Study: Climate change may eliminate 82% of Calif. native fish

By Matt Weiser, Sacramento Bee

Climate change may cause the extinction of 82 percent of California's native fish species, including iconic ones such as Central Valley salmon and Delta smelt, according to a new study.

The peer-reviewed study by fishery experts at UC Davis created a framework to measure how vulnerable numerous species are to climate change. It assesses habitat conditions, climate change projections and temperature sensitivity for the 121 native and 50 non-native fish species that inhabit California.

It found that 82 percent of the native species are at risk of extinction in the next 100 years, largely because climate change will make water temperatures too warm. For nonnative fish, which are generally more adaptable to warm water, only 19 percent are likely to die off.

A Kokanee swims to its natural death in Taylor Creek. Photo/LTN file

The top 20 vulnerable native species identified include Delta smelt, Central Valley late-fall run chinook salmon, upper

Klamath-Trinity River spring chinook salmon, Clear Lake hitch, Kern River rainbow trout, Central Coast coho salmon and Southern Oregon-Northern California Coast coho salmon.

Peter Moyle, lead author of the study and a UC Davis professor of fish biology, said the mix of cold-water fish species that define California's aquatic environment are at risk. Decades hence, they could be largely usurped by invasive species such as carp, largemouth bass and green sunfish.

He said some native species could avoid extinction if changes are made to store more cold water behind existing dams and release it at times important to each species.

Also, plans to restore access above large dams for some species, such as salmon, may help. But it remains to be seen if these efforts will help enough fish to preserve entire populations.

"All the climate change projections suggest that water temperatures are going to get significantly warmer as time goes on," Moyle said. "We'll be making choices. Either we have these species around for the future, or we don't."

Options are much more limited for species such as Delta smelt, which spends its entire life well downstream from dams in the Sacramento-San Joaquin Delta. Cold water releases are unlikely to help so far downstream.

Smelt begin to experience stress when water temperatures exceed 68 degrees, Moyle said, and temperatures above 77 degrees are considered deadly.

"The prognosis for Delta smelt, frankly, is just not very good," Moyle said. "It's going to be really stressed."

Delta smelt, already an endangered species, are at the vortex of a decades-long battle over statewide water supplies. The species is considered an important indicator species for the

health of the entire estuary.

Jon Rosenfield, a conservation biologist at The Bay Institute, said the study's results are not a complete surprise. That is because many of the species at issue, especially salmon and steelhead, are known to be vulnerable to climate change because they live at the southern end of their range, and are more vulnerable to warmer weather as a result.

But Rosenfield called the study "an overwhelming and historic call to action."

"A misinterpretation that I'd be concerned about is that there's nothing we can do, therefore we should give up: Build more dams, divert more water, because they're all going extinct anyway," he said. "We have the ability, and some would say the mandate, to change what needs to change to save these fish, and all the other resources that go along with them."

The study is available .