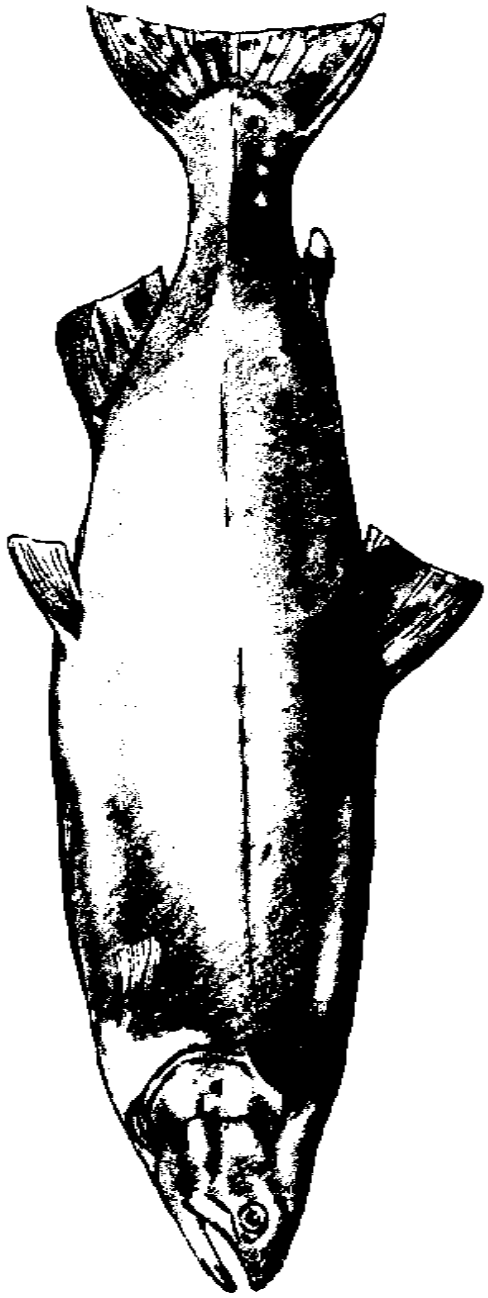


## Attachment A—Glossary

**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.

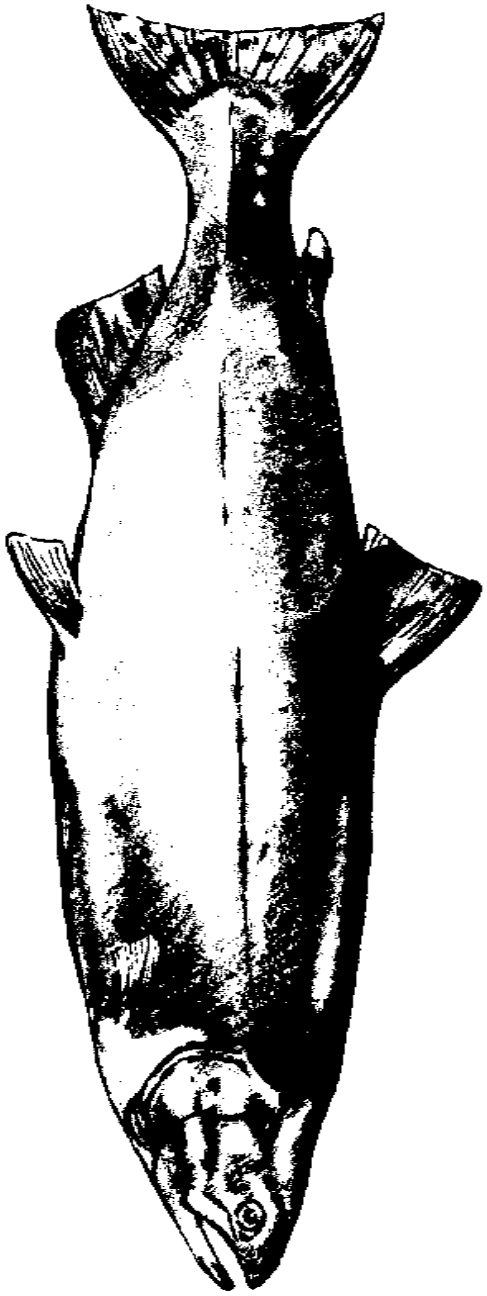
**Stoplog.**—A wooden plank or fabricated material structure that is added to the structural crest of a barricade to raise the water level.

**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 |
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| 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 |

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|---|---|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|---|---|
| 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 |

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|---|---|---|---|---|---|
| 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.

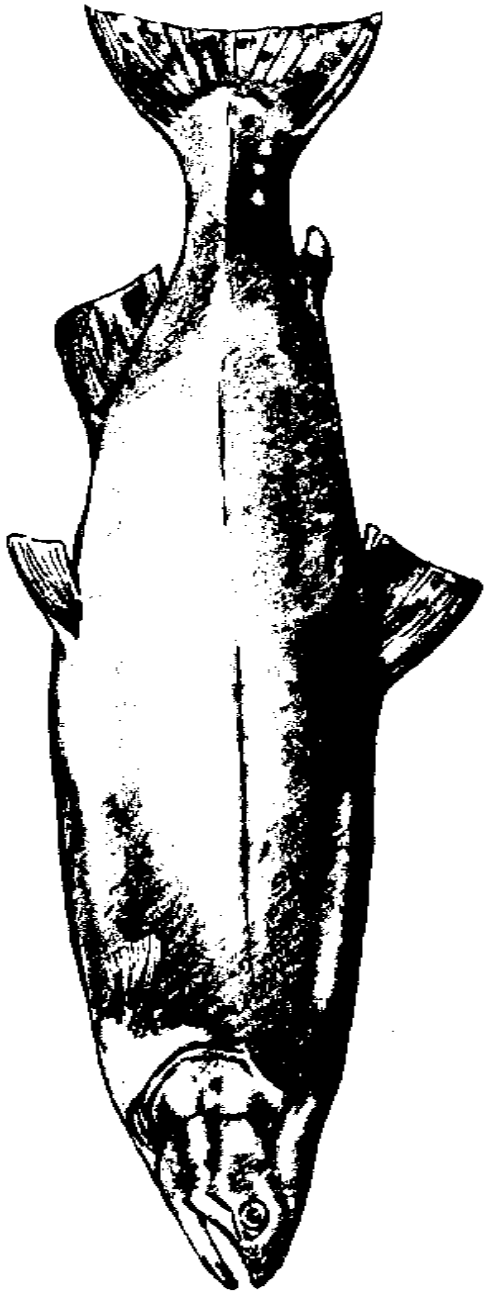
The use of water allowed herein may be made only at times when sufficient water is available to satisfy prior rights, including rights for maintaining instream flows.

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**




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 2 7 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,

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**




July 18, 1995

Memorandum

To: Regional Director, Pacific Northwest Region, U.S. Bureau of Reclamation, Boise, Idaho
Attn: Bob Hamilton

From: 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 Gast

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
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
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
ENVIRONMENTAL & TECHNICAL SERVICES DIVISION
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PORTLAND, OREGON 97232-2737
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MAY 15 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:

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.

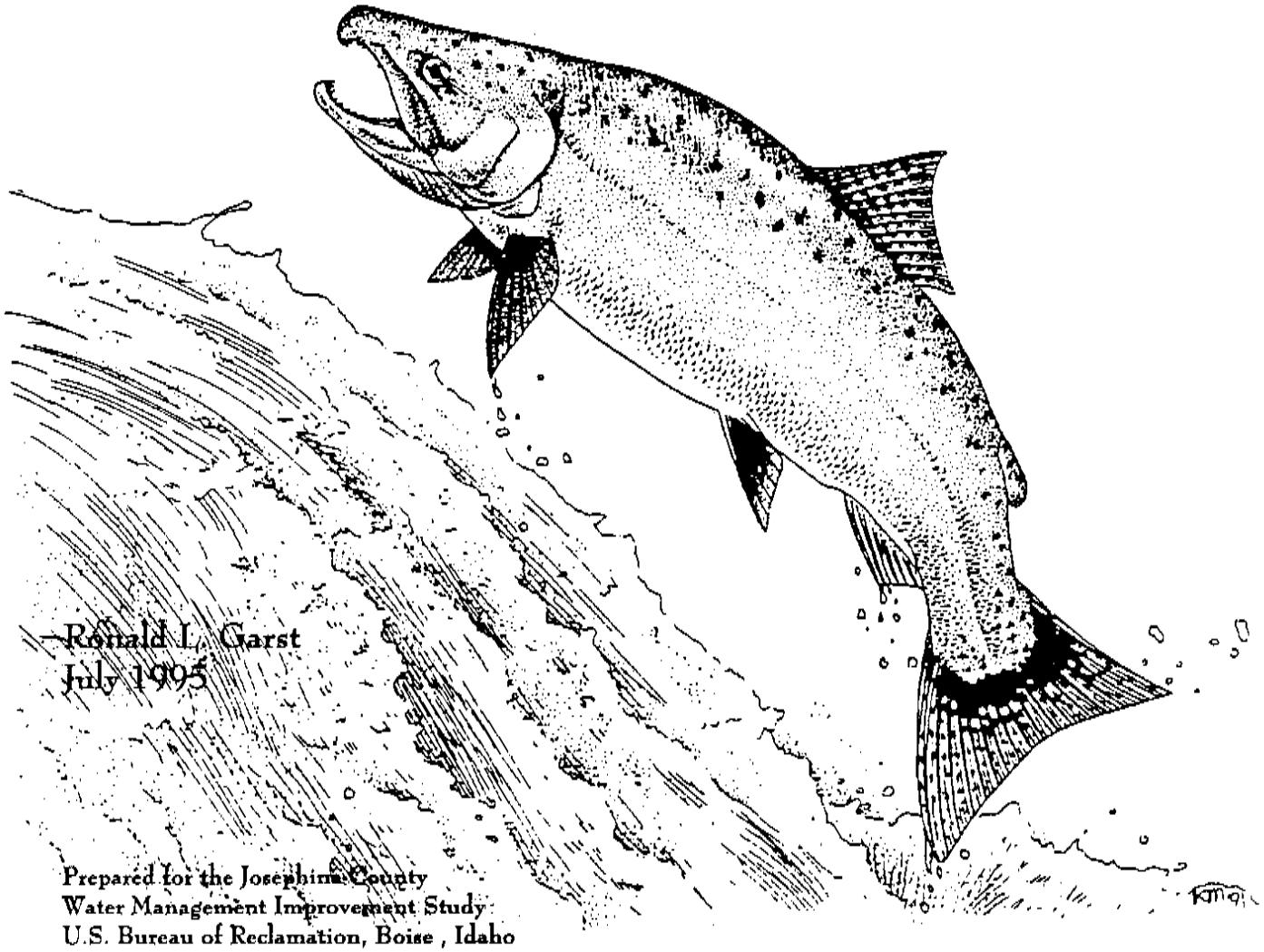
Sincerely,

Brian J. Brown

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,

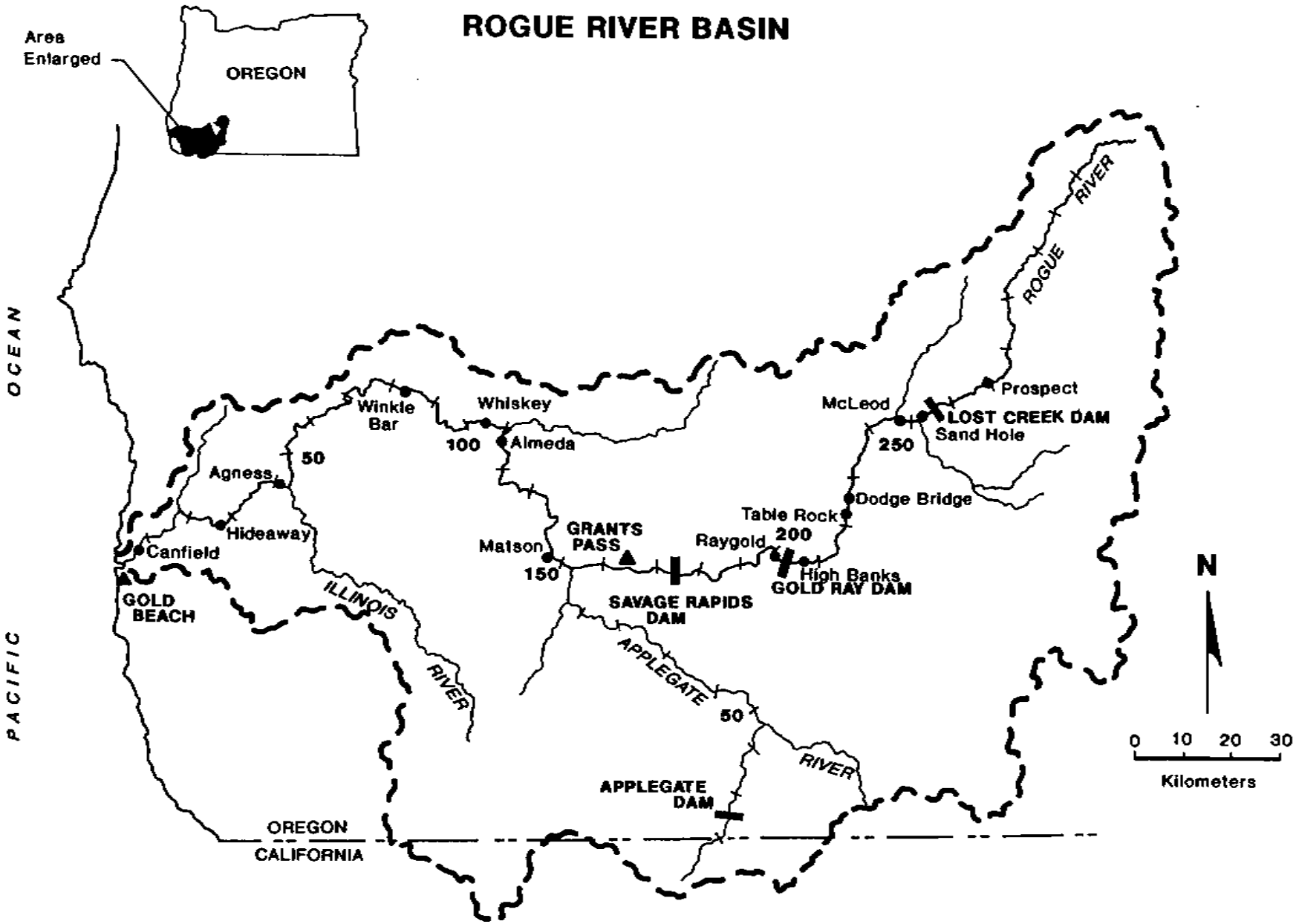


Figure 1. Map of the Rogue River Basin (Oregon Department of Fish and Wildlife, 1985).

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

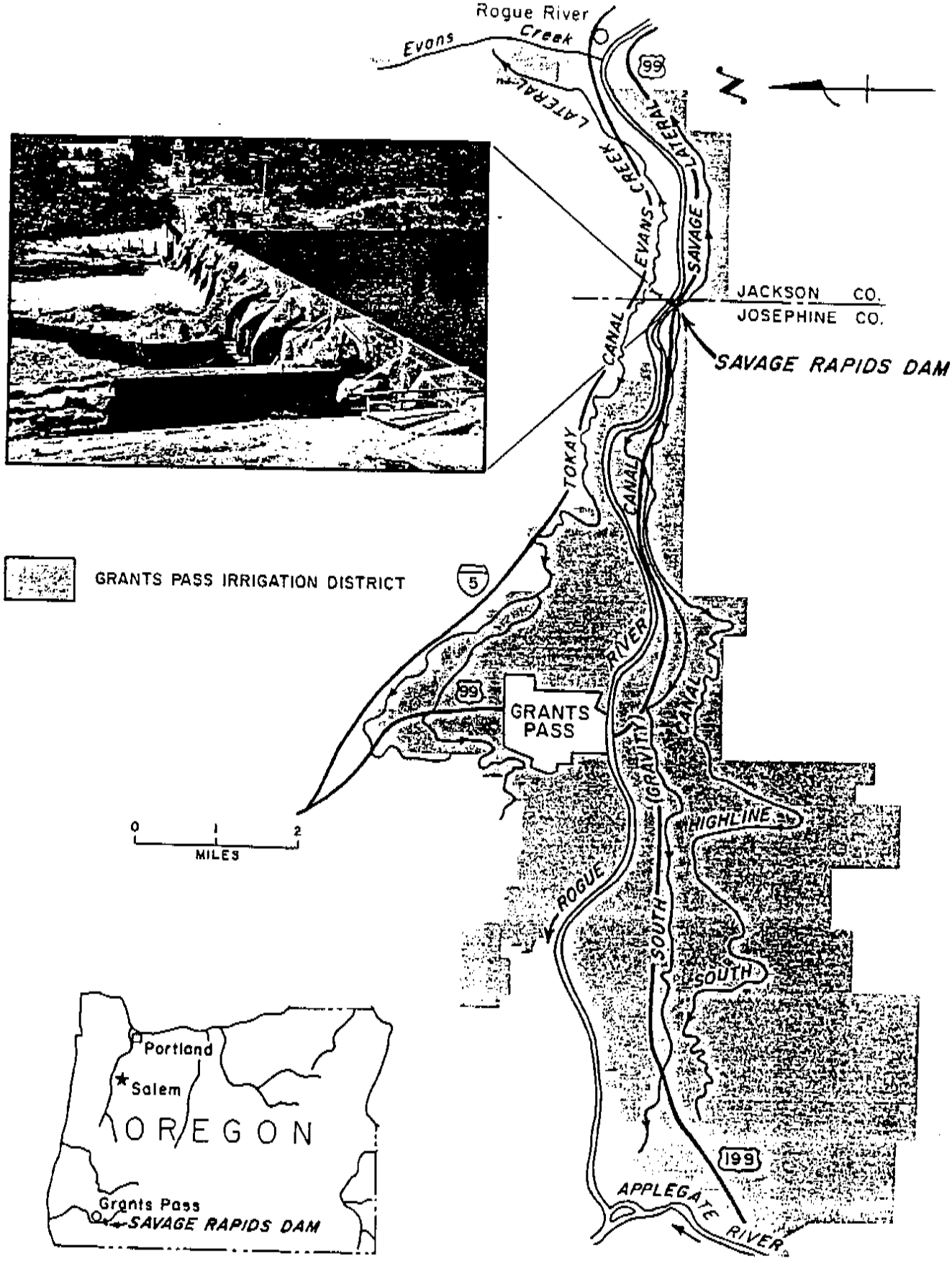


Figure 2. Savage Rapids Dam and GPID. (USBR, 1979)

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:<br>(1) Interim fish passage problems at Savage Rapids Dam (Phase I).<br>(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:<br>(1) New bulkhead gates in front of the fish screens to facilitate maintenance,<br>(2) Modify south fishway,<br>(3) Replace north fishway, and<br>(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:<br>(1) Prospects poor for a Federal project to improve irrigation facilities, so discontinue study;<br>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:<br>SPRING CHINOOK — COHO SALMON<br>FALL CHINOOK — WATER CHEMISTRY<br>SUMMER STEELHEAD — BENTHIC BIOLOGY<br>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.<br>LOST CREEK DAM JUVENILE SAMPLING REDUCED.<br>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 to 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**

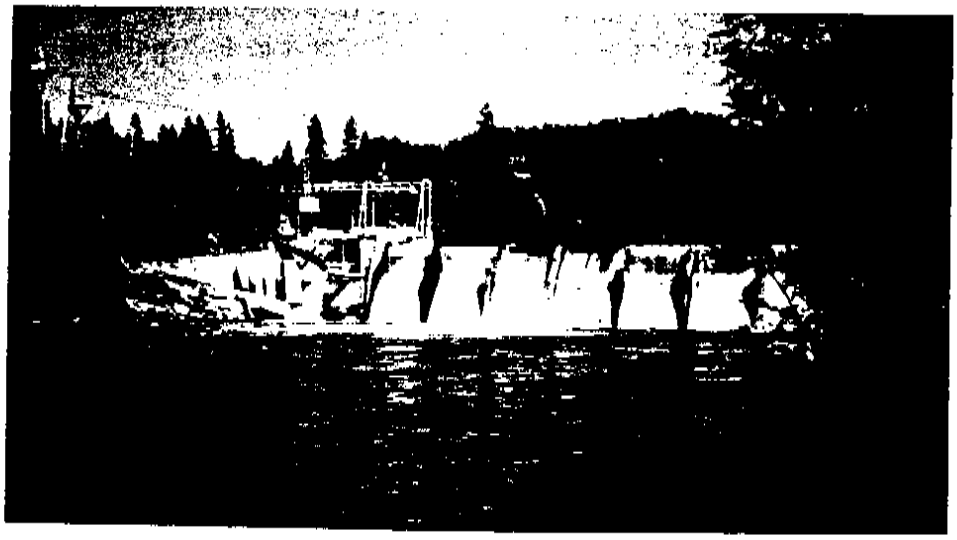

*Fig. 2***

**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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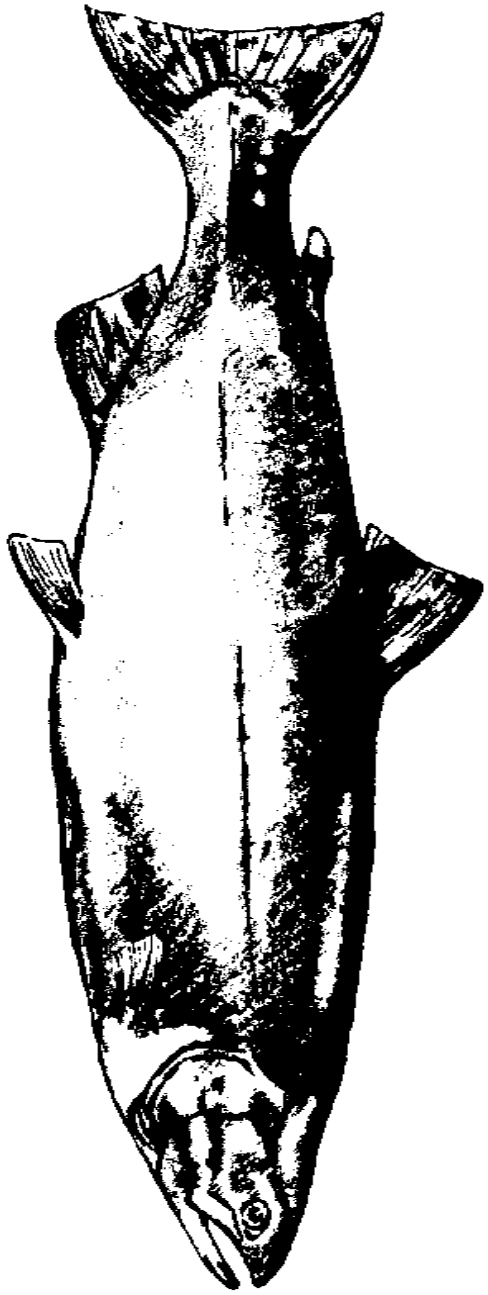
APPENDICES

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:

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"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

**Oregon Department of Fish and Wildlife***
2501 SW First Avenue
Portland, OR 97207

October 1994

## 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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* Prepared by Stephanie Burchfield, Michael D. Evenson, Mark W. Chilcote, Franklin R. Young, Michael D. Jennings, and Barry P. McPherson

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. (Does not include adult returns from half-pounders to avoid double counting). — Source: ODFW, 1994, p.189

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 3,458 | + | Adult Equiv. Downstream Passage 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 1,389 | + | Adult Equiv. Downstream Passage 886 | + | Spawning Population Increase 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 | | | Upstream Passage | | Half-pounder Equiv. Downstream Passage |
|---|---|---|---|---|---|
| | 25,697 | = | 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 | | | Upstream Passage | | Adult and Half-pounder Equiv. Downstream Passage |
|---|---|---|---|---|---|
| | 21,631 | = | 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 Increase | | Upstream Passage | | Adult Equiv. Downstream Passage |
|---|---|---|---|---|
| 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**

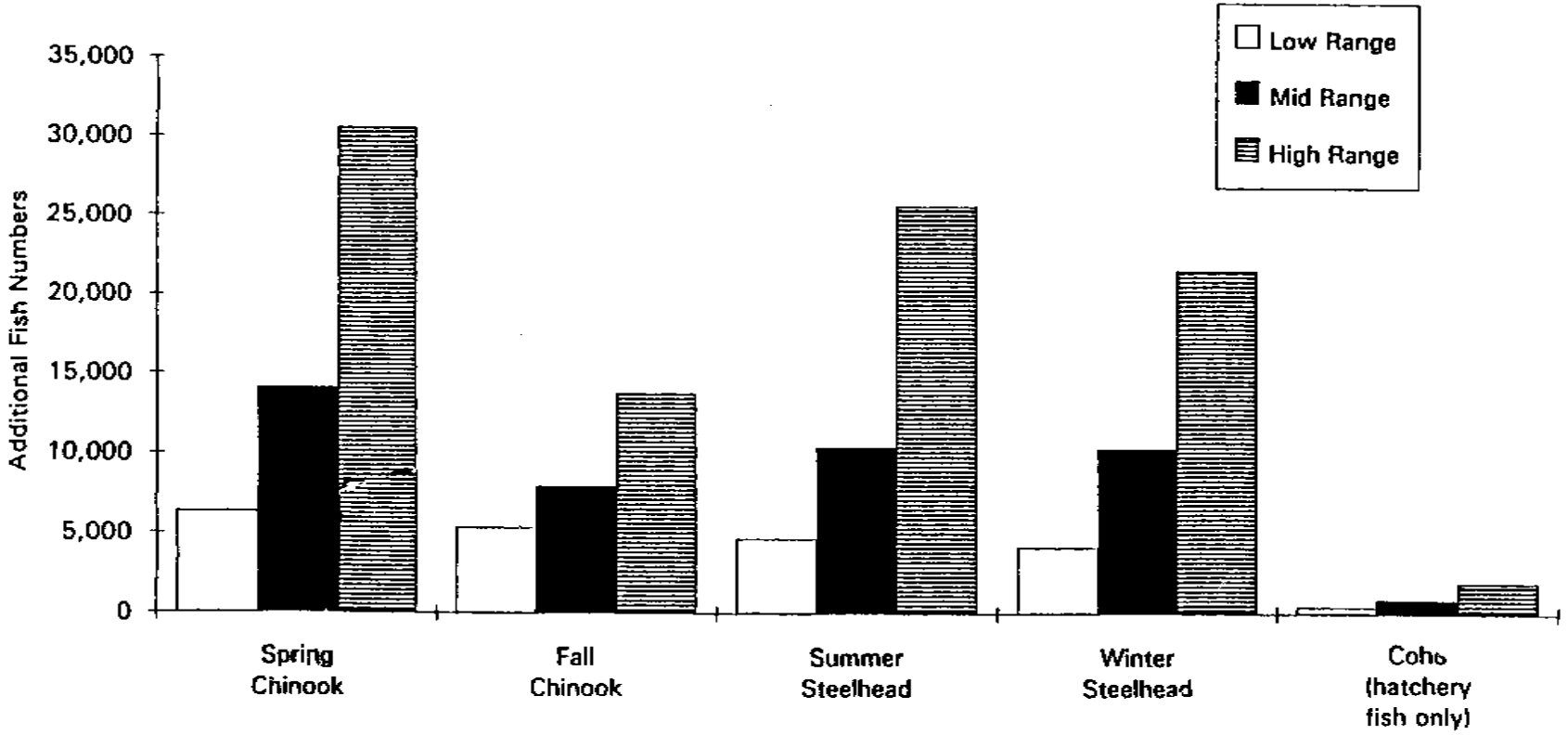
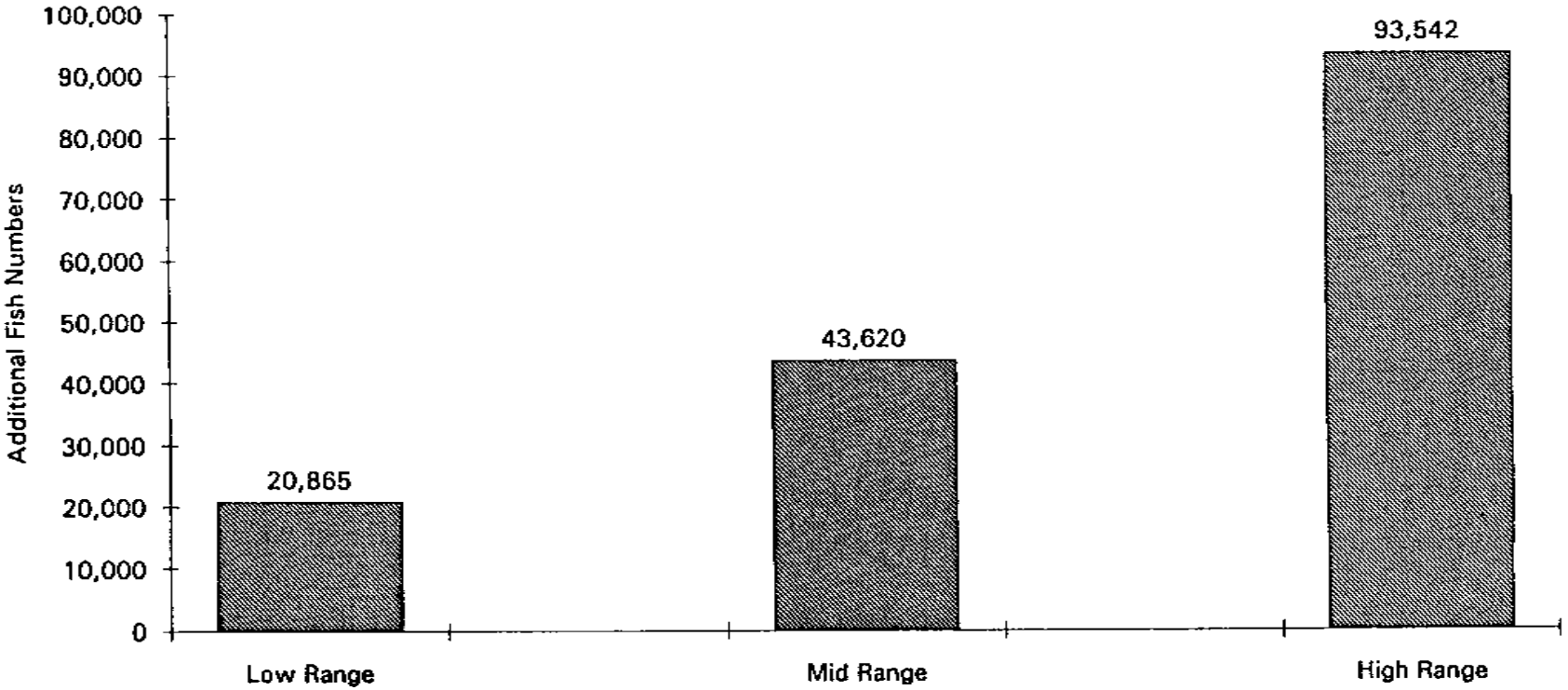


**Figure 2. Total Potential Increased Salmon and Steelhead Returns for Harvest and Spawning resulting from Savage Rapids Dam Removal**



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

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* 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,
(Adult return = 30% of total returns) 1978/79 and 1979/80

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,
(Adult return = 30% of total returns) 1978/79 and 1979/80

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**

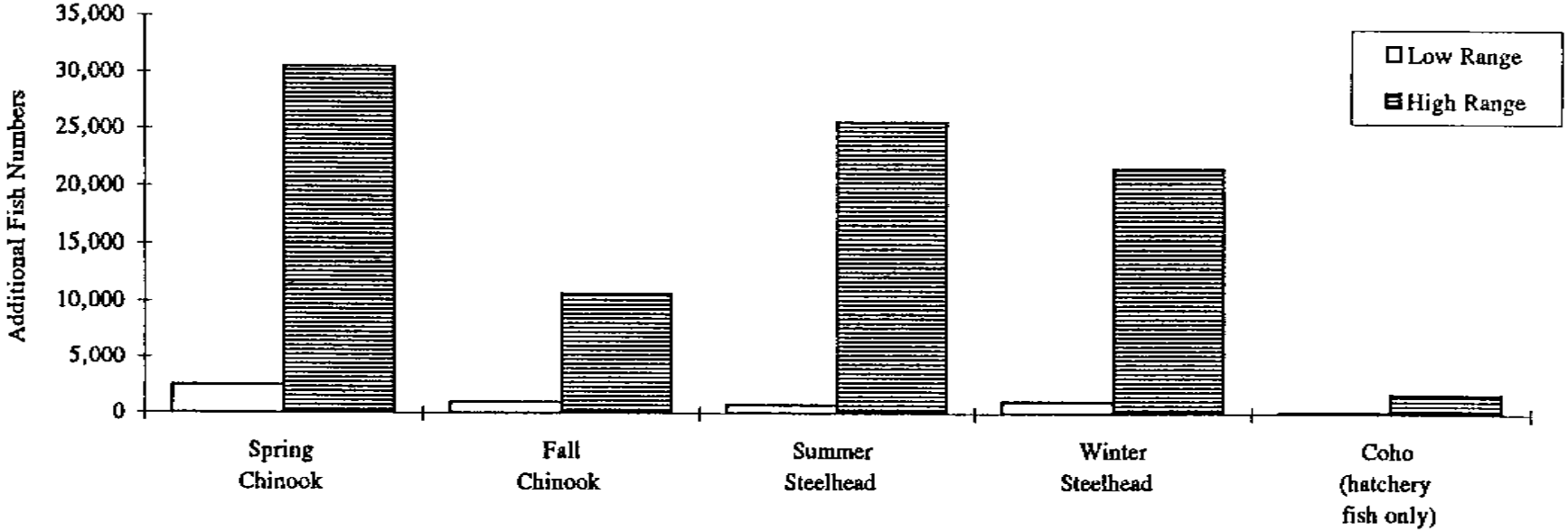
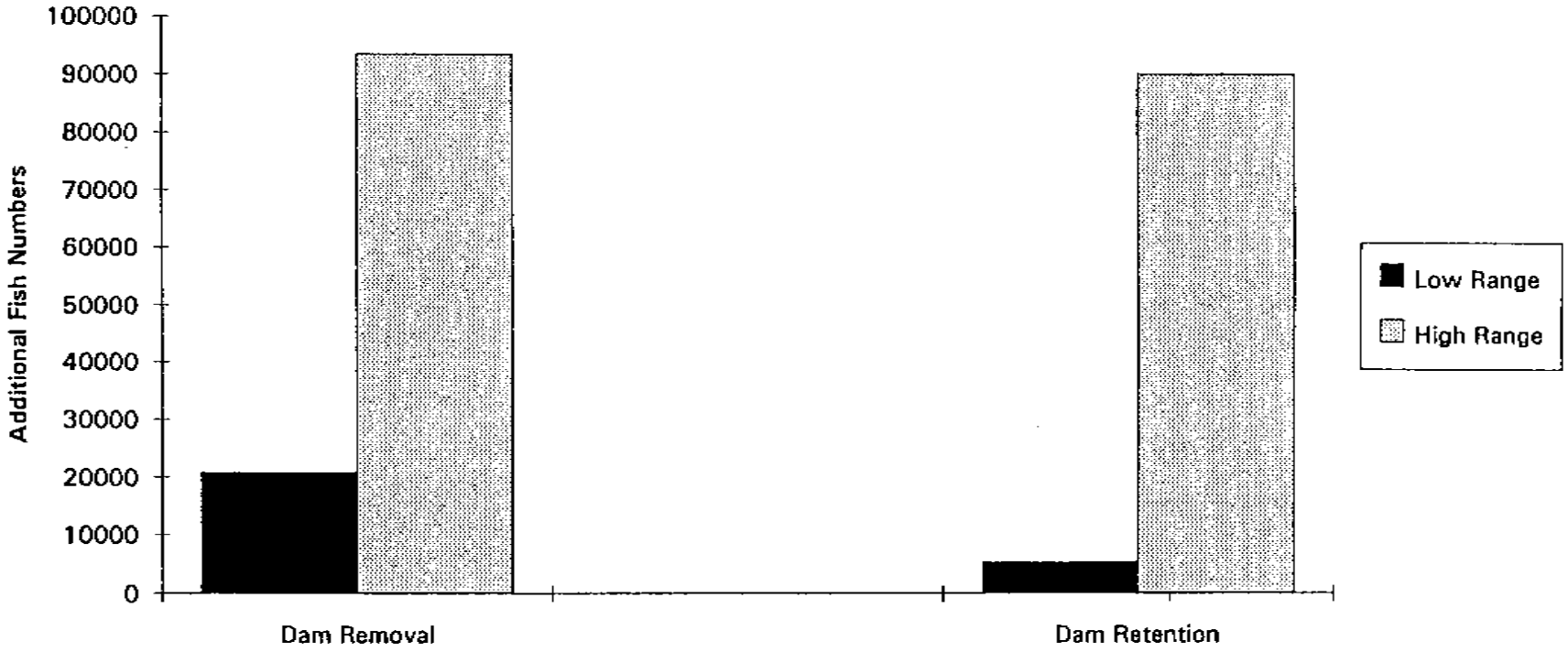


Figure 2. Total Potential Increased Salmon and Steelhead Returns for Harvest and Spawning Expected from Two Alternatives for Savage Rapids Dam: Dam Removal and Dam Alternative



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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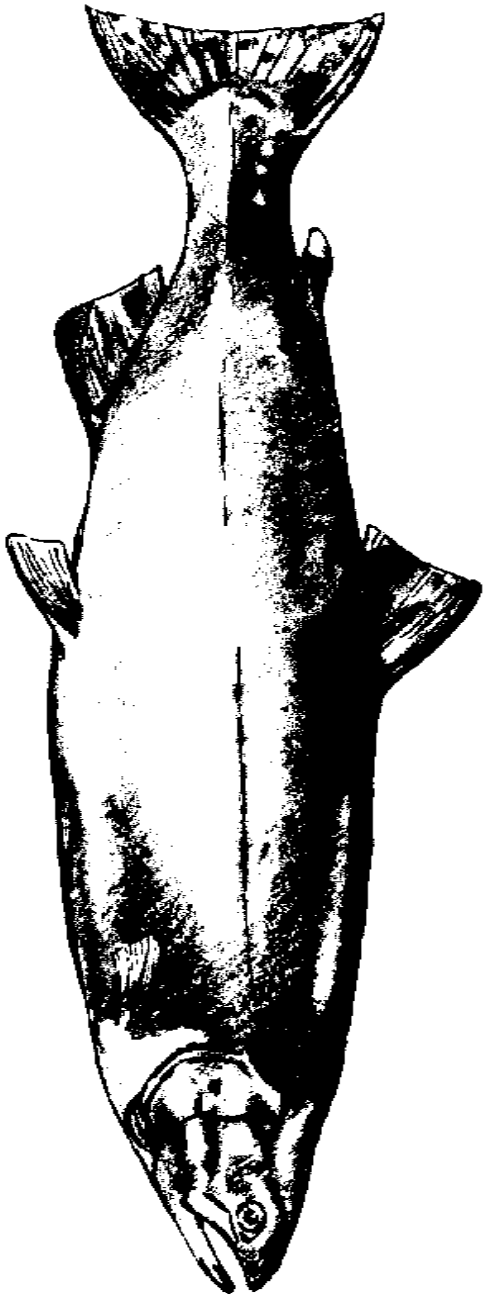


**Attachment E—GPID Resolution**

# 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. Hilius 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 right 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

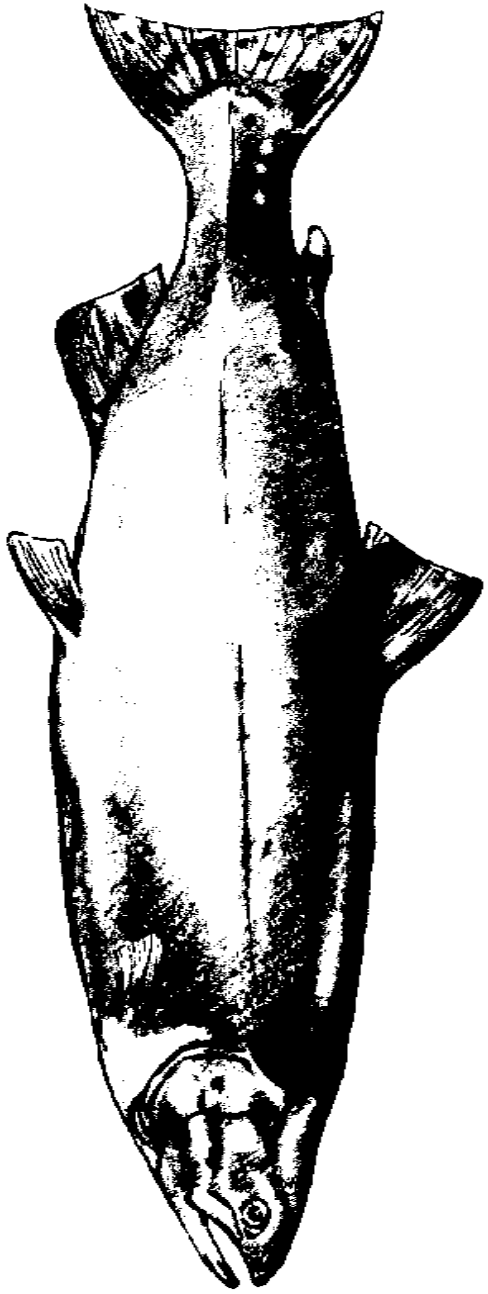
7. GPID outstanding debt for construction of Savage Rapids Dam must be forgiven; AND

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.

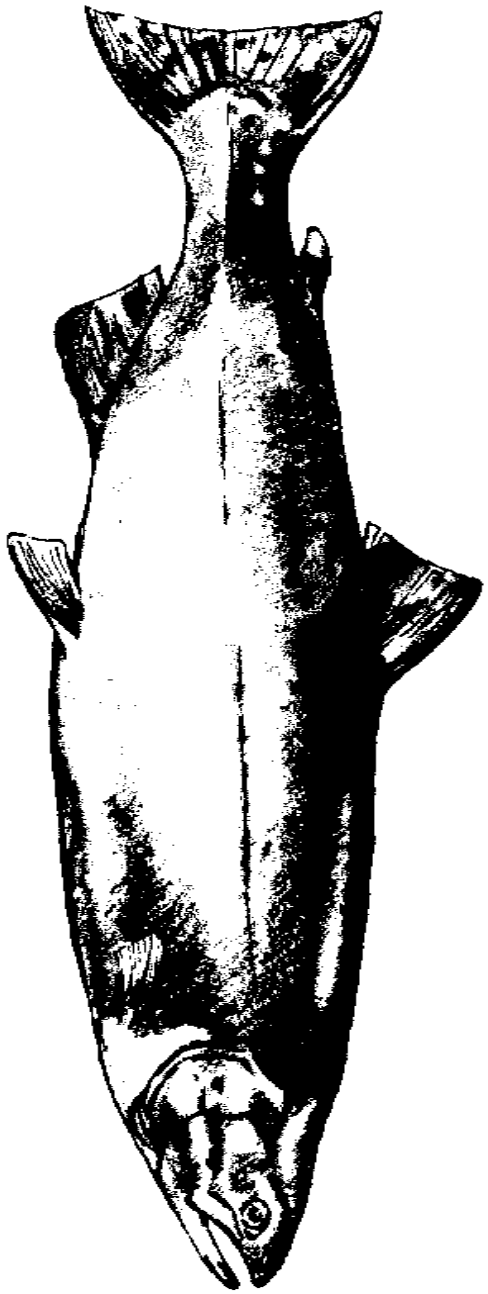
Noise abatement walls around the pumping plants of the Preferred Alternative would focus sound upward, reducing the perceived sound level of operating pumps.

## 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.

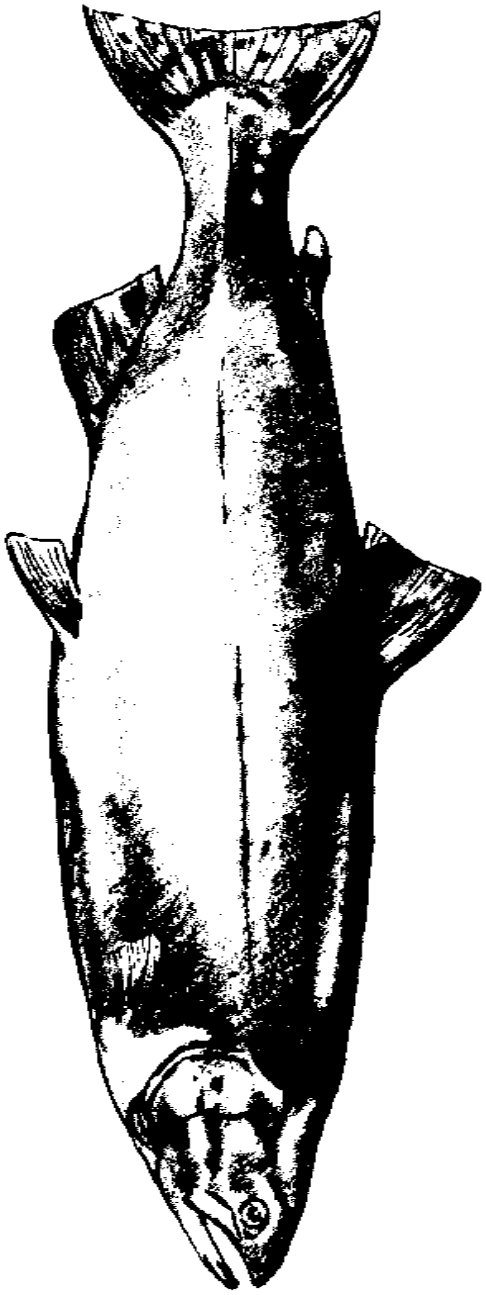
12. In addition to the terms and conditions specified herein, the use of water under this permit shall be subject to any regulation by the watermaster necessary to eliminate waste, compliance with any efficiency standards or conservation requirements which may be imposed by statute or administrative 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

73410-807

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,

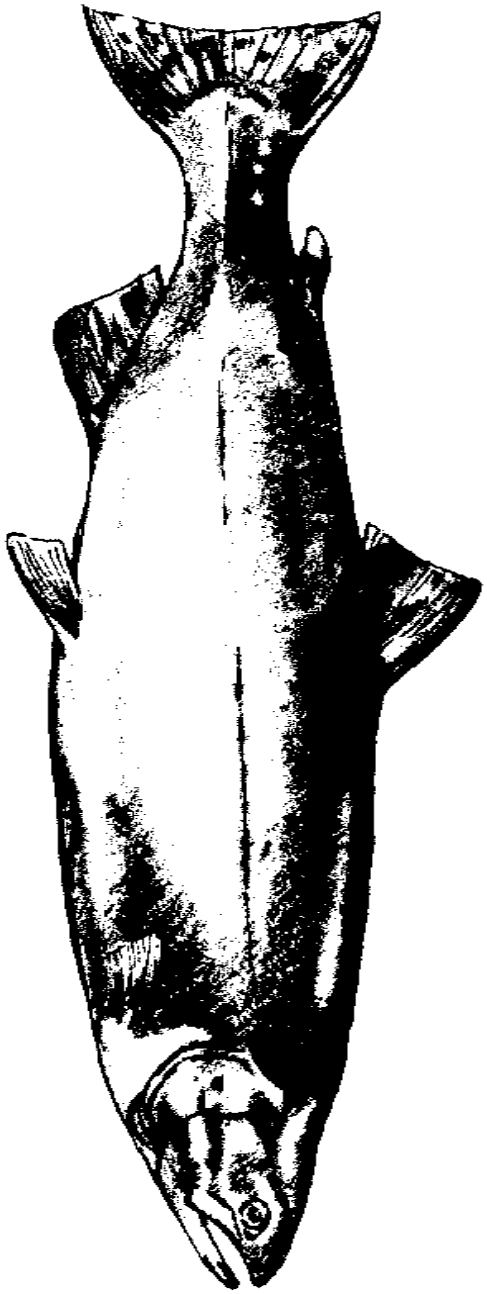
KENNETH R. REDDE

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**

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National Park Service, Seattle WA ..... I-13
U.S. Fish and Wildlife Service, Portland OR ..... I-14

State Agencies:

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Organizations:

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Randy Hinke, Grants Pass OR (2) ..... I-50
Jerry Kl---- (could not decypher name), No address
(letter identical to Charles Weaver letter) ..... I-56
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Juanita Pickett, Grants Pass OR ..... I-60
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Center for International Environmental Law, Washington DC ..... I-72
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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
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Helen E. Brown, Medford OR ..... I-85
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T.E. Mechem, Medford OR ..... I-93
Edith Newby, Grants Pass OR (2 letters) ..... I-93
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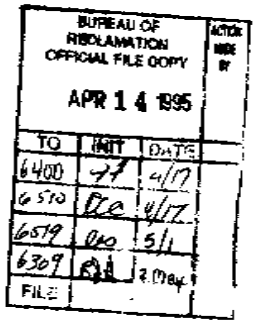
Kelley Webb, Portland OR ..... I-98
Sarah M. Willson, Wolf Creek OR ..... I-98

**UNITED STATES DEPARTMENT OF COMMERCE**
**Office of the Under Secretary for**
**Oceans and Atmosphere**
Washington, D.C. 20230

April 11, 1995




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/NWO3

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 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

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,

for

Jacqueline V. Wyland
Division Chief

cc: USFWS - Ron Garst
ODFW - Stephanie Burchfield
GPID - Dan Shephard
Donald R. Greenwood

## References

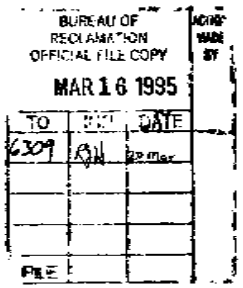
Oregon Department of Fish & Wildlife, 1994. Estimation of Rogue River salmon and steelhead population increases for the Savage Rapids "dam removal" option. ODFW, 2501 SW First Ave., Portland, OR. 97207.

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.

Response (National Park Service Letter)

# United States Department of the Interior

NATIONAL PARK SERVICE
Pacific Northwest Region
909 First Avenue
Seattle, Washington 98104-1060




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**



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

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 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. 1

**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.

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,
2 as they relate to the economic analysis. The Service recommends that the final PR/DEIS also 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.

Response (U.S. Fish and Wildlife Service Letter)

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.

4

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

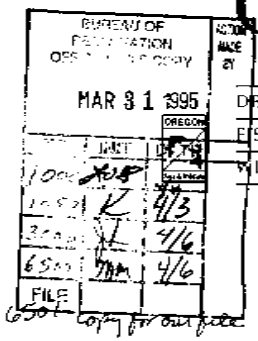
Response (U.S. Fish and Wildlife Service Letter)

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




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 encompasses the point estimates identified in the Draft ES. 1

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 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. 2

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 BOR consider identifying ranges of estimated benefits, which present a more realistic picture than point estimates. 3



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.

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.

Response (Oregon Department of Fish and Wildlife Letter)

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

American Fisheries Society
Oregon Chapter
P.O. Box 722
Corvallis, Oregon 97339



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 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. 1

Fine sediment content, or better yet, intergravel dissolved oxygen, in chinook salmon redds 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 2





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
2 was done in the 1970s. Since that time, state-of-the-art fishways, 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 retrofitting 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.

Response (Northwest Environmental Defense Fund Letter)

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
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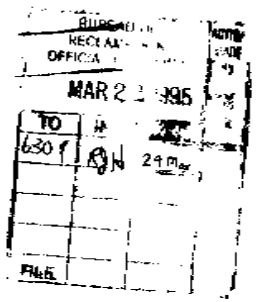
*Protecting Oregon's lands, waters and natural resources*




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 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.

1

**Preferred Alternative**
The Bureau has correctly identified removal of Savage Rapids Dam as its preferred 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

*Printed on 100% recycled paper (50% post-consumer waste)*

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.

THREE RIVERS WATERSHED COUNCIL, INC.
P.O. Box 880 · Rogue River, OR 97537

ENV-2.00 — Cop



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 Hite 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.

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.

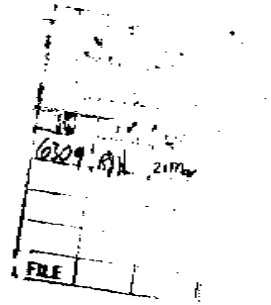
In your report (p. VI-41) you have two adverse effects of dam removal, loss of the lake and an increase in power consumption, but that neither are considered significant.

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

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)

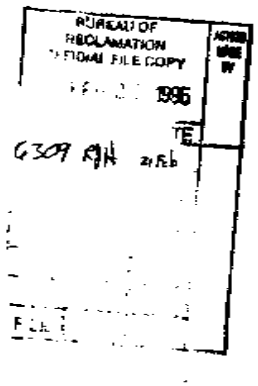
2. The size of facilities is shown in Drawings 1313-D-1 and 1313-D-2 and discussed in the "Facilities" discussion for the Preferred Alternative.

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




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

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

1. See ODFW letter of comment and attachment D..

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.

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

William H. Brecount
514 West Evans Cr. Rd.
Rogue River Ore. 97537

March 10, 1995



Bureau of Reclamation
1150 N Curtis Rd.
Boise Id. 83706

R.E. PN6309 (Savage Rapids Dam)

Dear Sirs:

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 trees and wild life. Without the G.P.I.D. the Rogue Valley might be named the Gobi Valley.

Response (William H. Brecount Letter)

WILLIAM H. BRECOUNT
P.O. BOX 1220
ROGUE RIVER, OR 97537



Without these 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 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 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. That 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



Over fishing in the ocean (Japanese and Russian drift net), an over population of predators 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, chances are they are always a resident of some other state or faraway 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 referring to the studies that proove 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.

4214 Midway Avenue
Grants Pass, OR 97527-9522
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

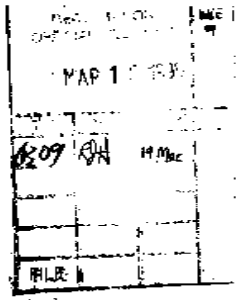


Response (Signe M. Carlson Letter)

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,

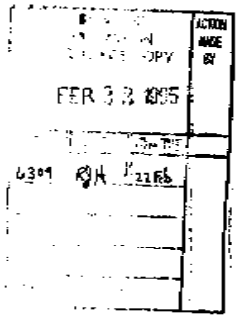
3/8/95

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.




**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.**

Response (Donald R. Greenwood Letter)

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

**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.**

5

**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.**

6

**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.**

Response (Donald R. Greenwood Letter)

4. Reclamation is unaware of any data that indicates such intense use of the pool behind Savage Rapids Dam.

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

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. 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.**

7

**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 improved to current state-of-the-art specifications, they would be acceptable to ODFW, NMFS, and USF&W.**

8

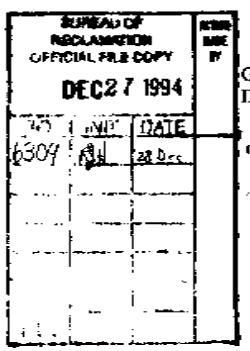
**It is abundantly clear than elimination of the north fish ladder, the juvenile fish trap facility, repair as opposed to replacement of the radial gates, modification and enlargement of the south fish ladder, reduction in the number of gravity canal fish screens from five to two, and a realistic allowance 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, 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.




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.

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 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. 1

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.

Response (Eric W. Hartmann Letter)

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 provide valuable fish habitat and avoid the necessity of transporting a significant part of the dam, thereby reducing the overall cost.. 2

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





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
Coment
Savage Rapids Dam.



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.= 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 turbines 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 sorce 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 way and all activities concerning Savage Rapids dam until ~~Such~~ such time that the threat from the Russans and there nuc. ~~weapons~~ weapons has been elemenated

Randy Hinke

Subject National + internal security threat from the removal of Savage Rapids Dam and pumping or generating septem, using the unstibility of the Russian Dam as a basis.

Randy Hinke
304 Woodlake Dr
Grants Pass OR 97527

2-12-95

Recomondation for fish passage improvement

Use native ~~bol~~ boulders to build a set of jump ponds that come up 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 gave 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.

2-12-95

Chapter 1

Page 1-1 authority PL 92-199, 85 Stat 664 enacted December 15, 1971

1 Does require a economic impact statement.

2 Stream continuum in context of Riparian Vegetation and how ~~this~~ this will effect Stream chemistry

3 Riparian Microclimates and the effect

4. What are the Factors effecting 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 Mychorrhizal relationships and there 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)

Bus. 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 service 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 ~~Hydrolics~~ Hydraulics

Removal of the dam will increase the
3 grade of the river above the ~~dam~~ 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
~~Deposition~~ transit. causing, deposement ~~Displacing~~ 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~~ at 1936 (approx date) ~~for approx yardage~~
~~displaced~~

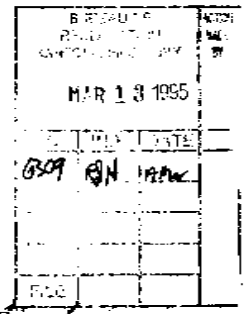
Justify this action and its harm to
in River life forms

Randy Hinke
304 Wood Lake Dr
Grants Pass OR. 97527

3. See response to American Fisheries Society letter.

Response (Jerry Kl---- Letter)

See response to Charles Weaver Letter.




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.

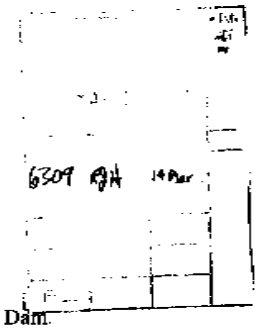
The spring Chinook run in 1993 was the highest since 1989, a record run. The annual run of Coho Salmon that ended Jan. 30, 1995 is the largest number ever recorded crossing Gold Ray Dam. . It seems that if the dam was killing as many fish, as the environmentalist predict, it would have effected the Chinook 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 L Kl----

Bureau of Reclamation
Attention PN-6309
1150 N. Curtis Rd.
Boise, ID 83706-1234

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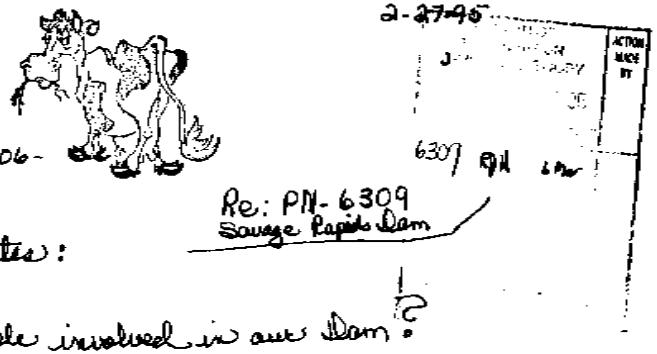
Respectfully,

Elaine Lake
6592 Rogue River Hwy
Grants Pass, Or 97526

Response (Elaine Lake Letter)

See Response to Charles Weaver Letter.



Bureau of Reclam.
1150 N. Curtis Rd.
Boise, Idaho 83706-

Re: PN-6309
Savage Rapids Dam

Dear Sirs & 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 specie 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.

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.

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, many forest 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.



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.

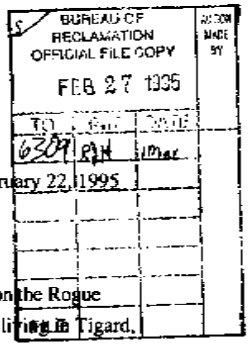
The dam should be acquitted from it's "crime" on this count alone.

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




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.

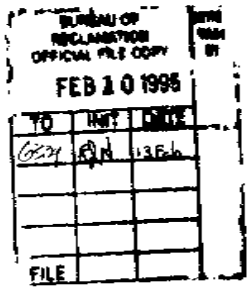
Sincerely,

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 JCWMfS 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.




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 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. 1

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

6309

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



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



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



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

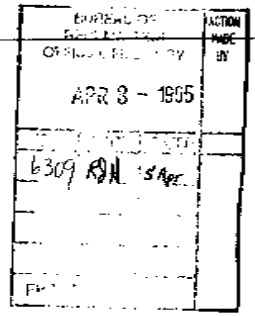
The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft 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




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.

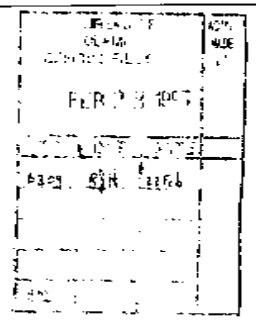
Sincerely,

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.

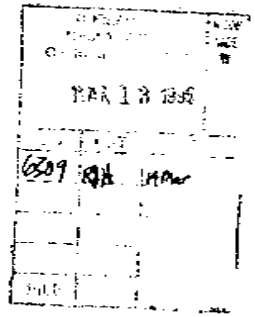
Sincerely,

Martha O. Pagel
Director

Commerce Building
158 12th Street NE
Salem, OR 97310-0210
(503) 378-3739
FAX (503) 378-8130



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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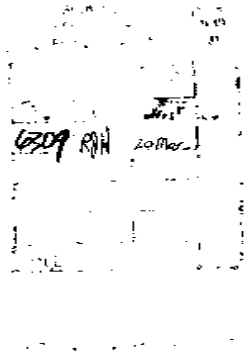
Suite 400
Washington, DC 20003
(202) 547-6900
(202) 543-6142 (FAX)

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

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.

NORTHWEST REGIONAL OFFICE
4518 UNIVERSITY WAY, N.E.
SUITE 312
SEATTLE, WA 98105
206-545-7133
206-545-7144 (FAX)

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
1621 Connecticut Ave. NW
Suite 200
Washington DC 20009-1052
Phone: 202-332-4840
Fax: 202-332-4865
E-Mail: ciellaw@igc.apc.org

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

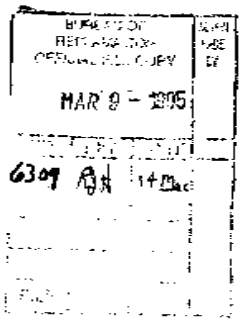
CIEL is a U.S. non-profit organization dedicated to protecting the global environment. The Rogue River's salmon and steelhead fishery is of international concern, as perhaps the greatest remaining river for wild fish in the continental U.S. Under the Law of the Sea Convention and customary international 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




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



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 impertance 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

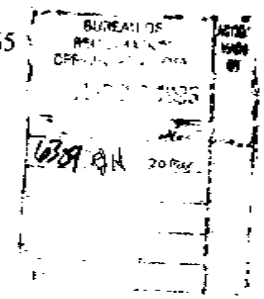
The League is in agreement with the Preferred Alternative (Pumping Alternative) contained in the Draft Environmental Statement. We are also pleased that the Board of Grants Pass Irrigation District (GPID) voted in favor of this alternative. It is realized that it may have been a reluctant move on their 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



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 laymans 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



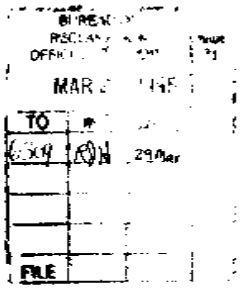
I believe the people who live behind the dam, would be better off in the long run without the dam, as well as recreation both commercial and private. The river would again be free flowing for use between Gold Hill, Rogue River, to Grants Pass and Grave Creek both for floaters and "tour" boating. The 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




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 6

MEDFORD, OREGON 97501

TELEPHONE (503) 772-5229

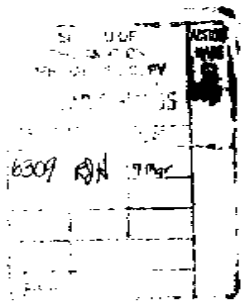
A. E. (GENE) PIAZZA

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

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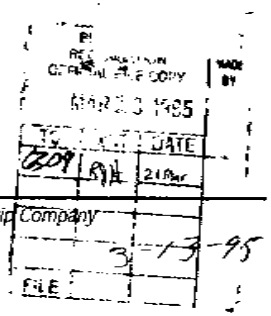


Bureau of Reclamation,

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 attended to and let the Fish have A Chance and the Farmers get what they deserve.

Please take my Knowlge into Concideration on this issue.

Randy Nelson



3207 Randall Avenue • Central Point, Oregon 97502 • (503) 826-3198

river trips unlimited
IRV URIE

March 16, 1995

Irvine L. & Patti L. Urie
GUIDE and OUTFITTER
4140 Dry Creek Road
Medford, OR 97504-9253
Phone 80[illegible]-3865
[illegible]-4798



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



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



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.



## 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.



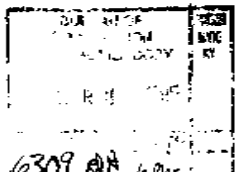
9. If the coho salmon are listed in the Rogue System, the dam retention/ladders and screens alternative may not be acceptable because of the losses that would still occur.

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




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.

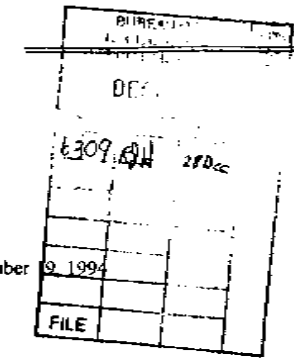
Several times over the years I have telephoned the Environmental Quality Dept in Medford. They say they don't have a boat so cannot look for the area where it enters the river.

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




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.

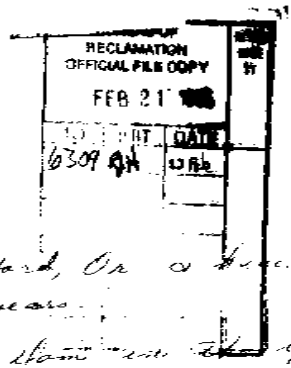
Respectfully,

Lynn Gerritson

Lynn and Della Berntson

Feb 18, 1995

U.S. Bureau of Rec
Attn: PN-6309
1150 N. Curtis Rd
Boise, Id. 83706-1234




Re: Savage Rapid Dam

I was born in Medford, Or & have lived here all my life - 69+ years.

Without Savage Rapids dam we would have 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 why these 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

Melvin E. Peterson
3555 S. Pacific Hwy #46
Medford, Or 97501

[redacted]
[redacted]
[redacted]
March [redacted], 1995

[redacted]
Bureau of Reclamation
[redacted] North Curtis Road
[redacted] Idaho 83706-1234

Dear Mr. [redacted]

[redacted] 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 [redacted].

It appears the state and federal agencies have done their homework and set the stage for every affected party to be a winner. It would have been a long downhill slide for both the fishery and the irrigation district.

[redacted] the years, I have been aware of situations where the [redacted] needed to de-water the ladders for emergency [redacted], and that migrating chinook would continue to attempt swim into a velocity barrier. The fish would be [redacted] back into the rocks below. As I see it, any other option where the financially strapped district would have to [redacted] with possible damage to fisheries in the future that are being considered as sensitive or threatened, would cause irreparable and permanent financial disaster. So many problems of the past can be prevented by your proposed [redacted]. Be for it and everyone is a winner.

Sincerely yours,

[redacted]

[redacted]

cc: [redacted]
[redacted]
[redacted]
[redacted]
[redacted]



Bureau of Reclamation
Re: Savage Rapids Dam

To whom It Concerns:

I and my family live in Cold Beach, Oregon, at the mouth of the Rogue. All the dam hearings are up stream, near Grants Pass, as though that area were the only area affected. But we in Cold 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'Carey
Cold Beach, OR.



SANDRYA DANEHY
1075 PEACHWOOD COURT
MEDFORD OR 9750[illegible]

Dear Sirs,

Savage Rapids Dam is too old and [illegible] ensive 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



Robert J. Hamilton
Bureau of Reclamation
1150 North Curtis Rd
Boise, Idaho, 83706-1234

Dear Robert,

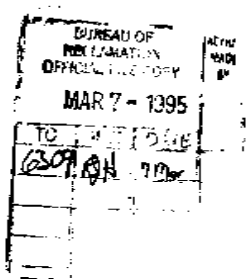
I support the Bureau of Reclamation's preferred alternative to remove Savage Rapids Dam on the Rogue River in Oregon. I strongly advocate federal funding for removal of the dam and supplying pumps to provide the irrigation district with water.

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




Robert J. Hamilton
Bureau of Reclamation
1150 North Curtis Rd.
Boise, Idaho, 83706-1234

Dear Robert,

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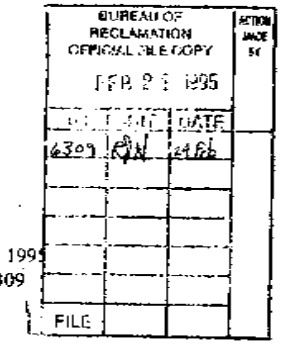
Sincerely,

Dennis Dedrick

Dennis Dedrick
837 Shafer Ln
Medford, OR. 97501

*Glenn M. Gray*
*2185 Foots Creek Road*
*Gold Hill, OR 97525*
*(503)-582-0639*




Robert J. Hamilton
Bureau of Reclamation
1150 North Curtis Road
Boise, ID 83706-1234

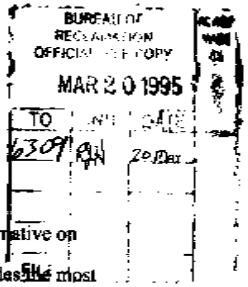
February 21, 1995
REF: PN-6309

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




13 March 1995

Dear Mr. Hamilton,

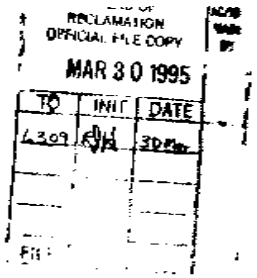
Please accept this letter as a strong endorsement for the preferred alternative on removal of Savage Rapids dam on the Rogue river. This alternative provides the most benefit for anadromous fish at the least cost while still allowing the Grants Pass Irrigation District (GPID) to withdraw water by way 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 Hazell




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.

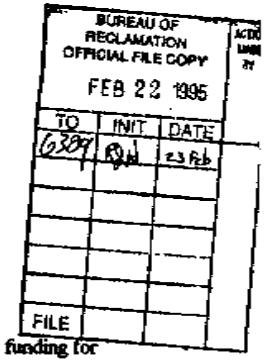
Then there are the LONG LINE FISHERMEN mostly from other countries I might add, in one of the clippings it is stated that the fishing was curtailed to help all the runs up and down the whole west coast.

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--479-3102




February 16, 1995

Robert J. Hamilton
Bureau of Reclamation
1150 North Curtis Road
Boise, Idaho 83706-1234

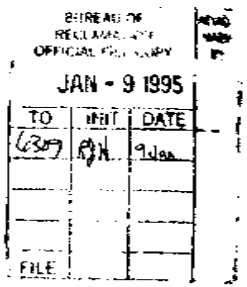
Dear Mr. Hamilton,

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




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

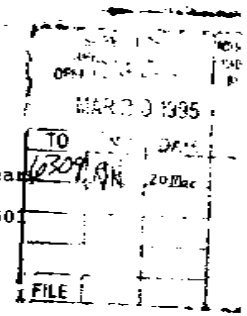
Frankly as an overtaxed citizen, I am not willing to pay for such nonsense. I will continue to politically support those representatives who will fight to save the dam and cut the funding or eliminate agencies that are biased toward the view of the radical environmentalist. Some compromise and thought 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 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. McGeary
210 Renault Av.
Medford, Or 97501
503-776-7011




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

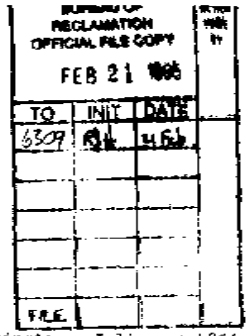
dam has not only out lived its usefulness, but that it is a serious obstacle to reclaiming the health of a threatened ecosystem.

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




February 16, 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.

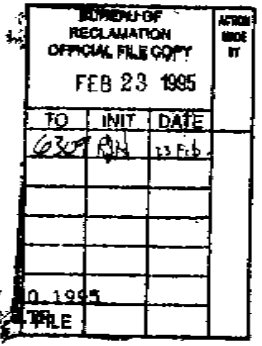
The defenders of the Dam, who have chosen Brady Adams as their champion, appear to expect the taxpayers to pay $17000000 for an anadromous fish passage solution that will provide for less fish survival than the $11000000 solution. Hopefully, such political intrigue will meet with no greater success than 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




T.E.& HELENE A.MECHEM
2202 CRESTON COURT
MEDFORD,OR.97504
503/776-4841

FEBRUARY 10,1995
F:SAVAGE.LTR

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.

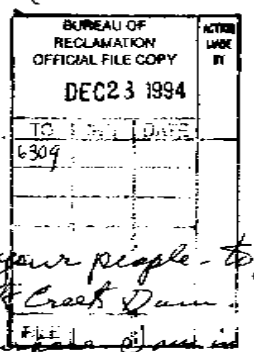
Sincerely,

T.E. Mechem

T.E.MECHEM



Thurs. Dec. 22, '94
Grants Pass, Or.




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 at all 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?

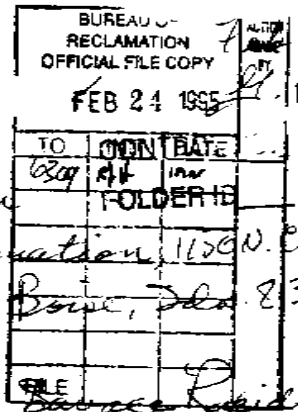
My husband & 3 sons have hunted & fished in practically all the Western States, true sportsmen, & are against so many dams. - if and when another good flood comes along, like the '55 & '64 floods, of what use will be those many little dams? Leave Nature alone - I am a conservationist, not an environmentalist.

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

476-7802




Feb. 18, 1995

E. P. Crag-

Robert J. Hamilton
Bureau of Reclamation, 1150 N. Curtis Rd.
Boise, Ida. 83706

Sir:

Yes 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 use 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



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!

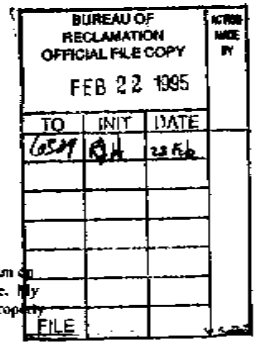
Recreational and commercial fishing industries, as well as boaters, will benefit. In addition, we will take a step away from listing Rogue River fish stocks by this significant habitat improvement.

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

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.

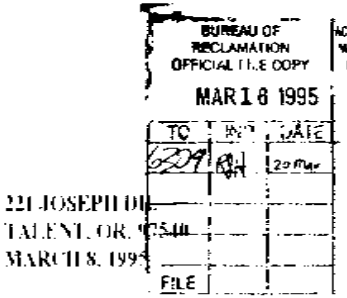
The Rogue River fishery is world famous, and in serious decline. Oregon Waterwatch reported that the loss of income due to the fishery decline is $5,000,000.00 annually. I cannot conceive that Savage Rapids dam is in any way capable of mitigating that loss to the citizens of Oregon. The owner of the 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,

Stephen K. Parsons

cc: Gov. John Kitzhaber, Sen. Mark Hatfield, Sen. Bob Packwood, Rep. Peter DeFazio, Rep. Les Cooley




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

January 18, 1995

Regional Director
Bureau of Reclamation
Annt: 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 Darneille Ln
Grants Pass, Oregon 97527
503-479-8389



Alice L. Kelly
557 Dimmick Road
Grants Pass OR 97527
3 March 1995

Robert J. Hamilton
Bureau of Reclamation,
Dear Sir:

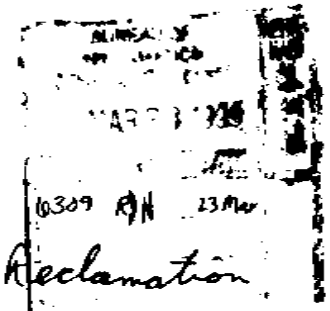
This a protest against the removal of Savage Rapids Dam. I have known this area for 50 years & I never knew the fish had become so stupid they don't know how to go up the ladder like they have been doing for 73 years.

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-500-



3/18/95 GP

P.O. Box 1874
Grants Pass, OR
97526

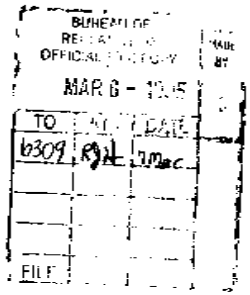
Bureau of Reclamation

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




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.

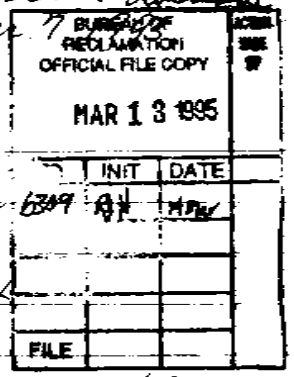
I hope this leads to a chain reaction removal of all unnecessary dams which misuse and abuse water, and harm essential fish populations.

Sincerely,

Kelley S. Webb

Kelley Webb

Sarah M. Williams



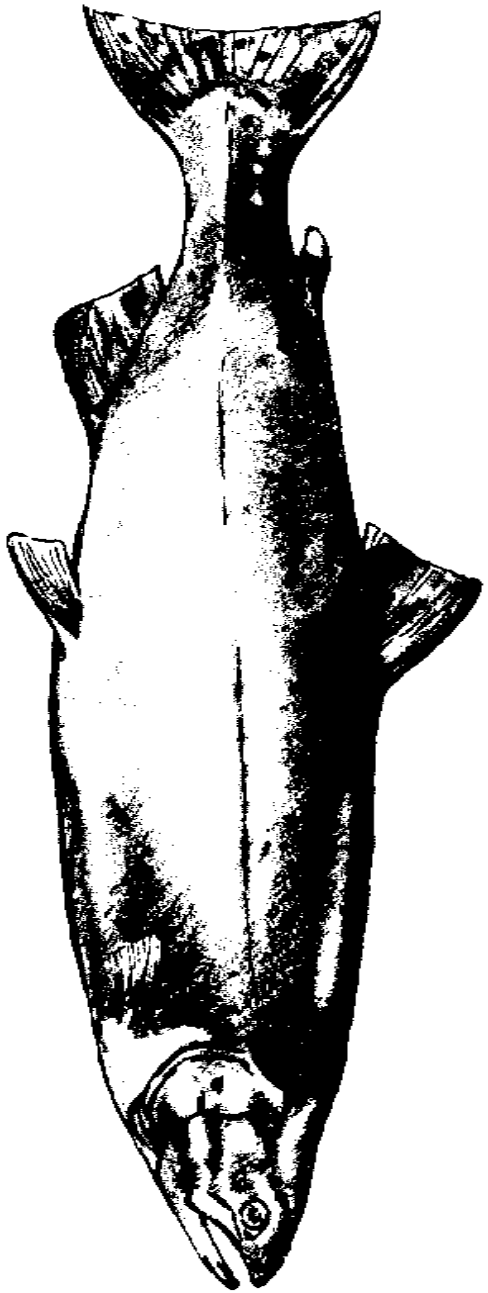

Robert J. Hamilton
Bureau of Reclamation
1150 Curtis Road
Boise, ID 83706-1234

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. Williams

3901 Placer Rd.
Wolf Creek, OR
97497



**Attachment J—Wild and Scenic Rivers Determination**

ENV 7.00
6P

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

6301 RH 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,

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. Fiske

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.**