

12. Assessment of the Dusky Rockfish Stock in the Gulf of Alaska

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Executive Summary

Gulf of Alaska (GOA) dusky rockfish (*Sebastes variabilis*) is typically assessed on a biennial schedule (even years) to align with the availability of new trawl survey data (odd year survey) with a harvest projection in years without an assessment. The Alaska Fisheries Science Center (AFSC) prioritized its workload due to a government shutdown in fall 2025, resulting in a harvest projection for GOA dusky rockfish in 2026 (instead of an update assessment). The next assessment is scheduled to take place in 2027.

The projection model is updated with finalized catch data for the years since the last assessment, including specified catch through the end of the current year. The harvest projection then provides recommended harvest levels for the next two years without re-estimating model parameters or biological reference points. In other words, no new assessment model is run, instead a projection from the assessment terminal year is carried out with observed catch specified through the current year.

The GOA dusky rockfish is classified as a Tier 3 stock and is assessed using a statistical catch-at-age (SCAA) integrated model. The assessment model consists of a population model representing the biological and fishery dynamics, an observation model to calculate predicted survey and fishery data, and a statistical maximum likelihood estimation model which enables fitting survey and fishery data to estimate key population parameters and the time series of population estimates (e.g., spawning stock biomass, recruitment, and fishing mortality). The projection model then uses results from the population model (e.g., demographic parameters, terminal year numbers-at-age, and fishery selectivity estimates) to forecast future population trajectories based on a stochastic recruitment assumption, which is used to determine the recommended harvest levels based on the North Pacific Fisheries Management Council's (NPFMC) $F_{40\%}$ harvest control rule (HCR). The data used in this assessment include total catch biomass, fishery age and size compositions, the trawl survey abundance index, and trawl survey age compositions.

Summary of Changes in Assessment Inputs

Changes in the input data: 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 (2,204 t), 2025 (2,284 t), and 2026. The 2026 catch was imputed by increasing the observed catch (through 8/18/2026) by an expansion factor of 1.03, which accounts for the average fraction of catch taken after August 18 from the last three complete years (2023-2025). This expansion factor is similar to the 2024 expansion factor of

1.04 and resulted in a specified catch for 2026 of 3,187 t. The specified catch from 2026 is then used to forecast recommended harvest levels for 2027 and 2028.

For harvest projections, the Acceptable Biological Catch (ABC) in projection year 1 (2027) is based on fishing at F_{ABC} (Projection Scenario 1 as described in the 2024 SAFE). The ABC for projection year 2 (2028) is then based on fishing at the ‘author’s F ’ (i.e., a yield ratio * F_{ABC} ; Scenario 2 as described in the 2024 SAFE) in projection year 1 (2027) and then fishing at F_{ABC} for projection year 2. The ‘yield ratio’ is the average ratio of catch to ABC for the last three complete catch years (i.e., 2023 – 2025), which was calculated to be 0.36. Adjusting projected catch aims to reflect best expectations of what will likely be removed and results in higher ABCs in later projection years. This yield ratio was multiplied by the F_{ABC} to generate catches of 2,127 t in 2027 and 2,021 t in 2028. The estimated catches in 2029-2031 are based on 5 year (2020-2024) average F .

Summary of Changes in Assessment Methodology

There were no changes from the 2024 assessment (Omori *et al.* 2024) as this was an off-cycle year. No new assessment model was run for the harvest projections.

Summary of Results

ABC recommendation

The projected total biomass (age 4+) for 2027 is 79,386 t and projected spawning biomass is 32,665 t. The recommended ABC for 2027 is 5,693 t, the maximum allowable ABC under Tier 3a. This ABC is a 5.4% decrease compared to the 2026 ABC of 6,021. The 2026 catch rate (specified catch/ total biomass) is greater than average (Figure 12-1), but the associated population harvest rate remains low.

The 2027 GOA-wide OFL for dusky rockfish is 6,920 t.

The stock is not being subject to overfishing, is not currently overfished, nor is it approaching a condition of being overfished. These status reports are based on current and past catch and projected spawning biomass estimates. More specifically, the official catch estimate for the most recent complete year 2025 is 2,284 t, which is less than the 2025 OFL of 7,705. Therefore, the stock is not being subjected to overfishing. The overfished scenarios are not updated in the harvest projection, and the 2024 stock status determinations state that the stock is not currently overfished, nor is it approaching conditions of being overfished. The ABC projections from the harvest projections indicated that the stock remains well above the minimum stock size threshold, $B_{35\%}$, of 20,814 t.

Reference values for dusky rockfish are summarized in the following table with the recommended OFL and ABC in bold:

Quantity/Status	As estimated or <i>specified</i> <i>last year for:</i>		As estimated or <i>recommended this year for:</i>	
	2025	2026	2027*	2028*
M (natural mortality)	0.07	0.07	0.07	0.07
Tier	3a	3a	3a	3a
Projected total (age 4+) biomass (t)	85,912	83,297	79,386	78,764
Projected female spawning biomass (t)	35,982	34,478	32,665	31,312
B _{100%}	59,467	59,467	59,469	59,469
B _{40%}	23,787	23,787	23,788	23,788
B _{35%}	20,813	20,813	20,814	20,814
F _{OFL}	0.111	0.111	0.111	0.111
maxF _{ABC}	0.090	0.090	0.090	0.090
F _{ABC}	0.090	0.090	0.090	0.090
OFL (t)	7,705	7,319	6,920	6,577
maxABC (t)	6,338	6,021	5,693	5,411
ABC (t)	6,338	6,021	5,693	5,411
Status	As determined <i>last year</i> for:		As determined <i>this year</i> for:	
	2024	2025	2026	2027
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 a specified catch of 3,187 t for 2026 and catch estimates of 2,127 t and 2,021 t used in place of maximum permissible ABC for 2027 and 2028.

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	2,127	6,920	5,693	32,665	0.549
2028	2,021	6,577	5,411	31,312	0.527
2029	2,146	6,223	5,119	29,813	0.501
2030	2,061	5,982	4,922	28,771	0.484
2031	2,018	5,867	4,835	28,119	0.473

Fishery Trends

Updated catch data (t) for dusky rockfish in the Gulf of Alaska as August 18, 2026 from NMFS AKRO CAS accessed through the Alaska Fisheries Information Network (AKFIN) database (<http://www.akfin.org>), are summarized in the following table.

Year	Western GOA	Central GOA	Eastern GOA		GOA Total	OFL	ABC	TAC
			West Yakutat	Southeast Outside				
2025	68	2,192	23	< 1	2,284	7,705	6,338	6,338
2026	37	3,009	40	< 1	3,086	7,319	6,021	6,021

Survey Trends

The AFSC bottom trawl survey was last conducted in the Gulf of Alaska in 2025. In 2025, AFSC transitioned to a new stratified sampling design for the bottom trawl survey to increase sampling efficiency while maintaining unbiased estimates of biomass indices and composition data. The total number of stations was reduced by ~ 18%. The GOA dusky rockfish uses a geostatistical model-based approach (i.e., sdmTMB). Results from the bottom trawl survey sdmTMB model indicate that there are no large changes in survey biomass from previous years and the 2025 estimated biomass is near the average (Figure 12-2).

Biologically-informed Recommended Distributions

The following table shows the Biologically-informed Recommended Distributions (BRDs) for 2027 and 2028. BRDs are based on the proportion of survey biomass in each area using the survey averaging random effects REMA model (<https://github.com/afsc-assessments/rema>). Please refer to the *Area Allocation of Harvests* section of last full assessment (Omori *et al.* 2024) for information regarding the apportionment rationale for GOA dusky rockfish.

		Western	Central	Eastern	Total
Area Apportionment		3.3%	91.8%	4.9%	100%
2027	ABC (t)	188	5,225	280	5,693
2027	OFL (t)				6,920
2028	ABC (t)	178	4,967	266	5,411
2028	OFL (t)				6,577

Amendment 41 prohibited trawling in the Eastern GOA east of 140° W longitude, resulting in the Eastern GOA being subdivided into West Yakutat (between 147° W and 140° W) and Southeast Outside. The ratio of BRD allotted to W. Yakutat is 0.69 while the remaining 0.31 is assigned to Southeast Outside.

		W. Yakutat	Southeast Outside
2027	ABC (t)	193	87
2028	ABC (t)	184	82

References

Omori, K., Williams, B., Hulson, P.-J. and Ferriss, B. (2024) Assessment of the dusky rockfish stock in the Gulf of Alaska. In: *Stock assessment and fishery evaluation report for the groundfish resources of the Gulf of Alaska*. North Pacific Fishery Management Council, Anchorage, AK. Available at: <https://www.npfmc.org/library/safe-reports/>

Figures

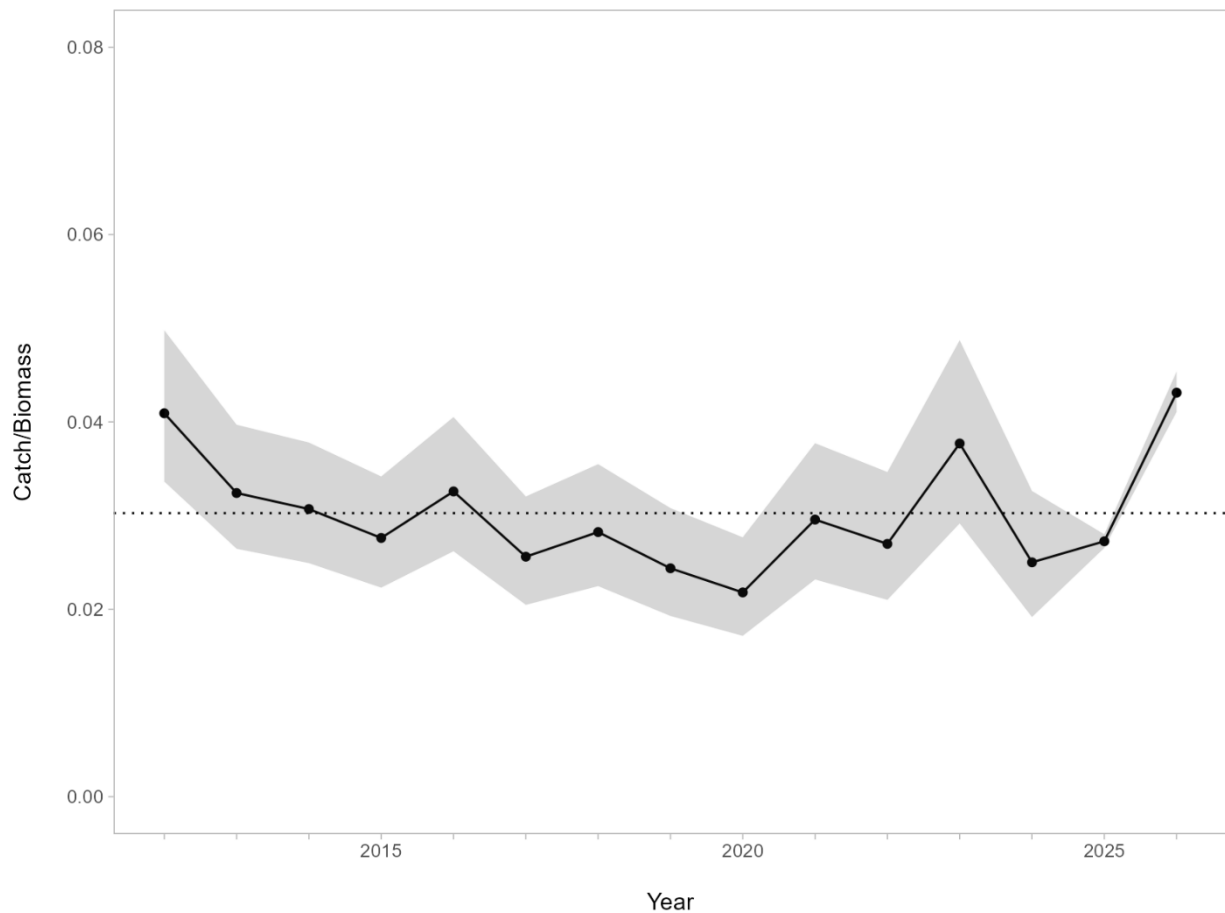


Figure 12-1. Gulf of Alaska dusky rockfish catch/age 4+ biomass ratio with approximate 95% confidence intervals. Observed catch values were used for 1991-2025, the 2026 catch values were imputed using an expansion factor to obtain the 2026 specified catch. The horizontal dashed line is the mean value for the entire dataset.

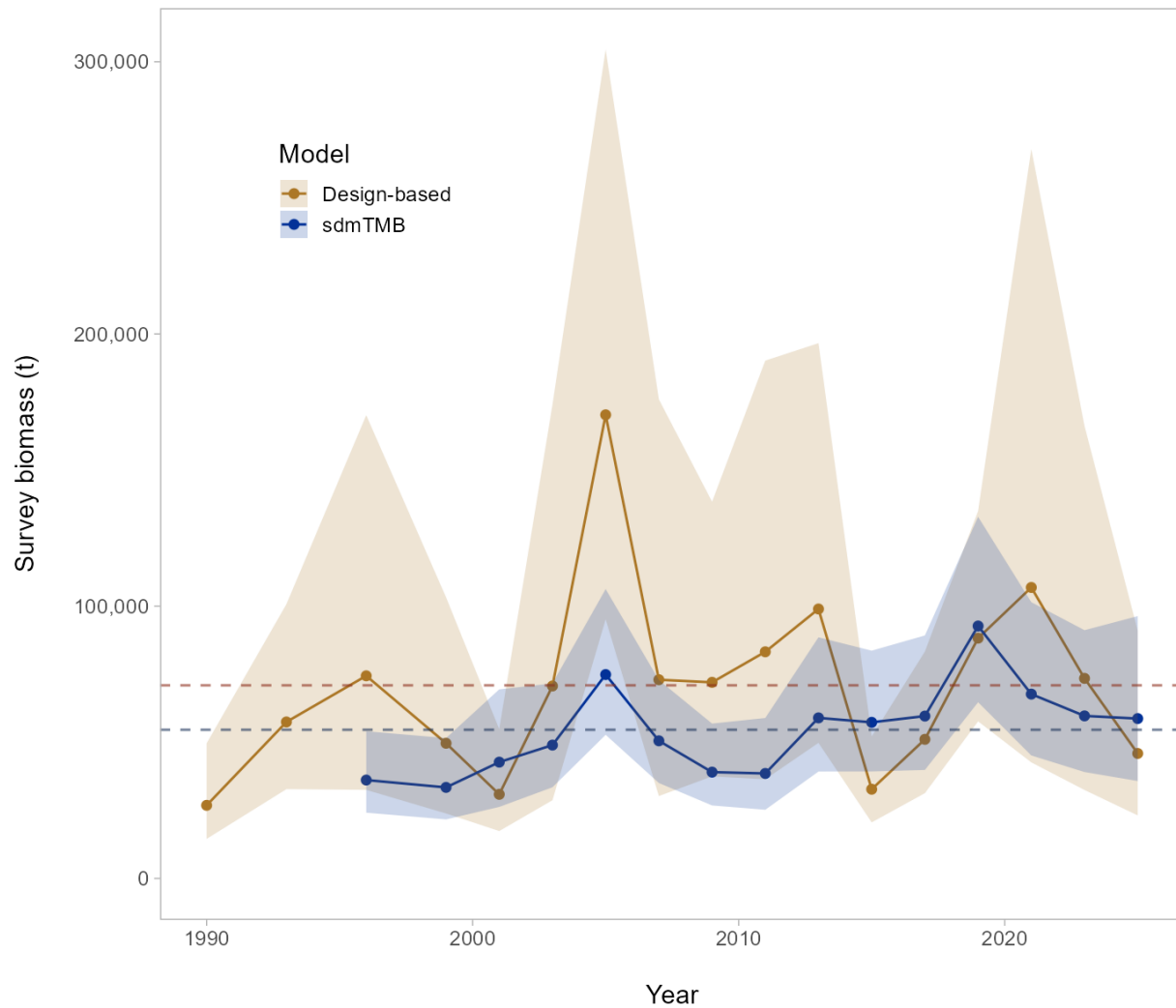


Figure 12-2. Geostatistical model (sdmTMB with lognormal observation error) and design-based model estimates of trawl survey abundance for dusky rockfish in the Gulf of Alaska. Shaded areas are 95% confidence intervals and the dashed lines are the data means of each model type.