

8. Assessment of the northern rock sole stock in the Bering Sea and Aleutian Islands

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Executive Summary

Introduction

The Bering Sea and Aleutian Islands northern rock sole stock is typically assessed every two years and was last assessed in 2024. This year, we present a harvest projection to recommend harvest levels for the next two years. Please refer to the 2024 full stock assessment report for further information regarding the assessment model (McGilliard et al., 2024, available online at <https://files.npfmc.org/SAFE/2024/BSAIRocksole.pdf>).

BSAI northern rock sole is assessed using an age-structured model and Tier 1 determination. Thus, the single species projection model was run using parameter values from the accepted 2024 northern rock sole assessment model (McGilliard et al., 2024), together with updated catch information for 2024-2026, to predict stock status for BSAI northern rock sole in 2027 and 2028 and to make ABC recommendations for those years. Projections are conducted using numbers-at-age for northern rock sole from age 6-20+ and historical recruitment of age 6 individuals from 1978-2024 to calculate OFL's and ABC's.

The Eastern Bering Sea Bottom Trawl survey biomass for northern rock sole was at the lowest level observed in 1982 (583,193 mt), and subsequently increased to a high of 2,744,548 mt in 1994. Subsequently, the stock has fluctuated with an overall decline to 976,868 mt in 2019, followed by an upward trend since that time (Figure 1). The 2025 survey biomass was 1,489,405 mt. Figure 2 shows the catch to age-6 total biomass ratio, which reached a high of 0.08 in 1988 and a low of 0.02 in 2021. Catching the full ABC in 2027 and 2028 is predicted to lead to catch to biomass ratios close to 0.05. Recently, the catch to biomass ratio has been between 0.05 and 0.02 largely due to annual catches that are typically below the ABC.

Description of Updated Catch

Projections are based on catches for BSAI northern rock sole of 27,339 t for 2026. The 2026 estimated catches were calculated by dividing the current realized catches from January 1 to August 1 for 2026 by the long-term (1991-2025) mean proportion of annual catches occurring between January 1 and August 1. Estimated catches of 29,151 t were used in place of maximum permissible ABC for 2027-2029, which was the average catch over 2016-2025.

Summary of Results

The ABC for BSAI northern rock sole is 152,865 t in 2027 and 153,993 t in 2028 and the OFL is 160,588 t in 2027 and 161,774t in 2028. The new ABC recommendation and OFL for 2027 are similar to those developed for 2025 and 2026 in the 2024 operational full assessment. There were no harvest projections in 2025. The principal reference values are shown in Table 1.

Table 1. Key quantities, including OFL, maxABC, and recommended ABC for the BSAI northern rock sole stock.

Quantity	As estimated or <i>specified in <u>2024</u> for:</i>		As estimated or <i>recommended this year for:</i>	
	2025	2026	2027	2028
M (natural mortality rate)	0.19(f), 0.23(m)	0.19(f), 0.23(m)	0.19(f), 0.23(m)	0.19(f), 0.23(m)
Tier	1a	1a	1a	1a
Projected total (age 6+) biomass (t)	881,154	885,284	855,290	861,606
Projected Female spawning biomass (t)	301,051	330,774	344,634	357,753
B_0	516,007	516,007	516,007	516,007
B_{MSY}	183,756	183,756	183,756	183,756
F_{OFL}	0.188	0.188	0.188	0.188
$maxF_{ABC}$	0.179	0.179	0.179	0.179
F_{ABC}	0.179	0.179	0.179	0.179
OFL (t)	165,444	166,220	160,588	161,774
maxABC (t)	157,487	158,225	152,865	153,993
ABC (t)	157,487	158,225	152,865	153,993
Status	As determined in <u>2024</u> for:		As determined <i>this</i> year for:	
	2022	2023	2025	2026
Overfishing	no	n/a	no	n/a
Overfished	n/a	no	n/a	no
Approaching overfished	n/a	no	n/a	no

Five-Year Harvest Projections

Table 2. Five year harvest projections for BSAI northern rock sole using the species-specific projected ABC for catches in 2027 and 2028, and the five-year average catch from 2021-2025 for estimated catches in 2029-2031. These projections are similar to Scenario 3, as presented in the last operational full assessment (McGilliard et al. 2024), but use the five-year average catch from 2021-2025 for estimated catches in 2029-2031 instead of the five-year average F for those years.

Year	Expected Catch	OFL	ABC	Mean SSB	Mean Relative SSB
2027	152,865	160,588	152,865	339,463	0.66
2028	153,993	144,464	137,516	300,213	0.58
2029	26,273	131,706	125,372	260,928	0.51
2030	26,273	157,715	150,130	271,654	0.53
2031	26,273	202,892	193,134	291,826	0.57

Figures

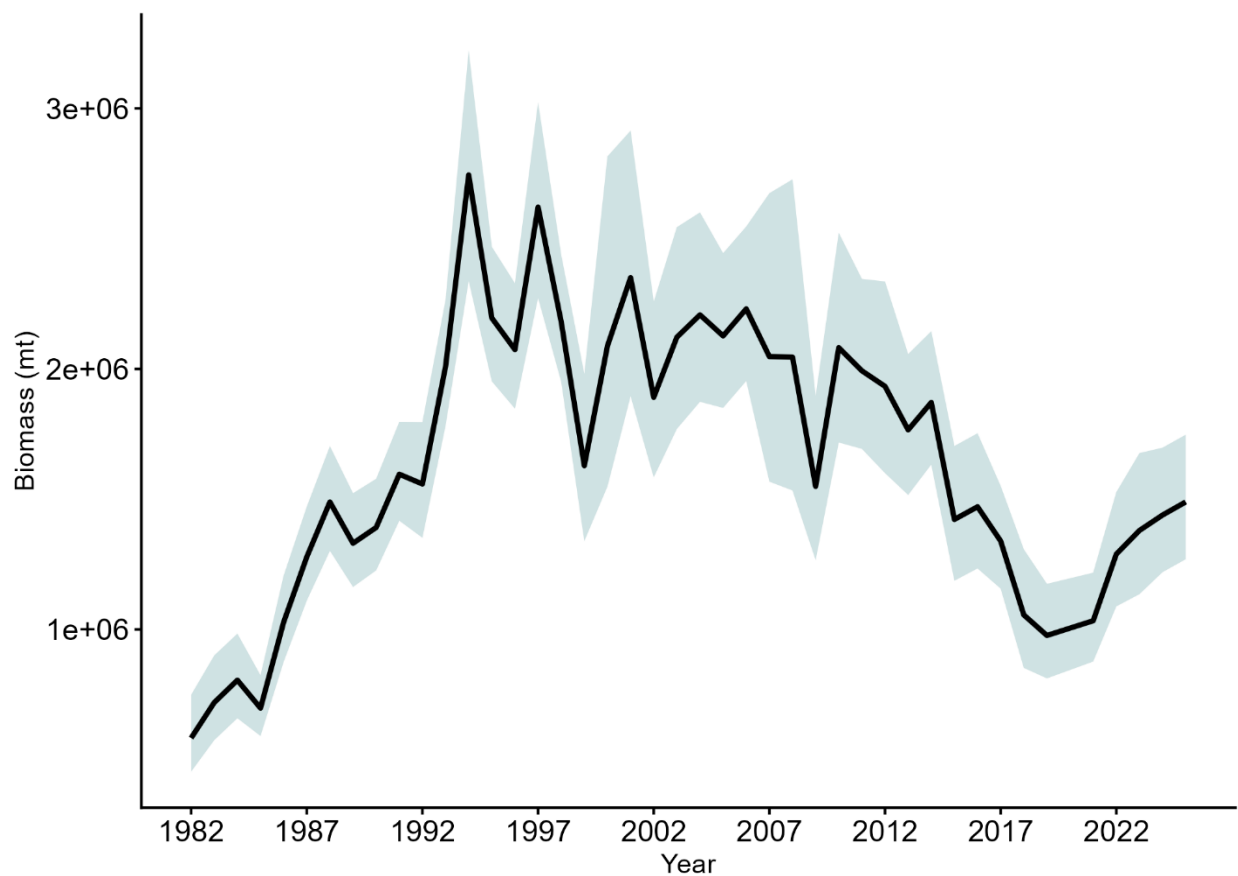


Figure 1. Eastern Bering Sea Bottom Trawl design-based survey biomass (mt) for northern rock sole from 1990-2025 (black line) with 95% confidence intervals (blue shading).

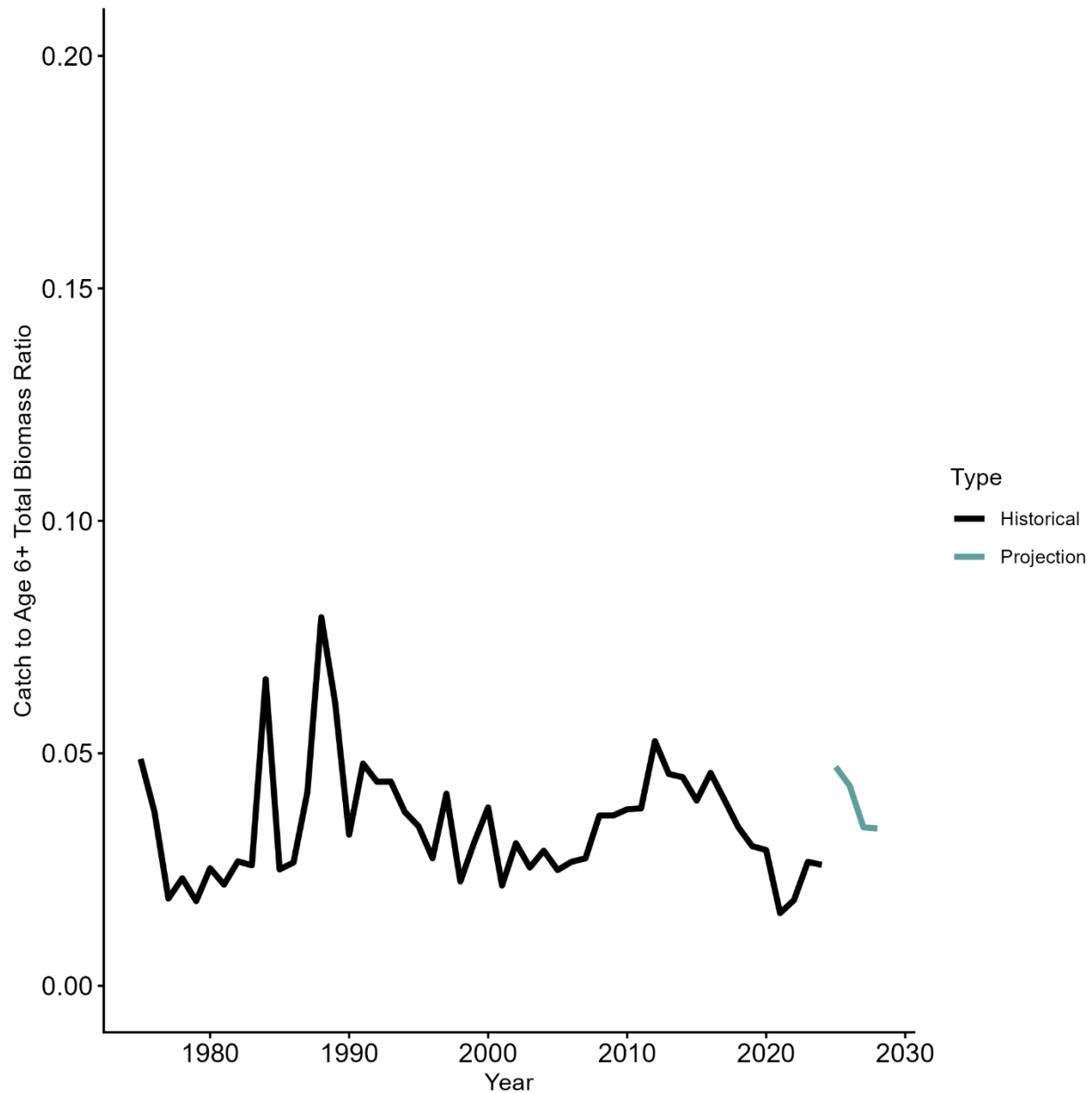


Figure 2. Ratio of total catch to total age 6+ biomass from 1978 to 2028. Values for 2024-2028 originate from the projection model and catch estimation methods used for developing Table 1, the Executive Summary table. Values from the projection model are used for 2024-2025 because the most recent operational full assessment occurred in 2024.

References

McGilliard, C.R., Ianelli, J., and Siddon, E. 2024. Assessment of the northern rock sole stock in the Bering Sea and Aleutian Islands. North Pacific Fishery Management Council, P.O. Box 103136, Anchorage AK 99510.