

Young salmon may face hungry new competition from juvenile sablefish along northwest coast

January 8 2025



Researchers on a NOAA Fisheries survey pull in a net full of juvenile sablefish from the same coastal waters where salmon spend their first months at sea.
Credit: Elizabeth Daly/CIMERS

There is a new mouth to feed in the coastal waters of the Northwest where juvenile salmon first enter the ocean, and it's a hungry one.

Over the last two decades, large numbers of juvenile sablefish have increasingly spread into coastal waters from central Oregon north to northern Washington. [Research](#) published in the journal *Marine and Coastal Fisheries* shows the influx follows the warming of ocean temperatures off the West Coast. It matches reports of fishing boats catching more small sablefish closer to shore.

The finding means that salmon may face new competition from sablefish at a critical time in their [life cycle](#), which is already at risk from climate change.

Adult sablefish live for many years in deep offshore waters along the [ocean floor](#). Juvenile sablefish—like young salmon—first feed and grow along the highest layers of water near the surface that teem with life. Sablefish are voracious eaters, often consuming large prey and lots of it.

"They are around the same size as [juvenile salmon](#), but they can eat bigger prey and much more prey than salmon can at the same size," said Elizabeth Daly, an ecologist with the joint NOAA-Oregon State University Cooperative Institute for Marine Ecosystem and Resources Studies in Newport, Oregon. She is the lead author of the paper documenting increased competition between the two species, which both support important commercial fisheries off the West Coast.

Eating bigger, and more

Researchers on NOAA Fisheries survey examined nets full of juvenile sablefish collected in the same coastal waters where salmon spend their first months at sea.



Scientists examined the stomach contents of juvenile sablefish in coastal waters, finding evidence of their voracious appetite including other fish almost as big as they are. Credit: Elizabeth Daly/CIMERS

The young sablefish eat much the same thing as juvenile salmon do, but a lot more of it, Daly said. She and her team discovered this by examining their stomach contents.

For instance, even small sablefish consumed several times more krill than yearling Chinook salmon. The scientists did not find clear evidence of sablefish consuming young salmon, but based on the size of their other prey, they certainly could.

Other research has documented a similar influx of juvenile sablefish in waters off Alaska, although the new study did not include Alaska.

Salmon numbers and survival vary so widely from year to year that it's difficult to detect a specific impact from sablefish competition on salmon survival. However, the scientists suggest that the direct overlap of sablefish in the waters where young salmon first feed and grow may put salmon at a competitive disadvantage. That would be especially true if continued ocean warming makes food harder to find.

Salmon spend most of their lives in the ocean, which remains the most unpredictable chapter in their life cycle. The competition from sablefish comes during their first risky months at sea, when they are trying to eat and grow fast enough to stay ahead of predators.

"We now know that prey resources are extremely important for salmon growth and survival during this critical early marine period," said Brian Burke, research scientist at NOAA Fisheries Northwest Fisheries Science Center, and co-author of the research.

"But unraveling the impact of competition on salmon is extremely difficult. This new data helps us understand how species interact in our coastal environment. They also point to potential changes from continued ocean warming due to [climate change](#)."



Researchers on NOAA Fisheries survey examine nets full of juvenile sablefish collected in the same coastal waters where salmon spend their first months at sea. Credit: Greg Williams/Pacific States Marine Fisheries Commission

Sablefish outnumbering salmon

Juvenile sablefish were most numerous in coastal waters off Oregon and Washington in 2020, which was a boom year for the species. They outnumbered juvenile salmon so much that year that sablefish were approximately:

- Four times more numerous than subyearling Chinook salmon
- 32 times more numerous than yearling Chinook salmon
- 13 times more numerous than coho salmon

The sablefish also had significantly more food in their stomachs at the time.

Salmon consumed significantly less food in areas with numerous sablefish, said Brandon Chasco, a co-author and research scientist with the Washington Department of Fish and Wildlife Quantitative Synthesis and Reporting Unit.

"When sablefish were there, juvenile salmon ate less," he said. "Whether they're disrupting salmon feeding, or if salmon avoid them as potential predators, we are not sure."

Climate change projections have indicated a rising risk to salmon in the ocean, since higher ocean temperatures often reduce salmon survival. The additional competition from sablefish could make things even rougher. Sablefish, in contrast, could benefit if the juveniles that have expanded into [coastal waters](#) grow into adults that add to the population.

Fishing crews have recently reported catching many smaller adult sablefish, likely the result of more juveniles joining the populations. "Regardless of what happens to the sablefish, we know they are increasingly competing with salmon in these waters," Daly said.

More information: Elizabeth A. Daly et al, Implications of increased spatial and trophic overlap between juvenile Pacific salmon and Sablefish in the northern California Current, *Marine and Coastal Fisheries* (2024). [DOI: 10.1002/mcf2.10325](https://doi.org/10.1002/mcf2.10325)

Provided by NOAA Headquarters

Citation: Young salmon may face hungry new competition from juvenile sablefish along

northwest coast (2025, January 8) retrieved 9 January 2025 from
<https://phys.org/news/2025-01-young-salmon-hungry-competition-juvenile.html>

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