



REGION FACES TOUGH CHOICES

The System Configuration Study (SCS) Phase I Report is being released for regional review this month (please see story this issue). Within the next few months the region will decide which alternatives for physically altering the Columbia and Snake River dams to improve salmon survival should be studied further, or perhaps implemented without further study.

Also discussed in this issue is a new Appendix and expanded analysis on the Juvenile Fish Transportation Program that is being carried out through the multi-agency Columbia River System Operation Review (SOR). The SOR looks at operational changes that can be made to the Federal Columbia River Power System to better serve all uses. The SOR Draft Environmental Impact Statement (EIS) is expected to be available for public review this summer.

The Corps and National Marine Fisheries Service (NMFS) will soon be releasing a Draft EIS and holding public meetings on biological drawdown testing. This EIS is a joint effort to determine whether and how to conduct a reservoir drawdown test to measure effects of drawdown on salmon. The information from a biological drawdown test will be used by the Corps in SCS evaluations of reservoir drawdowns, as were results of the March 1992 drawdown test of physical effects.

No Easy Answers

In the next few months the region will face tough choices as far as improving salmon migration through the lower Snake and Columbia rivers. More and more it looks as though there are two main options that are mutually exclusive.

One of these is reservoir drawdowns at the four lower Snake River dams—Lower Granite, Little Goose, Lower Monumental, and Ice Harbor. Most modeling studies and scientists agree that the only drawdown scenario that has a good chance of improving salmon survival

past the dams is a four reservoir drawdown to natural river level for the spring and summer months of juvenile salmonid migration.

This is an expensive proposition. The powerhouses cannot operate at that level of drawdown, and the existing juvenile and adult fish bypass systems will not work. Instead, fish would pass through new low-level river openings built into the dams. The modifications to the four dams could cost as much as \$5 billion. For up to six months each spring and summer, turbines would be shut down, navigation would be halted through this stretch of the Snake River, and recreation opportunities created by the reservoirs would cease.

But the fish would migrate more naturally to the ocean in-river. Many, including some fishery biologists, believe this is the best way to begin restoring salmon populations. They believe the Endangered Species Act can only be satisfied if we do whatever we can to bring back a more natural condition.

The other option is to continue to refine the existing juvenile bypass systems at the dams and improve the Juvenile Fish Transportation Program. There are many improvements that could be made. A new collection facility could be built above Lower Granite Dam—it might use surface collection to gather juvenile fish in the upper 10 to 30 feet of water where they are normally found, rather than 70 feet down as current bypass systems do. A Lower Granite Reservoir drawdown could be used to speed fish to a collection point.

This option is less expensive although

not without costs. Improvements could cost hundreds of millions of dollars. Flow augmentation could continue for the purpose of helping to move fish to the collection facilities: this program is becoming unpopular with communities that depend on filled upstream reservoirs for recreational businesses.

And the fish would continue to be barged and trucked past the dams, the prospect of which is unsettling for many. A program which began as an experiment,



The new McNary Dam Juvenile Fish Facility is shown here under construction. A dedication/open house is scheduled for June 30th, 1994. Photo by Tom Holt, Walla Walla District.

and has for years been called an interim measure, would become permanent. Some scientists believe this is the best way to improve salmon survival past the dams. They believe that transporting fish will bring at least as much benefit for fish as natural river drawdown, with substantially lower costs and impacts to other river uses.

Are there other real options? What about a migratory canal or in-river flume for fish? Study so far indicates that this would be very expensive, totally artificial, and require constant maintenance. Or how about improving dam bypass systems to

the point where we can bypass all the fish back into the river at each dam with no injury to the fish? This would do nothing to address the problems of predation in the reservoirs. What about spilling water at every dam during the times juveniles are moving past the dams? Gas supersaturation could become unacceptably high and cause high levels of gas bubble disease in adult and juvenile fish.

Environmental groups, fishery agencies, Tribal groups and some elected representatives, notably Governor Andrus of Idaho, favor reservoir drawdowns. Power, aluminum and other industry interests, local communities at the reservoirs and ports on the lower Snake River, and agricultural interests favor the transport option.

Biological Drawdown Test

The SCS phase I report analyses suggest that drawdown of all four lower Snake River dams to natural river level, or Lower Granite drawdown with transport, are the only reservoir drawdown options that will benefit salmon as much as the present mode of system operation. A biological drawdown test may not provide definitive information for a four pool test since the test as currently conceived would not include natural river level drawdown, and would not include all four reservoirs. Testing could provide useful information on the effects of a single pool drawdown.

Biological drawdown test results will contain many uncertainties. For example,

ocean influences such as El Nino may affect food supplies for salmon, which could in turn affect adult salmon returns. Also, in a drawdown test all the fish in a given population would be subjected to the test conditions. There would be no "control" population traveling through an unmodified system to monitor for comparison. And the ability to measure drawdown test results from one year against another year is affected by natural influences in the river system and the ocean.

The costs of drawdown testing will be high. The Corps estimates that four years of testing a one-reservoir drawdown would cost \$113.5 million.

Choices need to be made concerning the System Configuration Study, System Operation Review, and biological drawdown test—public policy choices that will have far-reaching effects.

DRAFT SCS PHASE I REPORT RELEASED

The draft Phase I report on the preliminary conclusions reached to date through the System Configuration Study will be available in early April for public review.

A series of public meetings is tentatively scheduled for mid-May to

provide an opportunity for agency representatives, Tribes, interest groups and the public to discuss and comment on the draft report findings and recommendations. Written comments are also welcome and can be mailed or provided at the meetings.

The report provides findings on the technical feasibility, economic and environmental impacts, costs and construction schedules for several alternative ways to reconfigure the federal projects on the lower Columbia and Snake Rivers to improve salmon migration conditions.

Lower Snake River Drawdown

Annual lowering of the four lower Snake River reservoirs substantially below normal levels is one of the alternatives being considered. Drawdowns would increase river velocities, theoretically reducing the travel time for smolts to complete their migration and increasing survival.

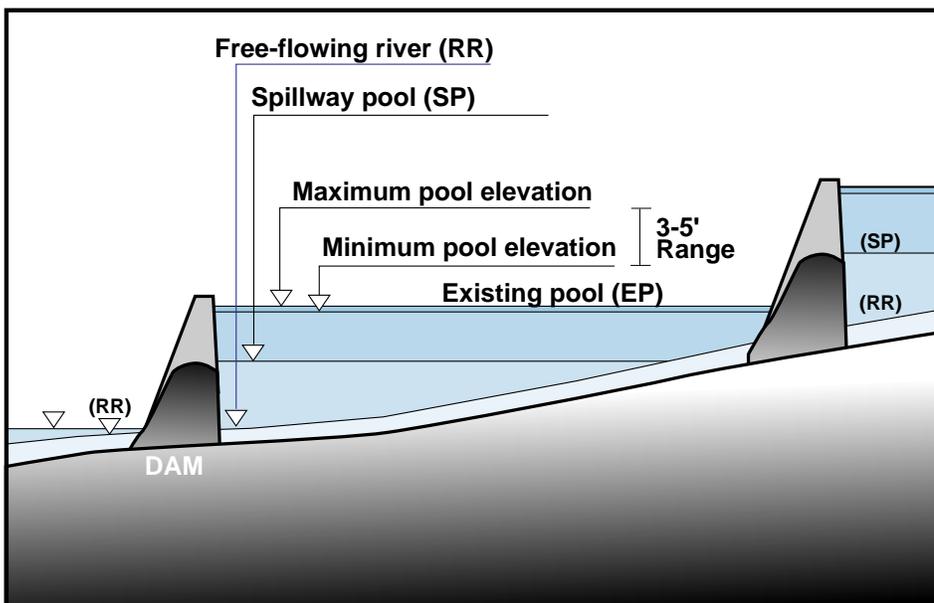
Nine drawdown alternatives to a variety of depths using variable or stable reservoir pools, are evaluated in this report. A tenth alternative was recently added that combines drawdown of Lower Granite reservoir only, with transporting juvenile fish by barge.

Two mathematical models were used to attempt to quantify the relative benefits of reservoir drawdown alternatives to salmon survival. Both were run using a range of assumptions about how reduced travel time for juvenile fish would affect survival. Both used optimistic and pessimistic reservoir mortality and dam passage factors.

Of the drawdown options, the study team determined that only two would provide benefits to salmon over and above survival rates expected under current operations (which include flow augmentation, juvenile fish transportation, spilling fish over dams, and operating certain dams at lowered levels). These are drawdown of the four lower Snake project reservoirs to natural river level, and Lower Granite drawdown with barge transportation.

Study members believe that even though there are many uncertainties with computer modeling, it is unlikely that refinements to the model parameters would change these findings substantially.

Analysis indicated that mid-level drawdown alternatives (below minimum operating pool to near spillway crest) reduced survival for all stocks of salmon analyzed over the current mix of measures included in system operation.



The Drawdown Concept

The cost of modifying the four lower Snake River reservoirs to natural river level is estimated at just under \$5 billion. Economic impact from loss of recreational business, navigation benefits, power loss, etc., is estimated at \$420 million per year. The cost to modify Lower Granite pool only would be \$87 million, plus the cost of improved collection or a new collection system for transporting fish. Other economic impacts such as lost power generation would total \$130 million.

Operating John Day at Elevation 257

Operation of John Day at its minimum operating pool level (elevation 257') from May 1 through August 31 is also evaluated.

The proposal would require relatively minor modifications to project structures as John Day was designed to operate at elevation 257' to provide flood control, although the project design did not anticipate regular or sustained operation at this level.

Some 24 agricultural irrigation pump stations would require modifications to operate. Most would be modest fixes but several larger stations would require additional low-head pumps. A few municipal and other groundwater users surrounding the project area may require adjustments to facilities. The majority of 16 recreation sites on Lake Umatilla (John Day reservoir) would require some extension of boat ramps, swimming beaches and dock facilities. Work would be necessary to maintain adequate channel depths.

Fish and wildlife would be affected in some 8,000 acres of shallow water habitat and 2,000 acres of marsh-riparian zones. These zones may also be important to rearing juvenile salmon. One possible way to mitigate this impact would be to operate the pool at level 257 year-round, thus creating stable new habitat. However, this would replace only about 25 percent of losses. The study identified no other on-site opportunities to mitigate resident fish impacts.

A significant number of cultural resource sites would be exposed; a monitoring program would be required to protect the sites during drawdown.

Effects on salmon

Water particle travel time (WTT) would be reduced about 12-15 percent in the pool itself and about 8-10 percent below Bonneville. From Lower Granite Dam on the Snake river or from Wells on the mid-Columbia to below Bonneville, the reduction in WTT due to John Day

drawdown ranges from 2 to 5 percent.

Potential benefits to juvenile spring chinook salmon were examined using several regional fish passage computer models. Results were varied. The models showed up to a three percent increase in survival.

The effects on Snake River stocks with the transportation program in place are negligible due to the large number of fish barged past John Day. Effects of John Day drawdown alone on Snake River stocks would be negative compared to survival rates with transportation.

Costs

Cost of needed construction to mitigate impacts of the four-month drawdown is estimated at \$65 million. For the year-round option, estimated cost

is \$99 million. Annual operation and maintenance are \$600,000 for the four-month option and \$2.1 million for the year-round. Lost hydropower generation for the four-month option would cost \$3.8 million annually, and for the year-round option, \$12.3 million. There would be a reduction in net farm income due to pumping station modifications and the increased costs of pumping.

Upstream Collection and Conveyance

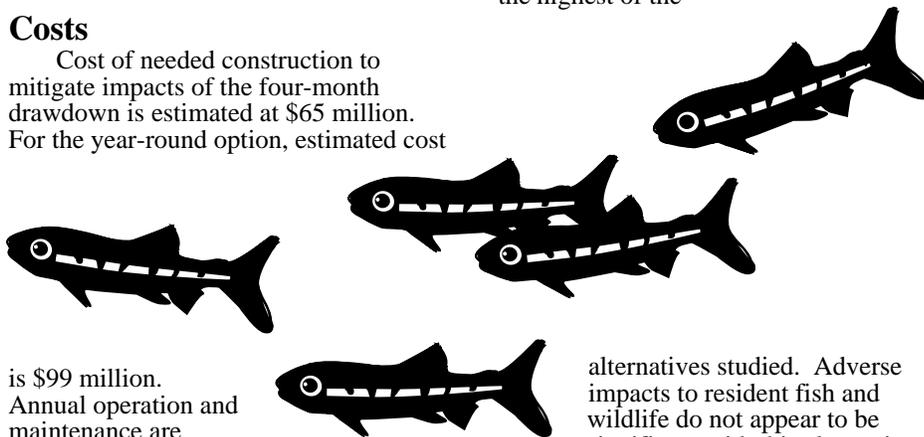
Four collection and conveyance systems were studied. All involve a method of collecting juvenile fish upstream of Lower Granite Dam and lifting or otherwise moving them into a conveyance system. The first of these conveyance systems is a migratory canal along the length of the lower Snake and Columbia Rivers. The second is a buried pressure pipeline along the shoreline. The third would collect fish for barging; the fourth for transfer to a floating open channel in the river. For study purposes, the collection system was assumed to be a single collector upstream of Lower Granite Dam, and would require construction of some type of barrier to channel fish into collection and sorting facilities.

The estimated cost of the upstream collector is \$** million. The cost to construct the migratory canal is estimated

at \$5 billion, and \$1 billion for the floating pipeline. All would have high maintenance costs, ranging up to \$32 million annually for the floating pipeline.

As already noted, drawdown of Lower Granite reservoir combined with a new collection system is also being studied. This method looks promising in terms of salmon survival benefits. The cost to modify the dam is estimated at \$87 million.

Estimated benefits to juvenile fish associated with the collector coupled with barge transportation appear to be among the highest of the



alternatives studied. Adverse impacts to resident fish and wildlife do not appear to be significant with this alternative.

The study team found reason for concern over biological uncertainties with the migratory canal and pipeline proposals. The team points out that these are untested artificial systems that would require mechanical means to lift and/or move fish to the conveyance system, artificial means of feeding the fish, and constant maintenance.

System Improvements

The study team identified a number of improvements that could be made to existing fish facilities. One of these is a surface collector system. Such a system would collect or deflect migrating juvenile salmon within 10 to 30 feet of the water's surface where they normally are found. Current screened bypass systems collect the fish after they have sounded some 70 feet below the surface to the turbine intake area—an experience that some believe may severely stress the migrants.

Other system improvements, such as extended length screens, additional and/or improved barges, and a fish separator at Lower Granite, have the possibility of being implemented as interim (reasonable and prudent) measures under the Endangered Species Act, without waiting for completion of SCS Phase II.

Additional Upstream Storage

Columbia and Snake River flow augmentation has been used for several years to help flush young fish to the ocean and to regulate water temperatures for fish. The need for more water for flow augmentation led to consideration of possible sites for new upstream storage dams on the upper Snake River. Impacts of eleven potential sites were studied. Effects of these sites on increased salmon survival were modeled and found to be limited compared with operating the existing storage dams to meet the same targets. However, additional upstream storage could ease the strain on other storage projects within the system such as Dworshak. The costs to build another upstream storage dam range from \$200 million to \$1 billion.

Report/Public Meetings

For a copy of the SCS Draft Phase I Summary Report, contact Greg Graham at the phone number or address below. Copies of the summary report and a full set of Technical Appendices, one for each alternative analyzed, are available at the main public library in several cities and municipalities in the region. If not at your library, please contact Mr. Graham.

The Corps will hold public meetings on the Draft Phase I report of the System Configuration Study and the Draft EIS on biological drawdown testing in mid-May 1994. Both studies will be covered in the meetings. Opportunity for informal discussion as well as formal testimony will be provided. Tentative cities and dates:

Boise ID	May 16
Lewiston ID	May 17
Kennewick WA	May 18
Portland OR	May 19

Newspaper announcements will provide further details.

FOR FURTHER INFORMATION CONTACT: Greg Graham for SCS, 509-522-6596, or Pete Poolman for the biological drawdown test EIS, 509-522-6619. Their address is US Army Corps of Engineers, Walla Walla District, Walla Walla WA 99362-9265.

BIOLOGICAL OPINION RELEASED

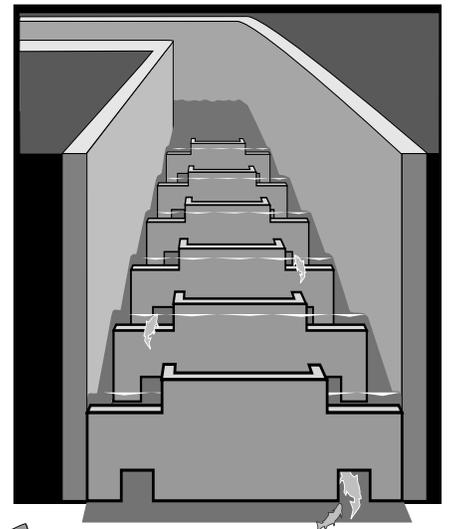
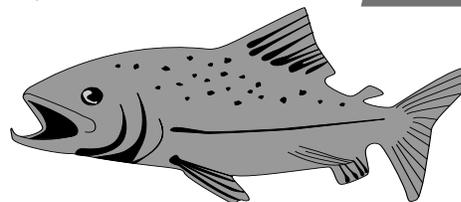
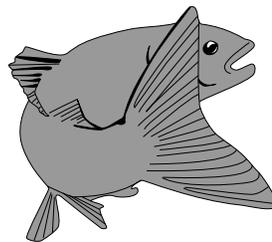
Under the Endangered Species Act, federal agencies must consult with NMFS on proposed activities that might have an adverse impact on listed species. The NMFS Biological Opinion on the proposed 1994-98 operation of the Federal Columbia River Power System was signed on March 16. It found that operation of the Columbia River Federal Power System would not jeopardize the continued existence of listed salmon species. The Biological Opinion calls for higher flow augmentation from upstream storage dams for 1994-98 than was provided in 1993. Flow targets in the Biological Opinion could represent up to an additional two million acre feet of water over 1993.

'92 DRAWDOWN TEST REPORT AVAILABLE

The final report titled 1992 Reservoir Drawdown Test, Lower Granite and Little Goose Dams is available to interested parties. This report compiles physical, structural and environmental data and findings from the March 1992 drawdown test. Please call Dan Kenney at 509-522-6610 or write to him at Army Corps of Engineers, Walla Walla District, Bldg 602 City-County Airport, Walla Walla WA 99362-9265.

OROFINO MEETING— DWORSHAK OPERATION

On Thursday, April 14, the Walla Walla District will hold a public meeting on operation of the Dworshak Reservoir for 1994. Corps representatives will discuss expected reservoir elevations and effects on reservoir recreation. A National Marine Fisheries Service representative will discuss the Biological Opinion on 1994-1998 operation of Dworshak Dam and Reservoir. The meeting will be held at the Orofino Junior High School, 429 Michigan, at 7:00 p.m. **FOR MORE INFORMATION** contact Ed Kim, Chief, Reservoir Regulation Section at (509) 522-6608.



TAKING A “HARD LOOK” AT FISH TRANSPORT

In April 1993, the Northwest Resource Information Center, along with the Confederated Tribes and Bands of the Yakima Indian Nation, American Rivers, Oregon Natural Resources Council and the Sierra Club, filed legal actions with the National Marine Fisheries Service and the Corps of Engineers to stop the collection and transport of juvenile fish in trucks or barges past lower Snake and Columbia River dams.

In a December 1993 decision, Oregon District Court Judge Malcolm Marsh found that the Corps of Engineers had not met procedural requirements for the operation of the Juvenile Fish Transportation Program. The Judge found that the Corps needed to take a “hard look” at the potential environmental effects of the program and alternatives. The decision did not require that the barging program stop, and in fact did not rule on the efficacy of the program itself.

The judge upheld the NMFS decision to issue a Section 10 permit under the Endangered Species Act to allow the Corps to transport fish. The judge also found that the Corps acted in good faith in applying for the permit.

In his Opinion and the January 31 Judgment that followed, the judge left to the Corps’ discretion the manner in which it would “significantly analyze” transport impacts and alternatives and the vehicle for providing NEPA compliance.

SOR to be Vehicle

The Columbia River System Operation Review (SOR) is a multi-agency comprehensive study to examine the various ways the Federal Columbia River Power System could be operated to serve all uses better, including anadromous fish.

The Corps has decided that the most logical and efficient way to provide timely and thorough analysis of the environmental impacts of transportation and alternatives to transportation, is to expand the SOR evaluation. Although transport was a part of the public scoping process and is therefore already being analyzed in SOR, the depth of analysis will be expanded. An appendix devoted to transport will be added to the nineteen appendices already being prepared for the SOR Draft EIS.

Process and Schedule

SOR staff have begun work on the new appendix on fish transport. A draft outline was made available to known interested agencies, groups, and individuals, and meetings were held to discuss the outline and the process the Corps will follow. The Corps is seeking involvement of those parties in completing the analysis. The final draft is expected to be available to the general public, along with the entire SOR EIS and appendices, in summer of this year for review and comment. A ninety day period for comments and public meetings will follow release of the draft documents.

Streamline Special Insert

The SOR team is also including a special insert to the March/April Streamline publication to explain the expansion of the SOR analysis. If you are not already on the mailing list for SOR and are interested in more information, call the SOR Interagency Team toll-free number: 1-800-622-4519.

A Quick History

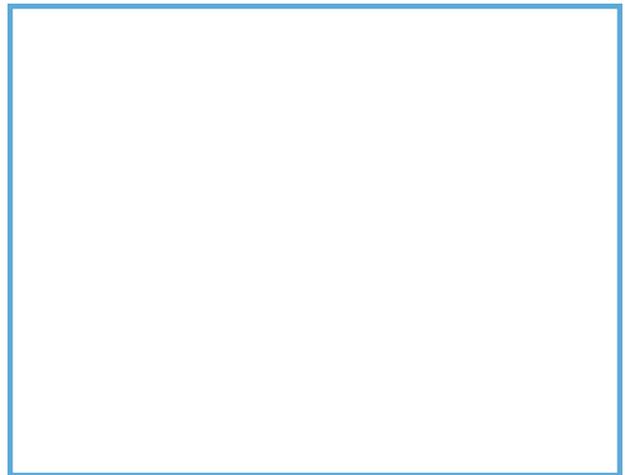
The program for collecting and barging or trucking juvenile salmon past the dams, grew out of several problems migrating juveniles began to face in the late 1960’s and early 1970’s with more dams being built in the Columbia and Snake River system. More dams meant more turbines to negotiate; and more water spilled over the dams when turbines were idle—causing increases in harmful gases trapped in the water and the potential for gas bubble disease in fish. There was an increase in predation due to more “predator friendly” reservoirs behind the dams. The slower water velocities also meant a longer migration time for the juveniles.

In 1968 National Marine Fisheries Service obtained funding from the Corps to experiment with collecting fish at the dams and putting them in trucks to be taken past the dams and deposited in the Columbia River below Bonneville Dam, the last project in the system. The early experiments proved promising, and research and construction efforts began to

concentrate on ways to collect and transport more juvenile salmonids.

Barges to carry the juveniles were added to the program and equipped with systems to circulate river water during the downstream trip to give the young fish a stronger chemical imprint. Systems to remove gases from the water were built into the barges to combat the effects of supersaturation from spill. Changes were made to the bypass and collection systems to collect more fish and decrease stress on fish.

In 1981 the Corps took over the transportation program from NMFS and it became a part of annual fish operations. But some opposed the transport operation, believing that the stress of being collected and loaded into barges could weaken the fish to the point they could not recover or were more susceptible to predation after being released. There was concern that



A fish barge departs Little Goose Lock and Dam. Walla Walla District Photo.

crowding wild smolts with unhealthy hatchery fish would allow disease to spread to the wild fish.

These doubts continue today. Opponents say that if the program were beneficial, salmon runs would have improved over the fifteen years the program has been in full swing. Instead, some salmon runs have continued to decline.

Proponents say study data shows that transported fish survive and return as adults in greater numbers than non-transported fish, and that without the transportation program the fish runs would be even worse off.

The process for addressing the judge’s ruling will provide the region a forum for exploring, discussing and reexamining pros and cons of juvenile salmonid transportation and the alternatives, and making informed decisions for operating the federal Columbia River power system.

LETTERS

A number of people responded to a request in the last issue of Salmon Passage Notes for comments on salmon issues.

One suggested that we provide information on ocean effects on salmon, such as the potential effects of El Nino on feeding and migrating habits. Knowledge of the effects of ocean life on salmon is limited, but we will try to cover this topic in a future issue.

Another asked that we review a recent article in *Willamette Week*, a Portland, Oregon, publication, that suggested taking out certain dams to improve salmon habitat. We will review the proposal in our next issue.

One called reservoir drawdowns a potential tragedy for certain Northwest communities. Another believes the Endangered Species Act is holding America hostage. A couple of letters requested information on the juvenile fish barging program, and another talked about the loss of salmon and effects on native Americans.

Thank you for your letters. It helps us better understand the various points of view in the region, and to know what the information needs are.

Salmon Passage Notes is published by the North Pacific Division of the U.S. Army Corps of Engineers.

If you would like to be added to our mailing list, or if you have questions or comments, please write to:

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