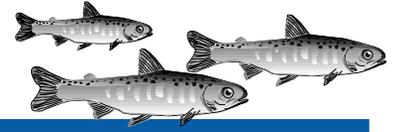
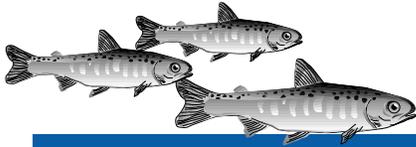




US Army Corps  
of Engineers®  
Walla Walla District

## Lower Snake River

# JUVENILE SALMON MIGRATION Feasibility Study



APRIL 1999

NEWSLETTER NO. 6

The U.S. Army Corps of Engineers (Corps) is conducting a feasibility study of ways to improve juvenile salmon migration through the hydropower system on the lower Snake River. The study focuses on how the lower Snake River dams can be changed to improve survival and recovery prospects for Snake River salmon stocks listed under the Endangered Species Act.



## STUDY UPDATE

By Greg Graham, Corps  
Project Manager for the  
Study

### Status of Technical Analyses & Schedule

The feasibility study team continues to work hard to wrap up technical analyses using the best scientific and engineering information available. The National Marine Fisheries Service (NMFS) completed and released the draft Anadromous Fish Appendix (A-Fish Appendix) on April 14. The economic analyses being conducted by the Drawdown Economic Workgroup (DREW) are progressing. Not all of the data are in, but we currently anticipate the draft feasibility report/environmental impact statement (FR/EIS) will be released for publication in

October 1999. As outlined in the last newsletter (No. 5), the draft FR/EIS delay from April was the result of delays experienced by NMFS in preparing the A-fish Appendix.

### Federal Caucus

There is a new team player in the cooperative effort towards Endangered Species Act (ESA) compliance and recovery in our region. A federal caucus has been formed with the goal of outlining a recovery plan for multiple ESA species such as salmon, steelhead, bull trout, sturgeon, and snails. The federal caucus will develop alternative proposals for the Federal Columbia River Power System (FCRPS) as a whole, as well as consider other factors affecting endangered species—habitat, harvest, and hatcheries. The caucus also intends to address legal responsibilities such as treaties, the Clean Water Act, and the Northwest Power Act.

The federal caucus is looking at the big picture. The Lower Snake River Juvenile Salmon Migration Feasibility Study fits in as a very detailed picture of issues related to the four lower Snake River dams. The caucus will make use of the detailed information gathered for the feasibility study. The federal caucus will also coordinate with other regional and federal efforts studying salmon recovery issues, including the Multi-Species Framework Process and the Columbia River Basin Forum. This federal caucus will continue to be a cooperative effort aimed at determining appropriate actions for both salmon and people.

*To receive information on the study and upcoming public involvement opportunities, please visit the Walla Walla District home page at <http://www.nwm.usace.army.mil>, write us, e-mail our Public Involvement Coordinator, Dave Dankel, at [dave.a.dankel@usace.army.mil](mailto:dave.a.dankel@usace.army.mil), or call him at 509-527-7288. ☎*



## NMFS Releases Anadromous Fish Appendix

NMFS released a draft options report on April 14, 1999 that will be included as the Anadromous Fish Appendix to the Corps' draft FR/EIS in October 1999.

The report provides NMFS' scientific assessment of the biological effects of several basic hydro-power options that the region is examining. The document does not recommend a preferred course of action or reflect a policy decision. Instead, it provides scientific information and assessments decision-makers can use in making policy determinations.

The report, a map, fact sheets, and additional information are accessible on the NMFS' Northwest Fisheries Science Center web site at <http://www.nwr.noaa.gov>. Summary information from the report is also provided under "Biological Issues" on pages 4-5 of this newsletter.



## COMMONLY ASKED QUESTIONS



The following questions were posed by participants during the set of five public information meetings held in November in Portland, Boise, Richland, Lewiston, and Spokane. The comments and questions raised at the public meetings were broken out into seven categories (see pie chart). Answers are provided here to representative questions from each of these categories.

### ENGINEERING

**Question:** Does the Corps feel that dam breaching is feasible from the standpoint of the ESA?

**Answer:** Efforts for the FR/EIS are being conducted to answer that very question. In its 1995 biological opinion, NMFS requested that the Corps conduct a feasibility study to look at several alternatives including natural river drawdown (dam breaching) on the lower Snake River. The entire purpose of the study and the resulting FR/EIS is to determine and disclose the relative feasibility of dam breaching and other measures that could improve salmon and steelhead passage at the four lower Snake River dams. The draft FR/EIS released in October will attempt to identify the most feasible approach to meeting salmon and steelhead passage goals. If breaching is recommended, the Corps will work with NMFS and others to ensure compliance with the ESA throughout the implementation period.

### ECONOMIC/SOCIAL

**Question:** Can the roads handle the increased transportation demands put on them if the dams are breached?

**Answer:** The estimated costs to upgrade the roads receiving a net increase in traffic is currently being studied by the Washington State Highway Department and others. This information along with Corps estimates of the net increase or decrease in truck traffic by state will be discussed in the transportation section of the FR/EIS.

**Question:** Will agriculture, navigation, labor, and business issues be included in your study?

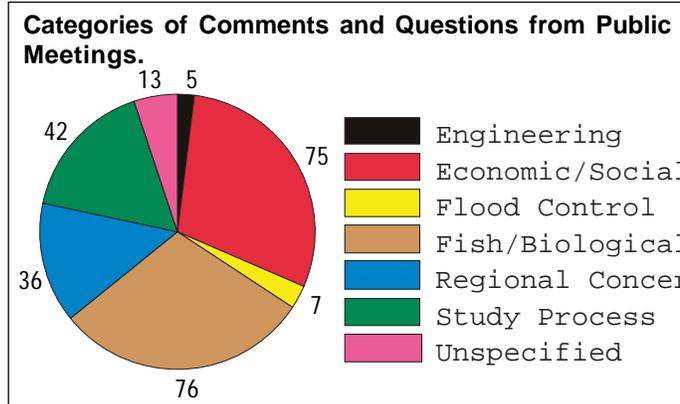
**Answer:** There are DREW study teams evaluating cost and benefit information for each of these areas relative to the three pathways—Existing System, Major System Improvements, and Natural River Drawdown (Dam Breaching) (see past newsletters or our website at <http://www.nww.usace.army.mil> for a description of these pathways). This information will be

evaluated and presented to the public as part of the FR/EIS.

### FLOOD CONTROL

**Question:** How much flood control is involved in the operation of the lower Snake River dams?

**Answer:** None. The four lower Snake River dams are all “run-of-the-river” dams. This means that about the same amount of water that enters the reservoirs is released through the dams. The four reservoirs have only minimal capacity for flood storage. However, flood control is a primary purpose for many other large dams on the Columbia-Snake River System, including Grand Coulee, Dworshak, etc. Flood control was not one of the authorized purposes when the Lower Snake River Hydropower Project was commissioned, and the project dams have never been operated for flood control.



### FISH/BIOLOGICAL

**Question:** Why is any harvest of listed species allowed at all?

**Answer:** No current fisheries specifically direct their efforts at listed salmon or steelhead. However, listed species mingle with other salmon runs that are not threatened and are sometimes caught incidentally. Incidental catch of listed species by fisheries in the Columbia River has been greatly reduced in recent years. For example, for Snake River spring/summer chinook, total fishing has been limited to a harvest rate of 5 to 10 percent for the past 15 to 20 years. For Snake River fall chinook, ocean and in-river total fishing has been reduced by 30 percent or more from pre-listing rates. However, some measure of incidental catch does still occur by certain fisheries. For instance, the upriver bright run of fall chinook from the Hanford Reach is comparatively healthy and fishable, and it is not possible for fishermen to distinguish

this run from threatened runs. So, the fishery co-managers develop fishery plans each year which provide fishing opportunity on upriver bright fall chinook salmon while keeping the impact to listed chinook salmon at relatively low levels.

In addition to incidental catch by fisheries in the Columbia River, there are tribal treaty rights that allow harvest above Bonneville Dam. While most tribal harvest effort here is directed at the more abundant and healthy stocks, incidental harvest of weaker stocks occurs due to overlap in run timing. Tribal fisheries occur at levels lower than in years past and they have been managed specifically to reduce impacts to listed salmon and steelhead, while still providing for treaty Indian harvest to take place.

In addition to in-river incidental catch, chinook salmon from the Columbia-Snake River System mingle with healthy stocks in the ocean and are caught in ocean waters from Alaska to California. In fact, more than 30 percent of all upper Columbia and Snake River fall chinook harvested are caught in Southeast Alaska and British Columbia.

**Question:** Will sediment transport caused by dam breaching kill the fish?

**Answer:** This issue is being addressed by PATH and NMFS. It is included in the A-fish Appendix and will be included in the draft FR/EIS. Preliminary evaluations indicate that suspended sediments would likely cause some periods of impaired growth and some mortality and blockage of adult passage. However, because of the large flow of the Snake and Columbia rivers, the sediment concentrations after about two seasons

should not rise to lethal levels for extended periods or distances. Periods of lethal levels would coincide with spring runoff for an estimated 10 years.

The potential effects of suspended sediment on anadromous fish will be addressed in the Anadromous Fish Appendix and in the FR/EIS.

### REGIONAL CONCERNS

**Question:** What is being done about the Caspian terns on Rice Island?

**Answer:** A Caspian tern work group of federal, state, and tribal representatives is working on short- and long-term options to deter Caspian terns from nesting on Rice Island. One method currently being tried is to grow vegetation at the colony site and along other portions of the island to discourage nesting. In addition, new nesting areas on islands downstream are being developed. Food sources are more diverse in

(continued on page 5)



# REGIONAL COORDINATION UPDATE

## Community Forum Summary

As part of the Corps' social assessment for the FR/EIS, a team of social scientists from the University of Idaho has been traveling throughout the region to meet with a cross-section of affected communities. All 17 planned community forums are completed. Community members turned out in force to participate in these structured interactive workshops by discussing and identifying their perceptions of the social and economic impacts associated with the three major pathways under consideration in the study. The products of these community interactive forums will provide valuable input into the social resources section of the draft FR/EIS.

The 877 people attending these workshops (See table) represent towns selected as representative communities because of their population size, economic diversity, relationship to the river, and geographic location. The highest turnout has been in the smaller

communities, particularly those in the immediate region of the lower Snake River.

During the 4-hour meetings, community members were asked to assess their community today by thinking about four dimensions of community: the people, wealth and jobs, the place, and community vision and vitality. Participants were then presented with preliminary biological and economic information for each of the three study pathways and asked, using their local knowledge, to assess and forecast the potential social, cultural, and economic impacts to their community.

The participants from each community represented a diversity of perspectives within the community ranging from education leaders and newcomers to persons active in land-based production and health care issues. These individuals talked about their community and the salmon recovery

pathways under consideration by the Corps. The information that emerged from this exchange will be useful for the FR/EIS and decision makers. At times the meetings revealed the intense emotions associated with salmon issues as people throughout the region struggled to find opportunities for a win-win resolution.

The results from the forums will be analyzed and synthesized by the University of Idaho scientists over the next few months. Their report will then become one of the study reports and will be part of the public record that will be used to develop the Corps' draft FR/EIS. 🌐

### Community Forum Participant Totals

Town	Date	Number of Community Workshop Participants	Number of Public Observers	Total Attendance
Prescott, WA	1/20/99	51	10	61
Washtucna/Kahlotus, WA	1/26/99	71	124	195
Stanfield, OR	2/8/99	14	9	23
Adams, OR	2/8/99	10	3	13
Umatilla, OR	2/9/99	19	14	33
Burbank, WA	2/11/99	70	22	92
Riggins, ID	2/16/99	26	2	28
Enterprise, OR	2/17/99	23	4	27
Kennewick, WA	2/20/99	19	0	19
Colfax, WA	2/25/99	72	21	93
Pasco, WA	2/27/99	10	13	23
Pomeroy, WA	3/3/99	40	19	59
Weippe, ID	3/4/99	21	5	26
Genesee, ID	3/8/99	37	22	59
Lewiston, ID	3/9/99	33	12	45
Clarkston, WA	3/24/99	36	10	46
Orofino, WA	3/25/99	27	8	35
<b>TOTAL</b>		<b>579</b>	<b>298</b>	<b>877</b>



## ROADMAP TO THE PATHWAYS: NATURAL RIVER DRAWDOWN (DAM BREACHING) PART II— WHAT ECONOMIC, SOCIAL, AND BIOLOGICAL TRADEOFFS WOULD THIS PATHWAY INVOLVE?

Ongoing technical analyses on the natural river drawdown pathway (dam breaching) (and the other two pathways) are attempting to answer two important questions:

- What would physically be involved in breaching the dams?
- What economic, social, and biological tradeoffs would this pathway of action involve?

Roadmap to the Pathways: Natural River Drawdown (Dam Breaching) Part I in Newsletter No. 5 (January 1999) tackled the first question. This article will discuss issues raised by the second question.

### Economic and Social Issues

The feasibility study and resulting FR/EIS will consider, among other things, the potential economic and social effects of dam breaching and the other alternatives on electric power generation, navigation (transportation), irrigation, tribal circumstances, social resources, anadromous fish, resident fish, wildlife, recreation, and cultural resources. For each alternative under consideration, some river uses would experience negative impacts, while other river uses would benefit. The economic analysis being conducted by the DREW is designed to measure the economic and social costs and benefits associated with each proposed pathway for each river use.

The DREW analysis measures economic and social impacts from three perspectives. First, the National Economic Development (NED) view which measures changes in the resource cost of providing various goods and services. NED analyses are concerned only with economic efficiency at the national level. Generally NED effects represent the direct impacts to the national economy due to changes in the operation of the lower Snake River system.

The costs of replacing hydropower with a less efficient alternative power source are an example of negative NED costs associated with the proposed dam breaching alternative.

The Regional Economic Development (RED) perspective considers economic impacts on the region from the proposed alternatives. The regional economies near the lower Snake River will be the most severely impacted directly and indirectly. The direct and indirect impacts in the RED analysis are measured as changes to employment and income. Changes in recreation associated with the dam breaching pathway may, for example, affect regional employment and income by altering recreation spending patterns. If the dams were breached,

changes in regional shipping patterns could lead to changes in employment and income in the transportation and other sectors.

The third perspective addresses some of the likely effects on selected local communities. Each proposed pathway would affect communities differently. One community might lose business and suffer an increase in unemployment and decreases in income and tax revenue, while other communities might benefit. The University of Idaho recently completed a series of interactive community forums to address the potential effects of the proposed alternatives on selected communities (see page 3).

### Biological Issues

The draft FR/EIS will evaluate the full spectrum of potentially affected biological elements. Major biological issues include potential effects on resident fish, on riparian areas, and on water quality. The feasibility study will include an investigation on what effects dam breaching might have on resident fish populations in the reservoirs. Habitat changes and increased competition could have significant effects on smallmouth bass, a regionally important recreation species. Effects on riparian areas—the vegetated areas that grow along the reservoirs—will also be evaluated. Scientists are working to determine both the potential positive and negative effects to wildlife that could result from changes to the riparian areas along the reservoirs and in newly exposed areas due to dam breaching. These evaluations will be addressed in the U.S. Fish and Wildlife Services Coordination Act Appendix and the draft FR/EIS. Scientists are also evaluating how dam breaching might affect water quality due to an increase in suspended sediments, temperature changes, suspension of contaminants, and dissolved gas (see page 2).

The most prominent biological issue of concern related to dam breaching is the effect of potential management actions on anadromous fish such as salmon and steelhead. At the request of the Corps, NMFS is evaluating the likely effects and risks to these fish from dam breaching and other potential actions. NMFS reached a milestone in that process on April 14, when it released a draft options report that will become the Anadromous Fish Appendix to the Corps' draft FR/EIS in October 1999. The NMFS assessment presented in this report relies heavily on the analyses produced by the Plan for Analyzing and Testing Hypotheses (PATH). PATH—a diverse group of regional biologists, engineers, and statisticians—uses a lifecycle model of salmon to examine the possible outcome of different

management options on the listed species. The species in the Snake River listed under the ESA—spring/summer chinook, fall chinook, sockeye, and steelhead—have complicated lifecycles as the fish lay their eggs, migrate downriver, grow in the ocean, and eventually return to spawn. PATH ran a large set of simulations through the model that were designed to take into account the hundreds of different variables salmon could face throughout their lifecycles in the future under different potential management actions. Although PATH examined as many as 6 or 7 different management options, for clarity, the NMFS report focuses primarily on comparisons between dam breaching versus no dam breaching with current or expanded downriver juvenile fish transportation. The model helped the PATH workgroup determine the relative probabilities that management options would meet “survival” and “recovery” levels based on the number of adults returning to their spawning grounds in the Snake River. In this way, PATH allowed NMFS to evaluate which management actions seem most likely to improve salmon survival under the widest range of potential future conditions.

In addition to discussing PATH findings, the NMFS report describes three key uncertainties that affect the outcome of the PATH analyses. These uncertainties arise because of the difficulty in determining the degree to which aspects of the ecosystem other than hydropower have contributed significantly to declines in salmonid populations. Although the construction of dams is perhaps the most visible threat to Snake River salmon, the species are affected by a variety of factors within their ecosystem. The three key uncertainties are differential delayed transportation mortality, which involves the degree to which fish are affected by barge and truck transportation after they are released back into the water below Bonneville Dam and continue their lifecycle in the ocean. Another uncertainty concerns the possible effect of climatic conditions in the estuary and ocean. A final major uncertainty involves what scientists have labeled “extra mortality.” Extra mortality describes the unexplained mortality (not

(continued next page)



## ROADMAP TO THE PATHWAYS

(continued from Page 4)

directly attributable to dam-related mortality or overall ocean conditions) that must occur below Bonneville Dam to account for the low return rates of Snake River adults since the 1970s. Many hypotheses for the cause of this extra mortality have been proposed: the hydrosystem itself may weaken fish and disrupt their natural rhythms, hatcheries may interfere with the fitness and survival of wild fish, habitat degradation may have reduced stock vigor, genetic effects may have reduced stock viability, and the degraded ocean conditions may have differentially taken a toll on salmonids that spawn above the Snake River dams. The impact of dam breaching compared to keeping the dams intact could depend on the true nature of these uncertainties.

Based on the PATH analysis and the uncertainties identified, the NMFS report presents five major conclusions regarding the likely effects and risks associated with dam breaching versus no breaching:

1. Breaching is more likely than any other hydrosystem action to meet survival and recovery criteria for the listed species across the widest range of assumptions and scenarios. This makes breaching the most “risk averse” option.
  2. There are potential scenarios under which breaching yields little or no improvement over no breaching with transportation. The most notable scenario is if differential delayed transportation mortality is assumed to be low for spring/summer chinook salmon. This scenario points to the value of narrowing our uncertainty about transportation mortality through PIT-tagging studies that have already been initiated by NMFS.
  3. Additional studies mean additional delays. Delays increase the risk of failing to increase salmon survival to acceptable levels. Additional research to minimize key uncertainties would cause a 5-10 year delay.
  4. Assessments to date have focused primarily on hydrosystem effects, so
5. Although NMFS concludes that breaching is the most risk-averse strategy, it is not clear that breaching is absolutely necessary. The necessity of dam breaching depends on which assumptions regarding the key uncertainties are correct.

NMFS cautions that there are no simple answers—there are only trade-offs between potential risks and benefits to be weighed and considered. The scientific data NMFS analyzed can be used to estimate risks, but the challenge for the region and decision makers will be to determine what level of risk is acceptable given all the other constraints.

The NMFS report, a map, fact sheets, and additional information are accessible on the NMFS’ Northwest Fisheries Science Center web site at <http://www.nwr.noaa.gov>. 🌐

## COMMONLY ASKED QUESTIONS

(continued from Page 2)

these areas, which scientists hope will limit predation on salmon and steelhead smolts. The Corps is currently working with NMFS and others on long-term management options.

**Question:** Why is the Corps only looking at the lower Snake River?

**Answer:** The scope of this feasibility study involves only the four lower Snake River dams. However, the Corps and its partners are, where feasible, considering the broader picture in their analyses. In addition, the newly formed federal caucus (see Study Update, page 1) is specifically tasked with considering the bigger regional picture, and the Corps’ feasibility study will coordinate with these efforts.

**Question:** How are the salmon runs doing on rivers without dams?

**Answer:** There are runs on unrestricted rivers in our region that are doing well, and there are some that are doing poorly. It really depends on which examples you pick. In general, salmon runs have shown a similar trend in population changes over the same period, but not as dramatic as those on the Snake River.

## STUDY PROCESS

**Question:** Who are the decision makers?

**Answer:** The Corps is the lead agency for the Feasibility Study. It is responsible for complying with the applicable NEPA requirements and is therefore in charge of the NEPA process and decisions. The Corps must also comply with the applicable

requirements of the ESA. The Corps is working closely with other federal agencies and intends to identify a preferred alternative in the draft FR/EIS. Once a preferred alternative is selected, the Corps will prepare a Biological Assessment (under ESA) of the proposed action and initiate formal consultation with NMFS. NMFS is responsible for determining whether a proposed action is likely to cause jeopardy to listed anadromous species. If the final, regionally coordinated recommendation is to breach dams, Congressional authority and appropriations would be needed. If a final recommendation is for actions other than breaching, Congressional appropriations would be needed.

## UNSPECIFIED

**Question:** The Scandinavians had a real problem with fish reduction. They turned it around with improvements to their water quality. Will the study emphasize a good hard look at water quality?

**Answer:** The major water quality concerns regarding the Snake River are dissolved gas supersaturation from spill, elevated water temperatures, and high levels of suspended sediment if the four dams were breached. The FR/EIS will take a look at each of these issues as they are affected by the three pathways. Water quality will be evaluated in relation to state water quality standards, and in relation to the effects of water quality conditions on fish. 🌐

## Reported Recreation Figures Inaccurate

Recreational benefit figures related to drawdown that were released to the press in early March by the Sierra Club, Save Our Wild Salmon, Trout Unlimited, and the NW Sportfishing Industry were incomplete and misrepresented a partially completed study of potential future recreational uses of the lower Snake River.

The dollar amounts reported came from a preliminary document that was stamped “pre-decisional—for review purposes only.” The document reported raw data that had not been adjusted by the value of current recreation benefits, the costs of dam removal and mitigation, the carrying capacity of the system, or other factors that must be calculated in order to arrive at an accurate net value. The Corps and the DREW had not yet reviewed the material.

“This was unfair to the public and to the stakeholders in the region. It was also unfair to the group of state and federal agencies, special interest groups, and contractors that are working to provide the best scientific and engineering information to the region to base their decisions on for salmon recovery,” said Greg Graham, Walla Walla District Project Manager.

DREW’s study of the potential impacts of each of the alternatives on recreation is not yet complete. When it has been completed and reviewed, the Corps will include the written report for examination by the public in the FR/EIS. Through DREW, the Corps continues to work with a variety of stakeholders in the region, and has re-emphasized to those stakeholders the importance of not releasing information publicly before it has been completed and reviewed. 🌐



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## STUDY MILESTONES

= Task already completed

- Notice of Intent ..... June 1995
- Scoping Meetings ..... July 1995
- Interim Status Report ..... December 1996
- Regional Roundtable Workshops  
Initiated ..... April 1997
- First Set of Public Information Meetings ..... September 1997
- Second Set of Public Information  
Meetings ..... November 1998
- NMFS Release of Draft Anadromous Fish Appendix .... April 1999
- Complete Technical Analysis  
(Economics, Engineering,  
Biological, etc.) ..... June 1999\*
- Distribute Draft EIS ..... October 1999\*
- Public Review of Draft EIS ..... October 1999\*
- Distribute Final EIS ..... To Be Determined
- Sign Record of Decision ..... To Be Determined

\* These projected dates are tentative.

## NMFS ANNOUNCES ADDITIONAL REGIONAL SALMON ESA LISTINGS

NMFS announced the ESA listing of nine additional salmon populations in the region on March 16, 1999. These listings could have significant effects on Pacific Northwest residents, because they represent the extension of federal protection to salmon found in streams in heavily populated areas in our region. Those listed as threatened include: Puget Sound chinook, lower Columbia River chinook, upper Willamette River chinook, Hood Canal summer run chum, Columbia River chum, upper Willamette River steelhead, middle Columbia River steelhead, and Ozette Lake sockeye. Upper Columbia River spring-run chinook were listed as endangered.

NMFS also announced that it will defer for 6 months its decision on whether to include the Deschutes River fall chinook with the already threatened Snake River fall chinook under the ESA. The agency will use the 6-month extension to resolve areas of scientific disagreement about the need for listing. NMFS also deferred listing of three other chinook runs in Oregon and California. 🌊