CONTRA COSTA TIMES

Environmental sirens in Delta are screaming

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The Delta's open-water fish populations are mysteriously collapsing in a crisis that threatens to unravel the food web of the West Coast's largest estuary.

Delta smelt, already a threatened species, fell last fall to the lowest level ever measured. Same with young striped bass, according to the results of annual surveys by the California Department of Fish and Game

And the key food source for small fish in the Delta, tiny organisms called copepods, are plummeting as well, with numbers of a key species falling to extremely low levels.

The rapid, multispecies decline could trigger measures that might affect water quality and supply from Contra Costa County to Southern California.

Scientists say information in a number of different surveys of the Delta and Suisun Marsh revealed an ongoing, sweeping population crash that could not be explained by drought or any other easily identifiable cause.

Scientists familiar with the decline expressed varying degrees of concern, but some said they are alarmed.

Asked if the latest information reflected "a widespread ecological collapse" in the Delta, a fisheries biologist at the U.S. Environmental Protection Agency said, "I'm not much of an alarmist, but I'm starting to look at it that way. I'm starting to look at it as the sky is falling."

The EPA biologist, Bruce Herbold, said it was the sudden decline of threadfin shad, a previously common baitfish, that caught his attention.

"To have it going from really abundant to scarce, it's scary," Herbold said. "Something is really, really wrong. It is not just the sensitive fish. The cockroaches are dying off."

The ongoing crisis threatens not only the Delta's food web, it also threatens to disrupt two of the state's largest water delivery systems.

Those water systems, which together deliver trillions of gallons of water each year from the Delta to the Central Valley and Southern California, are more likely to be curtailed when concerns deepen over fisheries.

If that happens, and large water users south of the Delta begin taking more water at other times of the year, it can worsen the water quality in the Contra Costa Water District.

The crash is especially surprising because it comes 10 years into an ambitious and expensive program called CalFed that was designed to prevent this kind of crisis.

"Despite all the work that has been done, we're not making progress," said Tina Swanson, a senior scientist at the Bay Institute, an environmental group. "We are now seeing a decline, and that is disturbing."

For Delta smelt, a year-round Delta resident whose status has major implications for water management, the slide is particularly dramatic.

In late 2002, the tiny fish ended a five-year cycle in which it met all the criteria to be considered a recovered species no longer in need of the protection of the Endangered Species Act. As a result, water users sued to prevent regulators from imposing water restrictions to protect the smelt, but so far that lawsuit has not been successful.

Some scientists at the time said the apparent recovery of Delta smelt was probably due to a string of wet years, while others noted that even though it had met criteria for the five-year period, its numbers were already beginning to taper off.

Now, the Delta smelt population is at its lowest level ever.

Herbold said one of two things has happened: either the Delta has degraded so badly that conditions have passed a "pivot point" and are in a general collapse, or some unknown factor has changed.

The suspected culprits that could have quietly changed the Delta environment over the last three years or so fall into three broad categories, and scientists say it is most likely that a combination of factors is causing the problems:

€ Toxins. Pesticides from throughout the Central Valley drain into the Delta, and herbicides are sprayed directly into the Delta to kill weedy plants. Also, as regulators are phasing out one class of pesticides, another called pyrethroids that is especially toxic to fish is being used more commonly throughout California.

€ Invasive species. Numerous non-native plants and animals have been introduced into the Delta from various sources -- including ship ballast and dumped aquariums -- dramatically changing the Delta environment.

€ Giant pumps. Not only has Delta pumping increased during the last two years to near record highs, the timing of the greatest pumping has shifted from spring to later in the year. The amount or timing of pumping might be contributing to the problem by altering the flow of water in the Delta and killing organisms that are drawn into the pumps.

The spring runoff has been strong this year, and in theory that should lead to at least some improvement in fish surveys later this year.

"If it doesn't, then we need to be really, really concerned," said Swanson. "That would be a sign that the system is no longer capable of responding to improved environmental conditions."

The decline in fish species was revealed in the results of annual surveys biologists do for

"pelagic," or open water, fish and zooplankton.

Scientists say the decline appears to have begun about three years ago, although the exact date is hard to pinpoint; it may have started earlier but gone undetected because wet years can mask stresses on fish populations.

The slide has affected all of the dominant pelagic fish in the Delta, including Delta smelt, longfin smelt, threadfin shad and young striped bass, said Randall Baxter, a senior fisheries biologist at the state fish and game department.

Paradoxically, adult striped bass populations remain healthy despite what has been a longer-term decline among the young striped bass.

In addition, copepods have fallen to worrisome levels. One of the most important pelagic fish food sources, a tiny organism called pseudodiaptomus forbesi, has fallen dramatically.

"It's pretty scary," Baxter said. "The other copepods that we're aware of are kind of in the same boat. They're all looking pretty bad. ... What we're seeing is a portion of the food web is collapsing."

Baxter cautioned that so far, the problems appear confined to open water species. He said he hopes that copepods are still abundant in pockets around the Delta where scientists have not collected samples.

Meanwhile, scientists are looking to see if similar problems are developing among shore fish, bottom fish or migratory fish.

So far, they have found no clear evidence that those categories are affected. Baxter said it is too early to say for sure, but survey records for bottom, or benthic, fish do not appear to show a problem.

On the other hand, recent surveys of juvenile salmon migrating down the San Joaquin River showed a sharp drop in the number of successful migrations during the last two years.

"Perhaps there's a problem (causing the salmon to die), but it's probably too early to say for sure," said Pat Brandes, a fisheries biologist at the U.S. Fish and Wildlife Service.

Scientists have begun meeting and planning a summer of intensive work in the Delta and say that by fall they should be able to eliminate several culprits and begin sorting out exactly what's going on.

"We're going to put everything on the table, from toxics to water operations to (invasive) species to even toxic algae," said Kevin Fleming, a state fish and game fisheries biologist. "Everyone is pretty clear in that there's something going on out there. The only question is what it is and what is going to be done about it."

The decline of copepods is obviously important, since it is a key food source for all of the pelagic fish that are in decline.

But no one knows what is killing the copepods, and whether whatever it is that is killing those organisms is also killing small fish.

Pesticide use patterns offer one intriguing possibility, said Herbold, the EPA biologist.

In recent years, one class of pesticides, organophosphates, is being phased out and in many cases replaced with pyrethroids, one of the least toxic insecticides to mammals, according to the National Pesticide Telecommunications Network.

But pyrethroids have a significant drawback.

"Pyrethroids are much more toxic to fish," said Kathryn Kuivila, a research chemist who studies pesticides in California surface water for the U.S. Geological Survey. "Some of the newer ones are ... more toxic (to fish) than the ones that were used in the 1990s."

Invasive species, meanwhile, have wreaked havoc on the Delta ecosystem in a whole host of ways. Exotic clams now consume massive amounts of phytoplankton that are important food sources, while aquarium plants have grown so thick in places they slow down water circulation.

The pumps at Byron and Tracy that move Delta water to the Central Valley and Southern California are a highly visible suspected cause.

In the last two years, those pumps moved water at the second and third highest rates ever. Only in 2000 was more water pumped out of the Delta.

And to protect fish like Delta smelt, much of that pumping has been shifted to the summer from the spring, when smelt tend to congregate in areas affected by the pumps.

"That (pumping) comes to the top of the list for a lot of people," said Herbold.

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