

## Report: California fish face extinction on increased level unless trends change

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Nearly half of California's diverse types of native salmon, steelhead and trout are headed toward extinction in 50 years unless environmental trends are reversed, a team of scientists warn in a new report.

And nearly three-fourths - 21 of 31 types-will disappear in a century unless people figure out how to manage harm linked to dams, water diversions, habitat damage, [global warming](#) and other problems, said the scientists from the University of California, Davis and the CalTrout conservation group in the report released Tuesday.

The bleak outlook was softened by a note of hope: Scientists say there is time to save the salmon.

Government, landowners, regulators, farmers, water agencies and others need to mount a series of long-term measures to make the fish more resilient by improving their habitat from headwaters to rivers to bays, the group said.

"If we don't act, we face losing our native salmon, steelhead and trout species," said Curtis Knight, executive director of CalTrout, a nonprofit group. "This would be tragic, not just because we would lose these iconic species, their beauty, their mystery, but as importantly, we would lose what they signify - cold, clean water, healthy rivers, a better California."

So far only one of member of California's diverse salmon family - a big spotted fish called the bull trout - has disappeared. The bull trout was last

seen in 1975 in the McCloud River north of Redding.

With 31 remaining salmon types, California has the most diversity of any state in the lower 48 states below Alaska.

But California's five-year drought from 2012 to 2016 underscored how many of those 31 fish types are struggling to survive, including the Sacramento River winter-run Chinook salmon and the Central Coast coho salmon.

The Central Valley Chinook salmon, the source of most commercially caught salmon, is doing better, but largely through hatchery fish.

The drought, scientists said, offered a preview of global warming hardships that will mean more extreme weather, and less snow left in spring and summer to melt and sustain healthy river flows for salmon.

"Climate change is warming up the water, pushing the cold water higher, and making it harder for the fish to survive," said Peter Moyle, the associate director of the UC Davis Center for Watershed Science. He is the lead author of the report called "SOS II: Fish in Hot Water."

The report calls for making the fish more resilient by improving their habitat in upstream spawning areas, flood plains where baby fish grow, and in wetlands in the estuary formed by the San Francisco Bay and the Sacramento-San Joaquin River Delta.

The scientists urged an expansion of a test program doing early flooding of Sacramento Valley rice fields to provide shallow nursery areas to feed baby [salmon](#).

The report calls for restoring many degraded Sierra meadows to act as sponges to store cold [water](#) that would trickle into streams in summer

and fall when fish struggle to find enough.

The scientists also called for relocating fish hatcheries downstream closer to or in the Delta to make it easier to steer anglers to catch hatchery fish, not fish that spawned in the wild.

Protecting wild fish as opposed to [hatchery fish](#) provides a tougher more resilient fish able to withstand hard times, the scientists said.

State fish and wildlife officials said it is too early for them to analyze the new report, but noted they have been carrying out some of the recommendations such as improving habitat.

"We need to take care of the entire system to have more resilient [fish](#) that can take care of themselves in the hard times," said Kevin Shaffer, fisheries branch chief of the state Department of Fish and Wildlife.

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