

16. Assessment of the Other Rockfish stock complex in the Gulf of Alaska

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EXECUTIVE SUMMARY

The Other Rockfish complex in the Gulf of Alaska (GOA) is assessed on a biennial stock assessment schedule to coincide with the availability of new trawl survey biomass estimates in odd years. The last operational full [assessment](#) was conducted in 2023. However, an operational update assessment has been provided this year as a result of alterations to the species assignment to the GOA Other Rockfish complex. Recommendations to remove the seven demersal shelf rockfish (DSR) species previously assessed in the Other Rockfish complex in the Western GOA, Central GOA, and West Yakutat areas to a separate GOA-wide stock complex was approved by the Council in 2023. The Council [motion](#) of the removal of the DSR species from the Other Rockfish complex was for the 2024 assessment cycle for implementation in the 2025 fisheries. The next operational assessment is scheduled for 2025.

The Other Rockfish stock complex beginning with this year's assessment consists of twenty non-target rockfish species (*Sebastes* spp.) that are managed in three tiers (Table 16.1). There is one species in Tier 4, four species in Tier 5, and the fourteen species in Tier 6. Northern rockfish are included in this complex for the purposes of catch accounting and inseason management in the Eastern GOA only and are not assessed as part of the Other Rockfish complex. The stock complex overfishing limit (OFL) and acceptable biological catch (ABC) is the sum of the recommendations for the Tiers 4, 5, and 6 species.

Summary of Changes in Assessment Inputs

Changes to the Input Data: The total catch for GOA Other Rockfish has been updated from 2003 to 2024 (through October 8, 2024). Data in this assessment include the current twenty GOA Other Rockfish species.

Changes in Assessment Methodology: There were no changes made to the assessment methodology. However, the modifications in the species composition of the GOA Other Rockfish complex, specifically in Tier 6 (decreasing from twenty-one species to fourteen species), change the resulting ABC and OFL. Harvest specifications for Tier 6 are based on the maximum catch from 2013 to 2022 for each species.

Summary of Results

The recommended ABC for the 2025 fishery is 3,504 t and the OFL is 4,618 t for the Other Rockfish stock complex. The recommended ABCs and OFLs for Tier 4 and Tier 5 did not change from the 2023 full assessment because no new GOA survey data were available to rerun the assessment models (i.e., REMA models). However, there was a 72% decrease in the ABC for Tier 6 due to the reduction in the number of species assigned in the tier. As a result, there is a 7% decrease in the GOA-wide complex-level ABC. There is no evidence to suggest that overfishing is occurring for the Other Rockfish stock complex in the GOA because the OFL has not been exceeded. Total Other Rockfish catch in 2023 was 1,079 t and catch in 2024 was 501 t as of October 8, 2024, which is lower than the Gulf-wide OFL and ABC of 4,054 t and 3,774 t, respectively. The authors do not recommend reductions below the max ABC.

Tier 4 recommendation of ABC and OFL for sharpchin rockfish for 2025–2026.

Quantity	As estimated or <i>specified last year for:</i>		As estimated or <i>recommended this year for:</i>	
	2024	2025	2025	2026
<i>M</i> (natural mortality rate)	0.06	0.06	0.06	0.06
Tier	4	4	4	4
Biomass (t)	7,008	7,008	7,008	7,008
$F_{OFL} = F_{35\%}$	0.079	0.079	0.079	0.079
$maxF_{ABC} = F_{40\%}$	0.065	0.065	0.065	0.065
$F_{ABC} = F_{40\%}$	0.065	0.065	0.065	0.065
OFL (t)	554	554	554	554
maxABC (t)	456	456	456	456
ABC (t)	456	456	456	456
Status	As determined <i>last year for:</i>		As determined <i>this year for:</i>	
	2023	2024	2024	2025
Overfishing		n/a		n/a

Tier 5 recommendation of ABC and OFL for four Other Rockfish species for 2025–2026.

Quantity	As estimated or <i>specified last year for:</i>		As estimated or <i>recommended this year for:</i>	
	2024	2025	2025	2026
<i>M</i> (natural mortality rate)	0.062	0.062	0.062	0.062
Tier	5	5	5	5
Biomass (t)	63,291	63,291	63,291	63,291
F_{OFL}	0.062	0.062	0.062	0.062
$maxF_{ABC}$	0.046	0.046	0.046	0.046
F_{ABC}	0.046	0.046	0.046	0.046
OFL (t)	3,924	3,924	3,924	3,924
maxABC (t)	2,943	2,943	2,943	2,943
ABC (t)	2,943	2,943	2,943	2,943
Status	As determined <i>last year for:</i>		As determined <i>this year for:</i>	
	2023	2024	2024	2025
Overfishing		n/a		n/a

Tier 6 recommendation of ABC and OFL for fourteen Other Rockfish species for 2025–2026.

Quantity	As estimated or <i>specified last year for:</i>		As estimated or <i>recommended this year for:</i>	
	2024	2025	2025	2026
Tier	6	6	6	6
OFL (t)	499	499	140 ¹	140
maxABC (t)	374	374	105	105
ABC (t)	374	374	105 ¹	105
Status	As determined <i>last year for:</i>		As determined <i>this year for:</i>	
	2023	2024	2024	2025
Overfishing		n/a		n/a

¹For Tier 6, ABC and OFL recommended *this year* now exclude the seven Demersal Shelf Rockfish species.

ABC and OFL recommendations for the full Other Rockfish complex for 2025–2026.

Quantity All Other Rockfish Combined	As estimated or <i>specified last year for:</i>		As estimated or <i>recommended this year for:</i>	
	2024	2025	2025	2026
Tier	4/5/6	4/5/6	4/5/6	4/5/6
OFL (t)	4,977	4,977	4,618	4,618
maxABC (t)	3,774 ¹	3,774 ¹	3,504	3,504
ABC (t)	3,774 ¹	3,774 ¹	3,504	3,504
Status	As determined <i>last year for:</i>		As determined <i>this year for:</i>	
	2023	2024	2024	2025
Overfishing	n/a		n/a	

¹ABCs include the transferred EGOA northern rockfish ABC to the EGOA Other Rockfish ABC.

Updated catch data (t) for the Other Rockfish stock complex in the GOA are summarized in the following table with ABCs and TACs. Source: NMFS Alaska Regional Office Catch Accounting System (CAS) accessed through the Alaska Fisheries Information Network (AKFIN) database, <http://www.akfin.org> as of October 8, 2024.

Year	Western	Central	Eastern GOA		Gulf-wide	Gulf-wide	Gulf-wide
	GOA	GOA	West Yakutat	Southeast Outside	Total	ABC	TAC
2023	131	859	58	31	1,079	4,054 ¹	1,610
2024	73	346	53	29	501	3,774 ¹	1,653

¹The ABCs include the transferred EGOA northern rockfish ABC to the EGOA Other Rockfish ABC. The total northern rockfish ABC is estimated in the northern rockfish assessment for the GOA, and the EGOA ABCs are deducted from the northern rockfish ABC and added to the GOA Other Rockfish total ABC. Historically, this quantity has ranged from 1 to 4 t and is done during the Plan Team deliberations in November.

Area Allocation of ABC

Area apportionment was estimated using the REMA model for Tier 4 and 5 in the 2023 assessment. The area apportionment for the Western and Central GOA were combined since 2014. In 2023, the Plan Team, SSC, and the Council recommended the West Yakutat area apportionment of the ABC be combined with the Western and Central GOA for the 2024 fisheries due to overages in the Central/Western GOA in the recent years. The authors recommend continuing to combine the Western GOA, Central GOA, and West Yakutat subarea ABCs, as data do not suggest any developing conservation concerns that would be alleviated by splitting the ABCs. Furthermore, the authors acknowledge the possibility of overages in area specific ABCs that may constrain the fisheries, but have little area-specific biological concerns. Further discussion on alternative apportionment considerations are provided in the “Area Allocation of Harvest” section.

The tables below show the apportionment for the Tier 4 (sharpchin rockfish), Tier 5, and Tier 6 species separately.

Tier 4 - Sharpchin	Western GOA	Central GOA	Eastern GOA		Total
			West Yakutat	Southeast Outside	
Area Apportionment	0.4%	12.8%	13.3%	73.5%	100%
Area ABC (t)	2	58	61	335	456
OFL (t)		121			554

Tier 5 - 4 species	Western GOA	Central GOA	Eastern GOA		Total
			West Yakutat	Southeast Outside	
Area Apportionment	0.1%	15.7%	13.6%	70.6%	100%
Area ABC (t)	3	462	400		
OFL (t)		865		2,078	2,943
					3,924

Tier 6 – 14 species	Western GOA	Central GOA	Eastern GOA		Total
			West Yakutat	Southeast Outside	
Area ABC (t)	3	75	19		
OFL (t)		97		8	105
					140

Total Other Rockfish ABC apportioned by area

	Western GOA	Central GOA	Eastern GOA		Total
			West Yakutat	Southeast Outside	
Area ABC (t)	8	595	480		
OFL (t)		1,083		2,421	3,504
					4,618

Summaries for Plan Team

Species	Year	Biomass ¹	OFL	ABC	TAC	Catch ²
Other Rockfish	2023	70,687	5,320	4,054 ³	1,610	1,079
	2024	70,299	4,977	3,774 ³	1,653	501
	2025	70,299	4,618	3,504 ⁴		
	2026	70,299	4,618	3,504 ⁴		

Stock/ Assemblage	Area	2024				2025		2026	
		OFL	ABC	TAC	Catch ²	OFL	ABC	OFL	ABC
Other Rockfish	WGOA/ CGOA/ EGOA- WY		1,353	1,353	472		1,083		1,083
	EGOA- SE		2,421 ³	300	29		2,421 ⁴		2,421 ⁴
	Total	4,977	3,774 ³	1,653	501	4,618	3,504 ⁴	4,618	3,504 ⁴

¹Total biomass estimates from the random effects model for the Tier 4/5 species only.

²Current as of October 8, 2024. Source: NMFS Alaska Regional Office Catch Accounting System via the Alaska Fisheries Information Network (AKFIN) database (<http://www.akfin.org>).

³The ABCs for past years include the transferred EGOA northern rockfish ABC to the EGOA Other Rockfish ABC. The total northern rockfish ABC is estimated in the northern rockfish assessment, and the WY and SEOs ABCs are deducted from the northern rockfish ABC and added to the GOA-wide Other Rockfish ABC during the Plan Team deliberations in November.

⁴The recommended ABCs (in 2025–2026) are only for GOA Other Rockfish in this assessment, which starting in 2025 exclude DSR species, and do not include northern rockfish ABC because the value has not been set.

Responses to SSC and Plan Team Comments on Assessments in General

“The SSC continues to support a three-category risk table with categories normal, increased, and extreme, and requests that the category descriptions be revised to cover the range covered by the original table.”

A new risk table was not produced for this assessment, but will be updated following the new risk table guidelines in next year’s full assessment.

Responses to SSC and Plan Team Comments Specific to this Assessment

Spatial Management for DSR:

*“The Council is considering a motion to change the spatial management of demersal shelf rockfish (DSR), by moving DSR species out of the other rockfish category to a GOA-wide assessment. **The SSC supports making this change to the DSR complex in the 2024 stock assessment for implementation for the 2025 fisheries and looks forward to examining the area apportionment at that time.**” (SSC, October 2023)*

The DSR species have been removed from the GOA Other Rockfish stock complex for this assessment cycle for implementation for the 2025 fisheries. This operational update assessment reflects those changes. The assessment model for Tier 4 and 5 was not rerun as no new survey data are available, but the sum of the Tier 6 maximum catch histories only includes the slope Other Rockfish Tier 6 species.

GOA Other Rockfish

“Evaluate past research and investigate estimating catchability in the next assessment, with a focus on key components such as harlequin, sharpchin and redstripe rockfish. See Jones et al. (2012, 2021) and Zimmermann (2003) for relative “trawlability” of rockfish species.” - (SSC, December 2021, December 2023)

“Leave redstripe and harlequin rockfish in Tier 5, as recommended by the author, but continue to explore these Tier 5 biomass estimates which have CVs >0.50.” – (SSC, October 2023)

There is an ongoing effort to address catchability issues for Other Rockfish species including species with patchy distributions and those inhabiting both trawlable and untrawlable habitat. Species of particular concern that will be further investigated in the future include: harlequin and redstripe. Two research projects aim to address the “trawlability” and catchability of rockfish species: untrawlable grounds cooperative work [Science-Industry Rockfish Research Collaboration, SIRRCA] and estimating groundfish densities in GOA untrawlable habitat using a camera system (implemented by AFSF RACE GAP bottom trawl survey team). Data for the Other Rockfish species (e.g., harlequin) are not yet available, but the authors plan to incorporate the data when results become available.

Introduction

The Gulf of Alaska (GOA) Other Rockfish stock complex is a group of 20 non-target rockfish species (*Sebastes* spp.; Table 16.1). The complex is managed in Tier 4, 5, and 6 on a biennial cycle with a single complex-wide overfishing limit (OFL) and acceptable biological catch (ABC) for the GOA and subarea ABCs for East Yakutat/ Southeast and a combined West Yakutat, Western GOA, and Central GOA management areas. There are five species that generally comprise > 95% of the Other Rockfish catch and/or biomass: Tier 4- sharpchin, and Tier 5- harlequin, redbanded, redstripe, and silvergray rockfish (Figure 16.1). The remaining Other Rockfish species (i.e., often referred to as “minors”) are managed in Tier 6 with the exception of northern rockfish. Northern rockfish is assessed in a separate assessment, but the subarea ABC from the Eastern GOA is added to the Eastern GOA Other Rockfish ABC (specifically to West Yakutat) after the November Plan Team deliberations.

Recommendations to remove the seven demersal shelf rockfish (DSR) species previously assessed in the Other Rockfish complex in the Western GOA, Central GOA, and West Yakutat areas to a separate GOA-wide stock complex was approved by the Council in 2023. The Council [motion](#) of the removal of the DSR species from the Other Rockfish complex was for the 2024 assessment cycle for implementation in the 2025 fisheries. This is an operational update assessment to reflect the updated catch and changes in the harvest specifications due to alterations to the species assignments to the GOA Other Rockfish stock complex. No new models were run in this assessment because there are no updated GOA survey data since the previous assessment. Thus, only new, pertinent information and changes are included in this assessment including: updated catch, updated Tier 6 methods and results due to the removal of DSR species, and updated Other Rockfish harvest specification and area apportionment. A full introduction with description of the general distribution, stock structure, and life history information can be found in last year’s operational full assessment (Omori et al., 2023).

Fishery and Management History

A full description of the fishery can be found in the last operational full assessment (Omori et al., 2023) with updated management and fishery catch in Tables 16.2, 16.3, and 16.4. Included below are the recent significant changes in the fishery or management measures.

Management History and Management Units

The management history of the Other Rockfish stock complex is presented in Table 16.2. Previous research supported the removal of the seven DSR species from the Other Rockfish stock complex into a separate GOA-wide DSR stock complex. The Council [motion](#) to separate these two rockfish sub-groups into two GOA-wide stock complexes was for the 2024 assessment cycle to be implemented for the 2025 fisheries as specified in the [Spatial Management for DSR document](#) presented in October 2023. The updated species assigned to the Other Rockfish stock complex for the 2025 fishery is found in Table 16.1.

While the Other Rockfish catch has not exceeded the GOA-wide ABC (Table 16.3), the catch has exceeded the subarea ABC in the combined Western and Central GOA in recent years (2021–2023; Table 16.4). The majority of the Other Rockfish catch in the Western and Central GOA was from harlequin rockfish. Catch levels of harlequin rockfish are not believed to be a conservation concern because the species biomass is likely underestimated by the trawl survey, due to the species affinity for more structured, rocky habitat not sampled by the survey. Thus, beginning in 2024, the subarea ABC for West Yakutat was combined with the Western and Central GOA subarea ABC. Further discussion on the subarea overages can be found in the ‘Area Allocation’ section in the previous 2023 operational full assessment and in the [Spatial Management for GOA Rockfish document](#).

Fishery History

Directed fishing has not been permitted for Other Rockfish species in the GOA since the mid-1990s, but can be retained as “incidental-catch”. Five species comprise > 95% of the total Other Rockfish catch (sharpchin, harlequin, redbanded, redstripe, and silvergray; Table 16.5; Figure 16.1). Other Rockfish are predominately

caught in the trawl fisheries (89%), with the majority occurring in the Central GOA Rockfish Program trawl fishery (Figure 16.1). Catch in the Eastern GOA (i.e., West Yakutat and Southeast) remains small due to trawling being prohibited east of 140° W. longitude line.

Discards

Discard rates have been at roughly 50% throughout the entire time series. See the previous full operational assessment for details on the species-specific discards and impacts of retention requirements (Omori et al., 2023).

Data

A full description on data can be found in the last full assessment (Omori et al., 2023).

Time series of catch and biomass for the Other Rockfish species are obtained from the following sources:

Source	Data	Years
AKRO Catch Accounting System	Catch estimates	1991 – 2024
NMFS Bottom Trawl Surveys – GOA	Biomass Index	1984 – 1999 (triennial) 2001 – 2023 (biennial)

Fishery Data

Updated fishery catch statistics for the Other Rockfish stock complex are available in Table 16.3, Table 16.4, and Table 16.5. The recent species-specific catch (2010–present) are from the Catch Accounting System (CAS) and are updated through October 8, 2024. Methods to estimate catch prior to 2010 are described in the last full assessment (Omori et al., 2023).

Survey Data

There are no new survey biomass estimates available in this assessment. The AFSC GOA bottom trawl survey biomass estimates are only available from 1990–2023 and are presented here for reference (Table 16.6). See the last assessment for further details (Omori et al., 2023). New trawl biomass estimates will be included in the next operational assessment in 2025 when the GOA bottom trawl survey is scheduled to be conducted.

Analytic Approach

The Other Rockfish stock complex is assessed using three separate methods: Tier 4 (sharpchin) random effects model using the REMA model (Model 15.2), Tier 5 (four species) random effects model using the REMA model (Model 23.1), and Tier 6 (14 species) species using maximum catch from 2013–2022 (Model 23.1). Associated reference points are calculated using the appropriate harvest control rule outline in [Amendment 56](#) of the North Pacific Fishery Management Council (NPFMC) GOA [Fishery Management Plan](#).

General Model Structure

Other Rockfish managed in Tier 4 and Tier 5 use the bottom trawl survey biomass as the primary data input in the REMA model (Hulson et al., 2021) using *rema* package (Sullivan et al., 2022). See the previous operational full assessment for further details (Omori et al., 2023).

Tier 4: Model 15.2 was used to estimate a Gulf-wide biomass for sharpchin rockfish.

Tier 5: Model 23.1 was applied to estimate a Gulf-wide Tier 5 biomass (i.e., all tier 5 species combined). The REMA model was run for each Tier 5 species individually to calculate the average estimated biomass weighted natural mortality (Wt_M).

Tier 6 (Model 23.1): Tier 6 Other Rockfish OFL is the sum of the maximum catch from 2013–2022 of the 14 Tier 6 species (Omori et al., 2023). The ABC is 75% of the OFL.

Results

Parameter Estimates

No new parameters were estimated in this assessment.

Model Results

Tier 4 and Tier 5: New models were not run for the Tier 4 and Tier 5 Other Rockfish species for this operational update assessment as there were no new survey data since the recent operational full assessment. The following are the accepted results from the 2023 Other Rockfish assessment, which includes estimated biomass for each tier and natural mortality (M) group and the associated F_{OFL} , OFL , F_{ABC} , and ABC . More detailed results can be found in the 2023 assessment (Omori et al., 2023) and REMA results from 2023 are shown in Table 16.6 and Figure 16.2.

Model	Group	Tier	2023 Est. Biomass	F_{OFL}	OFL	F_{ABC}	ABC
Model 15.2	Sharpchin	4	7,008	$F_{35\%} = 0.079$	554	$F_{40\%} = 0.065$	456
	$M=0.05$ Group	5	42,010				
	$M=0.06$ Group	5	6,541				
Model 23.1	$M=0.092$ Group	5	914				
	$M=0.1$ Group	5	11,162				
	Tier 5 Biomass	5	63,291 ¹	$F_{OFL} = \overline{Wt_M} = 0.062$	3,929	$F_{ABC} = 0.75 * F_{OFL}$	2,943
Total Tier 4/5 Gulf-wide					4,478		3,399

¹The total Tier 5 biomass is not the sum of the M groups, but the random effects biomass for the combined Tier 5 species.

Tier 6: The below table is the updated summary of the maximum catch from 2013 to 2022 for each of the 14 Tier 6 Other Rockfish species by area (Model 23.1). Changes in value from the previous assessment (if any) are due to CAS updates.

Tier 6 Model 23.1 (2013–2022)	Maximum Catch (t)			
	Western GOA	Central GOA	West Yakutat	Southeast Outside
Aurora	0	<1	<1	0
Blackgill	0	<1	0	<1
Bocaccio	0	<1	<1	<1
Chilipepper	0	<1	0	0
Darkblotched	3	4	<1	1
Greenstriped	<1	<1	<1	<1
Pygmy	<1	<1	0	<1
Shortbelly	0	0	0	0
Splitnose	<1	<1	3	0
Stripetail	0	1	<1	0
Vermilion	<1	<1	<1	1
Widow	1	85	22	<1
Yellowmouth	<1	<1	0	8
Yellowtail	<1	10	<1	1
Total by area		129		11
Total ABC			105	
Total OFL			140	

Harvest Recommendations

Amendment 56 Reference Points

The ABCs and OFLs for Other Rockfish are based on the NPFMC Amendment 56 definitions for Tier 4, 5, and 6 stocks. The harvest recommendations are as follows: Tier 4 uses estimates for $F_{35\%}$ and $F_{40\%}$ from a spawning biomass per recruit analysis, where $F_{OFL} = F_{35\%} = 0.079$ and $F_{ABC} = F_{40\%} = 0.065$; Tier 5 are defined as $F_{OFL} = \overline{Wt_M}$ and $F_{ABC} = 0.75 * F_{OFL}$; and Tier 6 applies $OFL = \text{sum of maximum catch and ABC} = 0.75 * OFL$. More details are available in the previous assessment or above section, “Analytic Approach”.

Specification of OFL and Maximum Permissible ABC

Resulting ABCs and OFLs based on the authors’ recommendations are below:

Tier - Model	2023 Biomass (with 95% CI)	F_{OFL}	OFL	F_{ABC}	ABC
4-Model 15.2	7,008 (2,964–16,583)	$F_{35\%} = 0.079$	554	$F_{40\%} = 0.065$	456
5-Model 23.1	63,291 (40,069–99,972)	$F_{OFL} = \overline{Wt_M} = 0.062$	3,924	$F_{ABC} = 0.75 * F_{OFL}$	2,943
6-Model 23.1			140		105
All Tiers Combined			4,618		3,504

Risk Table and ABC Recommendation

No new risk table was produced for this abbreviated update assessment. Below is the risk matrix from the past operational full assessment. There are no elevated risk levels and no recommended reductions from max ABC. See the 2023 assessment for the description and details on the scores for the risk table (Omori et al., 2023).

Risk Matrix

Assessment-related considerations	Population dynamics considerations	Environmental/ecosystem considerations	Fishery performance considerations	Overall score (highest of the individual scores)
Level 1: Typical to moderately increased uncertainty/minor unresolved issues	Level 1: Stock trends are typical for the stock; recent recruitment is within normal range	Level 1: Normal, No apparent environmental/ecosystem concerns	Level 1: No apparent fishery/resource-use performance and/or behavior concerns	Level 1: No elevated concern

Status Determination

There is no evidence to suggest that overfishing is occurring for the Other Rockfish complex in the GOA because the OFL has not been exceeded.

Area Allocation of ABC

The apportionment for each tier is calculated separately. For apportionment of ABC for Tier 4 and Tier 5 species, the random effects model was fit to the area-specific *rema* biomass estimate and subsequent proportions of estimated biomass by area were calculated. The split fractions for delineating the biomass between West Yakutat and the East Yakutat/Southeast portions of the Eastern GOA are calculated at the species and tier levels using a weighted average and described in detail in the previous operational full assessment (Omori et al., 2023). The Tier 6 apportionment of ABCs was calculated based on maximum catch for each species in each area. The complex ABC by area (subarea ABCs) is the sum of the Tier 4, Tier 5, and

Tier 6 apportioned ABCs by area. The management subareas are as follows: combined subarea of Western GOA, Central GOA, and West Yakutat, and separate Southeast Outside subarea. For further details on management area history and apportionment methodology see the last full assessment (Omori et al. 2023).

The tables below show the apportionment for the Tier 4 (sharpchin rockfish), Tier 5, and Tier 6 species separately and Table 16.4 shows the historical catch for the Other Rockfish complex with historical area ABCs.

Tier 4 - Sharpchin	Western GOA	Central GOA	Eastern GOA		Total
			West Yakutat	Southeast Outside	
Area Apportionment	0.4%	12.8%	13.3%	73.5%	100%
Area ABC (t)	2	58	61		
OFL (t)		121		335	456
					554

Tier 5 - 4 species	Western GOA	Central GOA	Eastern GOA		Total
			West Yakutat	Southeast Outside	
Area Apportionment	0.1%	15.7%	13.6%	70.6%	100%
Area ABC (t)	3	462	400		
OFL (t)		865		2,078	2,943
					3,924

Tier 6 – 14 species	Western GOA	Central GOA	Eastern GOA		Total
			West Yakutat	Southeast Outside	
Area ABC (t)	3	75	19		
OFL (t)		97		8	105
					140

Total Other Rockfish ABC apportioned by area

	Western GOA	Central GOA	Eastern GOA		Total
			West Yakutat	Southeast Outside	
Area ABC (t)	8	595	480		
OFL (t)		1,083		2,421	3,504
					4,618

Ecosystem Considerations

A full description of the ecosystem considerations for the GOA Other Rockfish stock complex are summarized in the 2023 GOA Other Rockfish assessment (Omori et al., 2023).

Data Gaps and Research Priorities

Data limitations are severe for Other Rockfish in the GOA, and it is difficult to determine whether current management is appropriate with the limited information available. Gaps include imprecise biomass estimates, limited and unvalidated ageing, and lack of life history information (including movement, distribution, and reproductive parameters). Regardless of future management decisions regarding the Other Rockfish complex management category, improving biological sampling of Other Rockfish in fisheries and surveys is essential. Areas of research that would utilize existing fishery or survey data include: body condition, horizontal and/or vertical changes in fishery capture depth, and alternative modelling approaches that would incorporate other data sources where appropriate for each species. Likewise, observed differences between fishery catches and

the bottom trawl survey catches for some Other Rockfish species requires further investigation (e.g., harlequin), particularly when the bottom trawl survey serves as the main input in the assessment.

Acknowledgments

We gratefully acknowledge the following individuals for their timely and efficient work in providing survey and catch data for Other Rockfish species: Ned Laman and the Groundfish Assessment Program (GAP) for the GOA trawl survey estimates and EGOA split fractions (AFSC); the Alaska Regional Office (NMFS) provided estimates of commercial catch; and Bob Ryznar, Rob Ames, Niels Leuthold, Jean Lee and Matt Callahan (Alaska Fisheries Information Network, Pacific States Marine Fisheries Commission) provided a user friendly portal to access Catch Accounting System data and multiple AFSC survey data sources.

Literature Cited

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Tables

Table 16.1. Species comprising the Other Rockfish management category in the Gulf of Alaska for 2025 and the associated Tier designation and natural mortality (*M*) group, if applicable. The demersal sub-group species have been removed from this assessment (2024) for the 2025 fisheries and are assessed in a separate Gulf-wide Demersal Shelf Rockfish stock complex assessment.

Common name	Scientific name	Tier	<i>M</i> group
aurora rockfish	<i>Sebastes aurora</i>	6	
blackgill rockfish	<i>S. melanostomus</i>	6	
bocaccio	<i>S. paucispinis</i>	6	
chilipepper	<i>S. goodie</i>	6	
darkblotched rockfish	<i>S. crameri</i>	6	
greenstriped rockfish	<i>S. elongates</i>	6	
harlequin rockfish	<i>S. variegatus</i>	5	0.092
northern rockfish ^a	<i>S. polyspinis</i>	NA	
pygmy rockfish	<i>S. wilsoni</i>	6	
redbanded rockfish	<i>S. babcocki</i>	5	0.06
redstripe rockfish	<i>S. proriger</i>	5	0.1
sharpchin rockfish	<i>S. zacentrus</i>	4	SC
shortbelly rockfish	<i>S. jordani</i>	6	
silvergray rockfish	<i>S. brevispinis</i>	5	0.05
splitnose rockfish	<i>S. diploproa</i>	6	
stripetail rockfish	<i>S. saxicola</i>	6	
vermilion rockfish	<i>S. miniatus</i>	6	
widow rockfish	<i>S. entomelas</i>	6	
yellowmouth rockfish	<i>S. reedi</i>	6	
yellowtail rockfish	<i>S. flavidus</i>	6	

^aOnly in the West Yakutat and Southeast management areas (i.e., Eastern GOA), otherwise in the northern rockfish assessment.

Table 16.2. Management history for the Other Rockfish stock complex.

Year	Management Measures
1988	The NPFMC implements the slope rockfish assemblage, which includes the species that will become “other slope rockfish”, together with Pacific Ocean Perch, Northern Rockfish, Shortraker Rockfish and Rougheye Rockfish. Previously, <i>Sebastes</i> in Alaska were managed as the “Pacific Ocean Perch complex” or “Other Rockfish”.
1988	Apportionment of ABC among management areas in the Gulf (Western, Central, and Eastern) for slope rockfish assemblage is determined based on average percent biomass in previous NMFS trawl surveys.
1991	Slope rockfish assemblage is split into three management subgroups with separate ABCs and TACs: Pacific Ocean Perch, Shortraker/Rougheye Rockfish, and “other slope rockfish”.
1993	Northern Rockfish is split as a separate management entity from “other slope rockfish”.
1997	Area apportionment procedure for “other slope rockfish” is changed. Apportionment is now based on 4:6:9 weighting of biomass in the most recent three NMFS trawl surveys.
1999	Trawling is prohibited in the Eastern Gulf east of 140° W long. Eastern Gulf trawl closure becomes permanent with the implementation of FMP Amendments 41 and 58 in 2000 and 2001, respectively.
1999	Northern Rockfish in the Eastern Gulf is reassigned to “other slope rockfish”.
1999	Eastern Gulf is divided into West Yakutat and East Yakutat/Southeast Outside, and separate ABCs and TACs are assigned for “other slope rockfish” in these areas.
2005	Assessed using Tier 5 methodologies.
2007	Amendment 68 creates the Central Gulf Rockfish Pilot Program, which affects trawl catches of rockfish in this area.
2012	Yellowtail and Widow Rockfish are assigned to the “other slope rockfish” group, and group name is changed to “Other Rockfish” and assessed using Tier 5 methodologies
2013	Demersal Shelf Rockfish species were added to the Other Rockfish stock complex, but only Western GOA, Central GOA, and West Yakutat management areas.
2014	Merge Western and Central GOA ABCs and TACs
2023	Tier reassignment (moving 12 Tier 5 species to Tier 6)
2024	Merge of West Yakutat (in the Eastern GOA) with Western/Central GOA ABCs and TACs
2025	Removal of the seven Demersal Shelf Rockfish species into a separate Gulf-wide stock complex.

Table 16.3. Time series of catch estimates (t) for the Other Rockfish stock complex with Gulf of Alaska (GOA) wide acceptable biological catch (ABC), total allowable catch (TAC), and overfishing limit (OFL). Catch values presented are estimated catch for the species that belong to the complex **at that time**. Species membership alterations and current complex name (Other Slope Rockfish [OSR] to Other Rockfish [OR]) are presented in the “Management” column. Data queried through AKFIN on October 8, 2024.

Year	Gulf of Alaska Catch				ABC	TAC	OFL	Management Group
	Western	Central	Eastern	Total				
1991	20	175	83	278	10,100	10,100		OSR- includes northern ABC/TAC
1992	76	854	745	1,675	14,060	14,060	20,710	OSR
1993	342	2,423	2,577	5,342	8,300	5,383	9,850	OSR- northern removed
1994	101	715	753	1,569	8,300	2,235	9,850	OSR
1995	31	883	431	1,345	7,110	2,235	8,395	OSR
1996	19	618	226	863	7,110	2,020	8,395	OSR
1997	68	941	186	1,195	5,260	2,170	7,560	OSR
1998	46	701	101	848	5,260	2,170	7,560	OSR
1999	39	614	135	788	5,270	5,270	7,560	OSR- EGOA northern included
2000	49	363	165	577	4,900	4,900	6,390	OSR
2001	25	318	216	559	4,900	1,010	6,390	OSR
2002	223	481	70	774	5,040	990	6,610	OSR
2003	133	677	249	1,059	5,050	990	6,610	OSR
2004	240	534	106	880	3,900	670	5,150	OSR
2005	64	516	118	698	3,900	670	5,150	OSR
2006	279	603	216	1,098	4,152	1,480	5,394	OSR
2007	249	339	106	695	4,154	1,482	5,394	OSR
2008	250	439	78	768	4,297	1,730	5,624	OSR
2009	403	399	96	899	4,297	1,730	5,624	OSR
2010	366	431	334	1,130	3,749	1,192	4,881	OSR
2011	302	391	343	1,037	3,752	1,195	4,881	OSR
2012	255	725	244	1,224	4,045	1,080	5,305	OR - includes widow & yellowtail
2013	203	477	361	1,041	4,045	1,080	5,305	OR - DSR species added in WG/CG/WY
2014	170	720	91	981	4,081	1,811	5,347	OR
2015	212	844	52	1,108	4,080	1,811	5,347	OR
2016	155	1,030	88	1,273	5,773	2,308	7,424	OR
2017	135	864	81	1,080	5,773	2,308	7,424	OR
2018	49	988	183	1,221	5,594	2,305	7,356	OR
2019	110	583	263	955	5,594	5,594	7,356	OR
2020	98	555	202	855	4,053	4,053	5,320	OR
2021	129	924	162	1,216	4,053	1,609	5,320	OR
2022	179	984	126	1,289	4,054	1,610	5,320	OR
2023	131	859	89	1,079	4,054	1,610	5,320	OR
2024	73	346	82	501	3,774	1,653	4,977	OR

Table 16.4. Time series of total Other Rockfish catch estimates (t) and associated allocated acceptable biological catch (ABC) based on the current species membership and management areas **at that time**. Data queried through AKFIN on October 8, 2024. Note that beginning in 2014, the ABCs for the Western and Central GOA were combined, and beginning in 2024, the ABC for West Yakutat was also combined.

Year	Gulf of Alaska Catch				Allocated ABC			
	Western	Central	West Yakutat	Southeast	Western	Central	West Yakutat	Southeast
2012	255	725	38	206	44	606	230	3,165
2013	203	477	81	280	44	606	230	3,165
2014		890	61	29		1,031	580	2,470
2015		1,056	36	15		1,031	580	2,469
2016		1,185	52	36		1,534	574	3,665
2017		998	45	36		1,534	574	3,665
2018		1,037	136	48		1,737	368	3,489
2019		693	183	79		1,737	368	3,489
2020		653	104	98		940	369	2,744
2021		1,054	125	37		940	369	2,744
2022		1,163	79	47		940	370	2,744
2023		990	58	31		940	370	2,744
2024			472	29			1,353	2,421

Table 16.5. Time series of estimated catches (t) of the species in the Other Rockfish stock complex. Catch estimates for the five most often caught species are shown with all remaining species combined in the “Minors” category Catch was from the Alaska Regional Office Catch Accounting System. Catches are only shown for species that will belong to the Other Rockfish complex in 2025. Data queried through AKFIN on October 8, 2024.

Year	Harlequin	Redbanded	Redstripe	Sharpchin	Silvergray	Minors	Total
2003	418	40	28	220	16	177	899
2004	495	37	33	119	22	136	842
2005	457	31	7	44	3	38	580
2006	518	32	34	78	4	70	736
2007	347	37	28	69	15	19	515
2008	377	46	25	80	8	65	601
2009	528	36	30	62	20	42	718
2010	466	59	62	105	30	28	750
2011	354	60	67	114	63	32	690
2012	614	41	55	89	34	27	860
2013	307	84	25	46	18	98	578
2014	481	77	72	93	28	47	798
2015	580	60	50	106	43	58	897
2016	598	94	110	161	58	58	1,079
2017	468	83	76	123	49	69	868
2018	555	85	160	163	34	48	1,045
2019	361	72	133	67	68	99	800
2020	226	42	84	66	31	292	741
2021	391	64	169	119	145	127	1,015
2022	342	60	231	53	92	225	1,003
2023	191	53	242	38	52	223	799
2024	97	44	45	21	16	91	314

Table 16.6. Survey swept area biomass estimates with coefficient of variation (CV) and random effects (*rema*) biomass estimates (t) with 95% confidence intervals for Tier 4 (sharpchin) and Tier 5 species in the Other Rockfish complex in the Gulf of Alaska.

Year	Tier 4: Sharpchin					Tier 5				
	Survey biomass (t)	Survey CV	Biomass (t)	95% Confidence Intervals		Survey biomass (t)	Survey CV	Biomass (t)	95% Confidence Intervals	
				Lower	Upper				Lower	Upper
1990	38,334	0.37	36,691	18,968	70,972	62,162	0.28	61,731	36,543	104,278
1991			31,011	10,253	93,796			61,443	15,367	245,673
1992			26,467	9,313	75,219			61,361	14,948	251,882
1993	23,679	0.32	22,867	14,247	36,705	61,556	0.29	61,464	35,904	105,222
1994			29,781	10,199	86,962			61,642	14,143	268,663
1995			40,512	12,984	126,399			62,297	13,991	277,386
1996	64,570	0.32	56,585	31,832	100,588	63,711	0.26	63,433	38,986	103,210
1997			41,110	12,358	136,753			62,846	14,471	272,943
1998			30,081	8,453	107,051			63,176	15,442	258,461
1999	20,841	0.66	22,228	8,443	58,521	66,685	0.22	64,688	43,423	96,367
2000			17,583	4,654	66,424			63,034	13,941	285,014
2001	1,797	0.69	13,910	3,413	56,686	8,969	0.47	63,260	10,254	390,252
2002			10,743	2,980	38,727			63,675	11,271	359,722
2003	7,094	0.46	8,364	3,943	17,740	66,926	0.57	65,259	25,688	165,787
2004			10,598	4,022	27,927			64,909	16,535	254,801
2005	21,135	0.32	15,592	9,250	26,281	101,517	0.29	73,157	45,293	118,164
2006			15,929	6,600	38,442			60,073	17,577	205,311
2007	19,037	0.34	16,931	9,672	29,636	52,553	0.21	51,899	35,291	76,324
2008			14,370	5,357	38,546			33,725	9,479	119,994
2009	12,493	0.35	12,563	6,879	22,945	20,571	0.22	22,201	14,636	33,677
2010			11,254	3,801	33,322			48,188	14,062	165,131
2011	8,041	0.63	10,088	4,187	24,303	127,570	0.3	104,791	61,458	178,678
2012			12,305	4,014	37,724			65,956	21,249	204,724
2013	14,920	0.5	15,011	6,917	32,575	42,463	0.3	44,490	26,940	73,472
2014			18,698	6,224	56,174			54,213	18,125	162,160
2015	45,016	0.55	23,524	9,947	55,629	68,647	0.29	67,848	41,291	111,486
2016			17,018	5,586	51,848			70,070	22,723	216,070
2017	11,622	0.51	12,566	5,720	27,605	85,076	0.29	73,358	44,746	120,266
2018			11,108	3,785	32,603			62,717	19,985	196,813
2019	11,336	0.41	9,934	4,979	19,818	55,392	0.18	55,351	39,555	77,457
2020			9,004	3,122	25,973			54,474	15,787	187,971
2021	8,417	0.38	8,360	4,403	15,873	54,199	0.22	54,892	36,685	82,136
2022			7,493	2,495	22,505			58,680	16,482	208,907
2023	7,808	0.51	7,008	2,962	16,583	64,883	0.25	63,291	40,069	99,972

Figures

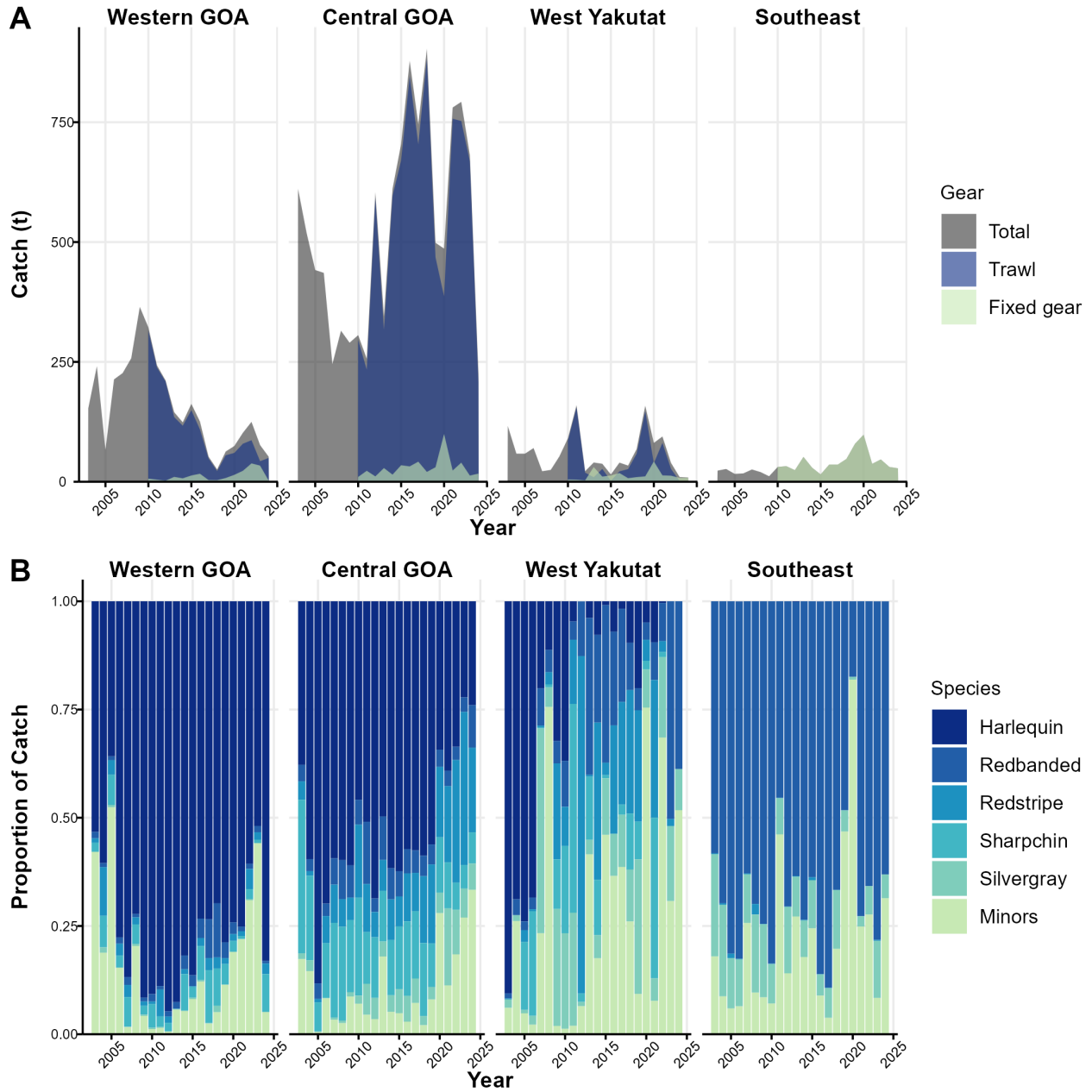
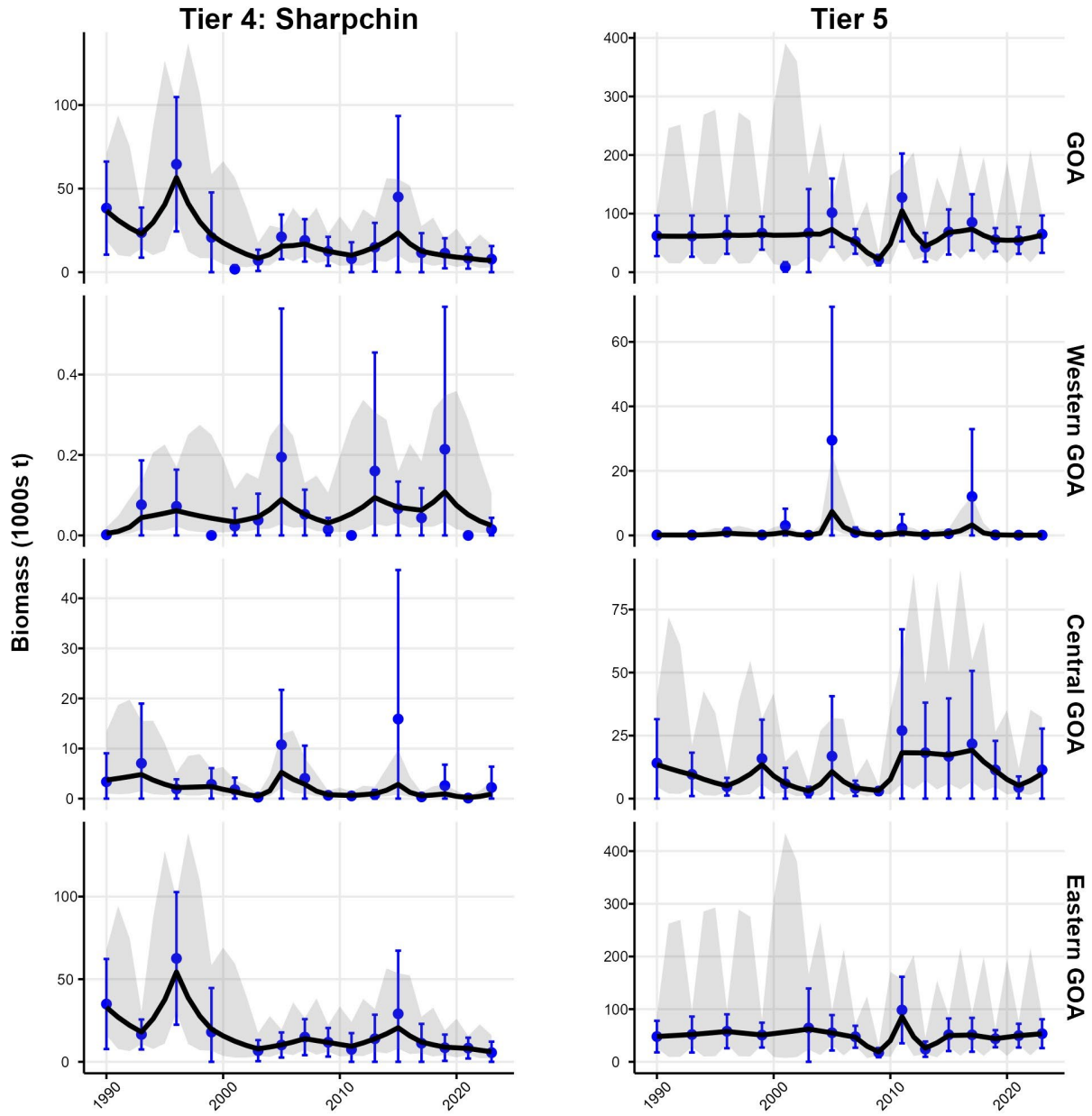


Figure 16.1. Estimated catch (t) of Other Rockfish in Gulf of Alaska (GOA) by area (Western GOA, Central GOA, West Yakutat, and Southeast Outside (Southeast) by (A) main gear types (trawl and fixed gear, which includes hook-and-line, jig, and pot gear) and (B) proportion of main species caught. Catches are only shown for species that will belong to the Other Rockfish complex in 2025. National Marine Fisheries Service Alaska Regional Office Catch Accounting System (queried through AKFIN on October 8, 2024).



Year

Figure 16.2. Estimated random effects biomass (black line with gray shaded confidence intervals) and NMFS bottom trawl survey biomass estimates (blue dots with confidence intervals) for Tier 4, sharpchin rockfish, (left panel) and the 4 grouped Tier 5 Other Rockfish species (right panel) by Gulf of Alaska-wide (GOA) and NMFS regulatory areas: Western GOA, Central GOA and Eastern GOA. Note: there was no updated survey data in this assessment and no updated model run.

Appendix 16A. Supplemental Catch Data

Table 16A-1. Research survey and non-commercial catch of Other Rockfish from 2010–present in the Gulf of Alaska (GOA), which are not counted against the total allowable catch. These catch data were provided by the Alaska Regional Office. Research catch from the AFSC Trawl survey from 1977–2009 can be found in Clausen and Echave 2011). Data queried from AKFIN October 25, 2024.

Year	Source	AFSC Trawl Surveys (t)	AFSC LL Survey (#s)	AFSC LL Survey (t)	IPHC LL Survey (t)	ADF&G (t) (includes sport and research)
2010	AKRO	tr	1,453	2.6	7.3	4.7
2011		7.7	1,212	2.2	4.8	3.9
2012			1,320	2.4	5.1	4.9
2013		3.8	1,191	2.2	4.7	50.8
2014			1,636	3.1	6.9	55.7
2015		12.0	1412	2.7	6.7	51.3
2016			1343	2.5	5.5	58.3
2017		5.2	1,598	2.9	4.2	60.8
2018			1,615	3.0	5.9	56.4
2019		4.3	1,059	2.0	8.4	75.1
2020			1,158	2.2	7.4	44.3
2021		3.7	1,335	2.5	10.0	46.1
2022			1,632	3.1	4.1	51.6
2023		3.9	1,556	3.0	10.6	