



## Forage Fish in the Western Pacific

Forage fish, also called prey or bait fish, are small fish and invertebrates eaten by larger fish, seabirds and marine mammals. Many species are short-lived and their abundance is often sensitive to environmental variables. Forage fish are not currently defined in the Western Pacific Council’s Fishery Ecosystem Plans. However, two species that could be considered forage fish are big eye scads (akule, *Selar crumenophthalmus*) and mackerel scads (‘ōpelu, *Decapterus macarellus*). Other species, such as Hawaiian anchovy (nehu, *Engraulis mordax*) and squid, could also be considered forage fish, but additional funding and research is needed.

Since 2019, akule and ‘ōpelu have been classified as “ecosystem component species” instead of “management unit species.” Stock assessments, annual catch limits and essential fish habitat designations are no longer required, but catches are closely monitored.

The Council is working with partners to develop near-shore ecosystem models that consider the biomass and productivity of forage fish species as drivers. The Council also funded cooperative research using aerial surveys to better understand forage fish spatial and temporal patterns around O‘ahu, Hawai‘i. The surveys create a fishery-independent baseline that improves the stock’s assessment.

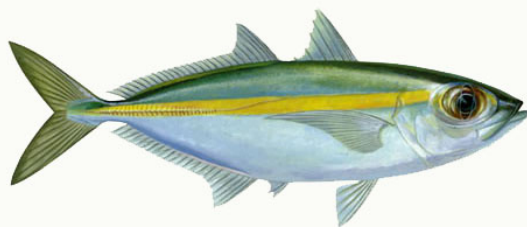
Although akule are prey items, they are also a targeted species important in Hawai‘i, American Samoa (atule) and the Mariana Archipelago (atulai). Akule are consistently the top species harvested in the main Hawaiian Islands due to the large quantities caught with certain gear types (purse seine, seine and gill nets), and persistent high demand from local markets. Akule is also an important species culturally for native Hawaiians. Communities conduct a hukilau—a method of fishing in which many people corral the school using ropes with ti leaves or a net—and scoop the fish out of shallow reef areas. The participating families and friends share the catch.



Source: [www.polynesia.com](http://www.polynesia.com)

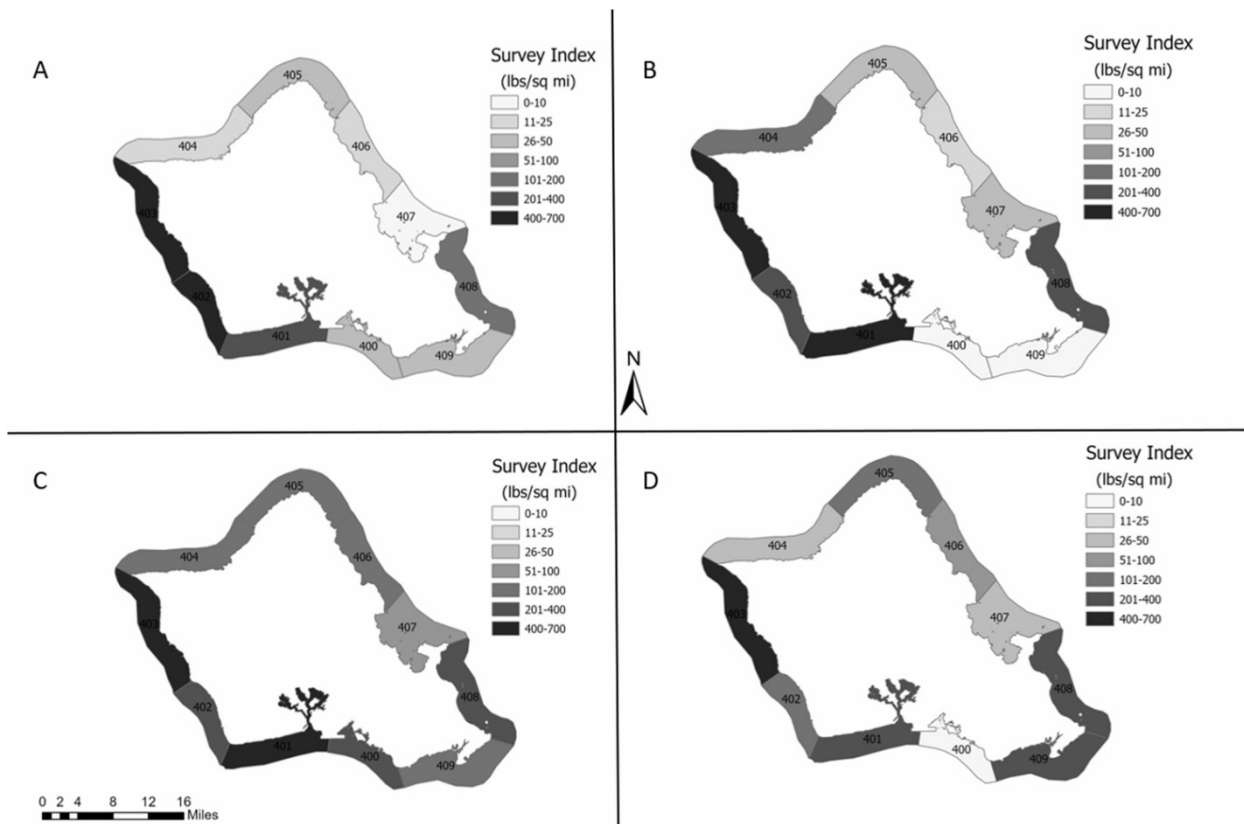
Species	No. Licenses	No. Trips	Catch (lbs)
Big eye scad (akule, <i>Selar crumenophthalmus</i> )	210	1,558	267,551
Mackerel scad (‘ōpelu, <i>Decapterus macarellus</i> )	115	1,082	70,774

Source: 2020 Annual Stock Assessment and Fisheries Evaluation Report for the Hawaii Archipelago Fishery Ecosystem Plan



Big eye scad (left) and mackerel scad.

Source: [www.thisfish.info](http://www.thisfish.info)



Aerial abundance indices – biomass estimate (pounds) divided by search area (square mile) – for big eye scad (akule) surrounding the island of O‘ahu from November 2015 – October 2016, separated by season: (A) Beginning (Nov–Jan), (B) Middle (Feb–April), (C) Peak (May–July), (D) End (Aug–Oct). Numbered areas represent Hawai‘i commercial fishing grids.

Source: Wiley J, Sabater M, Langseth B. 2021. Aerial survey as a tool for understanding bigeye scad (*Selar crumenophthalmus*) dynamics around the island of O‘ahu, Hawai‘i. *J. Fish. Res.*, Vol. 236, 105866, ISSN 0165-7836, <https://doi.org/10.1016/j.fishres.2020.105866>.