

FISHERMEN'S NEWS

The Advocate for the Commercial Fisherman



Pacific Coast Federation of Fishermen's Associations

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Saving Salmon from Drought

By Tim Sloane

2014 WAS A TOUGH YEAR FOR salmon production in California's Sacramento River. 95 percent of endangered winter-run Chinook eggs either failed to hatch into baby fish, or if they did, died before they made it more than a few miles downstream.

The result for commercial fishermen: closures of large temporal and geographic portions of the 2015 salmon season, in an attempt to minimize impacts on what few winter-run beat the odds by surviving the trip downriver, through the Golden Gate, and into the ocean.

Keep in mind that winter-run Chinook are listed as "endangered" under both the federal and California Endangered Species Acts. We can't catch these fish, and we can't sell these fish, but we've taken the management hit and resolved to weather season restrictions they create, and we can hold out hope that the same thing doesn't happen again.

And then more bad news.

US Fish & Wildlife Service data confirmed earlier this year that the same thing happened to the Sacramento River's 2014 fall-run Chinook, only worse. Close to 98 percent of the naturally spawned fall-run eggs failed to convert to fry, or failed to swim past the outmigration monitoring point.

Fall-run Chinook are the bread and butter of commercial fishermen in California, and also support

fishing communities in Oregon and Washington. These are the fish we do catch, the ones that support our families, as well as the communities of fish processors, wholesalers, restaurants, charter boat captains, tackle shops, mechanics, hotels, and marinas that depend on salmon fishing for their livelihoods. These are the fish that form the cornerstone of a \$2.1 billion industry on the West Coast that supports more than 33,000 jobs.

The result of the annihilation of the 2014 fall-run fish won't be felt until 2017, when what's left of them become the targets of the commercial and sport fisheries. Whether those fish can support a viable fishery is anyone's guess. It's a bridge we'll cross when we get there.

Drought Kills Salmon

The simple explanation for what happened to the 2014 Sacramento River winter and fall-run Chinook is drought. The complicated version is a story of the predictable impacts of drought, gone haywire by a series of human interventions and bureaucratic decision-making.

Drought means lower than normal precipitation, and brings with it higher than normal air temperatures. In drought years, what water we do get drains into waterways at lower volume, with higher ambient temperature – conditions ripe for increasing the temperature of the

water itself. That warmer water then enters warmer waterways.

Keep in mind that it's not just California. Washington Governor Jay Inslee earlier this year declared a drought emergency and Oregon, like much of the west, is also suffering dry conditions. None of this bodes well for salmon populations up and down the coast, not just in the California Central Valley.

In the case of the Sacramento River, warm water is impounded in warmer reservoirs, such as Shasta Lake. Already taxed by preceding drought years, Shasta Lake in 2014 was warmer and held less water than usual. This much seems logical.

This is where human beings started making mistakes.

Shasta Dam is a main impounder of water on the Sacramento River, and used as control point for water releases destined to supply agriculture and municipalities with annual water allocations. Shasta Dam is also the highest point on the Sacramento River that salmonids can reach. Just below Shasta is some of the most important spawning habitat for fall-run Chinook.

For several years, the water in Shasta Lake has been released from the Dam in a methodical manner – mostly to benefit federal water contractors, although the salmon Biological Opinion requires the Bureau of Reclamation to either hold back water for temperature reasons, or release



water for salmon. Water users rely on intermittent releases to water crops when they need it most. Salmon require different flow levels depending on the stage of their life cycle: in-migration, spawning, incubation, rearing and out-migration can all occur at different flows.

When the reservoir is sufficiently full, achieving the right timing and volume of releases to satisfy those competing needs isn't a problem. When the reservoir is low, however, getting the right balance is that much more difficult.

For salmon, an even more critical concern is the temperature of the water being released. 56° Fahrenheit is essentially the cutoff point for all stages of the Chinook life cycle. It's not the optimal temperature, which is closer to 54°. But anything above 56° will scramble salmon eggs and retard the development of those juveniles that do hatch. What's more, 56° is a legally enforceable benchmark, required by the salmon Biological Opinion.

Model Government

To implement this delicate dance of timing and temperature, the US Bureau of Reclamation, which operates the Shasta Dam, relies on a computer model. The model hopes to predict the ability to achieve release temperatures adequate for salmon over the course of a year. In doing so, it takes into account the reservoir contents and temperature, expected water inputs, environmental and climatic factors, and a host of other variables.

The model generates a schedule that dictates when to release water, and how much of it, to ensure that 56° water is available over the course of a year. The Bureau then uses a device in the reservoir to mix warmer surface water with cooler water at depth to achieve the target release temperatures.

In 2014, the model predicted that the Bureau would be able to just barely hit the 56° mark in every month of the year—with absolutely no margin for error.

That year, the model was off by more than 1° F.

That is, by releasing water per the schedule prescribed by the model, the Bureau was actually dumping water

more than a degree warmer than fish can withstand during critical spawning, incubation and rearing periods.

While that 1° might not seem like much in a bathtub, this mistake resulted in the massive mortality of incubating and baby salmon described above.

So it came as a big surprise when the Bureau proposed using essentially the same temperature model to plan its water releases in 2015, with the hope that the miscalculation was an anomaly.

And it came as an even bigger surprise when the California State Water Resources Control Board (State Board), which signs off on the Bureau's operations plan, gave its provisional approval of the plan in April 2015.

Fishing and Environmental Pressure Prevails

And so it should come as no surprise that PCFFA, along with our allies at Golden Gate Salmon Association, the California Sportfishing Protections Alliance, the Bay Institute, National Resources Defense Council, Restore the Delta, and several others, made a special effort to get the Bureau and the State Board to comply with the law. Even the Pacific Fishery Management Council offered a letter warning the Board of the danger to salmon by relying on the same flawed model.

The crux of our argument: the Bureau screwed up last year, the State Board was complicit, and salmon blood was on their hands. The temperature model was clearly faulty and incapable of predicting actual conditions. By failing to include a margin for error in the temperature-modeling program, those agencies were hoping not to cause the extinction of the winter-run, and the shutdown of the fall-run fishery.

We sent multiple letters to the State Board, and eventually appeared before them on 20 May, demanding that they avoid repetition of last year's massacre. They could do so by targeting temperatures lower than the 56°, to provide a cushion against real-world conditions.

The State Board listened. On Friday, 29 May, the State Board rescinded its provisional approval of the Bureau's

Shasta Dam operations plan, citing Board members' requests that a margin of safety be added to the plan. We prevailed, at least for the weekend.

The Bureau Blows It

Early the week of 1 June, however, it became devastatingly clear that although we had avoided the Bureau's poorly crafted operations plan, we could not fight off the drought itself.

Based on updated temperature readings, the Bureau revealed that the cold water pool in Shasta Lake that is mixed with surface water to achieve release temperatures was drastically warmer and smaller than it had previously believed.

What they found caused the "expert" agencies, including the US Bureau of Reclamation, the California Department of Water Resources, the National Marine Fisheries Service, and the California Department of Fish & Wildlife, to retreat from their former hope that achieving 56° was possible this year.

As of this writing, fishing and environmental groups are being asked to brace for the possibility that the agencies will be targeting 57-57.5° water releases for much of the Shasta Dam operational year. The hope is that higher temperature targets will preserve at least some of the cold water pool for the months most critical to salmon, in late August, September and October.

But temperatures in the 57-57.5° range caused the catastrophic loss of the 2014 brood year fall- and winter-run Chinook salmon.

Preparing for the Worst

The reality of drought is that disparate interests are willing to fight for a piece of a natural resource that is stretched to its absolute thinnest. We're looking at the potential extinction of a species. Let that sink in.

When an agency makes the decision to release water hotter than salmon can survive, we are actually making a decision to permanently remove those salmon from nature.

In doing so, we are asking that the species disappear to absolve us of our sins of water gluttony, irresponsible



planning, and the blind hope of a return to the water abundance, and minimal water demand, which we enjoyed when the Central Valley and State Water Projects were conceived.

And we're also hoping that the families that depend on those salmon will be able to weather the storm. There are tens of thousands of people in California, Oregon and Washington whose ability to buy groceries and put gas in the car depends largely on whether enough cold water is coming out of Shasta Dam. Those folks are now at the mercy of the Agencies' response to the drought.

Hoping for the Best

What can the fishing industry do to mitigate the grisly realities of this situation? Praying for rain hasn't worked. Hoping that the water users relent hasn't either.

It was very encouraging when the State Board listened to reason when we asked that they include a margin of safety in the Shasta operations plan. Pressuring agencies to act with caution, and with an understanding of every implication of their decisions, is a task left to the citizenry. Difficult governing decisions are made less so when members of the public chime

in on the discussion. Getting involved by writing letters and appearing at public hearings will never hurt our cause.

Additionally, the government needs to take steps to improve the information on which it bases its decisions. That the Bureau did not remedy the flaws in its model before it proposed this year's operations plan was a poor judgment call and a signal that we need some measure of redundancy in our information gathering. Hoping that a body of knowledge is the "best available science" is shameful when it is also the only available science.

Lastly, we all need to abandon the hope that things will "return to normal" on the Sacramento River. Change is the only remotely "normal" thing about this ecosystem. The only things we can normalize are our relationships to the watershed and its constituents. Revising the way we allocate and use water is going to be the critical factor in whether salmon survive. **FN**

Tim Sloane is the Executive Director of the Pacific Coast Federation of Fishermen's Associations (PCFFA), and can be reached at PCFFA's San Francisco Office at (415)561-5080, by mail at PCFFA, PO Box 29370, SF, CA 94129-0370 or by email at: tsloane@ifrfish.org.