

Young black rockfish affected by marine heat wave but not always for the worse, research shows

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Juvenile black rockfish. Credit: Will Fennie

Larvae produced by black rockfish, a linchpin of the West Coast commercial fishing industry for the past eight decades, fared better during two recent years of unusually high ocean temperatures than had

been feared, new research by Oregon State University shows.

"The study is important for gauging the conditions and making management plans that will affect the species' survival as the ocean experiences increasing variability because of climate change," said Will Fennie, the study's lead author.

Findings were published in Nature's *Scientific Reports*.

Rockfish, a diverse genus with many species, are a group of ecologically as well as economically important fishes found from Baja California to British Columbia.

They are known for lifespans that can reach triple digits, an ability to produce prodigious numbers of offspring and variable survival during their early life stages, during which they are highly sensitive to [environmental conditions](#).

"Oceanographic conditions dictate water temperature, which influences larval dispersal and [food availability](#)—these affect the early growth and survival of fish larvae," Fennie said. "Larval survival and performance then can influence later life stages—for example, rapid larval growth contributes to increased juvenile survival following settlement to rocky reefs."

Fennie, a former Oregon State doctoral student now at the National Oceanic and Atmospheric Administration, worked with OSU College of Science researchers Su Sponaugle and Kirsten Grorud-Colvert on the study.

The research involved analyzing juvenile black rockfish samples collected during a long-term collaboration among Oregon State, the Oregon Department of Fish and Wildlife and the Oregon Coast

Aquarium. The samples were collected nearshore from 2013 to 2019, a time frame that included a marine heat wave between 2014 and 2016.

"The goal was to shed light on how oceanographic conditions affect the early growth and survival of black rockfish," Fennie said. "We found that despite fears of doom and gloom with recent anomalous warming of the waters off Oregon's coast, some young black rockfish grew faster as the temperature increased and, surprisingly, there was both high and low survival during different years of the heat wave."

Survival was highest in years characterized by moderate larval growth rates, reduced predation and sufficient food to support growth, he added. When growth was highest, however, rockfish survival was very low, likely due to lack of food to sustain that high growth.

Black rockfish are the type of rockfish most commonly caught by recreational anglers at the Oregon coast, according to the [ODFW](#). They are dark gray to black on top, with a lighter belly, and have black spots on their dorsal fins. Adult black rockfish can reach more than 2 feet in length.

Starting at about age 5, a female can release thousands of able-to-swim larvae at a time. While they are developing and growing, juvenile rockfish are an important food source for a range of predators.

More information: H. William Fennie et al, Larval rockfish growth and survival in response to anomalous ocean conditions, *Scientific Reports* (2023). [DOI: 10.1038/s41598-023-30726-5](https://doi.org/10.1038/s41598-023-30726-5)

Provided by Oregon State University

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