

6. Assessment of the Arrowtooth Flounder Stock in the Bering Sea and Aleutian Islands

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Executive Summary

The scheduled frequency for some stock assessments was changed in response to a review of the National Stock Assessment Prioritization effort (Methot 2015; Hollowed et al. 2016). In previous years, BSAI flatfish stocks were assessed on a biennial stock assessment schedule to coincide with the availability of new survey data. Following the prioritization review, it was recommended that Bering Sea and Aleutian Islands (BSAI) arrowtooth flounder (*Atheresthes stomias*) change to a quadrennial stock assessment schedule with a full stock assessment produced every four years and a harvest projection produced in alternate years. For this off-cycle year, we present a harvest projection assessment consisting of an executive summary with recent fishery catch and survey trends as well as recommended harvest levels for the next two years. Please refer to the last full stock assessment and fishery evaluation (SAFE) report for further information regarding the stock assessment methodology (Shotwell et al. 2022). The next full assessment is scheduled for 2027.

We use a statistical age-structured model as the primary assessment tool for the BSAI arrowtooth flounder stock which qualifies as a Tier 3a stock. This assessment consists of a population dynamics model, which uses survey and fishery data to generate a historical time series of population estimates, and a projection model, which uses results from the population dynamics model to predict future population estimates and recommended harvest levels. The data sets used in this assessment include total catch biomass, fishery size compositions, bottom trawl survey biomass estimates, bottom trawl survey bottom water temperatures, bottom trawl survey age compositions, and bottom trawl survey size compositions when age compositions are not available. For an off-cycle year, we do not re-run the assessment model. Instead, we update the projection model with new catch information. This incorporates the most current catch information without re-estimating model parameters and biological reference points. We use the assessment base model from 2018 (Model 18.9) that was updated with new data in 2022 in the last full assessment (Shotwell et al., 2022).

Summary of Updated Catch

There were no changes made to the assessment model inputs as this is an off-cycle year. New data added to the projection model included updated catch data from 2024-2025 and newly estimated catches for

2026-2028. New catch data were available up to September 5, 2026. The remaining 2026 catch was estimated by increasing the observed catch by an expansion factor of 1.290, which accounts for the average fraction of catch taken after September 5, 2026 in the last three complete years (2023-2025). This expansion factor decreased from the last estimated expansion factor of 1.351 and resulted in an estimated total catch for 2026 of 5,864 t. To estimate future catches, we updated the yield ratio to 0.104, which was the average ratio of catch to ABC for the last three complete catch years. This yield ratio increased from the last estimated yield ratio of 0.100 and was multiplied by the projected ABCs from the updated projection model to generate catches of 8,752 t in 2027 and 7,525 t in 2028.

Summary of Results

ABC recommendation

The projected total biomass for 2027 is 891,053 t. The recommended ABC for 2027 is 83,787 t, the maximum allowable ABC under Tier 3a. This ABC is a 3.7% decrease compared to the 2026 ABC and the projected 2027 ABC of 87,035 from last year's assessment (available online at <https://www.npfmc.org/library/safe-reports/>).

The 2027 GOA-wide OFL for arrowtooth flounder is **98,654** t.

Reference values for arrowtooth flounder are summarized in the following table:

Quantity/Status	As estimated or specified in 2024 for:		As estimated or recommended <i>this year</i> for:	
	2025	2026	2027*	2028*
M (natural mortality – female, male)	0.2, 0.35	0.2, 0.35	0.2, 0.35	0.2, 0.35
Tier	3a	3a	3a	3a
Projected total (age 1+) biomass (t)	908,977	898,546	891,053	882,551
Projected female spawning biomass (t)	560,110	572,274	571,080	557,123
B _{100%}	561,219	561,219	561,219	561,219
B _{40%}	224,487	224,487	224,487	224,487
B _{35%}	196,427	196,427	196,427	196,427
F _{OFL}	0.174	0.174	0.174	0.174
maxF _{ABC}	0.146	0.146	0.146	0.146
F _{ABC}	0.146	0.146	0.146	0.146
OFL (t)	104,428	102,472	98,654	95,130
maxABC (t)	88,683	87,035	83,787	80,779
ABC (t)	88,683	87,035	83,787	80,779
Status	As determined in 2024 for:		As determined <i>this year</i> for:	
	2023	2024	2025	2026
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

*Projections are based on an estimated catch of 5,864 t for 2026 and estimates of 8,752 t and 7,525 t used in place of maximum permissible ABC for 2027 and 2028.

The stock is not being subject to overfishing, is not currently overfished, nor is it approaching a condition of being overfished.

The tests for evaluating these three statements on status determination require examining the official total catch from the most recent complete year and the current model projections of spawning biomass relative

to $B_{35\%}$ for 2026 and 2028. The official total catch for 2025 is 9,312 t, which is less than the 2025 OFL of 104,428 t; therefore, the stock is not being subjected to overfishing. The stock is above $B_{35\%}$ in 2026 so the stock is not overfished. The estimates of spawning biomass for 2028 and 2038 from the current year (2026) projection model are above $B_{35\%}$ t, therefore, the stock is not approaching an overfished condition.

Fishery Trends

Updated catch data (t) for arrowtooth flounder in the BSAI as of September 5, 2026 (NMFS Alaska Regional Office Catch Accounting System via the Alaska Fisheries Information Network (AKFIN) database, <http://www.akfin.org>) are summarized in the following table:

Year	Bering Sea	Aleutian Islands	Total	ABC	TAC
2025	6,392	2,920	9,312	88,683	14,000
2026	3,758	789	4,547	87,035	14,000

Catch of arrowtooth flounder decreased in both the Bering Sea and the Aleutian Islands in 2026 compared to 2024. The Bering Sea catch is the lowest in the time series and the Aleutian Islands catch is among the lowest of the time series (see Table 6.2 in Shotwell et al., 2022 for catch history). To date in 2026, about 66% of the catch was in the flatfish fishery, 15% in the Pacific cod fishery, 6% in the rockfish fisheries, 6% in the sablefish fishery, 5% in the pollock fishery, and 3% in the atka mackerel fishery. Currently, “off-year” assessments are required to present a catch to biomass ratio, which is calculated as the catch divided by the total age 1+ biomass from the last full assessment model (Shotwell et al. 2022) and total biomass from the projection model for years following the last full assessment year. The catch to biomass ratio for 1991-2026 has ranged from 0.005 in 2026 to 0.036 in 1991 (Figure 6.1). The arrowtooth flounder catch/biomass ratio had been steadily decreasing since 2012 (Figure 6.1).

Survey Trends

The most recent Alaska Fisheries Science Center (AFSC) eastern Bering Sea (EBS) bottom trawl shelf survey and Aleutian Islands bottom trawl survey were conducted in 2026. The EBS arrowtooth flounder biomass estimate was 478,737 (t) for 2026, which was 1.4% higher than the 2025 survey, and 4.3% higher than the long-term average for the time series (Figure 6.2).

5 Year Projections

The following table shows the projections for the next 5 years based on the author's catch projection recommendation (constant fraction of F based on the yield ratio) for 2027 and 2028 and harvest projection Scenario 3 (average F from the past 5 years) for 2029-2031.

Year	Catch	OFL	ABC	SSB	Mean Relative SSB**
2027	8,752	98,654	83,787	571,080	1.018
2028	7,525	95,130	80,779	557,123	0.993
2029*	9,611	93,623	79,467	541,166	0.964
2030*	9,528	83,280	78,784	527,013	0.939
2031*	9,472	75,120	78,317	518,236	0.923

*Note: For Scenario 3 projections (2029–2031), the projection model calculates the maximum ABC using the expected catch derived from the average recent fishing mortality, rather than assuming the catch is equal to the maximum permissible ABC for those respective years.

**Note: Mean Relative SSB is the ratio of female spawning biomass to equilibrium unfished female spawning biomass (B100%)

Summaries for Plan Team

Area	Year	Age-1+ Biomass	OFL	ABC	TAC	Catch
BSAI	2025	908,977	104,428	88,683	14,000	9,312
	2026	898,546	102,472	87,035	14,000	4,547
	2027	891,053	98,654	83,787		
	2028	882,551	95,130	80,779		

Note: Catch data are current through September 5, 2026.

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Literature Cited

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Figures

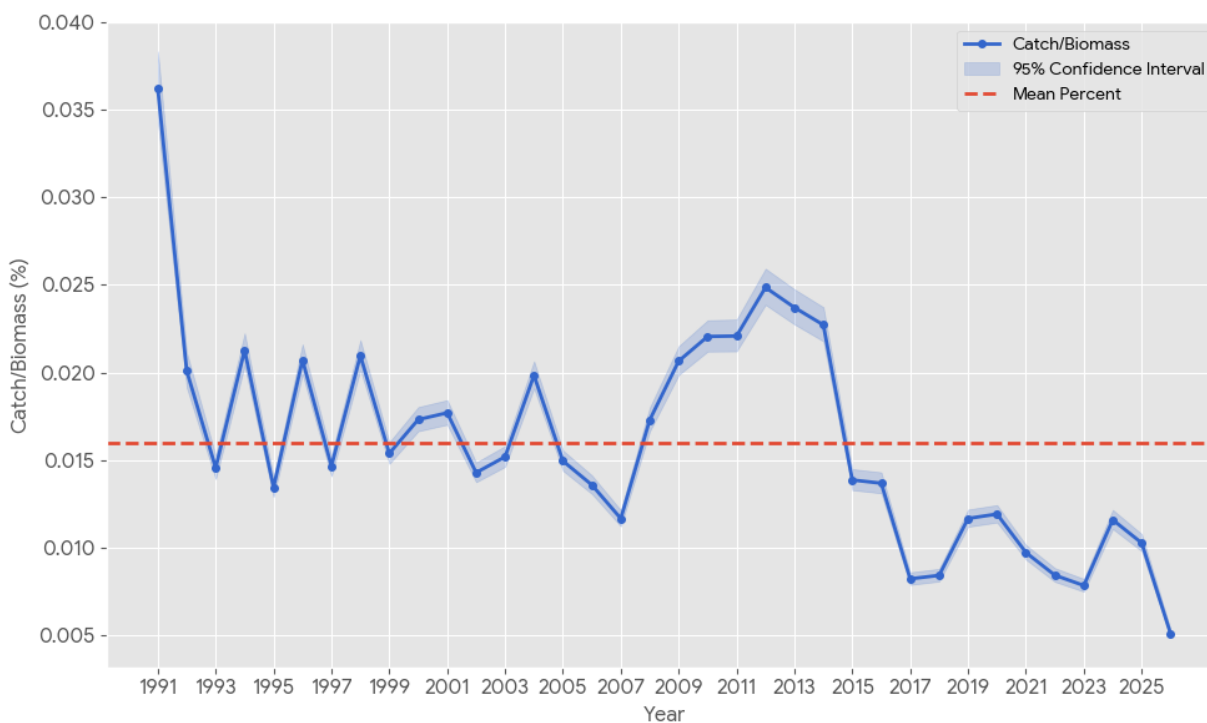


Figure 6.1. Bering Sea and Aleutian Islands (BSAI) arrowtooth flounder catch/age total biomass ratio with approximate 95% confidence intervals. Observed catch values were used for 1991-2025, the 2026 catch values were estimated using an expansion factor. The horizontal dashed line is the mean value for the entire dataset.

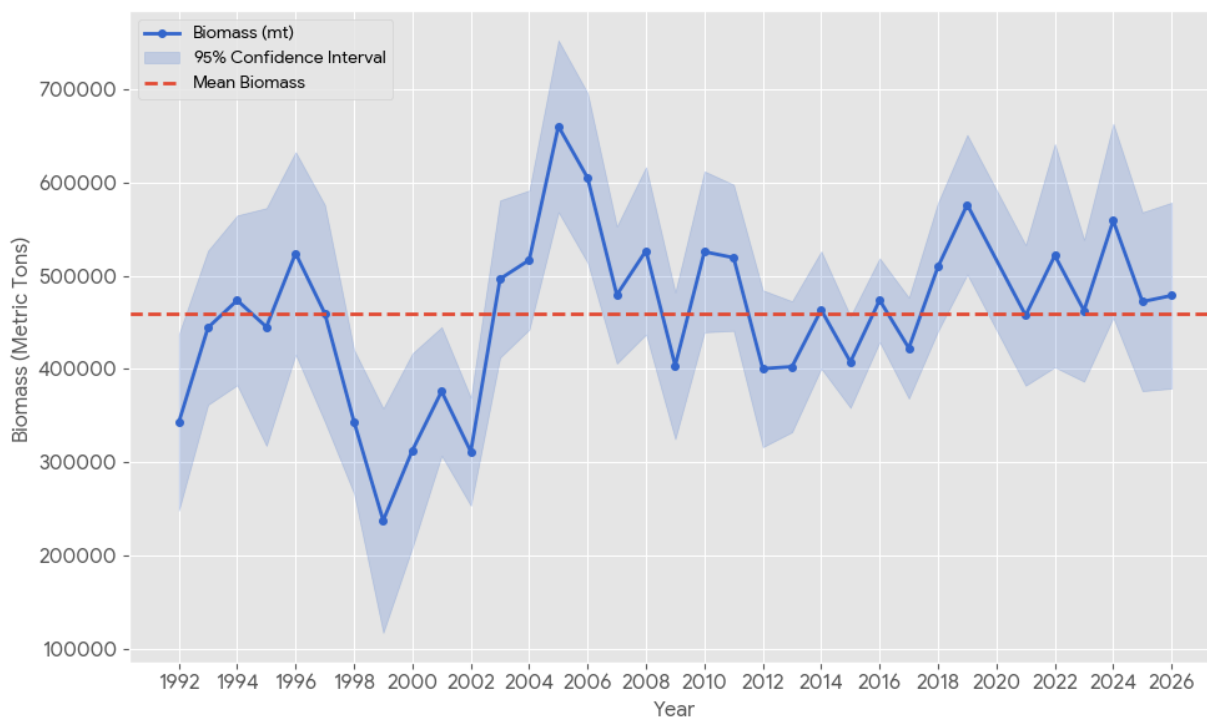


Figure 6.2. Design-based estimates of trawl survey biomass for arrowtooth flounder in the BSAI. Shaded areas are 95% confidence intervals, the horizontal dashed line is the mean value for the entire dataset.