguments that there is no proof that the dam harms salmonoid species traveling back and forth over the dam defy dam watchers', fishermens' and fishery experts' observations and experiences. The fact that the National Marine Fisheries Service is now openly considering a proposal to list northwest steelhead as an endangered species is strong evidence that the

dam has not only out lived its usefulness, but that it is a serious obstacle to reclaiming the health of a threatened ecosystem.

The political climate is bad for asking for any funds, but it certainly makes more sense to ask for money to do a less costly alternative of dam removal with pump replacement than the more costly one of repairing an old irrigation dam. There are no real legitimate reasons for keeping the dam, especially given that there is an alternative that is more economical, that is within financial reasonableness and that is environmentally sound. The time is right to remove the dam when so many of the parties are willing to cooperate and so much economic and environmental benefit can be obtained. Therefore, I urge you to adopt the preferred alternative of removing Savage Rapids Dam with pump replacement and immediately seek funding to that end.

Sincerely,

Douglas M. McGeary
Jackson County Resident

cc Sen. Mark Hatfield
Sen. Bob Packwood
Rep. Wes Cooley
Rep. Peter DeFazio
Gov. John Kitzhaber
State Sen. Brady Adams

BUREAU OF RECLAMATION OFFICIAL FILE COPY
FEB 21 1995
TO | INIT | DATE
6309 | | 2/21
FILE

February 14, 1995

Robert J. Hamilton
Bureau of Reclamation
1150 North Curtis Road
Boise, Idaho 83706-1234

Dear Sir:

My name is Ronald Marrington. I live at 4856 Rogue River Hwy, Gold Hill, Oregon. I have lived at this location for over nine years. This property has frontage on the Rogue River about four and one-half miles above Savage Rapids Dam.

I personally would not trade my property on the River for similar property on the "lake" created by the Dam. It would seem there should be no particular loss in property values to owners of property along the "lake" occasioned by removal of the Dam.

G.P.I.D. must either correct the fish passage problems posed by the Dam or cease taking irrigation water from the River at some future time certain. If the District has 7700 members and the costs to repair the Dam and correct fish passage problems is $17000000, it would require an assessment per member of over $2200. Such an assessment would seem out of the question. To do nothing would eventually result in no water for irrigators. The G.P.I.D. Board made the proper decision to remove the Dam and replace it with a pumping system.

The Bureau of Reclamation proposal for Dam removal and pump replacement, at a cost of $11000000, would eliminate most of the opposition from those factions who support the preservation and enhancement of the anadromous fish population.

The defenders of the Dam, who have chosen Brady Adams as their champion, appear to expect the taxpayers to pay $17000000 for an anadromous fish passage solution that will provide for less fish survival than the $11000000 solution. Hopefully, such political intrigue will meet with no greater success than the do nothing alternative.

Removing the Dam and replacing it with a pumping system as proposed by the Bureau of Reclamation is a win situation for all parties. Property owners preserve their property values. Irrigation users preserve their access to water. The Rogue River fishery is preserved and enhanced. The taxpayers interests are best served.

This writing supports the Bureau of Reclamations position for Dam removal and pumping system replacement and requests the Federal funding be made available to complete the project.

Very truly yours,

Ronald Marrington

BUREAU OF RECLAMATION OFFICIAL FILE COPY
FEB 23 1995

TO	INIT	DATE
6309	RJN	23 Feb

ACTION MADE BY

T.E.& HELENE A.MECHEM
2202 CRESTON COURT
MEDFORD,OR.97504
503/776-4841

FEBRUARY 10,1995
F:SAVAGE.RPD

U.S.BUREAU of RECLAMATION
Attention PN-6309
CURTIS ROAD,
BOISE,IDAHO 83706-1234

Subject:-Rapid Dam

DEAR SIRS:-

As a retired Plant Engineer from and aviation corporation, I find the lame arguments of the fish and game advocates that it is to costly to re-engineering said dam to improve fish runs is ridiculous. This is certainly not a major project as some of the fish and game advocates would like one to believe.

Gentlemen there comes a time in this world that fish just don't need to be 100% comfortable in their life and after all there are human beings with their properties rights that need to be protected also.

Also the beauty of the locale is paramount to the area, and yes the property owners certainly have their rights to have said backwater lake.

Lets for once let this dam remain and reengineer the fish runs for their happy progress up stream... it can be done.

For you information, I am not a property owner in this area but a concerned citizen that doesn't like to see property owners snowed with false actuations and bad propaganda.

Sincerely,

T.E. Mechem

T.E.MECHEM

Thurs. Dec. 22, '94
Grants Pass, Or.

BUREAU OF RECLAMATION OFFICIAL FILE COPY
DEC 23 1994

TO	INIT	DATE
6309		

ACTION MADE BY

Regional Director,
Bureau of Reclamation, Boise, Ida.

Dear Sir:

Am writing to urge you - and your people - to please remove Savage Rapids Dam, also Elk Creek Dam. Savage Rapids is an eye sore & serves no purpose ~~of dam in~~ favor of the salmon - the more fish that go up the rivers to spawn, make more money (a good livelihood) for the fishermen on the Coast. Of course, the people who live above the dam like having a lake (full of noisy summertime boaters). For a few short weeks?

My husband & 3 sons have hunted & fished in practically all the Western States, true sportsmen, & are against so many dams. - if and when another good flood comes along, like the '55 & '64 floods, of what use will be those many little dams? Leave Nature alone - I am a Conservationist, not an environmentalist.

Please remove Savage Rapids Dam, let the river flow free, & let the salmon live naturally.

Thank You

Edith Newby
601 N.E. 8th #E
Grants Pass, Or. 97526

476-4802

BUREAU OF RECLAMATION
OFFICIAL FILE COPY
FEB 24 1995
TO | ACTION | DATE
FOLDER ID
FILE

7 · 18, 1995
E. P. Gray

Robert J. Hamilton
Bureau of Reclamation, 1150 N. Curtis Rd.
Boise, Idaho 83706

Sir:
In for taking the Savage Rapids Dam Out.
My father, brother, husband & 3 sons use fished -
I see fewer & fewer fish & more & more dams.
When we came to Grants Pass 30 years ago,
a few salmon used to be seen struggling
over the dam, & there were eels to be seen too.
Now one doesn't see fish or eels or anyother
thing in the water except human bodies.
The dam is so unsightly & ugly. Let the river
run free.
I am 82 years old & have lived & travelled
all over the Northwest. I remember when
every stream, river, pond & lake was
full of fish, & other goodies. Now nothing,
not even a frog. Too many dams.

Sincerely,
Edith E. Newby
601 N.E. 8th #E. Grants Pass, OR
97526

6309 RJH

March 4, 1995

Robert J. Hamilton
Bureau of Reclamation
1150 N. Curtis Rd.
Boise, ID 83706

Dear Mr. Hamilton:

I support the dam removal/pumping alternative proposed for Savage Rapids on the Rogue River in Oregon.

The water diversion purpose of this dam would easily be replaced by a less costly pipe and pump. The Grants Pass Irrigation District will get the same amount of water it ever did and will avoid major dam repair costs.

The economic benefits of removing the dam include increasing by over 100,000 the salmon and steelhead runs on the Rogue River, one of Oregon's most important fisheries. The value of the enhanced fishery is estimated at $5 million annually. The projected $11 million removal cost would be offset in just over 2 year!

Recreational and commercial fishing industries, as well as boaters, will benefit. In addition, we will take a step away from listing Rogue River fish stocks by this significant habitat improvement.

I have yet to hear any sensible argument from the opponents of dam removal. I am sure that your careful analysis of this issue will lead you to a final decision to remove this dam, despite misguided efforts to retain it.

Thank you for considering my input.

Sincerely,

Chris Orsinger
3100 Willamette St.
Eugene, Oregon 97405

February 18, 1995

Mr. Robert J. Hamilton
Bureau of Reclamation
1150 North Curtis Road
Boise, ID 83706-1234

BUREAU OF RECLAMATION OFFICIAL FILE COPY
FEB 22 1995

TO	INIT	DATE
6209	RJH	22 Feb
FILE		

ACTION MADE BY

Dear Mr. Hamilton:

I am writing to support the preferred alternative, dam removal/pumping alternative, for Savage Rapids Dam on Oregon's Rogue River. I am a native of the Rogue Valley, and until recently have lived there all of my life. My family's property is on the Rogue, above Dodge Bridge. We moved to the river in the early fifties. Our property has one of the oldest water rights on the upper Rogue.

During the course of our tenure on the river, I have seen a steady decline in the fishery, and the overall quality of the river. I attribute this decline to many things, but foremost I believe that dams have had the most serious negative impact on the river. I believe that I have a good understanding of both the benefits and the drawbacks of dams. In the 1950's and 1960's our family lost nearly thirty acres to flooding. Regardless of the fact that dams now help protect our land, I do not believe that they are in the net, beneficial. It is not the taxpayer that needs to support and protect people who choose to live on a flood plain. It certainly should not be the eco-system that is made to pay.

The Rogue River fishery is world famous, and in serious decline. Oregon Waterwatch reported that the loss of income due to the fishery decline is $5,000,000.00 annually. I cannot conceive that Savage Rapids dam is in any way capable of mitigating that loss to the citizens of Oregon. The owner of the dam, Grants Pass Irrigation District (GPID) is currently under an order from the Oregon Water Resources Commission to remove the dam, but cannot do so without Federal assistance. The cost to remove the dam and replace it with irrigation pumps is estimated at $11,200,000.00. When contrasted with an annual fishery loss of $5,000,000.00 or $17,600,000.00 to repair the dam, your preferred alternative is clearly the best. It seems to me to be a win-win situation. The taxpayers spend less, we restore a significant annual income with the restoration of the fishery, and GPID still can provide water for their customers.

In summary, I support your preferred dam removal/pumping alternative. I believe that this is the most cost effective means of ensuring that GPID customers continue to have needed water, of restoring the fishery and bringing a significant annual dollar amount to Oregon and it's businesses.

Sincerely,

Steve

Stephen K. Parsons

cc: Gov. John Kitzhaber, Sen. Mark Hatfield, Sen. Bob Packwood, Rep. Peter DeFazio, Rep. Les Cooley

BUREAU OF RECLAMATION OFFICIAL FILE COPY
MAR 16 1995

TO	BY	DATE
6209	RJH	20 Mar
FILE		

ACTION MADE BY

221 JOSEPH DR.
TALENT, OR. 97540
MARCH 8, 1995

ROBERT HAMILTON
1150 NORTH CURTIS RD.
BOISE, ID. 83706-1234

DEAR SIR,

I AM WRITING TO ENCOURAGE THE REMOVAL OF SAVAGE RAPIDS DAM ON THE ROGUE RIVER. THE BUREAU OF RECLAMATION HAS RECOMMENDED THE DAM REMOVAL/PUMPING ALTERNATIVE TO SOLVING THE LONG STANDING PROBLEMS CREATED BY THIS DAM. I STONGLY SUPPORT FUNDING TO IMPLEMENT THIS ACTION.

SAVAGE RAPIDS IS A CLASSIC EXAMPLE OF PLANNING AND RESOURCE MANAGEMENT AT ITS WORST. THE DAM'S FATE HAS BEEN DEBATED FOR YEARS. DAM REMOVAL IS THE ECONOMICALLY AND ENVIRONMENTALLY FEASIBLE THING TO DO. IT WILL DRAMATICALLY INCREASE THE ROGUE'S SALMON AND STEELHEAD RUNS WHILE STILL PROVIDING WATER FOR GRANTS PASS IRRIGATION DISTRICT.

THE BUREAU OF RECLAMATION ESTIMATES THAT DAM REMOVAL HAS TWICE THE NET BENEFITS OF ANY OTHER ALTERNATIVE. PLEASE REQUEST AND SUPPORT FUNDING FOR THIS LONG OVERDUE PROJECT WHOSE BENEFITS WILL BE OBVIOUS AND LASTING.

SINCERELY,

Jon Pearson

JON PEARSON

BUREAU OF RECLAMATION OFFICIAL FILE COPY
FEB 22 1995

TO	INIT	DATE
6309	AN	2-15-95
FILE		

January 18, 1995

Regional Director
Bureau of Reclamation
Attnt: PN-6309
1150 North Curtis Rd.
Boise, Idaho 83706-1234

Gentlemen:

I do not believe it will take 17 Million dollars to fix the fish ladders at Savage Rapids Dam. That figure included more than just the ladders, it was for paved parking, observation decks, and public bathrooms. Now I ask you, why do we need these types of improvements? This figure is rediculas as is tearing down the DAM. We need this Dam for recreation, water storage and fire fighting, water foul and the beauty of the lake in the Summer.

Lets get some bids from contracotrs for only the necessary repairs. Tearing down this useful structure is just not acceptable to the homeowners above the dam or the reasons I've stated above.

My parents live on the lake and our whole family and many of our friends do enjoy recreation all Summer there. We want to keep the Dam.

Kathy Peckham

Kathy Peckham
1141 Darneville Ln
Grants Pass, Oregon 97527
503-479-8389

BUREAU OF RECLAMATION OFFICIAL FILE COPY

6309	AN	7 Mar
FILE		

Alice L. Kelly
557 Sunset Crest Road
Grants Pass OR 97527

3 March 1995

Robert J. Hamilton
Bureau of Reclamation,
Dear Sir:

This is protest against the removal of Savage Rapids Dam. I have known this area for 70 years & I never know the fish had become so stupid they don't know how to go up the ladder like they have been doing for 73 years.

But as usual as the government always does in the U.S.A. – Build & then tear down – Build & then tear down. Ruin the pleasure all of us receive because of the lake area, destroy the value of property. Good old Stupid government.

Do not destroy this lovely area – Please!!!

Yours truly
Alice L. Kelly

ENV-5.00-

3/18/95

P.O. Box 1874
Grants Pass, OR
97526

Bureau of Reclamation

Hello,

I am writing to support the idea of removing Savage Rapids Dam on the Rogue River near Grants Pass. The fish runs have declined drastically over the past 30 years, and Savage Rapids Dam is part of that problem. Removing the dam will benefit our anadromous fish runs, and a water pumping plant will satisfy our local irrigation needs.

Sincerely,

Steven Tichenor

BUREAU OF RECLAMATION OFFICIAL FILE COPY
MAR 6 - 1995
TO | INIT | DATE
6309 | RJH | 7 Mar
FILE

March 1, 1995

Robert J. Hamilton
Bureau of Reclamation
1150 N. Curtis Rd.
Boise, ID 83706

Dear Mr. Hamilton:

I am writing to inform you of my full support of the Savage Rapids Dam removal as outlined in the Environmental Impact Statement of December 1994. Funding for the implementation of this plan is the obvious next step.

I hope this leads to a chain reaction removal of all unnecessary dams which misuse and abuse water, and harm essential fish populations.

Sincerely,

Kelley S Webb

Kelley Webb

Sarah M. Willey
Mar 7

BUREAU OF RECLAMATION OFFICIAL FILE COPY
MAR 13 1995
INIT | DATE
6309 | RJH | 7 Mar
FILE

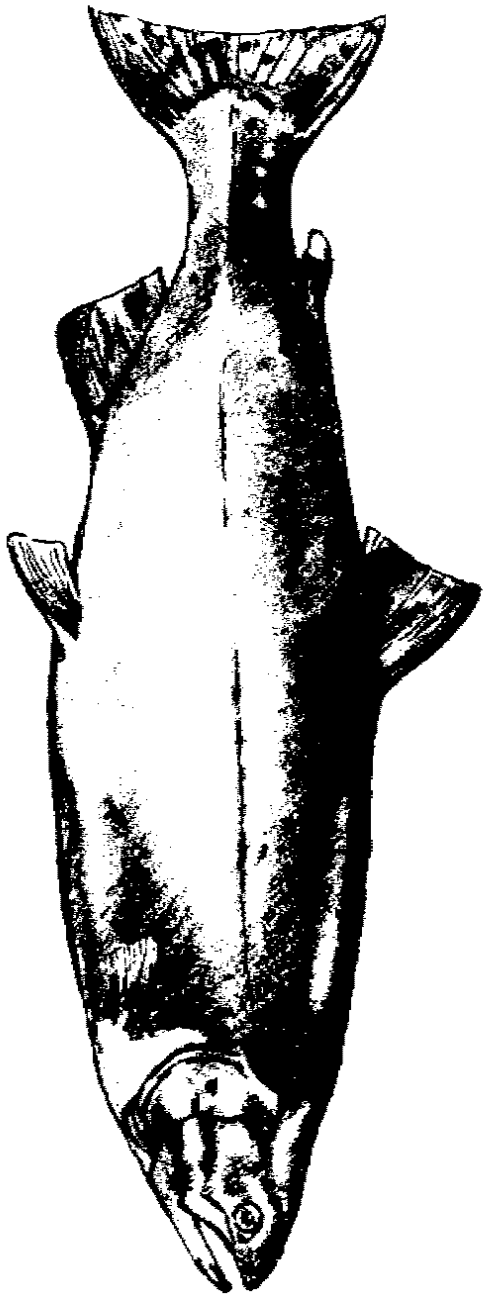
Robert J. Hamilton
Bureau of Reclamation
1150 Curtis Road
Boise, ID 83706-1234

Re: Savage Rapids Dam on the Rogue River

Dear Mr. Hamilton,

I live in Sunny Valley, about 20 miles from Grants Pass and am very concerned about the proposed removal of Savage Rapids Dam. Enclosed is an article from the Grants Pass Daily Courier by Dan Guthrie of the Courier's staff. I believe as he does; that it would be a big loss to this area to remove the dam. Would you please read the article and consider what he says? Thank you. Sarah M Willey

3901 Placer Rd.
Wolf Creek, OR
97497



Attachment J—Wild and Scenic Rivers Determination

ENV 700
GP

United States Department of Agriculture
Forest Service
Pacific Northwest Region
P.O. Box 3623
Portland, OR 97208-3623
333 S.W. First Avenue
Portland, OR 97204

MAR 23 1995

CONTROL NO. 95-1261

FOLDER ID 8610

Reply To: 2350

Date: March 21, 1995

630/RN 23 Mar

Mr. John W. Keys, III
Regional Director
Bureau of Reclamation, ATTN: PN-6309
1150 North Curtis Road
Boise, ID 83706-1234

Dear Mr. Keys:

Enclosed is the Wild and Scenic Rivers Act Section 7(a) Determination prepared jointly by the USDA Forest Service and USDI Bureau of Land Management for the proposed fish passage improvement at Savage Rapids Dam.

Our conclusion is that neither of the proposed action alternatives would invade or unreasonably diminish the scenic, recreational, and fish and wildlife values of the Rogue Wild and Scenic River.

Sincerely,

for Richard A. Fenaroli

JOHN E. LOWE
Regional Forester

Enclosure

SECTION 7(a) DETERMINATION

WILD AND SCENIC RIVERS ACT

for

Planning Report/Draft Environmental Statement (PR/DES)
Fish Passage Improvements -- Savage Rapids Dam

Prepared by:

USDA Forest Service
Pacific Northwest Region

and

USDI Bureau of Land Management
Oregon/Washington

SECTION 7(a) DETERMINATION, WILD AND SCENIC RIVERS ACT
Proposed Fish Passage Improvements -- Savage Rapids Dam
Upstream of Rogue Wild and Scenic River
Siskiyou National Forest and
Medford Bureau of Land Management District Office

Introduction

On December 15, 1994, the Bureau of Reclamation (BOR) filed a Planning Report/Draft Environmental Statement (PR/DES) for proposed fish passage improvements at the Savage Rapids Dam. The PR/DES analyzed two "action" alternatives. These alternatives can be summarized as follows:

1. PUMPING ALTERNATIVE (Preferred Alternative). This alternative would entirely remove the existing dam and install pumping stations to supply water to existing irrigation facilities. This alternative would increase salmon and steelhead escapement at the site by an estimated 22%. It would also eliminate a seasonal reservoir above the dam. The estimated cost of the alternative based on January 1993 prices is $11,205,000.

2. DAM RETENTION ALTERNATIVE. This alternative would retain the dam with numerous improvements to the dam, fish passage and other facilities. Steelhead and salmon escapement would increase an estimated 17%. Seasonal flatwater provided by the reservoir would continue. The estimated cost of the alternative based on January 1993 prices is $17,634,000.

The project is located approximately 30 miles upstream of the upper termini of the Rogue Wild and Scenic River (W&SR). The Rogue W&SR is administered by the Secretary of the Interior and the Secretary of Agriculture through the Bureau of Land Management (BLM), Medford District Office and the U.S. Forest Service (USFS), Siskiyou National Forest, respectively.

Section 7(a) Requirement

Section 7(a) of the W&SR's Act provides a specific standard for review of certain developments below or above a designated Wild and Scenic River.

> "...no department or agency of the United States shall assist by loan, grant, license or otherwise in the construction of any water resources project that would have a direct and adverse effect on values for which such river was established, as determined by the Secretary charged with its administration. Nothing contained in the forgoing sentence, however, shall preclude licensing of, or assistance to, developments below or above a wild, scenic or recreational river area or on any stream tributary thereto which will not invade the area or unreasonably diminish the scenic, recreational, and fish and wildlife values present in the area on the date of designation of a river as a component of the National Wild and Scenic Rivers System."

Background

Project: Savage Rapids Dam was constructed in 1921, nearly 50 years before the Rogue Wild and Scenic River was designated by Congress. The primary purpose of the dam is to divert water from the Rogue River for irrigation. The dam is seasonally raised for this purpose. This operation provides a seasonal reservoir during the summer. Fish passage facilities were constructed at the time the dam was completed. These passage facilities have been expanded and improved in steps over time but still result in considerable fish loss. Existing fish screens do not meet the current criteria of the National Marine Fisheries Service.

Rogue Wild and Scenic River: The Rogue River was one of the initial rivers designated via the enabling Wild and Scenic legislation in 1968. The river is designated from the mouth of the Applegate River downstream to Lobster Creek Bridge. The BLM administers the upper approximately 47 miles to the Siskiyou National Forest near Marial. The USFS has administrative responsibility for the lower approximately 37 miles located within the boundaries of the Siskiyou National Forest.

The Outstandingly Remarkable Values for which the Rogue River was designated are its natural scenic environment, the fisheries resource, and the recreational opportunities it provides. While not specifically singled out by Congress, Federal managers of the river also consider the wildlife and cultural resources to be significant.

The House Report (H.R. Rep. No. 1623, 90th Cong., 2nd Sess. 1968 USCC&AN 3801.) provides additional information about the river.

> "The section of the Rogue River under consideration for scenic river designation begins at its confluence with the Applegate River and runs 85 miles downstream to Lobster Creek Bridge. The Rogue, which drains the western slopes of the Cascade Range, is a major Pacific coast stream and contains a diversity of recreation and scenic values."
>
> "Several stretches of the river remain virtually in a natural state, passing through impressive rock gorges and canyons. The river passage is interrupted by numerous riffles and rapids. In other portions, the river flows through relatively undeveloped lands, marked only by an occasional farm."
>
> "The Rogue is a big-fish stream, with salmon catches exceeding 40 pounds and steelhead trout 15 pounds. The stream's outstanding fishing qualities, its many miles of near natural scenic environment, and its exciting whitewater boat trips are principal contributors to the river's fame. Hunting, swimming, hiking, boating, picnicking, camping, and sightseeing also are popular in the area."

The BLM and USFS manage the River under a jointly developed "Rogue National Wild and Scenic River Revised Development and Management Plan" which was published in the Federal Register on July 7, 1972". This plan provides management objectives for the entire Wild and Scenic River:

"Special efforts will be made to (1) maintain or improve the quality of water which empties in the river, (2) improve the fish and wildlife habitat, and (3) maintain its free-flowing condition."

Rationale for Determination

The determination of effects of alternatives is based on information contained in the Planning Report and Draft Environmental Statement (PR/DES) prepared by the BOR for fish passage improvements at the Savage Rapids Dam, the evaluation of BLM and USFS staff specialists and other available information. This is appropriate in accordance with 40 CFR 1502.21, 36 CFR 297.6, and 43 CFR Subpart 8351. This determination addresses both of the action alternatives in the PR/DES.

Analysis

The PR/DES prepared by the BOR specifically addresses the effects of the proposed action alternatives on Wild and Scenic Rivers (see Chapter VI, page 14). BOR findings conclude that:

"The action alternatives (Preferred Alternative and the Dam Retention Alternative) do not invade any river reach in the national system of wild and scenic rivers or state system of scenic rivers and would not diminish the scenic, recreational, or fish and wildlife values or have any effect on streamflows".

and

"the action alternatives would have no significant or measurable adverse effect on any wild and scenic river, but would have a large positive effect due to increased populations of salmon and steelhead".

The PR/DES does recognize that there would be temporary but insignificant increases in turbidity during construction with either action alternative.

USFS and BLM staff specialists who have reviewed the PR/DES and considered possible effects on downstream Wild and Scenic River values concur with the findings of the BOR.

Determination

Our conclusion is that neither of the action alternatives would invade or unreasonably diminish the scenic, recreational, and fish and wildlife values of the Rogue Wild and Scenic River.

for Richard A. Fenner

JOHN E. LOWE, Regional Forester
Pacific Northwest Region
USDA Forest Service

March 21, 1995 Date

Elaine Zielinski

ELAINE ZIELINSKI, State Director
Oregon/Washington
USDI Bureau of Land Management

March 16, 1995 Date

Responses to Public Comments -Emigrant Lake Draft EA

A. Oregon Dept. Of Agriculture

1. Thank you for taking time to review the EA and provide your comments. CRMP is widely used by archeologists in Federal agencies as an acronym for Cultural Resource Management Plan. To avoid confusing readers in Oregon , we have decided to not use the acronym CRMP in this document.

B. Joseph Strahl, Director - Jackson County, Oregon

1. Thank you for taking time to review the EA and provide your comments. We have corrected the County reference. We checked the use of the acronym SHPO in the Advisory Council on Historic Preservation Federal Register notice on the Protection of Historic Properties (36 CFR Part 800). SHPO correctly refers to the State Historic Preservation Officer.

2. We have identified Hill Creek on the aerial photograph.

3. Reclamation will work with the County to identify means of funding the recommendations contained in the RMP

C. Colonel D.Z. Boyd

1. The general locations of the no-wake zones are shown on The Plan map in the Emigrant Resource Management Plan. Boundaries will be refined and specific regulations will be developed as appropriate to protect fish and wildlife and other natural resources.

D. Bear Creek Greenway Equestrian Association

Thank you for taking time to review the draft EA and provide your comments. We are aware of your interests, and believe that connecting the Emigrant Lake area with your proposed trail system would enhance recreation opportunities. Reclamation will work with your Association to the extent possible to ensure that your planned trail extension is compatible with the multiple-use trail plan proposed under the preferred alternative.

E. R. Damasek

Thank you for taking time to review the draft EA and provide your comments.

F. James Woltanski

Thank you for taking time to review the draft EA and provide your comments.

G. Pat Hackett

Thank you for taking time to review the draft EA and provide your comments.

H. Sandrya Danehy, Parks Advisory Committee - Jackson County, Oregon

Thank you for taking time to review the draft EA and provide your comments.

1. See response to comment number 3 of Joseph Strahl, Director Jackson County Department of Public Works and Parks.

I. Frank H. Hirst

Thank you for taking time to review the draft EA and provide your comments.

J. W.R. Kim Boyd

Thank you for taking time to review the draft EA and provide your comments. Reclamation went through a long planning process before arriving at the preferred alternative. We believe the preferred alternative is a reasonable and fair compromise which addresses the most appropriate use for all the Reclamation lands **and resources at** Emigrant Lake.

K. Robert L. Peyton

Thank you for taking time to review the draft EA and provide your comments.

L. Robert J. Staal

Thank you for taking time to review the draft EA and provide your comments.

M. Rogue Group - Sierra Club

Thank you for taking time to review the draft EA and provide your comments.

N. U.S. Fish and Wildlife Service - Oregon State Office

Thank you for taking time to review the draft EA and provide your comments.

O. Oregon Department of Fish and Wildlife - Rogue District Office

Thank you for taking time to review the draft EA and provide your comments.

1. Reclamation has noted your suggestion regarding an impoundment for the Emigrant Creek arm to enhance wildlife habitat. As with the proposed Hill Creek impoundment project, we will have to pursue cost-sharing arrangements with non-Federal partners to implement fish and wildlife enhancement measures at Emigrant Lake in the future.

2. Reclamation has noted your suggestion. All special events are currently limited to the

developed park areas and, under the preferred alternative, will be subject to specific criteria to minimize disturbances to wildlife.

3. We have changed the text to reflect this information.

4. We added your department to the distribution list as requested and apologize for the oversight.

P. Vern Crawford

1. Thank you for taking time to review the draft EA and provide your comments. Night-time closure of the park is part of the County rules and regulations, but is not intended to be overly restrictive. County regulations actually state "closed at sunset," and we have corrected the statement in the document. You may want to further discuss this concern directly with the Jackson County Public Works and Parks Department.

2. Reclamation will work with Jackson County to be sure that recommendations in the Bald Eagle Management Plan (BEMP) regarding the Quarry Point area are carried out to minimize human access to the area. The BEMP will be adhered to in consultation with the Oregon Eagle Foundation and U.S. Fish and Wildlife Service.

3. The preferred alternative ensures that the road associated with hang gliding activities in Patrick Dunn Beach area will be carefully controlled and monitored. Development at this dispersed recreation area will be limited to designated vehicle access to the shoreline, designated parking, and an accessible restroom. The existing dirt road across an open grassy slope can be used only to access the hang gliding area. A permit will be issued annually to hang gliders for use of the area, maintenance of the access road, and trash pickup and removal.

4. The Emigrant Lake area remains accessible to rock climbing recreationists under the preferred alternative. If problems and conflicts associated with rock climbing activities develop in the future, they will be addressed by Reclamation and Jackson County.

5. See response number 1 to Motorcycle Riders Association letter.

Q. Oregon Eagle Foundation

Thank you for taking time to review the draft EA and provide your comments.

1. We have noted your recommendation. Reclamation will continue to work with the Oregon Eagle Foundation and other partners to ensure that any future impoundment constructed in upper Hill Creek is sited to reduce disturbance of perching and foraging bald eagles at the north end of Quarry Point.

2. We have noted your recommendation. Reclamation will consider multiple use trail plans that are consistent with the recommendations contained in the Bald Eagle Management Plan.

R. W. C. Nielsen

Thank you for taking time to review the draft EA and provide your comments.

S. Klaas and Conny van de Pol

Thank you for taking time to review the draft EA and provide your comments.

T. George Thompson

Thank you for taking time to review the draft EA and provide your comments.

U. Motorcycle Riders Association

Thank you for taking time to review the draft EA and provide your comments.

1. Reclamation is aware of the Statewide Comprehensive Outdoor Recreation Plan and its reference to the limited facilities for off-highway vehicle use in Oregon. During our lengthy **resource management and** National Environmental Policy Act planning process, we considered diverse opinions from all users and interested parties in an open public forum before formulating the preferred alternative which includes closure of all Federal land to off-road motorized vehicles. This measure reflects the general view of the **local** public that protecting the fish, wildlife, cultural, and public safety values at Emigrant Lake are major concerns**, and that continued OHV use at Emigrant Lake is not conducive to these values.**

2. See response to 1. above.

3. See response to 1. above.

V. Gary M. Reeser Jr.

Thank you for taking time to review the draft EA and provide your comments.

1. See response number 1 to Motorcycle Riders Association letter.

W. Bob Lofgren

Thank you for taking time to review the draft EA and provide your comments.

1. See response number 1 to Motorcycle Riders Association letter.

X. Tyrrell Hart

Thank you for taking time to review the draft EA and provide your comments.

1. See response number 1 to Motorcycle Riders Association letter.