4. Assessment of the Shallow-water Flatfish Stock in the Gulf of Alaska

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September 2024

Executive Summary

Gulf of Alaska shallow-water flatfish (SWF) stock complex includes Alaska plaice (*Pleuronectes quadrituberculatus*), butter sole (*Pleuronectes isolepis*), English sole (*Parophrys vetulus*), sand sole (*Psettichthys melanostictus*), starry flounder (*Platichthys stellatus*), yellowfin sole (*Pleuronectes asper*), northern rock sole (*Lepidopsetta polyxstra*), and southern rock sole (*Lepidopsetta bilineata*). Northern rock sole and southern rock sole are Tier 3 species and are assessed separately from the other shallow-water flatfish, which are Tier 5 stocks. The OFL and ABC for the SWF complex are calculated as the sum of the Tier 3 rock sole assessment values and the Tier 5 other shallow-water flatfish assessment values.

GOA SWF are assessed every 4 years according to the stock assessment prioritization schedule. The random effects model is fit to the AFSC GOA bottom trawl survey for all Tier 5 species to obtain estimates of annual biomass. The ABC and OFL for the Tier 5 stocks are derived as the product of the current biomass and F_{40}% and F_{35}%. The Tier 5 proxy for F_{40}% is assumed to be equal to M (0.2 for all Tier 5 stocks) and the Tier 5 proxy for F_{35}% is 75% of M. The last full assessment was conducted in 2021 (Bryan and Ferriss, 2021), and is available online https://apps-afsc.fisheries.noaa.gov/Plan_Team/2021/GOAshallowflat.pdf. A full stock assessment document with updated assessment and projection model results will be presented in November, 2025.

Description of Updated Catch

Catch data for northern and southern rock sole were updated for harvest projections (see Bryan 2023).

Summary of Results

The recommended ABCs for GOA SWF for 2025 and 2026 are 56,559 t and 56,910 t. The recommended OFLs are 69,277 t and 69,610 t for 2025 and 2026. The values for the entire SWF complex are shown in the table below. Table 1 has a summary of the Tier 3- and Tier 5-specific ABC and OFL values for 2025 and 2026. The projected values for 2025 are similar to those from the previous harvest projections conducted in 2023.

Quantity/Status	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
	2024	2025	2025	2026
M (natural mortality)	0.2**	0.2**	0.2**	0.2**
Tier	3a, 5	3a, 5	3a, 5	3a, 5
Biomass (t)	453,606	455,335	453,606	455,146
F_{OFL}	*	*	*	*
$maxF_{ABC}$	*	*	*	*
F_{ABC}	*	*	*	*
OFL (t)	68,121	69,354	69,277	69,610
*max*ABC (t)	55,565	56,623	56,559	56,910
ABC (t)	55,565	56,623	56,559	56,910
	As determined *last* year for:		As determined *this* year for:	
Status	2022	2023	2023	2024
Overfishing	No	n/a	No	n/a

*Table 1 below provides the specific Tier 3 projection model results for northern and southern and the Tier 5 random effects results for all other shallow-water flatfish.

** Natural mortality for Tier 5 SWF. Table 2 below provides area-specific natural mortality for northern and southern rock sole.

Area Allocation of Harvests

The ABC apportionment by area was estimated by fitting the random effects model to the survey biomass summed for all species (including Tier 3 rock sole) by area and estimating the percent biomass by area. This was done in 2021 and remains unchanged because this was an off-cycle year for the GOA bottom trawl survey (Bryan and Ferriss, 2021).

	Western	Central	Yakutat	Southeast	Total
Proportion	0.42	0.5	0.05	0.03	
2025	23,755	28,279	2,828	1,697	56,559
2026	23,902	28,455	2,846	1,707	56,910

References

Bryan, M.D., Ferriss, B. 2021. Assessment of northern and southern rock sole (*Lepidopsetta polyxstra* and *bilineata*) stocks in the Gulf of Mexico. In: Stock Assessment and Fishery Evaluation Report for Groundfish Resources in the Gulf of Alaska. North Pacific Fishery Management Council, Anchorage, AK, USA.

Bryan, M.D. 2023. Assessment of northern and southern rock sole (*Lepidopsetta polyxstra* and *bilineata*) stocks in the Gulf of Mexico. In: Stock Assessment and Fishery Evaluation Report for Groundfish Resources in the Gulf of Alaska. North Pacific Fishery Management Council, Anchorage, AK, USA.

Tables

Table 1. ABC and OFL recommendations by species in the GOA shallow-water flatfish stock complex.

Species	Tier	FABC	FOFL	2024 Biomass[1]	2025 Biomass[1]	As specified last year for: 2024		2025		As recommended this year for: 2025		2026	
						ABC	OFL	ABC	OFL	ABC	OFL	ABC	OFL
Northern rock sole	3a	*	*	105,941	107,247	13,382	15,976	13,799	16,466	13,768	16,429	13,993	16,623
Southern rock sole	3a	*	*	249,461	249,397	27,454	32,505	28,095	33,248	28,062	33,208	28,188	33,347
Yellowfin sole	5	0.15	0.2	24,835	24,835	3,725	4,967	3,725	4,967	3,725	4,967	3,725	4,967
Butter sole	5	0.15	0.2	11,873	11,873	1,781	2,375	1,781	2,375	1,781	2,375	1,781	2,375
Starry flounder	5	0.15	0.2	25,433	25,433	3,814	5,086	3,814	5,086	3,814	5,086	3,814	5,086
English sole	5	0.15	0.2	29,867	29,867	4,480	5,973	4,480	5,973	4,480	5,973	4,480	5,973
Sand sole	5	0.15	0.2	3,000	3,000	450	600	450	600	450	600	450	600
Alaska plaice	5	0.15	0.2	3,196	3,196	479	639	479	639	479	639	479	639
Total2				453,606	454,848	55,565	68,121	56,623	69,354	56,559	69,277	56,910	69,610

[1] Total biomass (age 0+) estimated from the northern and southern rock sole from the age structured model and the random effects model for Tier 5 species, [2] Sum of columns may not equal totals due to rounding, * Biomass, OFL, and ABC estimates are from the summation of area-specific model estimates with species-specific natural mortality (F_{ABC} and F_{OFL} are area-specific, Bryan 2023).

Table 2. Natural mortality for GOA other shallow-water flatfish and area-specific and sex-specific natural mortality for GOA northern and southern rock sole.

Other SWF			
0.2			
Northern Rock Sole		**Southern Rock Sole**	
WGOA			
Females	0.2	Females	0.2
Males	0.254	Males	0.271
C/E GOA			
Females	0.2	Females	0.2
Males	0.232	Males	0.253