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### Salmon arriving in record low numbers

Jane Kay, Chronicle Environment Writer  
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The Central Valley fall run of chinook salmon apparently has collapsed, portending sharp fishing restrictions and rising prices for consumers while providing further evidence that the state's water demands are causing widespread ecological damage.

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The bad news for commercial and sport fishermen and the salmon-consuming public surfaced Tuesday when a fisheries-management group warned that the numbers of the bay's biggest wild salmon run had plummeted to near record lows.

In April, the Pacific Fishery Management Council will set restrictions on the salmon season, which typically starts in May. A shortage could drive up the price of West Coast wild salmon. The council's leaders said the news is troubling because normally healthy runs of Central Valley chinook salmon are heavily relied upon by fishermen. Runs on the other river systems historically have been smaller.

"The low returns are particularly distressing since this stock has consistently been the healthy 'workhorse' for salmon fisheries off California and most of Oregon," the council's executive director, Donald McIsaac, said in a statement Tuesday.

At its peak, the fall run has numbered hundreds of thousands of fish, exceeding 800,000 in some years. But this year the preliminary count has put the number at 90,000 adults returning to spawn in the Sacramento and San Joaquin rivers and their tributaries. During the past decade, the number of returning fish has never fallen below 250,000.

Through the years, the chinook, or king, salmon that pass through San Francisco Bay have suffered from diversions of freshwater to cities and farms, the operation of the water-export pumps that send delta water to other regions, exposure to pollutants and warming ocean conditions.

"We've known that the numbers were going to come in low, but we didn't know they would be this low," said Zeke Grader, executive director of the Pacific Coast Federation of Fishermen's Associations, which represents commercial fishermen.

"This could end up closing us," Grader said. "Part of what we're trying to do is put a fish on the table that people can afford."

A few more than 1,000 commercial fishermen who catch the Central Valley salmon in the ocean from Santa Barbara to southeast Alaska received \$40 million in federal relief funds two months ago. The fishermen were given the funds for losses they incurred due to fishing restrictions in 2006 initiated to protect the Klamath and Trinity river runs that were suffering from a lack of fresh river water. In addition, related businesses received

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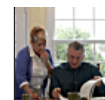
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\$20 million in aid.

Grader, along with representatives of most sport and environmental groups, attribute the salmon decline primarily to Central Valley dams that flood or block spawning grounds and the delta water pumps that move water around the state.

"Twenty years ago, we identified the amount of additional freshwater we needed for healthy fish," he said. A federal law was passed in 1988 to reserve water to help fish, but the water only makes it as far as the delta - not out to the bay, where it would help migrating fish like salmon, he said.

Pollution that drains off farms also hurts the fish, Grader said.

Heidi Rooks, an environmental program manager in the Department of Water Resources, said the salmon's woes probably are linked to the Pacific Ocean.

"Although there are environmental challenges in the Central Valley and the delta, I'm concerned that ocean conditions, including currents and food sources, are influencing our salmon populations as well," she said. "We're working on habitat restoration, but it's not going to address ocean conditions."

Jeff McCracken, a spokesman for the U.S. Bureau of Reclamation, which runs the federal part of California's water system, said he couldn't comment on the preliminary salmon numbers. He said the federal system is operated based on input from fisheries biologists.

The economic impacts from the loss of salmon also would affect businesses associated with sport fishing, including the boating, hotel and manufacturing industries.

"The last two years have been the worst salmon fishing years in all of California history," said Dick Pool, president and owner of Pro-Troll Fishing Products in Concord, a company that makes salmon-fishing equipment.

"The main reason has been the collapse of the delta. The tiny little smolts aren't making it the 100 miles from the rivers to the bay. As the water exports have increased over the last five years, the food chain has been significantly affected," he said.

According to the American Sportfishing Association, there are 2.4 million recreational anglers in California. The economic value of recreational fishing and related activities reached \$4 billion in 2001, according to the association.

The popular chinook salmon is the most recent of the fish that feed in the rivers, delta and the bay to suffer a loss in numbers, said Tina Swanson, senior scientist at the Bay Institute, an environmental group.

Delta smelt, threadfin shad, longfin smelt and striped bass have declined in numbers starting in the early 2000s, she said. "That's the same time that the salmon that returned this year to spawn were going through the delta," she said.

The five highest water-export years have all occurred since 2000, she said.

Today's adult fish were migrating out to the ocean in 2005, the year the delta exports hit a record high, Swanson said.

Salmon are hatched in the rivers and feed in the delta and bay. At three to four months, they move to the ocean, where they feed near shore before they head for the open ocean.

"Dams along the Sacramento and San Joaquin rivers are holding back water, and the flows are usually less than what the salmon need," Swanson said. The low flows of freshwater to the bay can also raise overall water temperatures beyond what is healthy for juvenile salmon, she said. In the delta, the water pumps suck up salmon and other fish. The pumping system moves the juvenile salmon into large, open areas of the delta,



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where they are prey for bigger fish.

Scientists studying the decline in fish populations also consider the effect of the ocean environment, although they agree that it is still too early to measure the effects of global warming. They look at the timing of migrations and food availability, said William Sydeman, a biologist with the Farallon Institutes for Advanced Ecosystem Research.

He found that in 2005, 2006 and, to a lesser extent, in 2007, the breeding failures of the Cassin's auklet on the Farallones could be linked to the demise of krill in the marine environment at the time when the birds needed it. Salmon, too, feed on krill, anchovies and other small aquatic creatures, which are affected in abundance by ocean conditions.

When salmon come through the bay to the ocean, they spend time in the Gulf of the Farallones, the same as the Cassin's auklets, where they need to find sufficient zooplankton and other food.

"The ocean environment has a strong influence on how many survive the initial period at sea and how many come back to spawn three to four years later in the Sacramento River," Sydeman said.

*E-mail Jane Kay at [jkay@sfchronicle.com](mailto:jkay@sfchronicle.com).*

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