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[1] Science Panel Takes A Hard Look At Hatchery Policies

The Independent Scientific Advisory Board (ISAB) didn't mince words during the March 13 meeting of the Northwest Power and Conservation Council, when it briefed members of the four-state compact on its **latest review** of the science behind the region's 2009 fish and wildlife program. They said the program could actually be hindering efforts to restore ESA-listed fish runs in the Columbia Basin, but nobody knows for sure.

"A key scientific uncertainty in the 2009 Program is whether the objective of using artificial production to mitigate for lost harvest opportunities can be reconciled with the dual objectives of ESA recovery and restoration of healthy natural populations," said the board's March 8 report, five months in the making.

The crown jewels of the Council's program--new fish hatcheries built for many Basin tribes over the years--may be part of that problem. According to the report, the tribal facilities now produce about one-third of the 100 million salmon and steelhead smolts released above Bonneville Dam every year. The states crank out about 40 million smolts annually, the feds nearly 30 million.

The report was commissioned by the Council to help begin the latest amendment process to the F&W program that the Northwest Power Act calls for updating every 5 years. If the ISAB's words are heeded, the direction of the program could conceivably shift considerably from the region's current fish-producing ways to a more holistic approach. But such a vision could be far-fetched, given the constraints and obligations of treaties and mitigation agreements that have boosted fish numbers to make up for dam operations.

The report noted that the science panel has already called for more research into the uncertainties about the "aggregate carrying capacity" for juvenile salmonids in the Basin, and called it the highest priority for research, management, and restoration activities. The

report said the Basin's carrying capacity for target species "must ultimately constrain Program objectives related to the abundance and productivity of those species and should be addressed when prioritizing restoration activities."

"We really ought to shift our focus from maximized production to sustaining the benefits from these natural complex systems," said Canadian scientist and ISAB member Chris Wood. He said the ISAB has re-examined the conceptual foundations for the program in light of recent advances in landscape ecology and the sciences of complex systems.

He added that increasing evidence from around the world shows that the effort to maximize production of natural systems "tends to be unsustainable in the longer term," partly because complex systems are usually shaped by extreme events that are often unpredictable.

ISAB member Greg Ruggerone said the large numbers of hatchery fish may be limiting the amount of food available during their juvenile migration, especially since conditions in the Basin have changed significantly over the years.

He said it was estimated that spring Chinook migrating from Lower Granite Dam on the Snake River eat about 166 metric tons of food before they reach Bonneville Dam. Are they getting enough to eat? No one knows for sure, but he said bio-energetic models should be developed to look into the question, then presented some evidence that seems to show limited food supplies have affected smolt numbers in some places--like steelhead in the Umatilla River.

Ruggerone said one of the biggest questions raised by the ISAB's new report is whether the recovery of ESA-listed populations can be "reconciled" with artificial production of fish destined for harvest. The panel has recommended quantitative objectives be developed for each artificial production program--harvest targets geared to ocean productivity--as recommended a few years ago by the Hatchery Scientific Review Group's **extensive study** of the hundreds of hatchery programs throughout the Columbia Basin.

The panel also recommended that integrated supplementation hatcheries have a conservation goal distinct from production-type hatcheries charged with producing fish for harvest. "It's very important to figure out ways to fully harvest the surplus fish returning to these production hatcheries," Ruggerone said.

He said effects of harvest need to be studied, too, to determine whether it is slowing the recovery of naturally reproducing populations.

Recognizing the "balancing act" between restoration efforts in the National Marine Fisheries Service's harvest BiOp and tribal trust obligations, the ISAB thought the Program can address "ecosystem-scale effects," like allowing more fish to spawn in rivers to provide nutrients for all fish and wildlife.

Ruggerone said spawning escapements have actually increased in the past 10 years, but that's partly because of the large numbers of hatchery fish straying to spawning grounds. Then there is the question of fishery-induced evolution of salmon characteristics from highly selective harvest methods like gillnetting--which targets fish of a certain size, tending to remove the larger, older fish in the returning populations at certain times during the spawning migration.

The ISAB feels that more work needs to be done to monitor spawning grounds for numbers of hatchery fish, because, as Ruggerone said, "it's an area where we still don't know the total number of hatchery--and wild-origin fish entering the Columbia River mouth."

In fact, the ISAB suggested adopting HSRG recommendations that call for limiting hatchery spawners from supplementation facilities to 10 percent of total spawners, and 5 percent for fish from production facilities. Ruggerone noted that currently, hatchery spawners make up 30 percent to 80 percent of the fish on spawning grounds in some ESA-listed ESUs.

Among many other recommendations, the ISAB said the F&W program should recognize the "tremendous impact" of ocean conditions on salmon survival and growth. Ruggerone said this information needs to be documented to better evaluate the influences of habitat restoration activities.

The panel also noted that the development of quantitative goals was called for in the 2009 program, but most haven't been implemented. The ISAB did comment on the 5-million fish goal mentioned in the 2009 program, but as, Ruggerone said, it never identified where these 5 million salmon were coming from. "Under this target, they could all be hatchery fish--that would be inconsistent with the program."

The report also said "realistic survival-rate goals that reflect self-sustaining salmon populations should be developed for each species and stock where feasible," instead of the nebulous 2-percent to 6-percent smolt-to-adult return rates for ESA-listed Snake River and upper Columbia River salmon and steelhead. SARs seldom reach those numbers, but many stocks seem to be improving, or at least maintaining current numbers in spite of it.

On March 27, the Council announced its call for amendments to the next F&W program, with a draft possibly ready by December, and a final version adopted by April 2014. ***-Bill Rudolph***

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