

Pressure's on to help Delta fish suffering amid drought

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With populations of numerous endangered Delta fish species at alarming lows, officials in California are planning a number of steps to help them survive if 2015 proves to be a fourth drought year.

The California Department of Fish and Wildlife last week released the results of its annual fall population survey for five key fish species in the Sacramento-San Joaquin Delta. It showed that Delta smelt, a small endangered fingerling, reached its lowest population level in nearly 50 years of monitoring.

Other species did not plunge to record lows but came close. Longfin smelt and American shad both recorded their second-lowest numbers, while striped bass and threadfin shad were at their third- and sixth-lowest levels, respectively.

The results, along with continued dry conditions in the region, have officials planning ahead to manage the species through another potential drought year.

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Northern California has not seen a significant storm in nearly a month, a time period that is normally the wettest of the year. The Sierra Nevada snowpack – crucial to summer water supplies for people and wildlife – is 36 percent of average.

Mark Cowin, director of the California Department of Water Resources, called the depleted fish populations “a very deep concern,” not only for fisheries, but because they can trigger provisions in the Endangered Species Act that restrict water diversions from the Delta.

The estuary, the largest on the West Coast of the Americas, provides drinking water to about two-thirds of California's population and irrigation water for some 3 million acres of farmland.

“It's real clear that the longer the drought persists, the more acute its effects are,” Cowin said. “That applies to fish and wildlife; it applies to water users; it certainly applies to our agricultural economy. I'm concerned on all of those fronts.”

The fishery numbers are not entirely surprising because all five species are known to decline in drought years. They are pelagic species, meaning they depend on constant freshwater flow through the estuary. When those flows decline, so does fish abundance.

But many scientists believe the drought has only exacerbated decades of pressure on Delta species caused by water exports, pollution from urban and agricultural runoff, and invasive species that compete for food and habitat.

“They're sort of the forgotten victims of the drought train wreck,” said Jon Rosenfield, a conservation biologist at The Bay Institute and an expert on the Delta's ecology. “From an estuarine fish's point of view, it's been an unprecedented drought for most of the last 35 years.”

DWR, the U.S. Bureau of Reclamation, and three state and federal wildlife agencies last week released a “Drought Contingency Plan” that outlines numerous steps to stretch water supplies and protect fish species this year. The plan also applies to salmon, which have slightly different needs than resident species in the Delta.

The agencies produced a similar contingency plan last year, but this one has been rolled out much earlier in anticipation of a worsening drought.

Among the measures planned are “early warning” fish sampling in Delta waters to determine where fish are located and where they are moving. This began in December and will continue through April. The primary goal is to guide water diversions from the Delta to avoid drawing sensitive fish such as smelt into water-export pumps.

The process is similar to the annual population surveys, which involve towing a net behind a boat and counting the fish it captures to calculate abundance. Officials also have begun using a high-tech “smelt cam” to count fish in a less invasive manner. The “smelt cam” uses a net like a funnel to direct fish through a special underwater camera without being captured. Computers use the imagery to identify and count the species.

Another new process involves monitoring how muddy the water is. Recent research has shown that Delta smelt prefer to inhabit muddy water, because it helps them locate food and hide from predators. Paying attention to such conditions can help avoid killing fish in water-export pumps.

For example, water officials voluntarily reduced water exports from the Delta when December storms created a “first flush” event that caused muddy rain runoff to surge through the estuary. On the theory that Delta smelt would choose the moment to swim upstream through the cover of cloudy water, DWR and Reclamation reduced their water diversions to avoid drawing any of that muddy-water habitat – and Delta smelt with it – toward their pumps.

To protect salmon, officials are planning to improve how they release hatchery fish. Last year, the state’s wildlife and water agencies carried out an unprecedented effort to haul millions of hatchery salmon downstream by truck, because flows and temperatures were too poor to release them into rivers. This year, they hope to minimize that by timing fish releases with favorable river flows.

To help in this effort, some hatchery-raised winter-run salmon – an endangered species – will be implanted with electronic tags to track their progress downstream. Sensors will be installed at regular locations along the Sacramento River that will send out an acoustic signal to “ping” the tags in the fish. This will help track the run’s progress downstream, which will allow officials to time water releases as well as water diversions in the Delta to avoid killing salmon in the pumps.

Last year, the State Water Resources Control Board adjusted salinity rules in the Delta so DWR and Reclamation could avoid releasing precious cold water stored in upstream reservoirs. One rationale, besides preserving the water for human consumption, was to retain cold water behind the dams to support salmon runs later in the year.

It appears the move was not entirely successful, as the abundance of winter-run salmon migrating downstream was the lowest in at least 12 years. Also, many of the nests, or redds, where salmon eggs incubate in riverbed gravels either dried up or became too warm at critical times due to low flows.

This year, officials plan similar efforts to retain cold water behind dams, if necessary. To monitor salmon redds better, the plan calls for installing probes in the Sacramento River where redds are present to better monitor water temperature and dissolved oxygen content.

Although the drought contingency plan includes many steps to help fish, it makes plain that the top priority is to preserve water supplies for human needs, a point also emphasized by DWR’s Cowin.

“Our first priority is to make certain that we have enough water in reserve and are able to meet the very basic human health and safety needs,” he said.

Saving all that cold water behind dams had at least one negative consequence last year. Downstream, it deprived the Delta of water flows that may have been helpful at critical times for smelt, striped bass and the other pelagic species, Rosenfield said.

He pointed out that in most years, the Sacramento River's freshwater flow gets divided about equally between fish and human needs. This isn't enough water for the fish to rebound from their endangered status, but it allows them to limp along. Last year, he said, the fish got even less water, because about two-thirds of the flow was reserved for people's needs.

"We may have lost last year's entire brood of winter-run Chinook salmon before they made it to the ocean," he said. "The outlook is really bad. There's this great emphasis and priority to refill the reservoirs. That is going to bode very poorly for the estuarine fish."

Carl Wilcox, a Delta policy adviser for the Department of Fish and Wildlife, defended last year's actions and said similar measures are planned this year.

"Winter-run, in particular, would have suffered even more than they did," Wilcox said. "It's kind of a difficult balancing act. We are working diligently to learn from what we did last year and ... refine how we manage water for species and water users as effectively as we can. We just hope it rains."

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