

GOA Shortraker Rockfish

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November, 2023, Presentation to the GOA Groundfish PT



GOA Shortraker Rockfish



- ❑ **Tier 5 species – 2 index multi area random effects model (REMA)**
- ❑ ***Changes in the input data***
 - Catch updated through 2 October 2023
 - Length compositions updated: longline and trawl fisheries, GOA bottom trawl and longline surveys
 - Longline survey RPWs (2022/2023) and trawl survey biomass values (2023) were updated for use in the REMA model
 - Biomass estimates from the 1984 and 1987 GOA trawl surveys were removed from input to the REMA model
- ❑ ***Changes in assessment methodology***
 - A coding error in the REMA model was corrected (Model 19*) (Sullivan *et al.* 2022)
 - Recommend new model (Model 23.3) which has equal weights of 1.0 for each survey and estimates an additional observation error term for the AFSC longline survey (Siwicke *et al.* 2023)
- ❑ ***Changes in apportionment methodology***
 - Recommend an alternative method for apportionment that is based on the mean proportions of predicted biomass and predicted RPW by area from Model 23.3 (Siwicke *et al.* 2023)
 - Suggest area apportionment alternatives be investigated for future management considerations



Current status - Catch



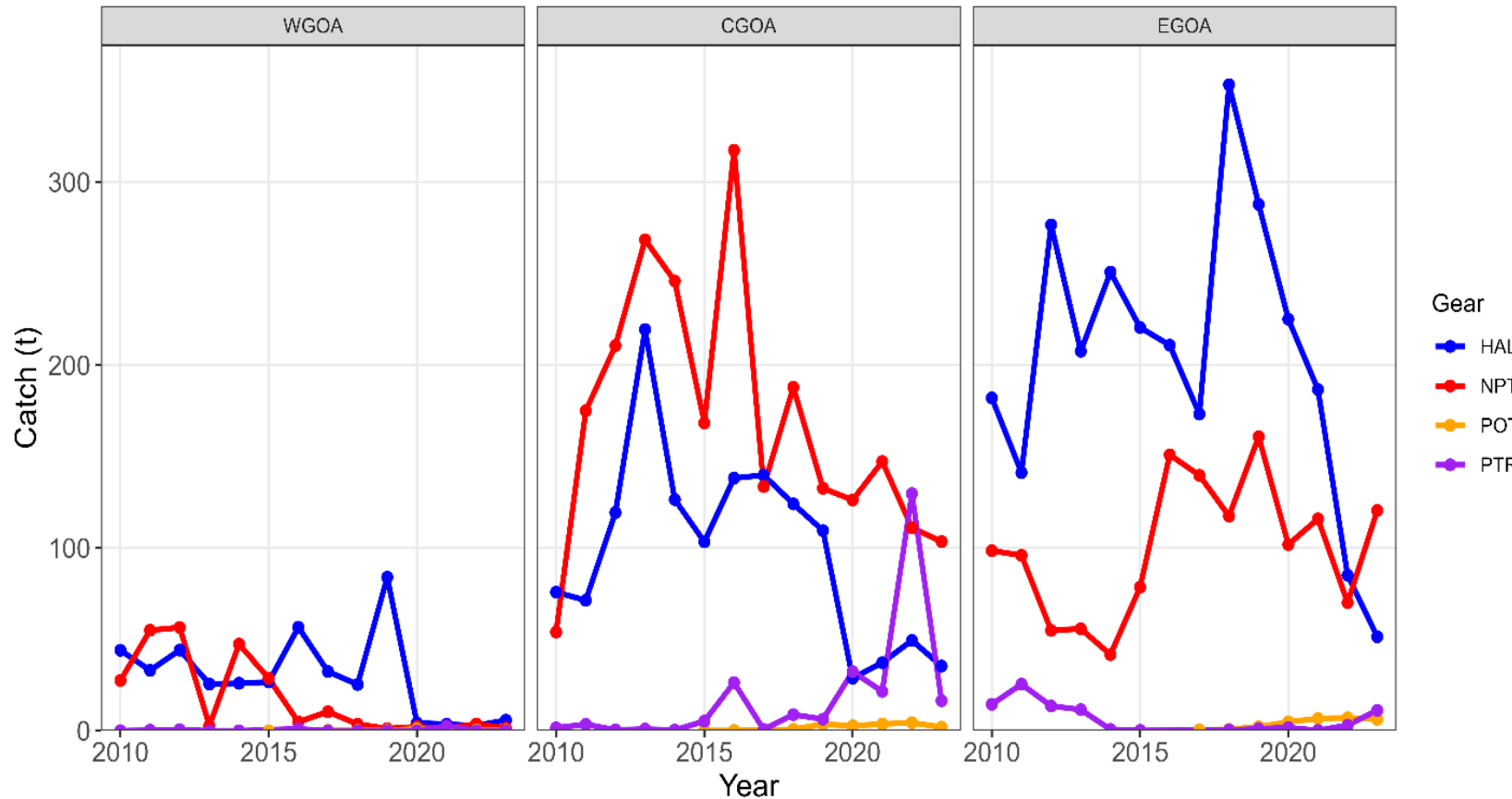
Area	2023 ABC	2023 TAC	2023 OFL	2023 Catch
Western	51	51		7
Central	280	280		157
Eastern	374	374		189
TOTAL	705	705	940	354*

*Catch as of Oct 3, 2023

- 2023 catch is down ~24% from 2022
- This is ~50% of gulfwide ABC



SR CATCH – by Target Fishery & Area



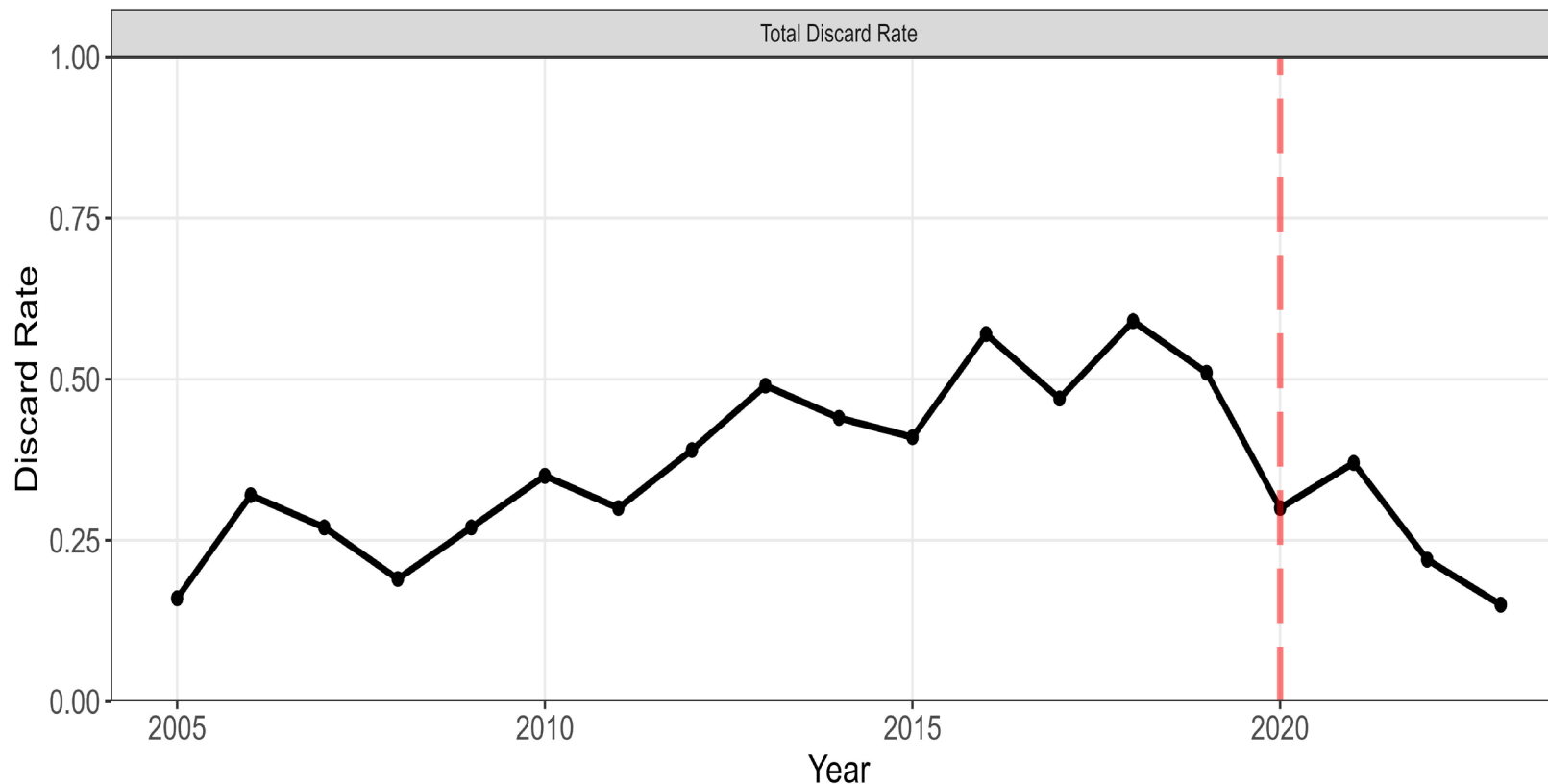
- Overall catch continues to decrease with increasing use of pot gear in the sablefish fishery
- Majority of catch now occurs in trawl gear (primarily in rockfish fisheries)



SR CATCH – Discards



“Discard rates for fixed gear under full retention mandates remain high, particularly in sablefish fleet, and an overall review is pending to determine how well this new regulation has been implemented and communicated with industry. (SSC, December 2021)



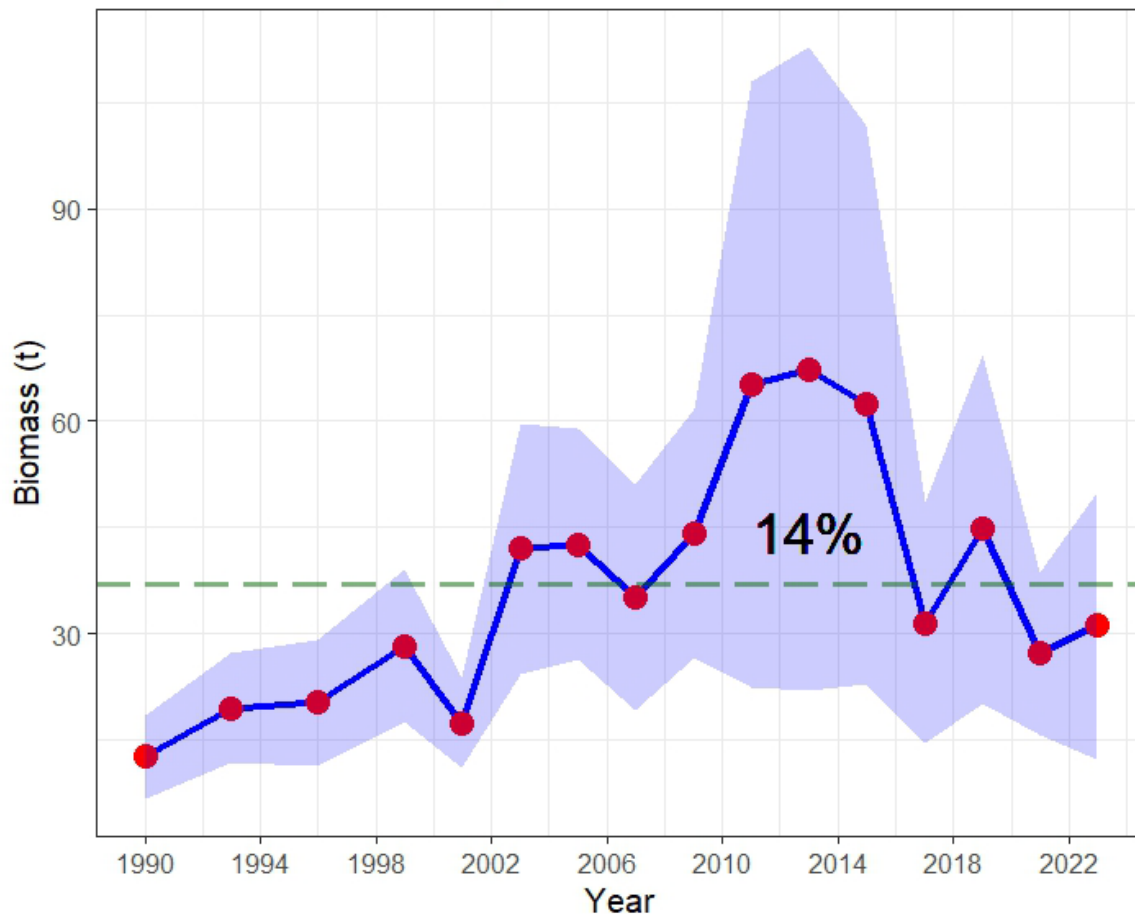
- Discarding continues to decrease
- Historically, discarding of SR has been highest in the sablefish and halibut fisheries



SURVEY DATA – Trawl Survey Biomass



GOA Shortraker survey biomass w/ 95% CIs



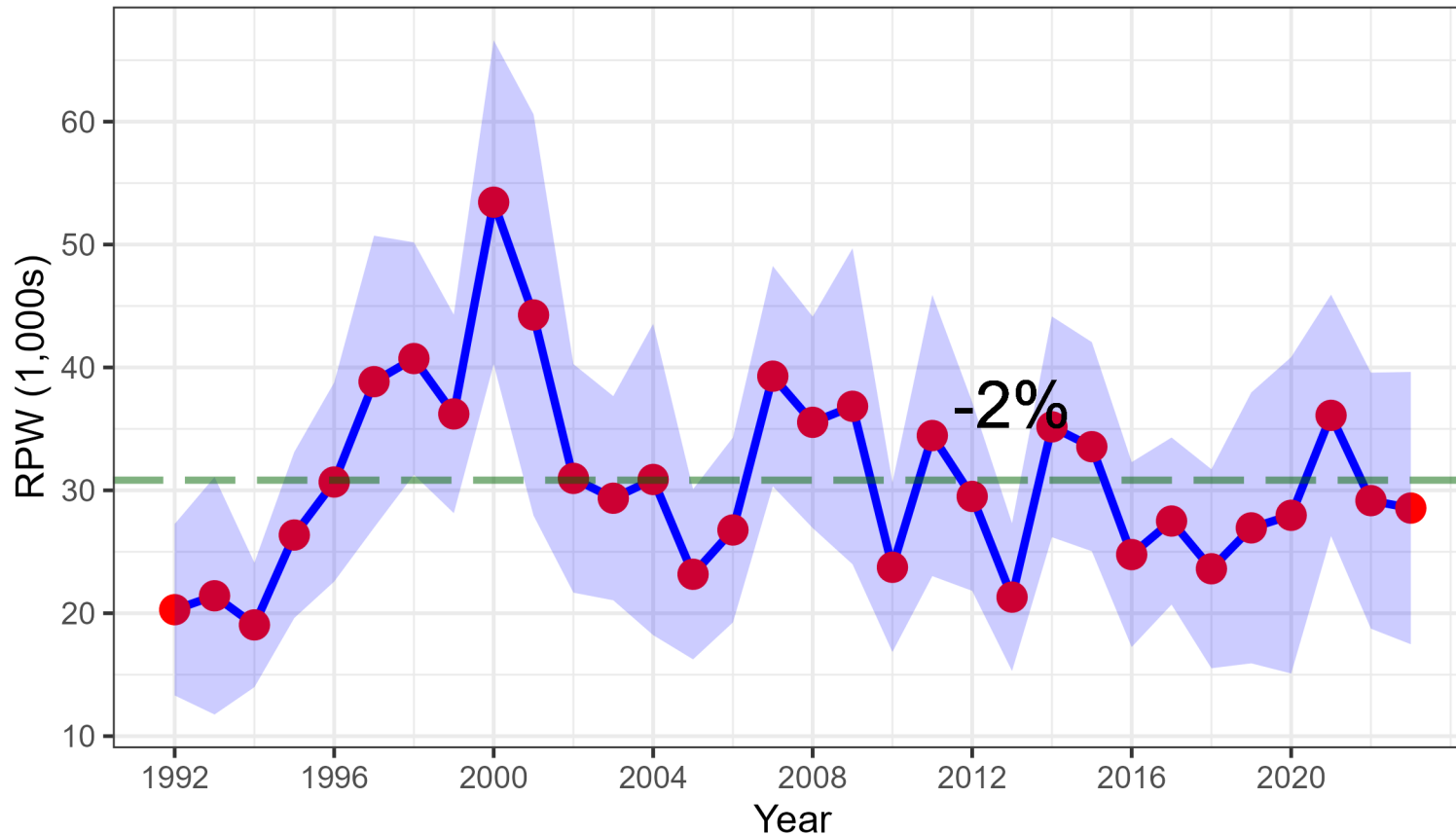
- **SR biomass increased** in 2023, still below time series mean
- Decreased in W/CGOA, increased in EGOA
- 1984 and 1987 biomass values removed from assessment model in 2023



SURVEY DATA – Longline Survey RPWs

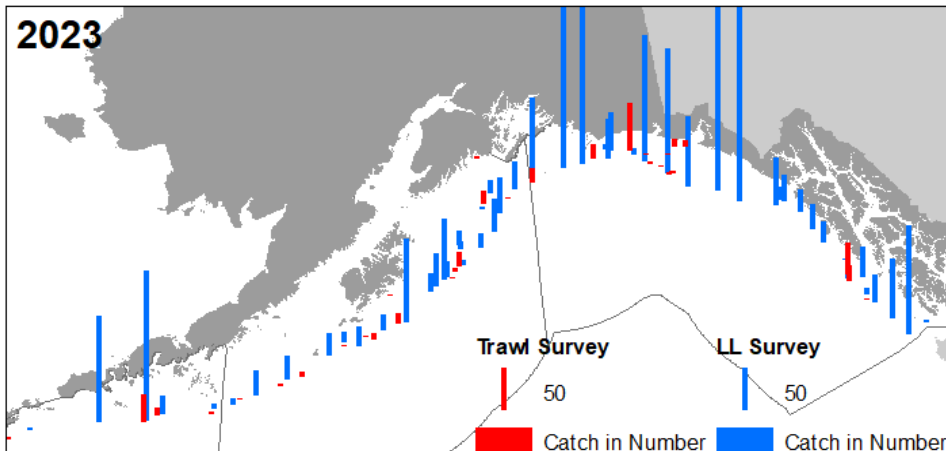
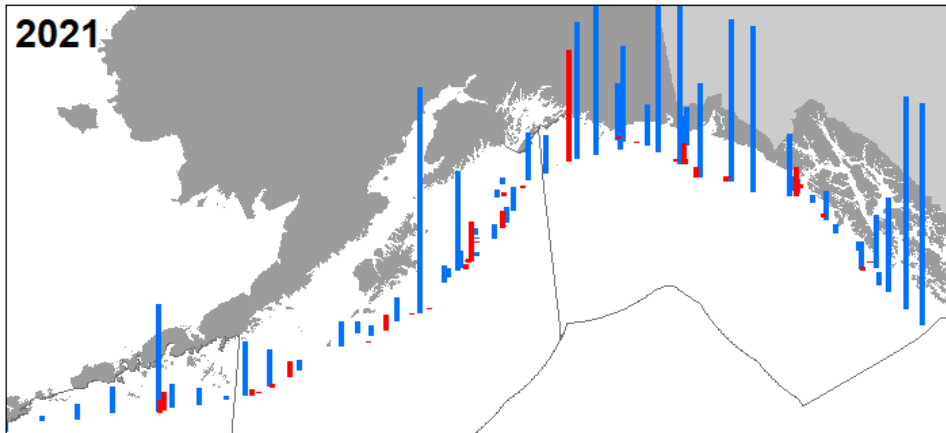
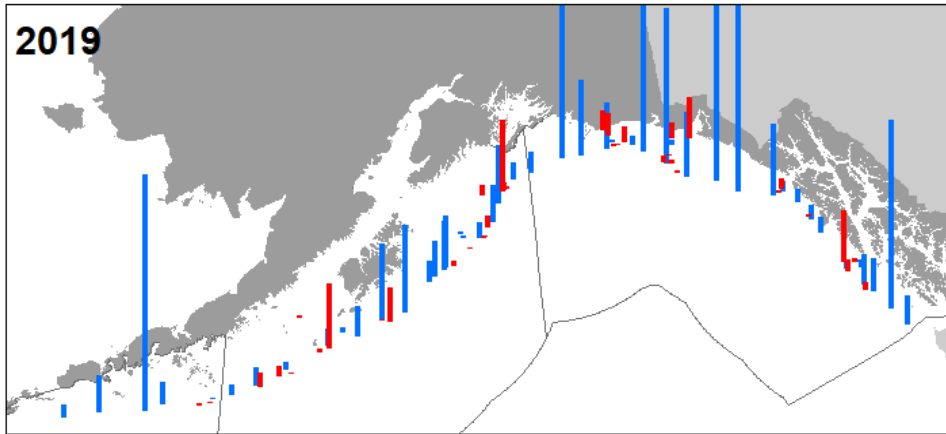


GOA Shortraker survey RPW w/ 95% CIs



- SR RPWs decreased slightly in 2023, still below time series mean
- Decreased in C/EGOA, increased in WGOA





SURVEY COMPARISONS:

- LL survey suggests higher proportions of biomass in the EGOA and WGOA compared to trawl survey biomass
- LL survey catches 1,000s of SR in comparison to 100s on trawl survey
- Length compositions show similarities in the EGOA, with an increasing divergence to the west with the LL survey lengths indicating larger fish being sampled
- LL survey has relatively consistent mean lengths by region, while the bottom trawl survey lengths have more interannual variability
- Amount of effort each survey has in the habitat (trawlable vs. untrawlable) and depths (between 250 and 500 m) that SR are found differs
- Sampling issues with both surveys



MODELS - Overview



“The SSC recommends exploring, in an alternative model for December, the author and GOA GPT recommendations to weight the longline survey and bottom trawl survey equally within the rema model and to estimate additional observation error for the longline survey only.”
(SSC, October 2023)

Model case	Description
19*	Model 19.2a accepted in 2019 with coding error corrected. Estimates 1 process error, 3 area-specific scaling coefficients, fixed longline survey weight to 0.5 and run using the <i>rema</i> package
23.3	Estimates 1 process error, 3 area-specific scaling coefficients, both surveys (bottom trawl and longline survey) have equal weights (1.0), estimates an additional observation error for the longline survey and run using <i>rema</i> package



MODELS – Biomass Estimates

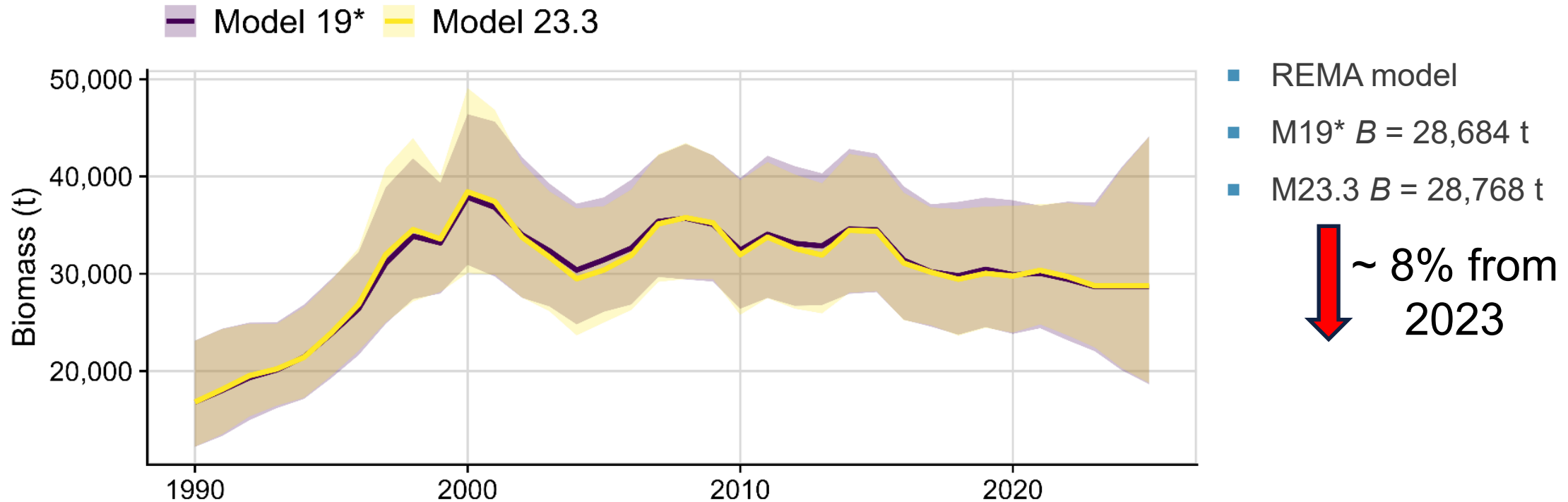


Figure 11-11.--Two-survey random effects (REMA) model fits to Gulf of Alaska shorttraker rockfish bottom trawl survey biomass and longline survey relative population weights, where the shaded regions are the model predictions and 95% confidence intervals from the REMA model. Results are shown for Model 19* (LLS weight = 0.5) in purple and Model 23.3 (LLS weight = 1.0 with extra LLS observation error) in yellow.



Harvest Recommendations



Model	Tier	Biomass Est.	F_{OFL}	OFL	F_{ABC}	ABC
19*	5	28,684 t	$F_{OFL} = M = 0.03$	861 t	$0.75 * F_{OFL}$	645 t
23.3	5	28,768 t	$F_{OFL} = M = 0.03$	863 t	$0.75 * F_{OFL}$	647 t



Area Allocation



“The SSC looks forward to continued exploration of alternative apportionment methods and believes this should remain a high priority.” (SSC, December 2019)

□ **Two apportionment methods examined:**

- “Biomass” = standard method based on proportion of predicted biomass by area
- “Biomass + RPW” = our proposed method based on the mean proportions of predicted biomass and predicted RPW by area

Area Allocation



“The SSC looks forward to continued exploration of alternative apportionment methods and believes this should remain a high priority.” (SSC, December 2019)

REMA model names	Apportionment Method	WGOA	CGOA	EGOA
M19*	Biomass	5.3%	29.5%	65.2%
M19*	Biomass + RPW	8.4%	20.7%	70.9%
M23.3	Biomass	5.2%	29.3%	65.5%
M23.3	Biomass + RPW	8.3%	20.7%	71%



Area Allocation - Recommendation



M23.3: “Biomass + RPW” Apportionment

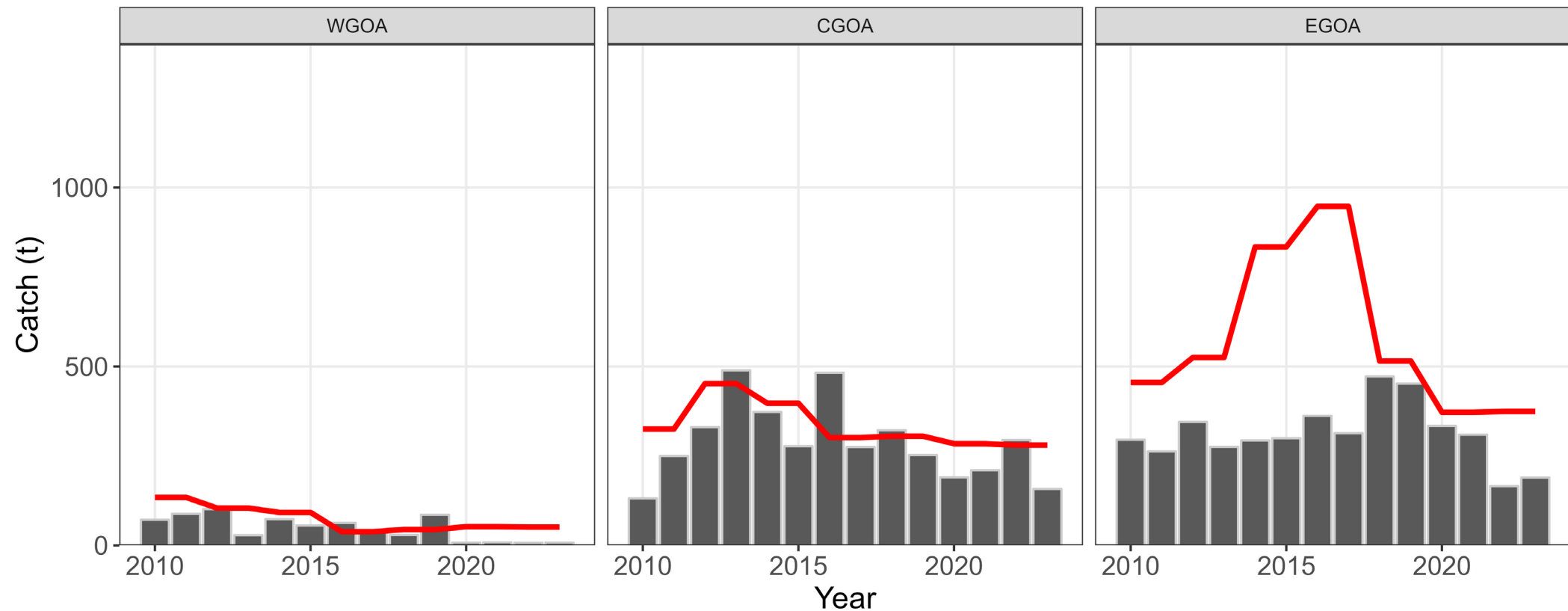
GOA Area	Percent of Total Biomass	Area ABC Apportionment (t)	% Change from 2023 Apportionment
Western	8.3%	54	+ 5.9%
Central	20.7%	134	↓ 52.1%
Eastern	71%	459	+ 22.7%
Gulfwide Total	100%	647	↓ 8.2 %



Alternative Area Allocation Discussion



CONCERN: regional ABC overages, particularly in the CGOA



Alternative Area Allocation Discussion



■ Less Concern of Overfishing this Species:

1. **NON-TARGET SPECIES**
2. **POORLY SAMPLED**
3. **NO EVIDENCE of AREA SPECIFIC STOCK STRUCTURE**
4. **LOW/STABLE to DECREASING CATCH w/ GOOD CATCH DATA**
5. **MINIMAL BIOLOGICAL CONCERNS BASED ON AVAILABLE LIFE HISTORY DATA**
6. **PRECEDENCE OF COMBINING SUBAREA ABCs: GOA Other Rockfish, GOA Demersal Shelf Rockfish**

Thus, no apparent conservation concern, but regulatory factors that need to be considered...



Risk Table - No Reductions of ABC



Assessment-related considerations	Population dynamics considerations	Environmental/ ecosystem considerations	Fishery Performance considerations
<p>Level 1</p> <ul style="list-style-type: none"> • Large annual changes in biomass but low CVs • Potential bias and uncertainty that may exist with both survey indices • Conflicting regional proportion of biomass between the two surveys 	<p>Level 1</p> <ul style="list-style-type: none"> • Little to no information on the population dynamics • Biomass estimates show normal variability for this species • Exploitable biomass estimates have been in a slow decline 	<p>Level 1</p> <ul style="list-style-type: none"> • Average physical environmental conditions • Unknown status of foraging conditions for adults • Potential increased competition for larvae and moderate predation pressure • Lack of understanding of the effects of environmental change on the survival and productivity 	<p>Level 1</p> <ul style="list-style-type: none"> • Non directed fishery species • Consistent gulfwide catches historically below the TAC • Potential for overages of ABC in the CGOA



Shortraker rockfish - Conclusions



Quantity	As estimated or <i>specified last year for:</i>		As estimated or <i>recommended this year for:</i>	
	2023	2024	2024	2025
M (natural mortality rate)	0.03	0.03	0.03	0.03
Tier	5	5	5	5
Biomass (t)	31,331	31,331	28,768	28,768
F_{OFL}	$F=M=0.03$	$F=M=0.03$	$F=M=0.03$	$F=M=0.03$
$maxF_{ABC}$	$0.75M=0.0225$	$0.75M=0.0225$	$0.75M=0.0225$	$0.75M=0.0225$
F_{ABC}	0.0225	0.0225	0.0225	0.0225
OFL (t)	940	940	863	863
maxABC (t)	705	705	647	647
ABC (t)	705	705	647	647
Status	As determined <i>last year for:</i>		As determined <i>this year for:</i>	
	2021	2022	2022	2023
Overfishing	No	n/a	No	n/a





Questions?

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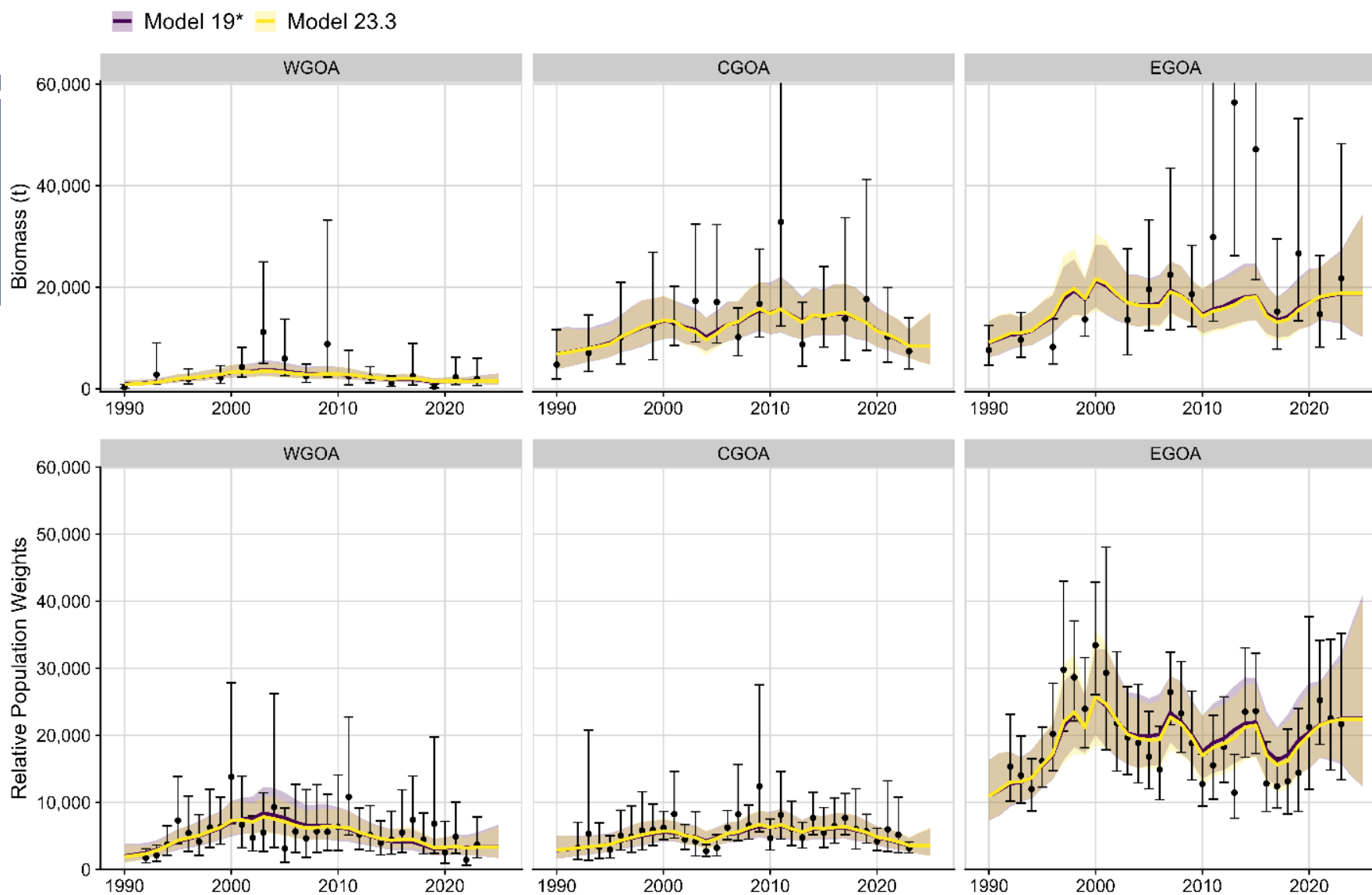


Figure 11-10.--Two-survey random effects (REMA) model fits to GOA shorttraker rockfish bottom trawl survey biomass (top panels) and longline survey relative population weights (bottom panels) by western, central, and eastern GOA management area, where the points and error bars are the design-based survey estimates and the lines with shaded regions are the model predictions and 95% confidence intervals from the REMA model. Results are shown for Model 19* (LLS weight = 0.5) in purple and Model 23.3 (LLS weight = 1.0 with extra LLS observation error) in yellow.

