

Gulf of Alaska Other Rockfish stock complex

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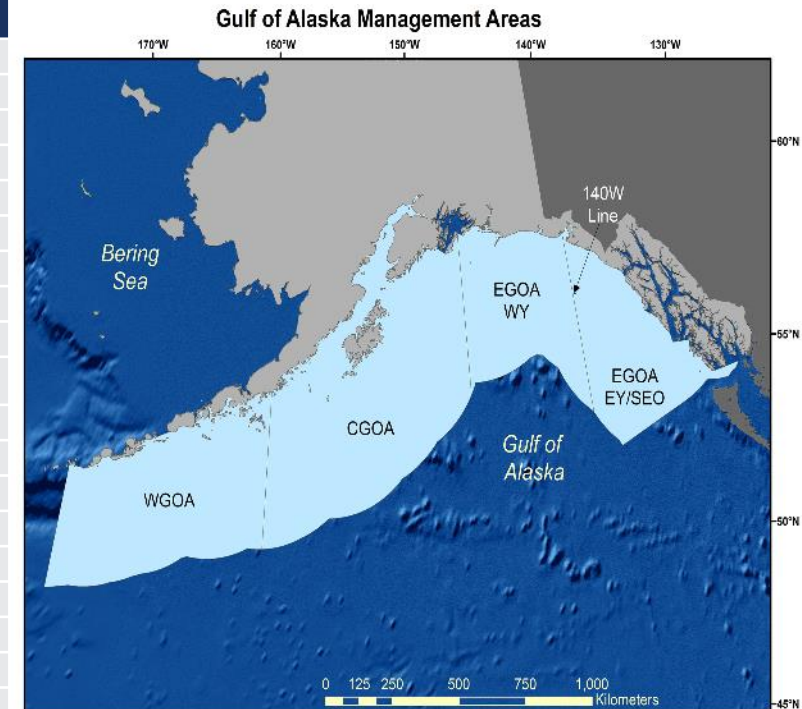
November 2023
Presentation to the Plan Team



Stock Overview

- 27 non-target rockfish (*Sebastes spp.*)
- Managed in 3 Tiers
 - Tier 4, 5, & 6
- 2 main groups slope & demersal shelf
 - by spatial distribution, fishery & survey
 - Slope (20 spp.): all GOA
 - Demersal shelf (DSR: 7 spp.): WGOA, CGOA, West Yakutat
 - Northern rockfish: EGOA

	Common name	Former Tier (2021)	Current Tier (2023)
Other Slope	sharpchin rockfish	4	4
	harlequin rockfish	5	5
	redbanded rockfish	5	5
	redstripe rockfish	5	5
	silvergray rockfish	5	5
	aurora rockfish	6	6
	blackgill rockfish	5	6
	bocaccio	5	6
	Chilipepper	5	6
	darkblotched rockfish	5	6
	greenstriped rockfish	5	6
	pygmy rockfish	5	6
	shortbelly rockfish	6	6
	splitnose rockfish	5	6
	stripetail rockfish	5	6
	vermilion rockfish	5	6
	widow rockfish	5	6
	yellowmouth rockfish	5	6
	yellowtail rockfish	5	6
	northern rockfish ^a	n/a	n/a
DSR	canary rockfish ^a	6	6
	China rockfish ^a	6	6
	copper rockfish ^a	6	6
	quillback rockfish ^a	6	6
	rosethorn rockfish ^a	6	6
	tiger rockfish ^a	6	6
	yelloweye rockfish ^a	6	6

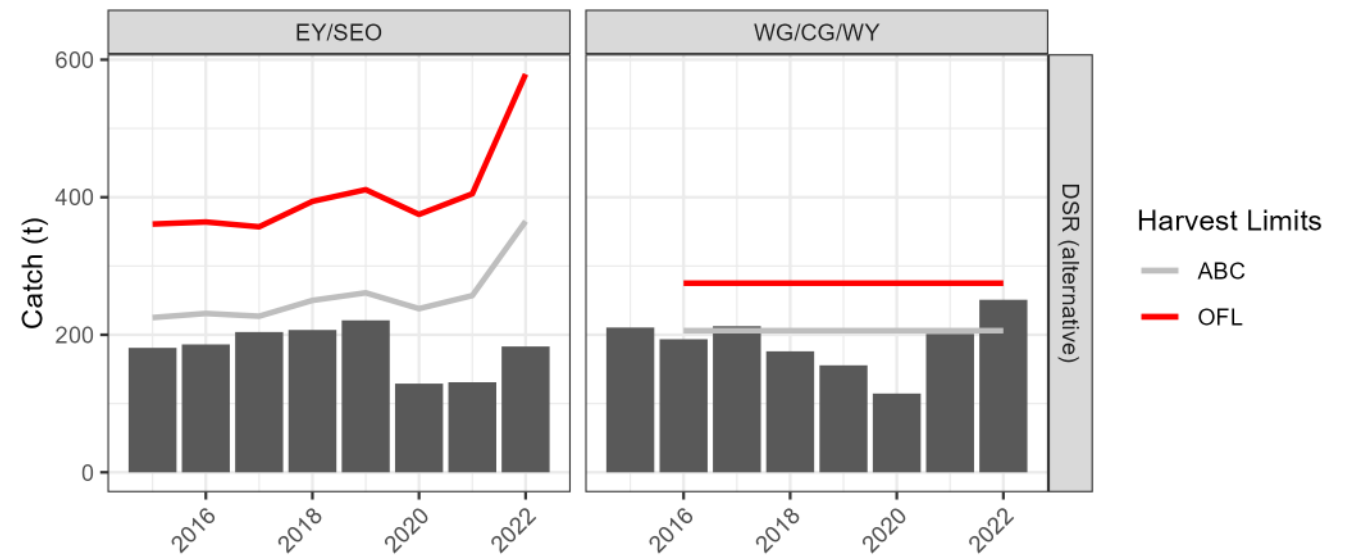


PT/ SSC Comments- Specific to Assessment

- *“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)*



- Next year by Council motion: DSR species (all Tier 6) in the Other Rockfish assessment will be moved into GOA-wide DSR stock complex.



PT/ SSC Comments- Specific to Assessment

SSC recommends that the authors (December 2021)

1. *Revisit the tier level assignments for the species included in the other rockfish complex. (Are they appropriate given survey catchability/availability issues?)*
 - September: reliable trawl survey biomass exploration → Based on metrics (CV, proportion of positive hauls, REMA, general spatial distribution), 12 species recommended to move from Tier 5 to Tier 6 due to unreliable survey biomass
 - Supported by PT (Sept. 2023) & SSC (Oct. 2023)
2. *For Tier 5 stocks, evaluated the random effects weighted mortality methodology and consider alternatives such as the long-term average.*
 - September: Evaluated alternative weighted- M (i.e., 3-survey average weighted M)
 - Supported by PT (Sept. 2023) & SSC (Oct. 2023)
3. *Re-examine the need for area-specific apportionments of ABC*
 - Addressed later in presentation



Stock Overview- Changes

Data Input Changes

- updated catch & NMFS GAP bottom trawl survey (using 1990-2023)

Methodology Changes Approved in September

- Tier 4 Model 15.2 change to REMA model framework
- Tier 5 Model 23.1 includes:
 - Change to REMA model framework.
 - Alternative average 3-survey weighted M as a proxy for F_{OFL} .
 - Four Tier 5 species (reduced from 17 species) due to unreliable survey biomass.
- Tier 6 Model 23.1 includes:
 - Extension of maximum catch time series to 2013-2022.
 - Twenty-one Tier 6 species (addition of 12 species) due to unreliable survey biomass.



Stock Overview- Current Status

Area		2023 ABC	2023 TAC	2023 OFL	2023 Catch*
Western/ Central		940	940		873
Eastern	West Yakutat	370	370		46
	East Yakutat/ Southeast	2,744	300		22
Total		4,054**	1,610	5,320	941

**Includes added Northern ABC for EGOA

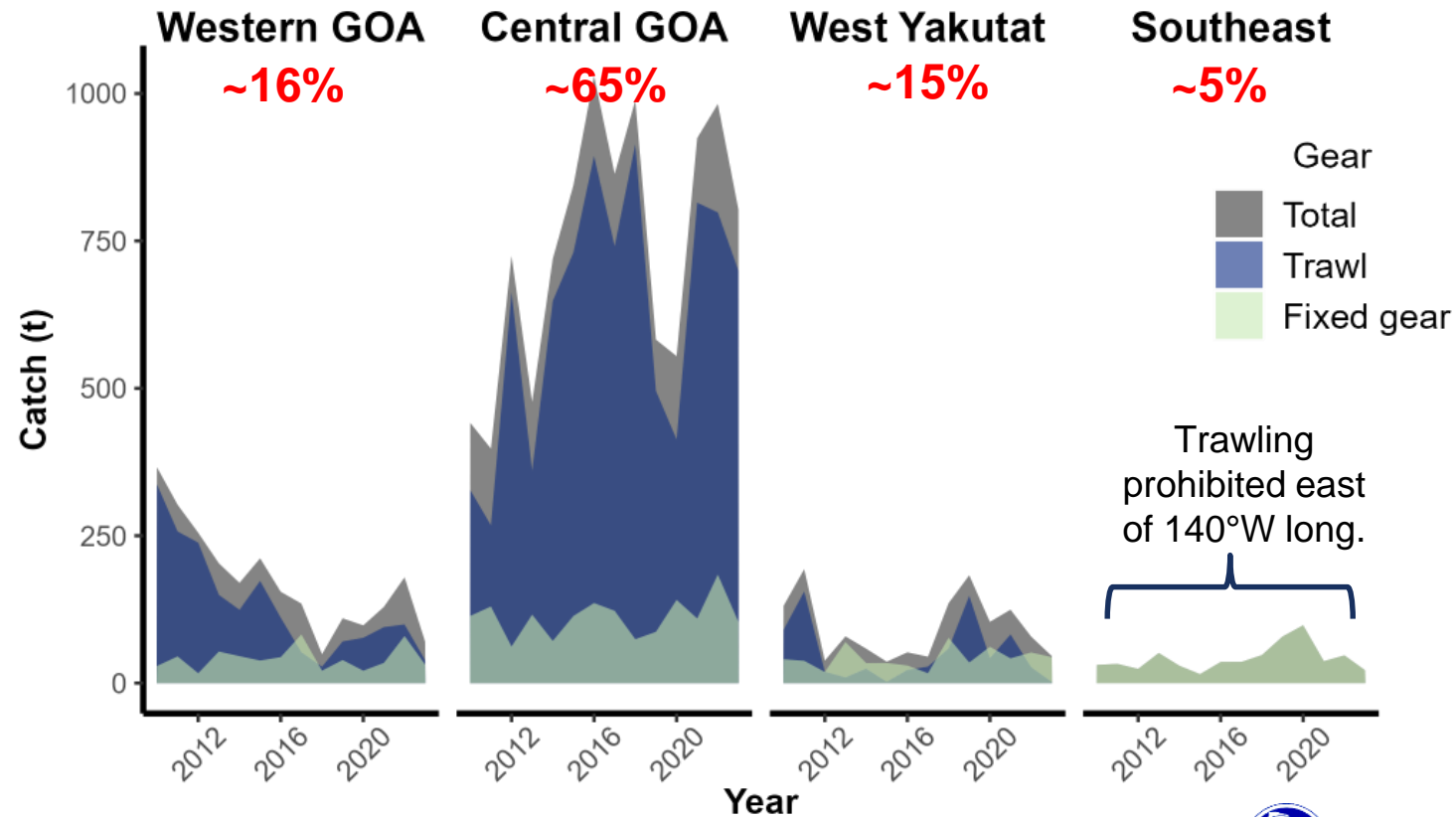
*Catch as of Oct. 10, 2023

- Total GOA catch is ~ 25% of OFL (~60% of TAC)
- Catch is nearing TAC/ ABC in Western/Central GOA
- 2023 catch is down ~ 25% from 2022 (1,287 t)



Catch

- Incidentally-caught
- ~77% trawl fisheries
- Highest in Central GOA by the rockfish trawl fishery
- Discards:
 - Since 2016: ranged from 28-48%
 - 2020: hook-and-line catcher vessels = full retention



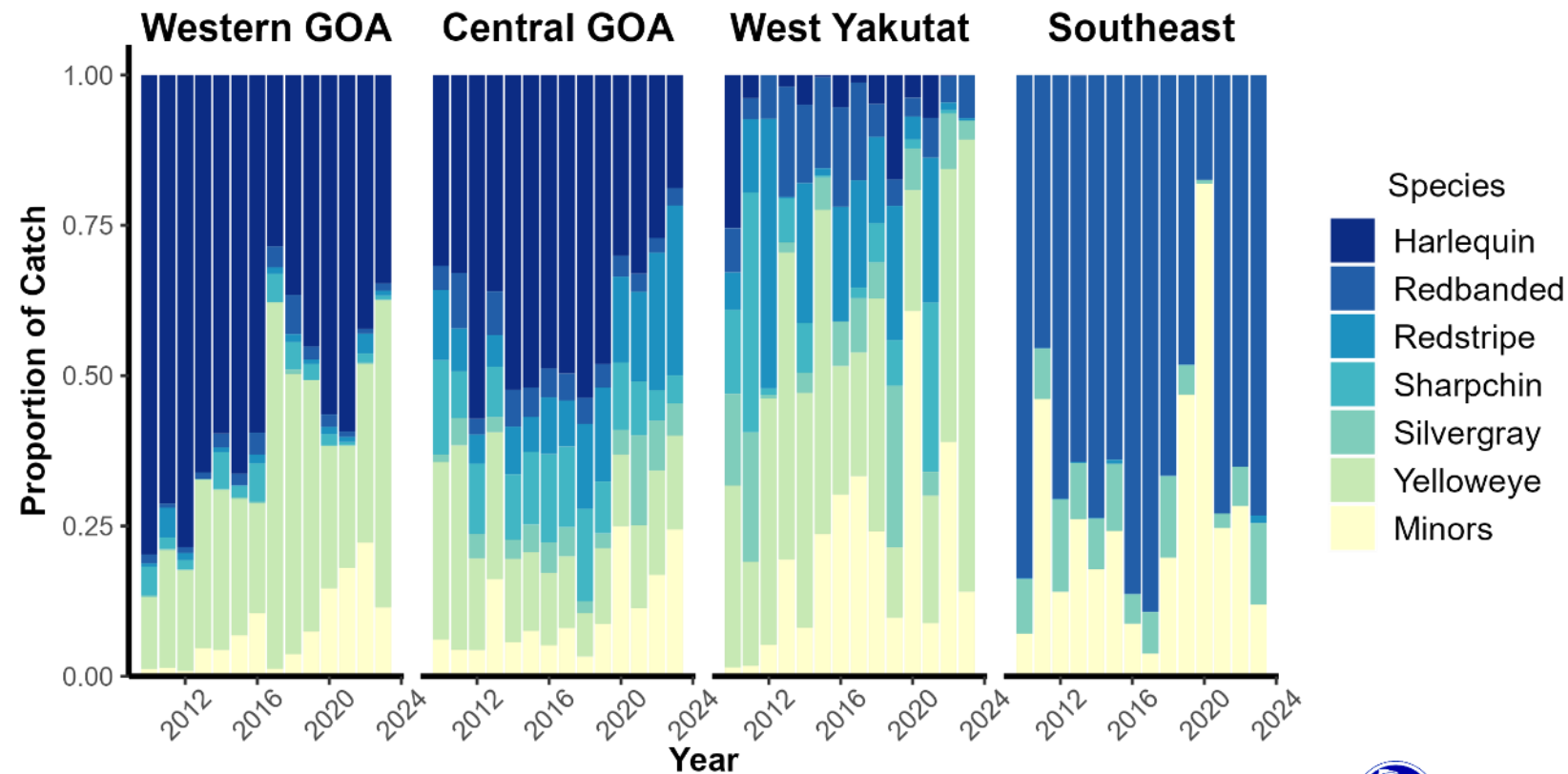
Catch

- 95% of total GOA Other Rockfish catch = 6 species

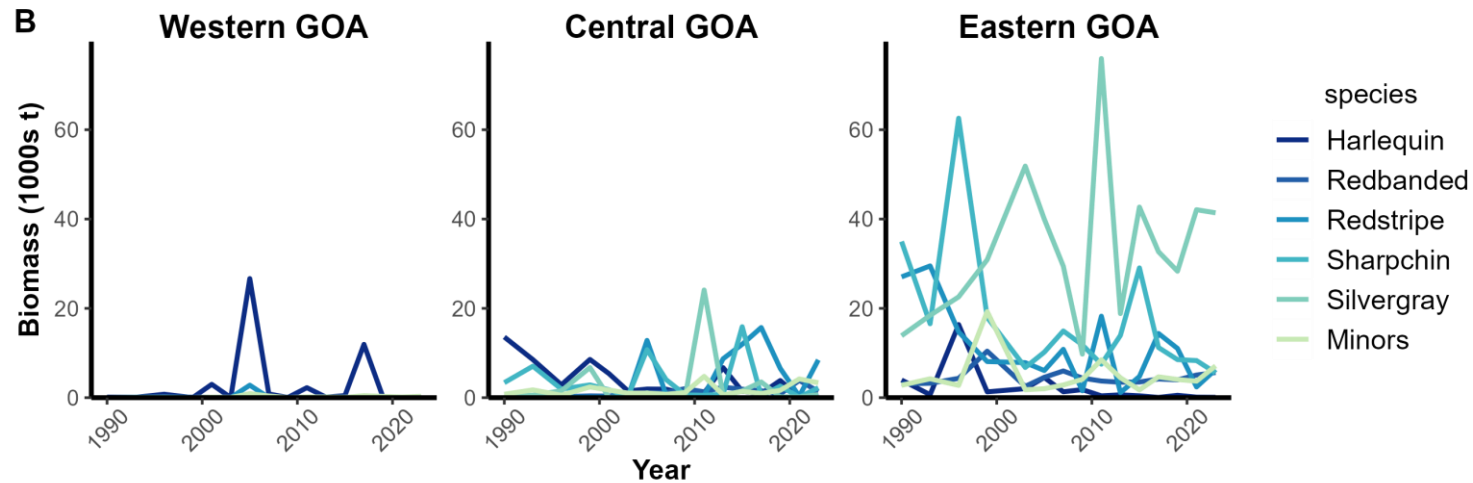
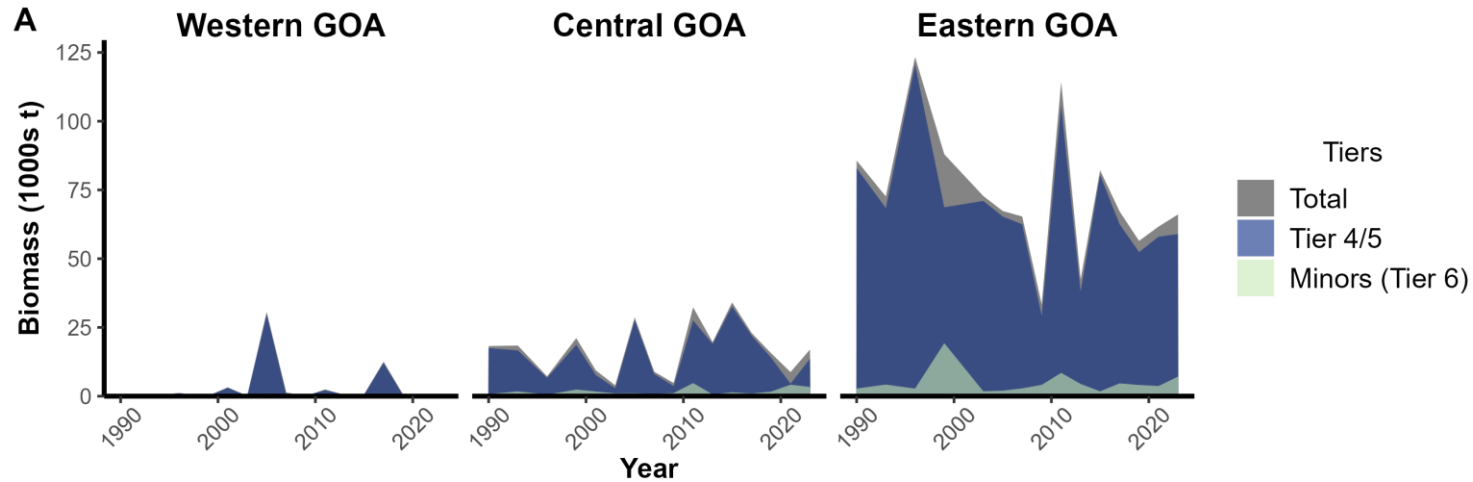
- Harlequin (45%)
- Yelloweye (17%; DSR)
- Sharpchin (10%)
- Redstripe (8%)
- Redbanded (6%)
- Silvergray (4%)

- Variable annual catch → patchy distributions

- Unidentified rockfish grouped with 'minors' & monitored



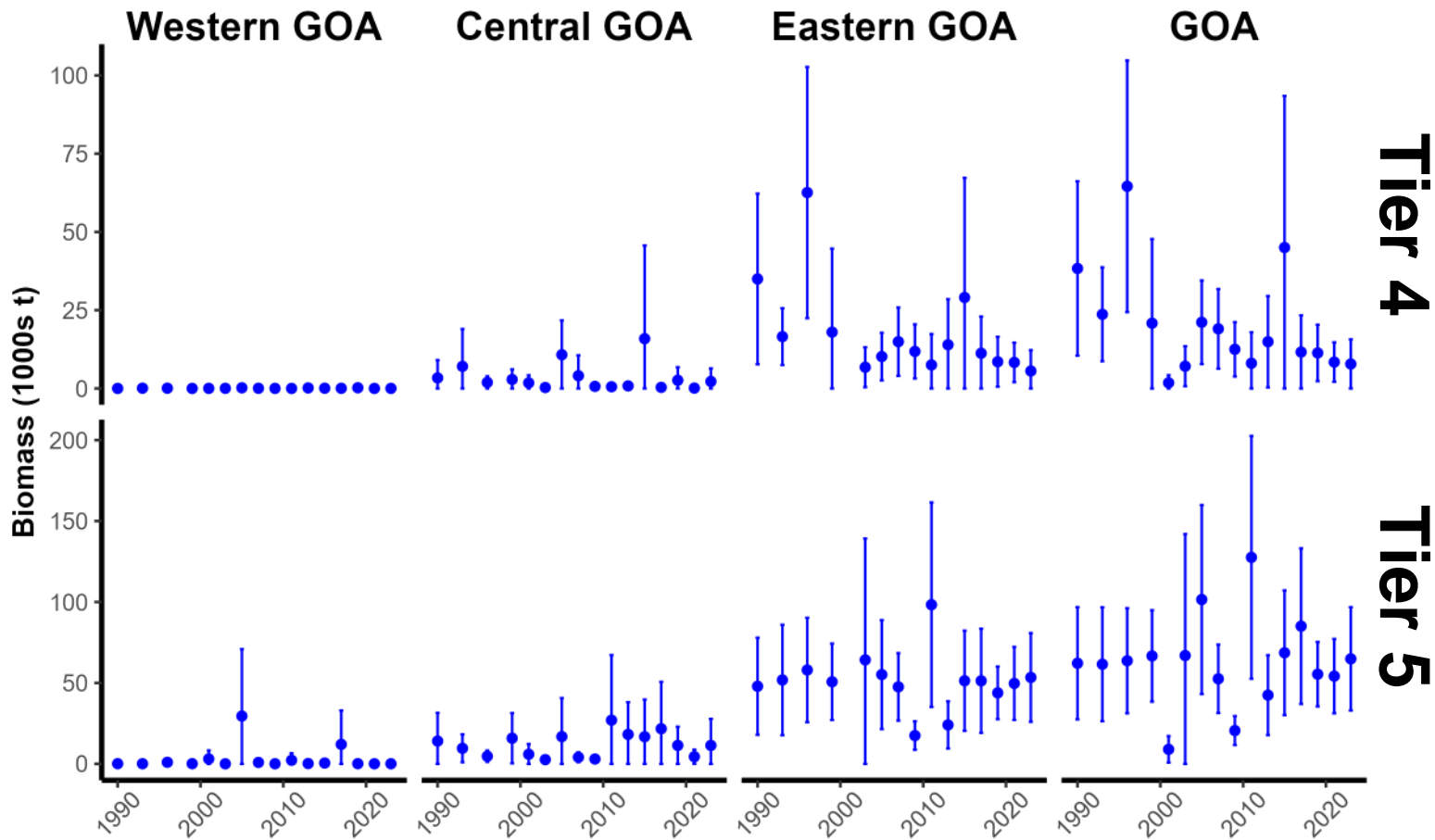
Trawl Survey Biomass



- Highest catch in Eastern GOA
- Typically ~95% of survey biomass = Tier 4 & 5 species



Trawl Survey Biomass



- Tier 4 + 5: 18% ↑ in 2023 survey biomass from 2021
- Highly variable catches (high CVs/ CIs)



Models- Overview

Tiers (total 27 species)	Data Input	Assessment method	OFL calculations
Tier 4:	GOA bottom trawl survey	Random effects	Biomass x $F_{35\%}$
Tier 5:	GOA bottom trawl survey	Random effects	Biomass x $Wt M$
Tier 6:	Fishery catch	Catch history	Maximum catch



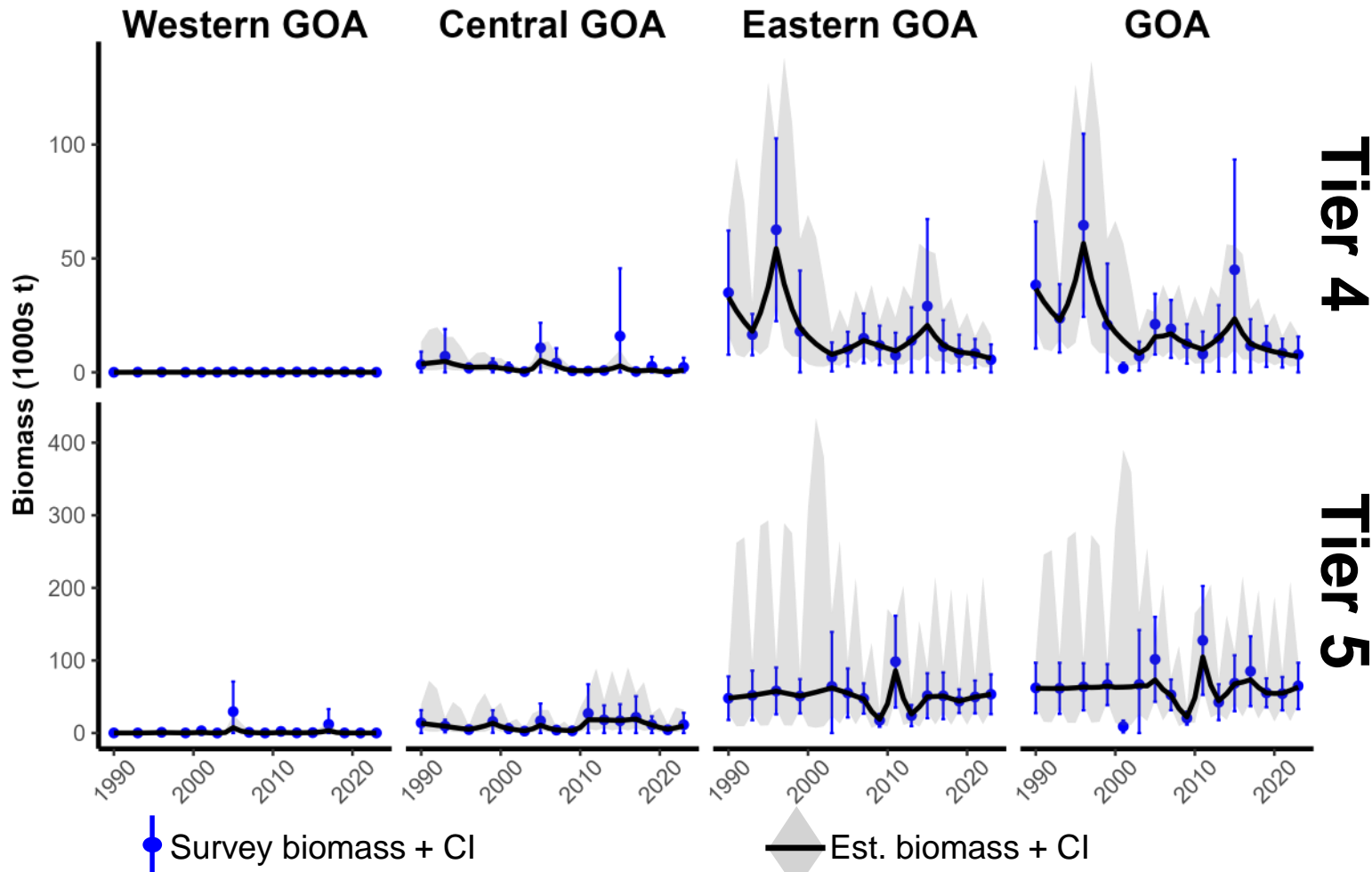
Models- Changes

Methodology Changes Approved in September

Tiers (total 27 species)	Data Input	Assessment method	OFL calculations
Tier 4: 1 species	GOA bottom trawl survey	REMA	Biomass x $F_{35\%}$
Tier 5: 5 species	GOA bottom trawl survey	REMA	Biomass x $\overline{Wt M_3}$ surveys
Tier 6: 9+12 = 21 species	Fishery catch	Catch history	Maximum catch (2013-2022)



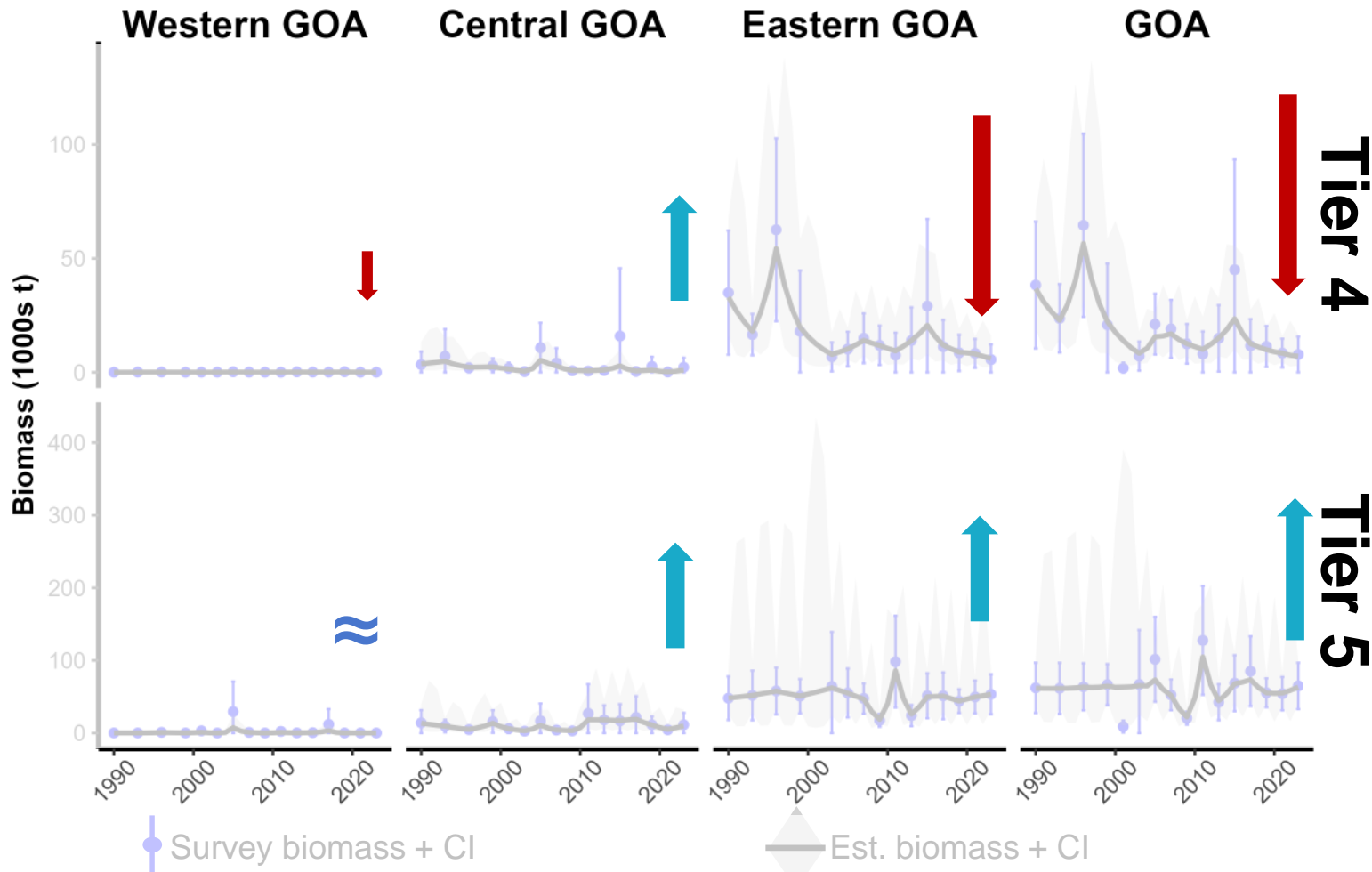
Models- Biomass Estimates: Tier 4 & 5



- REMA model
- 2023 B_{Tier4} (sharpchin): -7% ↓
- 2023 B_{Tier5} (4 species): ↑
 - harlequin & redstripe ↑
 - redbanded ↓
 - silvergray ≈



Models- Biomass Estimates: Tier 4 & 5



- REMA model
- 2023 B_{Tier4} (sharpchin): -7% ↓
- 2023 B_{Tier5} (4 species): ↑
 - harlequin & redstripe ↑
 - redbanded ↓
 - silvergray ≈



Harvest Recommendations: Tier 4 (sharpchin)

Model	Tier	Biomass Est. (2023)	F_{OFL}	OFL	F_{ABC}	ABC
15.2	Tier 4	7,008 t	$F_{35\%} = 0.079$	554	$F_{40\%} = 0.065$	456



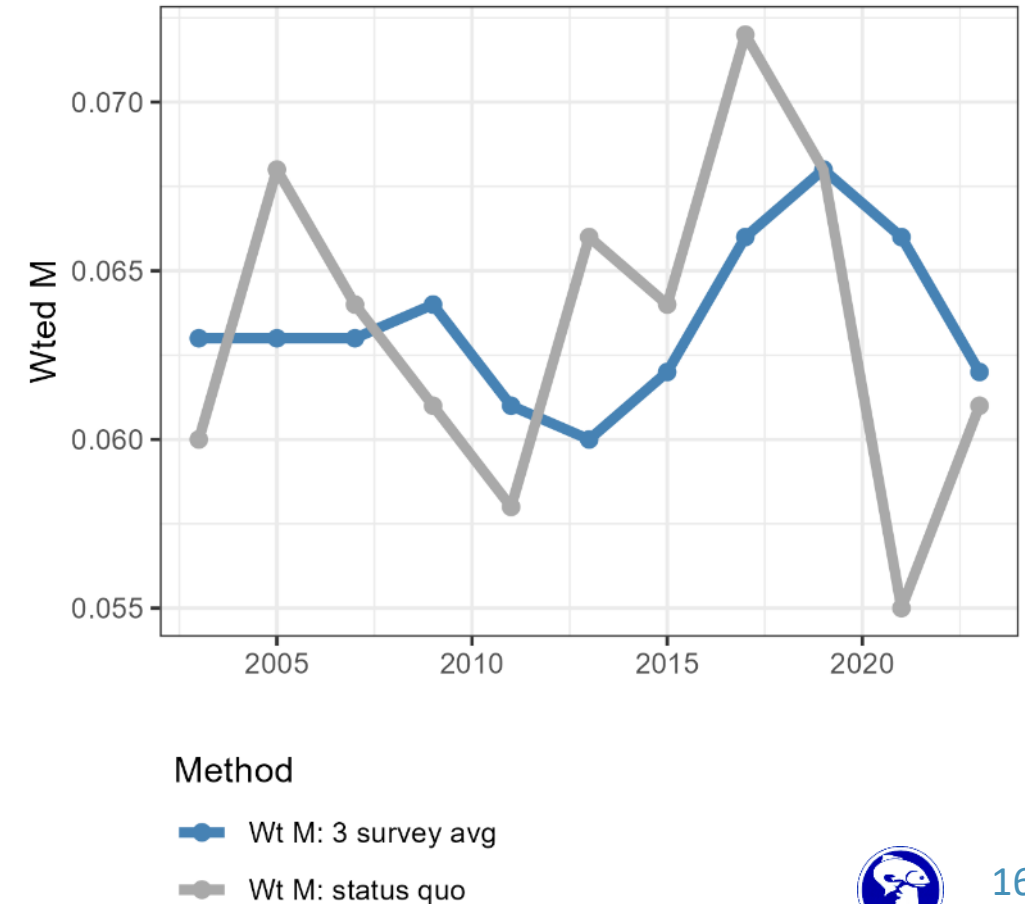
Models- Results: Tier 5

Status Quo (2021)

- 17 species
 - $M = 0.05$
 - $M = 0.06$
 - $M = 0.07$
 - $M = 0.092$
 - $M = 0.1$
- $F_{\text{OFL}} = Wt M$
(single survey)

Alternative (2023)

- 4 species
 - Silvergray ($M = 0.05$)
 - Redbanded ($M = 0.06$)
 - Harlequin ($M = 0.092$)
 - Redstripe ($M = 0.1$)
- $F_{\text{OFL}} = \overline{Wt_M}$
(3-survey average)



Harvest Recommendations: Tier 5

Model	Tier (# spp.)	Biomass Est. (2023)	F_{OFL}	OFL	F_{ABC}	ABC
15.2	Tier 5 (17 spp.)	70,759 t	$Wt M = 0.061$	4,316	$0.75 * F_{OFL}$	3,237
23.1	Tier 5 (4 spp.)	63,291 t	$\overline{Wt_M} = 0.062$	3,924	$0.75 * F_{OFL}$	2,943

Author recommended:

- New species tier assignments (based on (un)reliable survey biomass)
- Alternative weighted M ($\overline{Wt_M}$) using average weighted- M from previous 3-surveys



Harvest Recommendations: Tier 6

Status Quo (2021)

- 9 species
 - 7 DSR
 - 2 Slope
- Maximum catch: 2013 - 2016

Alternative (2023)

- 21 species
 - 7 DSR
 - 14 Slope
- Maximum catch: 2013 - 2022

Model	Harvest Specs	WGOA	CGOA	WY	EY/ SE
17.1- Status Quo (2013 - 2016) 9 species	ABC	161		32	0
	OFL	257			
23.1- Alternative (2013 - 2022) 21 species	ABC	295		71	8
	OFL	499			



Harvest Recommendations

Authors recommendation

Tier (# species)	Biomass (2023)	F_{OFL}	OFL	F_{ABC}	ABC
Tier 4 (1 species)	7,008 t	$F_{35\%} = 0.079$	554	$F_{40\%} = 0.065$	456
Tier 5 (4 species)	63,291 t	$\overline{Wt_M} = 0.062$	3,924	$0.75 * F_{OFL}$	2,943
Tier 6 (21 species)			499		374
All Tiers			4,977		3,773



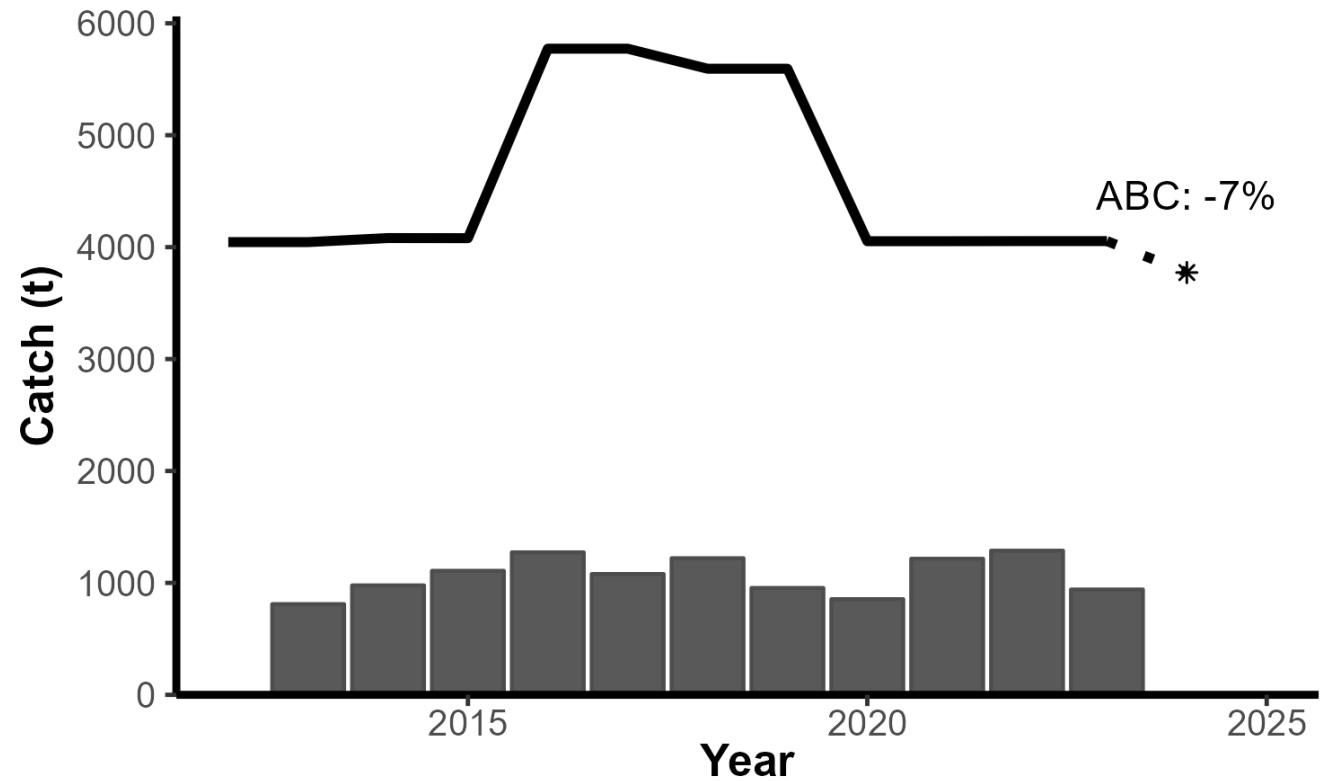
Harvest Recommendations



2023 to 2024
GOA Harvest Specs:

ABC = - 7%

OFL = - 6%



Area Allocation

Recommendation (2024 - 2025)

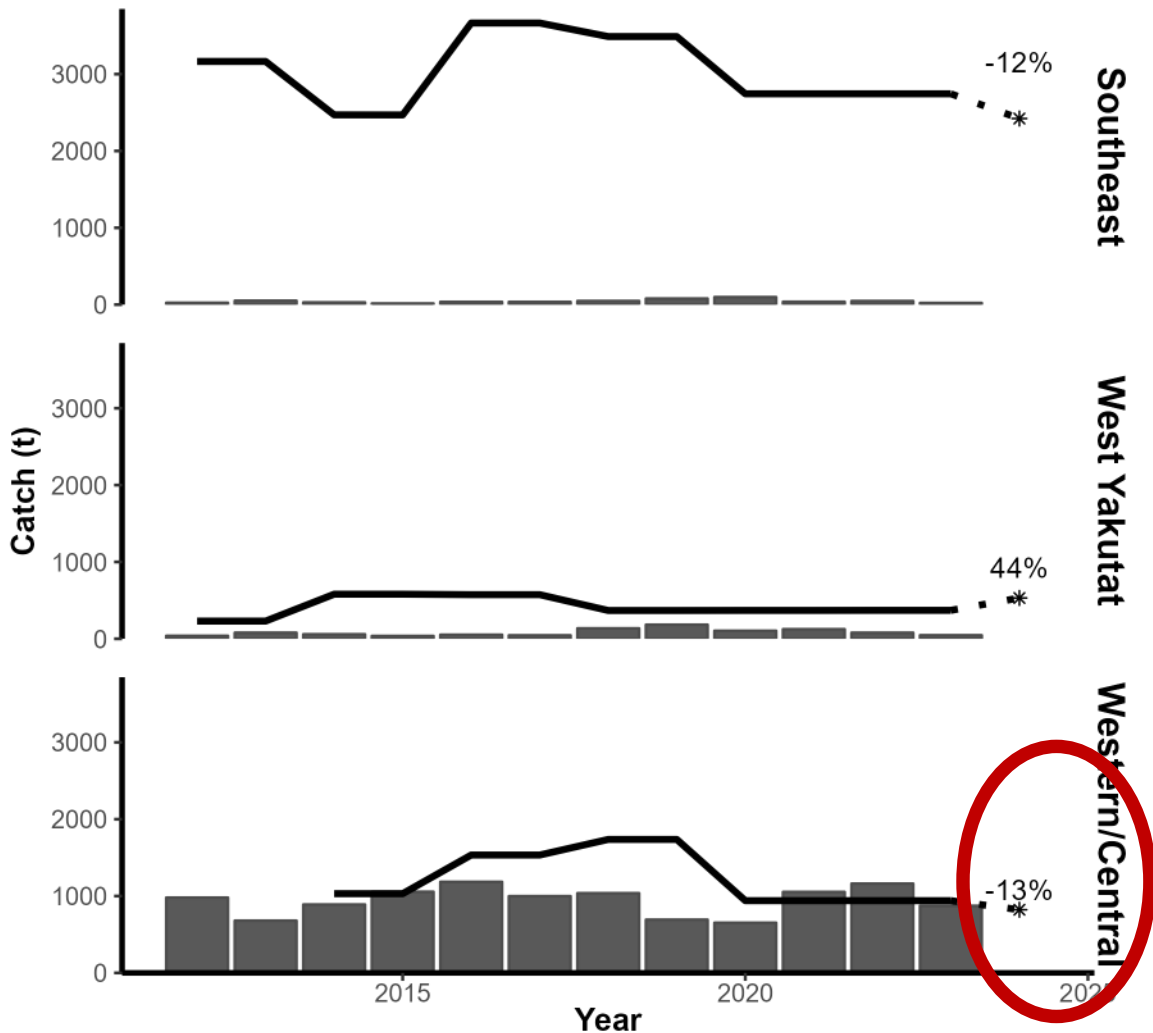
Complex	Western/ Central GOA	Eastern GOA		Total
		West Yakutat	E Yak./ Southeast	
Area ABC (t)	820	532	2,421	3,773
OFL (t)				4,977

Allocation from 2023 (based on 2019 assessment)

Complex	Western/ Central GOA	Eastern GOA		Total
		West Yakutat	E Yak./ Southeast	
Area ABC (t)	940	370	2,744	4,054
OFL (t)				5,320



Area Allocation



“Re-examine the need for area-specific apportionments of ABC” - (SSC, Dec. 2021)

Issues:

- Agree that regional ABC overages may continue to occur as is.
- Mismatch between survey catch (“trawlable habitat”) & fishery catch (“trawlable” & “untrawlable habitat”) → underestimated by trawl survey
 - e.g., harlequin
- Patchy distributions → variable survey catches → subarea ABC fluctuations



Area Allocation- Comments

- Less concern of overfishing these species:
 1. Non-target species
 2. Poorly sampled (2 pilot studies on untrawlable habitat, but no results [yet])
 3. Prelim genetic analyses on rockfish (general) → no to little genetic structure
 4. Majority of biomass in Southeast, but no trawling east of 140°W long.
 5. No major changes in fishing behavior, but good species-specific catch data
- Area apportionment examples:
 1. Combined WGOA & CGOA subarea ABCs approved in 2014 (Other Rockfish stock structure evaluation in completed in 2015)
 2. DSR GOA-wide complex → ABC/ OFL for WGOA+CGOA+WestYak



Thus, no apparent conservation concerns for Other Rockfish.



Risk Table

Assessment-related considerations	Population dynamics considerations	Environmental/ecosystem considerations	Fishery performance considerations	Overall score (highest of the individual scores)
<p>Level 1:</p> <ul style="list-style-type: none"> • Typical to moderate increased uncertainty/ minor unresolved issues • Mismatch between fishery & survey catch (i.e., trawlable vs. untrawlable habitat) • High CVs & CIs • Limited life history data 	<p>Level 1:</p> <ul style="list-style-type: none"> • Stock trends are typical for the stock • No data on recruitment or larval dispersal • Patchy distributions 	<p>Level 1:</p> <ul style="list-style-type: none"> • Sparse species-specific data • ~Typical conditions • No apparent environmental/ecosystem concerns 	<p>Level 1:</p> <ul style="list-style-type: none"> • No apparent fishery concerns • Incidental catch only • No notable changes in fishery to cause concern 	<p>Level 1:</p> <ul style="list-style-type: none"> • No elevated concern <p>NO reduction in maxABC recommended</p>



Other Rockfish- Conclusions

ABC and OFL recommendations for the full Other Rockfish complex for 2024–2025.

Quantity	As estimated or <i>specified last year for:</i>		As estimated or <i>recommended this year for:</i>	
	2023	2024	2024	2025
All Other Rockfish Combined				
Tier	4/5/6	4/5/6	4/5/6	4/5/6
OFL (t)	5,320	5,320	4,977	4,977
<u>maxABC</u> (t)	4,053	4,053	3,773	3,773
ABC (t)	4,053	4,053	3,773	3,773
Status	As determined <i>last year for:</i>		As determined <i>this year for:</i>	
	2021	2022	2022	2023
Overfishing		n/a		n/a

*Specs from 2019
assessment



Questions?



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