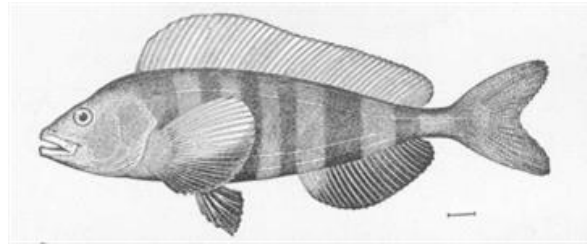


Assessment of the Atka mackerel stock in the Bering Sea and Aleutian Islands

Jane Sullivan, James Ianelli, and Sandra Lowe



Executive Summary

In 2023, Bering Sea and Aleutian Islands (BSAI) Atka mackerel changed from an annual to a biennial assessment frequency based on recent [groundfish stock prioritization](#) efforts. Under this new frequency, full assessments will be conducted in even years coinciding with the Aleutian Islands (AI) bottom trawl survey, and harvest projections (formerly called “partial” assessments) will be conducted in odd years. A harvest projection was conducted in 2023, and the next full assessment is scheduled for 2024.

BSAI Atka mackerel are managed as a Tier 3 stock (Lowe and Ianelli 2022). During full assessment years, a statistical catch-at-age model is used to generate historical time series of population estimates. Results from this model are input to the standard Alaska Fisheries Science Center (AFSC) projection model, which produces future population estimates, biological reference points, and recommended harvest levels. For 2023, only the projection model is run based on 2022 assessment model results with updated catch assumptions.

Description of Updated Catch

The following catch assumptions were made in the 2023 harvest projection:

1. The 2022 catch estimate was 58,107 t.
2. The 2023 catch was assumed to be equal to the 2023 Total Allowable Catch (TAC) of 69,282 t.
3. The 2024 and 2025 catches were assumed to be 81,054 t and 71,975 t, respectively. These projected catch estimates are based on the assumption that approximately 85% of the BSAI-wide ABC is likely to be taken under the revised Steller Sea Lion Reasonable and Prudent Alternatives (SSL RPAs) implemented in 2015. This percentage was applied to the 2024 and 2025 maximum permissible ABCs, and those reduced amounts were assumed to be caught in order to estimate the 2024 and 2025 ABCs and OFL values.

Summary of Results

We recommend the maximum allowable ABC of 95,358 t from the updated projection model for the 2024 fishery. This ABC is 10% higher than the 2024 projected ABC of 86,464 t from the 2022 assessment. Reference values for the Atka mackerel stock are summarized in the following table, with the recommended ABC and OFL values in bold.

Quantity	As estimated or <i>specified last year for:</i>		As estimated or <i>recommended this year for:</i>	
	2023	2024	2024*	2025*
<i>M</i> (natural mortality rate)	0.30	0.30	0.30	0.30
Tier	3a	3b	3a	3b
Projected total (age 1+) biomass (t)	615,027	606,661	625,578	631,261
Projected female spawning biomass (t)	122,541	111,122	116,618	110,694
$B_{100\%}$	280,456	280,456	280,456	280,456
$B_{40\%}$	112,182	112,182	112,182	112,182
$B_{35\%}$	98,160	98,160	98,160	98,160
F_{OFL}	0.76	0.65	0.76	0.75
$maxF_{ABC}$	0.61	0.56	0.61	0.60
F_{ABC}	0.61	0.56	0.61	0.60
OFL (t)	118,787	101,188	111,684	99,723
maxABC (t)	98,588	86,464	95,358	84,676
ABC (t)	98,588	86,464	95,358	84,676
Status	As determined <i>last year for:</i>		As determined <i>this year for:</i>	
	2021	2022	2022	2023
Overfishing	No	n/a	No	n/a

*Projections are based on estimated total catch of 81,054 t and 71,975 t in place of maximum permissible ABC for 2024 and 2025, respectively.

Fishery Trends

Updated catches for BSAI Atka mackerel as of September 16, 2023 (NMFS Alaska Regional Office Catch Accounting System via the Alaska Fisheries Information Network [AKFIN] database, <http://www.akfin.org>, accessed September 25, 2023) are summarized in the following table:

Year	541+SBS Catch (t)	542 Catch (t)	543 Catch (t)	BSAI Total Catch (t)	BSAI ABC (t)	BSAI TAC (t)
2022	19,138	16,761	22,208	58,107	78,510	66,481
2023	15,273	16,746	24,307	56,326	98,588	69,282

The ratio of catch to total age-1+ biomass has increased over time and is estimated to be 0.11 in 2023 based on a 2023 catch of 69,282 t and biomass estimate of 622,564 t from the projection model (Figure 1).

Survey Trends

The AI bottom trawl survey is only conducted in even years; therefore, there were no new bottom trawl survey estimates in 2023 (Figure 2).

Area Allocation of Harvests

The apportionments of the 2024 and 2025 recommended ABCs based on the most recent 4-survey weighted average:

	Survey Year				2024 & 2025 Apportionment	2024 ABC	2025 ABC
	2014	2016	2018	2022			
541+SBS	42%	35%	38%	52%	0.438	41,723	37,049
542	28%	30%	7%	16%	0.176	16,754	14,877
543	30%	35%	55%	32%	0.387	36,882	32,750
Weights	8	12	18	27	Total ABC	95,358	84,676

Literature Cited

Lowe, S. and J. Ianelli. 2022. Stock assessment of Aleutian Islands Atka mackerel. *In* Stock Assessment and Evaluation Report for the Groundfish Resources of the Bering Sea/Aleutian Islands Regions. North Pacific Fisheries Management Council, P.O. Box 103136, Anchorage, Alaska, 99510. Available online: https://apps-afsc.fisheries.noaa.gov/Plan_Team/2022/BSAIatka.pdf

Figures



Figure 1. Modeled catch (t) divided by modeled total (age-1+) biomass (t), where estimates for 1977-2021 come from the 2022 assessment model and estimates for 2022 and 2023 come from the projection model.

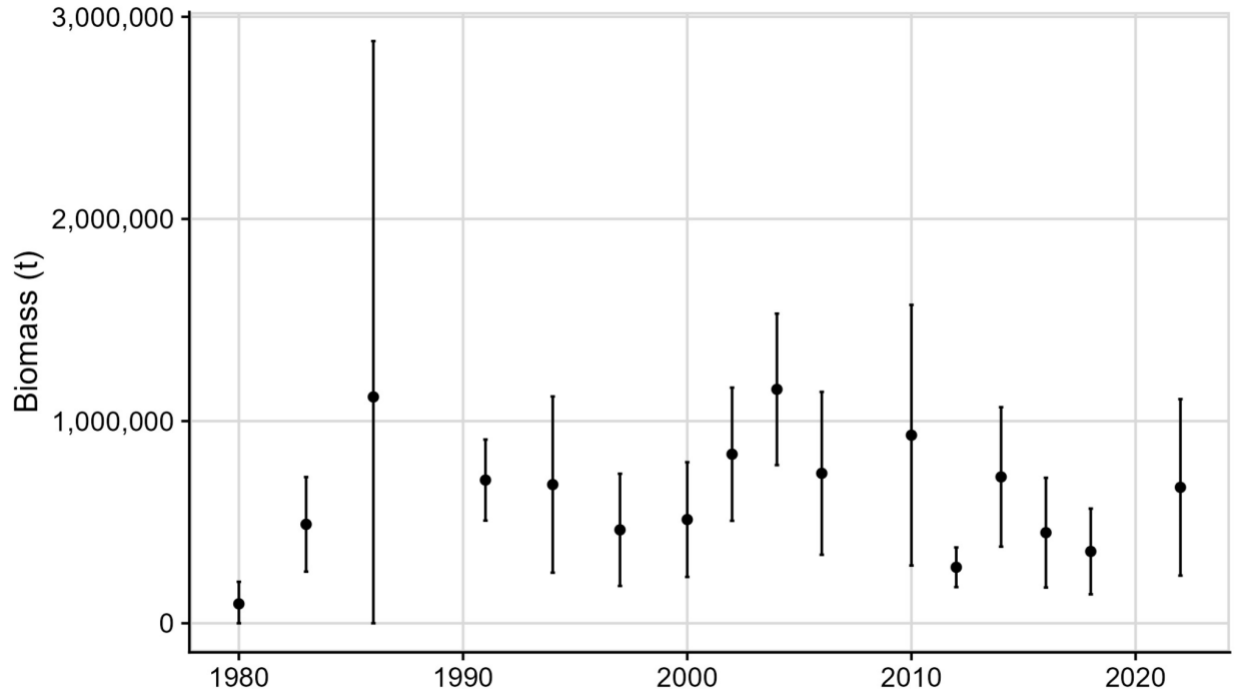


Figure 2. Design-based estimates of Atka mackerel biomass (t) with 95% confidence intervals from the Aleutian Islands bottom trawl survey.

