



# North Pacific Fishery Management Council

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## SCIENTIFIC AND STATISTICAL COMMITTEE DRAFT REPORT TO THE NORTH PACIFIC FISHERY MANAGEMENT COUNCIL December 2<sup>nd</sup> – 3<sup>rd</sup> & December 6<sup>th</sup> – 7<sup>th</sup>, 2021

The SSC met from December 2<sup>nd</sup> – 3<sup>rd</sup> and December 6<sup>th</sup> – 7<sup>th</sup> remotely.

Members present were:

Anne Hollowed, Co-Chair  
*NOAA Fisheries – AFSC*

Sherri Dressel, Co-Chair  
*Alaska Dept. of Fish and Game*

Alison Whitman, Vice Chair  
*Oregon Dept. of Fish and  
Wildlife*

Amy Bishop  
*University of Alaska Fairbanks*

Curry Cunningham  
*University of Alaska Fairbanks*

Mike Downs  
*Wislow Research*

Jason Gasper  
*NOAA Fisheries—Alaska Region*

Dana Hanselman  
*NOAA Fisheries—AFSC*

Brad Harris  
*Alaska Pacific University*

George Hunt  
*University of Washington*

Kathryn Meyer  
*Washington Dept. of Fish and  
Wildlife*

Franz Mueter  
*University of Alaska Fairbanks*

Andrew Munro  
*Alaska Dept. of Fish and Game*

Matt Reimer  
*University of California, Davis*

Chris Siddon  
*Alaska Dept. of Fish and Game*

Ian Stewart  
*Intl. Pacific Halibut  
Commission*

Patrick Sullivan  
*Cornell University*

Members absent were:

Chris Anderson  
*University of Washington*

# EXCERPT OF BSAI FORAGE FISH

## **BSAI Forage Species**

The SSC commends the authors on an excellent report for the Status of Forage species in the BSAI. There was no public testimony.

Forage species include numerous forage fishes (BSAI FMP listed), juveniles of managed groundfish, Pacific herring, and salmon, Arctic cod, shrimps, and squid. The purpose of this biennial report is to monitor potential impacts of bycatch on forage fish by (1) investigating trends in forage fish abundance and distribution, and (2) describing interactions between federal fisheries and forage species. Additional information on forage species diet, predation (e.g., seabirds) and ecology is linked in the Ecosystem Status Report.

A number of research surveys provide data for the report, including the AFSC bottom trawl surveys on the EBS shelf and slope, and in the AI, the AFSC Ecosystem Monitoring and Assessment (EMA) program surface trawl, biennial acoustic surveys for pollock in the middle and outer domain of the EBS shelf. None are optimized for sampling forage fish and there were several spatial, temporal, and selectivity issues identified; therefore, the authors note that results from individual surveys (i.e., years) are less important than longer-term trends.

Noteworthy items from the 2021 report are provided below:

- 1) The reclassification of squids as Ecosystem Components, for which catch limits are not required, has resulted in substantially increased squid catches in the EBS during 2019-2021. These catches are now similar in scale to catch levels during the 1970s and 1980s.
- 2) Capelin, eulachon, and other FMP forage species have decreased greatly in abundance since 2015. This general pattern occurs in the EBS and NBS.
- 3) Surface-trawl indices in the NBS indicate an overall reduction in the availability of forage fishes.
- 4) Herring abundance is relatively high in the eastern Bering Sea shelf bottom trawl survey.

- 5) Incidental catches of FMP forage species continue to be very low by historical standards. The preliminary 2019 catch is 24 t, and, as is typical, is dominated by osmerids, especially eulachon.
- 6) Prohibited Species catch (PSC) of Pacific herring exceeded the limit, an event discussed in the 2020 ESR; the herring bycatch in 2021 is high relative to previous years but is below the limit.

Forage fish are sensitive to changes to the physical environment, which may result in shifts in their distribution in the water column and their survival. Understanding the impacts of the recent persistent warming of the EBS on interactions between fisheries and forage species will require additional acoustic surveys and improved estimates of survey selectivity. There is a need to examine how changes in forage fish abundance affects predator prey choice and predation on the juveniles of commercially important species. The SSC is supportive of these research directions, as well as other research topics identified in the report.

As forage fish are the linkage between the lower and upper trophic levels, understanding stock structure, trends in abundance, interactions between federal fisheries and forage species, and movement distribution is key to ecosystem-based fisheries management. **The SSC concurs with the BSAI GPT recommendation for a forage species workshop** to discuss (1) surveying and population estimation of forage species, (2) importance of forage to different managed species (e.g., evaluate the suite of current food web models), (3) questions about how climate change may impact forage biomass and exploitation rates, (4) how best to report on changing populations, scientific knowledge about forage species, and the dependence of other species on them; including timing, frequency, and scope of the report, and (5) potential resulting management measures from shift in bycatch or spatial distribution of the forage base. **The SSC also recommends that in light of the recent substantial increases in squid catch levels, this workshop focuses on identifying the threshold for placing squid back in the fishery.**

The BSAI GPT recommended coordination between editors of the ESR and the forage report to reduce redundancy. While the SSC supports efforts to reduce redundancy, there was hesitancy to support the initial suggestion of considering a combined forage species report for Alaska due to the significant differences in stock structure, ecosystem role, and dynamics across the GOA, BS and AI. **The SSC recommends that this topic would be a good discussion point for the proposed workshop.**