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## NW Fishletter #318, June 4, 2013

### [8] *Analysis: 2013 --Another Mixed Message From Mother Nature*

The upriver spring Chinook run in the Columbia River will be lucky to hit 100,000 fish by June 15, which would make it the poorest return of the past seven years, despite gobs of flow and spill in the river when the little tykes headed out to sea on their grand adventure in 2011.

They were certainly well-fed, according to surveys that tracked them in their first few weeks in the ocean, but now it seems likely the fish encountered relatively poor conditions in the Gulf of Alaska. Most of Alaska's own Chinook runs have tanked in recent years. To add insult to injury, the spring jack count at Bonneville Dam has tripled last year's count. Does that mean 300,000 fish are going to show up next year? I wouldn't put money on it.

With all the flow and spill at federal dams to help the 2011 migration, even the Fish Passage Center -- home to the region's chief flow and spill evangelists -- may have a hard time explaining what went wrong. Since court-ordered spill went into effect in 2006, juvenile survival of inriver salmon and steelhead has generally improved a tad, but most adult returns have come in less than expected, regardless what some dam breaching advocates and recreational fishing lobbyists tell the gullible press.

Back in January, the FPC was asked why the 2012 A-run steelhead return was so poor. Most of the A's went out in 2011 and came back in 2012. Here's the answer the FPC gave in a January memo to Idaho Fish and Game (IDFG).

"The 2011 juvenile Snake River steelhead migration experienced high flows. With these high flows, survivals in 2011 were generally higher than average, fish travel times and water transit times were faster than average, and spill percentages were higher than average. The juveniles then entered the ocean and were presented with ocean conditions for survival that were intermediate in rank, when compared to the past 15 years.

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*"Based on CSS [Comparative Survival Study] analyses of SARs for yearling Chinook and steelhead, it appears that SARs in more recent years are in a downward cycle. This downward trend appears to be true for both yearling spring/summer Chinook and steelhead. Finally, estimates of 1-salt SARs for Snake River A-run steelhead indicate that the 1-salt SARs for 2011 out-migrants were the lowest among the four years analyzed. The same decreasing trend in 1-salt SARs is evident for juveniles that were transported and those that migrated in-river" (italics mine).*

Downward cycle? Did I read that right? So, in the immortal words of Tina Turner, altered slightly, WHAT'S SPILL GOT TO DO WITH IT?

Obviously, not a whole lot. But that hasn't stopped the FPC spill evangelists from advocating even more. In one of the recent presentations from their annual CSS workshop in April, they pushed for a "years-long" study that would look at salmon SARs resulting from spill levels bumped up another 5 percent to allow tailrace total dissolved gas levels to reach 125 percent. Waivers now limit TDG levels to 120 percent in tailraces and 115 percent in forebays.

Washington state would have to modify its regulations to allow for such a spill regime, which doesn't seem likely -- the state successfully fought court challenges in 2011 and 2012 to boost forebay gas levels to 120 percent.

Washington's Department of Ecology had already decided that changing the standard isn't worth it. According to a bi-state report in early 2009, "Ecology determined that there would be a potential for a small benefit to salmon related to fish spill if the 115-percent forebay criterion was eliminated, but there would also be the potential for a small increase in harm from increased gas bubble trauma."

But the CSS analyses used by spill advocates to support claims for higher SARs have failed to answer some simple questions such as, in years when higher levels of spill may have helped inriver SARs, why did transported SARs also go up? The answer is simple. In good water years, when flows and spill levels are relatively high, ocean conditions are also usually good.

It has been reported that several in-depth looks at the SAR-boosting CSS analyses have found serious problems with its methodology, and no one's been able to replicate the results. BPA knows this, NOAA knows this, but so far, mum's the word.

However, even the FPC has nodded to the oceanic elephant in the room. In their January memo, it noted, "Based on these results, it

appears that there is some common year effect that results in transported and in-river migrants to have similar patterns in SARs over the four years we analyzed."

They have a hard time saying it, but it's the ocean they're talking about -- where adult returns can rise and fall by an order of magnitude in the space of just a few years. In fact, some researchers are now mumbling into their beers that it doesn't really matter whether juvenile fish are barged or go inriver, because ocean factors outweigh everything else by so much. It boils down to one thing -- the bigger you are, the better chance you have making it home alive.

A **recent commentary** by renowned University of Washington fish biologist Ray Hilborn, in the prestigious *Proceedings of the National Academy of Sciences*, asked the question -- *Is it the dams?* In his April 9 piece, Hilborn asked why juvenile Chinook from the Snake have so much poorer survival rates than stocks further down the Columbia, even after ocean conditions appear to be more favorable and passage survival improved at projects.

First, he pointed out that new tagging techniques, such as the acoustic research by Canadian David Welch and associates have shown that survival of the Snake juveniles is comparable to survival of juvenile Chinook in B.C.'s Fraser River, "where there are no dams."

If the dams aren't killing the fish, asked Hilborn, "why do they do so poorly?" He reasoned that since Welch's research found no evidence of delayed mortality for the Snake fish compared to fish from the Yakima River all the way to the northern tip of Vancouver Island, it must be found at a later point in their life in the ocean.

And that's where NOAA is looking right now, hoping to add a new factor in the agency's spring Chinook prediction model that takes it into account. After stellar predictions the past several years, NOAA's prediction for the 2013 Columbia upriver spring Chinook run was more than 100 percent too high.

At this point in his commentary, Hilborn shifted gears, and took a closer look at the Fraser, where he said lessons could be learned from the Chinook declines observed there. He said hatchery Chinook SARs dropped from 5 percent in the mid-1970s to 1 percent by the mid-1980s, due to a combination of overharvest and poor ocean survival. The ocean was warming during this time, but Alaska stocks were then experiencing an increase in survival.

He noted that Canada had built some Chinook hatcheries in the Fraser in the 1970s, some

near the river mouth, others far upriver ("comparable in travel distance to the Snake River Chinook on the Columbia"). The upriver hatcheries, he said, had "abysmal survival."

One of these located 400 miles up the river averaged about 0.1 percent survival through most of the 1980s, while another hatchery about 200 miles up the river average 0.5 percent for the same period of time. But survival from hatcheries near tidewater was up to 10 times higher than that.

He said it certainly is "suggestive that the pattern of declining ocean survival with distance upstream may be a phenomenon found in places other than the Columbia River and may ultimately not be related to the hydroelectric system."

Hilborn acknowledged that Welch's results had come with caveats -- maybe some migrants did not head north toward detectors, and the larger fish needed to carry the relatively large tags -- but he called it a significant advance in measuring early ocean survival of upstream and downstream fish from the Columbia.

"The importance of dams in the Columbia River has deeply divided the scientific community," said Hilborn, "with very reputable scientists on both sides of the debate. Those arguing that dams are the major problem with Snake River Chinook salmon will remain unconvinced by this study and the earlier work of Welch et al. Extensive efforts to bring these two scientific communities together have proved unsuccessful, and by now it is hard for outside observers to see what kind of data will resolve the differences in perspective.

"Overall," he continued, "Chinook salmon are doing poorly throughout their range, from the Yukon River to the Sacramento. Although there are more salmon in the ocean now than any time in the past, the boom in salmon has been in pink, chum, and sockeye, while the freshwater river-rearing coho and Chinook have declined. It may be that with current ocean conditions, many stocks of Chinook salmon cannot survive, and that the geographic range of Chinook may contract and the long-distance migrating Chinook of the southern rivers may not persist."

It makes one wonder why the infamous PATH process of the late-1990s never looked to the nearby Fraser in its search for answers to hypothetical questions about delayed mortality. Several participants told me it was a "political" decision, because by looking at the Fraser survivals, some players would not be getting the answers they wanted. **-B. R.**

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