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SCIENCE PANEL REVIEWS LOWER SNAKE HATCHERIES: 'INTERACTIONS BETWEEN HATCHERY/WILD BEING EXAMINED'

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Creating fish for harvest while still protecting the sanctity of threatened wild Snake River salmon and steelhead remains "a critical adaptive management challenge" for Lower Snake River Compensation Plan managers, but one they should be equipped to handle, according to a recent review prepared by the Independent Scientific Review Panel.

"Overall, the hatchery component of the LSRCP is scientifically sound. It has established goals, quantitative targets, and objectives for research, monitoring, and evaluation.

"Finally… it has demonstrated the ability to be managed adaptively as new challenges develop," according the "Summary of ISRP Reviews of Steelhead and Spring and Fall Chinook Salmon Programs of the Lower Snake River Compensation Plan" released June 18. The review can be found at:
http://www.nwcouncil.org/media/7109146/ISRP2014-6.pdf

"After Snake River spring and fall chinook and steelhead were listed by the ESA, the LSRCP recognized the need to assist in the recovery of these species in addition to meeting original program objectives," according to the ISRP. The list of Columbia/Snake river basin threatened and endangered salmon and steelhead species was started in November 1991 with NOAA Fisheries' declaration under the Endangered Species Act that the Snake River sockeye stock was endangered. A total of four Snake River stocks are listed – including fall and spring/summer chinook salmon and steelhead.

"The ISRP encourages the LSRCP to continue collaborative efforts with ESA recovery planning while also providing the harvest opportunities originally sought by the LSRCP," the ISRP report says.

This report summarizes the ISRP's review of the three LSRCP hatchery programs. The ISRP completed a review of the spring chinook program in 2011, the steelhead program in 2013 and the fall chinook program in 2014. The reviews were requested by the Northwest Power and Conservation Council and U.S. Fish and Wildlife Service.

"The ISRP found that the LSRCP's hatchery programs for steelhead and spring and fall chinook salmon are largely consistent with the scientific foundation, artificial production strategy, and artificial production principles contained in the Council's Fish and Wildlife Program," the report says.

The ISRP was created via a 1996 amendment to the 1980 Northwest Power Act, which created the Council and required it to develop a fish and wildlife program to mitigate for the impact of Columbia and Snake river dams. The amendment instructed the science panel to review projects proposed for funding by the Council through the Bonneville Power Administration's fish and wildlife budget. BPA markets power generated in the Federal Columbia River Power System and is required to provide funding from ratepayer revenues to mitigate for fish and wildlife losses.

In 1998 Congress expanded ISRP responsibilities to include review of projects in federal agency budgets that are reimbursed by BPA. The LSRCP is a program funded with congressional appropriations that are reimbursed to the U.S. Treasury by Bonneville.

The new directive required the ISRP to review reimbursable program projects using the same criteria as used to review projects in the Council's Fish and Wildlife Program and to "make any recommendation that the Panel considers appropriate to make the project, program, or measures meet the criteria."

Bonneville funds the "hydroelectric share" of operations and maintenance and other non-capital expenditures for fish and wildlife activities by the U.S. Army Corps Engineers and Bureau of Reclamation (O&M of fish facilities at the federal mainstem dams operated by those two agencies and Corps/Reclamation mitigation hatcheries), and U.S. Fish & Wildlife Service (for hatcheries under the Lower Snake River Compensation Plan – 11 hatcheries and 18 satellite facilities).

The new ISRP review says that each LSRCP hatchery program "has objectives, including targets for broodstock abundance, egg-to-smolt survival rates, smolt size-at-release, and contributions to fisheries and, in the case of supplementation programs, to natural spawning populations.

"Adequate monitoring and evaluation programs are in place to ascertain if these objectives and outcomes are realized. Data produced from project experiments are being used to refine how fish are reared, released, and identified," the report says. "Interactions between hatchery and wild fish are being examined, and methods used to estimate the survival and contribution of project fish to fisheries and natural spawning populations are being employed and refined.

"Data gaps have been identified, and program activities designed to address these issues are either under way or planned in the future."

The ISRP review notes that "the effects of supplementation on adult abundance and productivity of natural populations are also being investigated" through the LSRCP.

Supplementation involves the rearing in hatcheries of young fish, most of which have wild parentage, that are acclimated near streamside spawning grounds before their release. The idea is that those juvenile salmon will return as adults and spawn in the wild, thus supplementing the abundance of naturally produced fish.

"Results of these studies have been mixed," the ISRP review says. "Spring chinook supplementation programs have increased the total abundance of spawners in their rivers (hatchery plus wild) but have not produced an increase in natural-origin adults.

"Fall chinook supplementation has likely contributed to the recent increases in natural-origin fish abundance in the Snake River Basin, but the productivity of the natural-spawning population remains very low," the report says. "Clear evidence for density dependence has been observed in supplemented populations, especially in spring chinook, and this ecological response may inhibit desired increases in abundance and productivity.

"In fall chinook, there has been a marked increase in natural-origin fish, and it is reasonable to believe that a number of these represent the progeny of naturally spawning hatchery fish. For logistical reasons, assessing the role of supplementation versus improvements in survival and harvest reductions is not complete.

"Additional research is needed to understand how genetic and environmental factors, including habitat restoration, affect the consequences of supplementation on natural populations. The LSRCP's supplementation programs offer important opportunities for such work," the report says.

LSRCP hatcheries in Idaho, Oregon and Washington produce and release salmon, steelhead and rainbow trout. Satellite facilities associated with the program's fish hatcheries provide opportunities for acclimation prior to release and adult trapping for spawning, according to the USFWS. LSRCP hatcheries are operated by USFWS, Idaho Fish and Game Department, Oregon Department of Fish and Wildlife, and Washington Department of Fish and Wildlife.

Congress authorized the construction of four dams on the lower Snake River in 1945. When construction funding was appropriated by Congress in 1954, only adult fish ladders and other minor dam modifications were funded to mitigate for anticipated adverse impacts to salmon and steelhead.

Congress authorized the LSRCP as part of the Water Resources Development Act of 1976. A major element of the authorized plan was a program to design and construct fish hatcheries to compensate for some of the losses of salmon and steelhead adult returns.

According to the USFWS, spring/summer chinook for the LSRCP are reared at six hatcheries and acclimated and released at eight other satellite facilities. The mitigation goal established for spring/summer Chinook (hereafter referred to as spring Chinook) was to return 58,700 adult fish above Lower Granite Dam after providing 234,800 adults to fisheries in the ocean and Columbia River.

In aggregate, the production goal for the spring chinook hatcheries is 6.75 million smolts.

Two hatcheries and ten satellite facilities are used to rear, acclimate, and release project fall chinook. Release goals of 900,000 yearling and 4.6 million sub-yearling smolts were established for this program. This program has a mitigation goal of 18,300 adults above the project area.

For steelhead, a mitigation goal of 55,100 adult fish returning back to the project area was established after downriver harvests of 37,000 and 73,200 steelhead by commercial and recreational fishermen, respectively. The program was projected to generate 130,000 angler days of recreational fishing. Juvenile steelhead are reared in five hatcheries and acclimated and released at 11 satellite facilities, according to the ISRP report.