

# 13. Assessment of the Northern Rockfish Stock in the Bering Sea and Aleutian Islands

by

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## Executive Summary

In 2005, Bering Sea/Aleutian Islands (BSAI) rockfish were moved to a biennial assessment schedule with full assessments in even years to coincide with the frequency of trawl surveys in the Aleutian Islands (AI) and the eastern Bering Sea (EBS) slope. In 2017, the scheduled frequency for some stock assessments was changed in response to the National Stock Assessment Prioritization effort. Bering Sea/Aleutian Islands (BSAI) northern rockfish will maintain a biennial schedule but with full assessments in odd years, with the next full assessment scheduled for 2025. The 2023 full assessment can be found at <https://www.fisheries.noaa.gov/resource/data/2023-assessment-northern-rockfish-stock-bering-sea-and-aleutian-islands>. In years without a full assessment, a “partial assessment” is produced by revising the recent catch data and re-running the projection model using the results from the previous full assessment as a starting point. Therefore, this update does not incorporate any changes to the 2023 assessment methodology, but does update the catches for 2023-2024 and provides estimated catches for 2025-2026. The partial assessment also includes estimates of catch/biomass (i.e., exploitation rates) using estimated total biomass.

### Summary of Changes in Assessment Inputs

*Changes in input data:* The updated information for this partial assessment is replacing the estimated 2023 catch with the final catch value, revising the 2024 and 2025 catch estimates, and adding the projected 2026 catch. The 2023 catch was 10,433 t, 5.5% larger than the estimate of 9,888 t that was used in the 2023 projection. The 2024 catch is projected to be 7,934 t, 6.6% smaller than the estimate of 8,494 in the 2023 projection. The projected 2024 catch was obtained from the sum of the 2024 observed catch through week 28 (i.e., mid-July, which is the latest available information and queried on August 21, 2024) and the average catch from weeks 29 – 52 from 2023 and 2022). The projected 2024 catch declined relative to the value used in the 2023 projection due to a decline in 2024 observed catch through mid-July relative to recent years. The estimated 2025 and 2026 catches are assumed to result from fishing at the estimated 2024  $F$  (from the 2024 projection model, and updated estimate of the 2024 catch), resulting in 7,706 t and 7,514 t, respectively.

*Changes in assessment methodology:* There were no changes in assessment methodology since this was a partial assessment year.

### Summary of Results

For the 2025 fishery, we recommend the maximum ABC of 18,694 t and an OFL of 22,848 t based on the updated projection model. The recommended 2025 ABC is 3.0% smaller than the 2024 ABC of 19,274 and 0.05% larger than the projected 2025 ABC of 18,685 from the 2023 projection model. A summary of the updated projection model results is shown below.

Quantity	As estimated or specified last year for:		As estimated or recommended this year for:	
	2024	2025	2025*	2026*
<i>M</i> (natural mortality rate)	0.052	0.052	0.052	0.052
Tier	3a	3a	3a	3a
Projected total (age 3+) biomass (t)	297,189	292,686	292,807	289,639
Female spawning biomass (t)				
Projected	128,229	124,651	124,767	122,075
<i>B</i> <sub>100%</sub>	187,268	187,268	187,268	187,268
<i>B</i> <sub>40%</sub>	74,907	74,907	74,907	74,907
<i>B</i> <sub>35%</sub>	65,544	65,544	65,544	65,544
<i>F</i> <sub>OFL</sub>	0.086	0.086	0.086	0.086
<i>maxF</i> <sub>ABC</sub>	0.070	0.070	0.070	0.070
<i>F</i> <sub>ABC</sub>	0.070	0.070	0.070	0.070
OFL (t)	23,556	22,838	22,848	22,284
maxABC (t)	19,274	18,685	18,694	18,232
ABC (t)	19,274	18,685	18,694	18,232
<b>Status</b>	As determined last year for: for:		As determined this year for:	
	2022	2023	2023	2024
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 estimated catches of 7,706 t and 7,514 t used in place of maximum permissible ABC for 2025 and 2026.

BSAI northern rockfish was not subjected to overfishing in 2023 and is not overfished or approaching an overfished condition.

BSAI northern rockfish exploitation rates have averaged 0.016 from 2004-2023 (Figure 13.1), which is below the exploitation rate associated from fishing at  $F_{40\%}$  (defined as  $U_{F40\%}$ ). Exploitation rates are computed as the ratio of catch within a year to the beginning year biomass (ages 3+). The estimates of biomass were obtained from the 2023 stock assessment. Exploitation rates for BSAI subareas were obtained by using smoothed estimates of survey biomass from the random effects models to spatially partition the estimated total biomass. The exploitation rates from the BSAI subareas are below  $U_{F40\%}$ . The exploitation rate in the eastern Aleutian Islands peaked in 2015 and 2019 and has declined since 2019. The exploitation rates in the central and western Aleutian Islands have been increasing since 2014. The biomass estimates in the southern Bering Sea area are not viewed as reliable due to relatively large standard deviations and high variability between years, which accounts for the unusually high exploitation rates from 2009 - 2017.

## Summary table for the Plan Team

Year	Biomass <sup>1</sup>	OFL	ABC	TAC	Catch <sup>2</sup>
2023	277,133	22,776	18,687	11,000	10,433
2024	297,189	23,556	19,274	16,752	3,487
2025	292,807	22,848	18,694		
2026	289,639	22,284	18,232		

<sup>1</sup> Total biomass (ages 3+) from age-structured projection model.

<sup>2</sup> Source: AKFIN database, catch as of week\_end\_date of July 23, 2024.

SSC and Plan Team comments are listed below. In general, responses to comments relating to analyses of the age-structured assessment model are deferred until the next full assessment, currently scheduled for 2025.

### **Responses to SSC and Plan Team Comments Specific to this Assessment**

SSC (December, 2023) *The SSC concurs with the author and BSAI GPT that there is a mismatch between the spatial management unit and the stock structure. Consequently, the stock is vulnerable to localized depletion should the increasing trend in catch and regional targeting continue. The SSC also agrees that while there is not presently a conservation concern, the author and BSAI GPT should continue to closely monitor sub-area trends in exploitation, incorporating industry perspectives to elucidate trends in directed targeting if possible.*

The authors will continue to interact with industry representatives to gain their perspectives on BSAI rockfish fishing patterns.

SSC (December, 2023) *The SSC appreciates the inclusion of a figure with sub-area exploitation rates and suggests that the authors also evaluate other sources of data for possible signs of localized depletion and include an updated stock structure template as an appendix to the next full assessment.*

To date, the analysis of subarea exploitation rates have not suggested localized depletion for BSAI northern rockfish. In future assessments, additional data sources will be considered when evaluating signs of localized depletion.

SSC (December, 2023) *Investigate whether information on sex ratio, that might indicate different mortalities between sexes, or the inclusion of time blocks for survey selectivity and/or catchability may be informative in resolving the retrospective pattern.*

These topics will be evaluated in the next full assessment.

## Figures

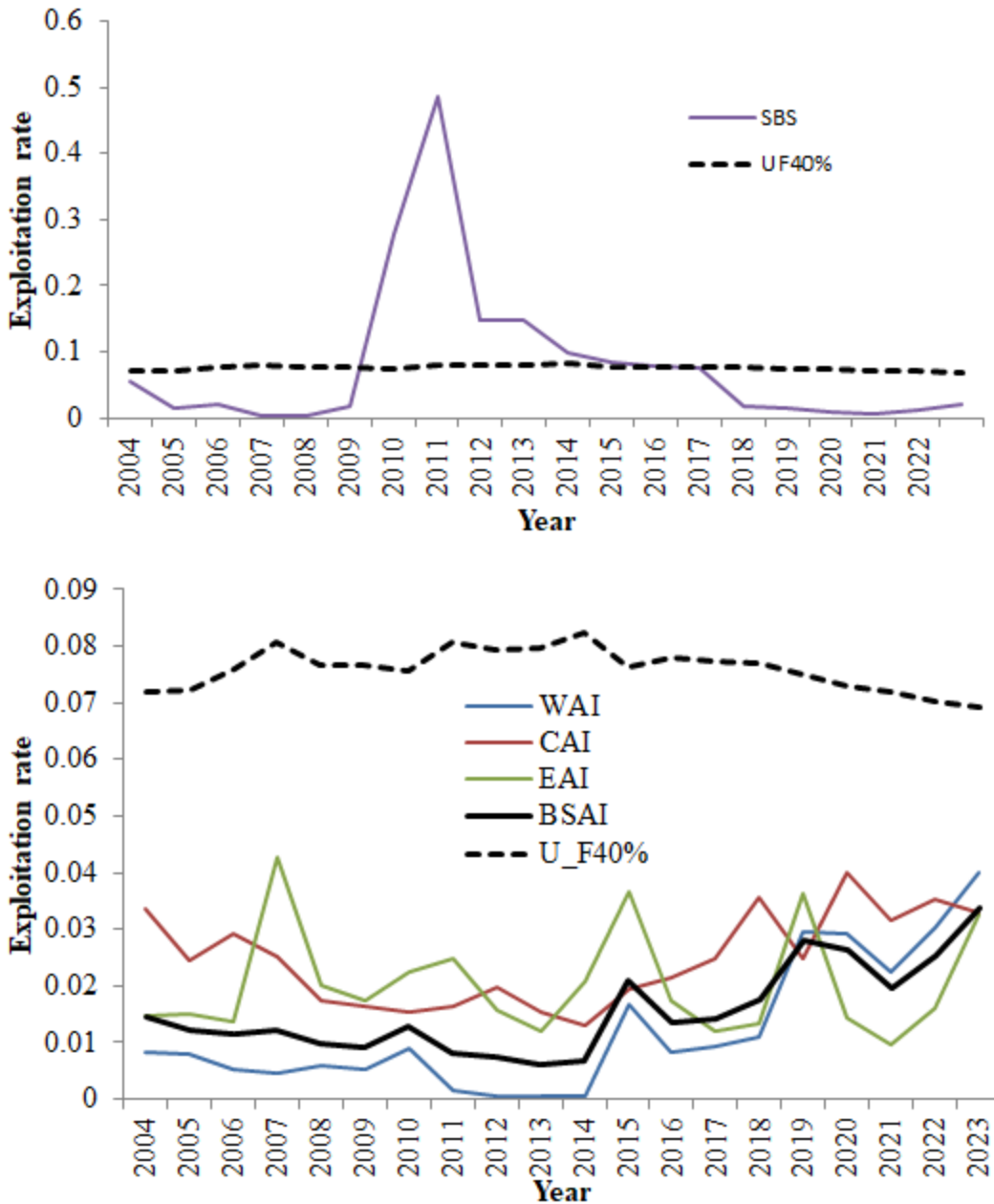


Figure 13.1. Exploitation rates for northern rockfish. The  $U_{F40\%}$  is the exploitation rate for each year that would occur from fishing at  $F_{40\%}$ , and is a function of the beginning year numbers at age, size at age, and fishing selectivity. The high exploitation rates in the southern Bering Sea (SBS) area result from highly variable survey biomass estimates for this area.