GOA THORNYHEAD COMPLEX

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TEAM/SSC COMMENTS

"…transition from the ADMB RE variants to the rema framework, which implements the same model variants in a single framework with several improvements."(SSC, Oct 2022)

Transitioned to the R package rema framework that allows for estimating additional observation error.

"…recommended excluding BTS data from 1984 and 1987 due to different survey methodology and to continue utilizing a two-survey model." (Plan Team, Sept 2022)

Removed the 1984 and 1987 BTS data from the estimation of exploitable biomass, and continue to utilize a two-survey model for biomass estimation.

"…recommended discontinuing the misspecified status quo model (Model 18) and bringing forward both the corrected model (Model 18) and the model with observation error on both the BTS and LLS (Model 22) for the November assessment." (Plan Team, Sept 2022)*

Authors present two models: 1) Model 18* is the corrected status quo model, and 2) Model 22 is the same as status quo but with additional observation error on the BT and LL surveys.

"…investigate hook competition with sablefish on the longline survey and, if appropriate, develop a correction factor either by using existing data or conducting a hook timer study." (SSC, Dec 2020)

The longline survey staff have not formally analyzed hook competition on the survey, but a decrease in the number of baits was noted in 2022 with an increase in the number of empty hooks returning. SST catch on the LL survey was up in 2022 despite large increase in sablefish catch. Hook competition in longline surveys can be difficult to ascertain and no adjustments to account for competition are currently being made to the thornyhead catch on the AFSC LL survey.

"… investigate potential shifts in gear or fishing behavior in TH habitat as a possible cause of the decrease in catch." (SSC, Dec 2020**)**

Changes in gear use is the most probable cause of the decrease of TH catch. This can most likely be attributed to the increased use of slinky pots by the sablefish fishery.

GOA TH STOCK COMPLEX

- **Tier 5 species –** represented by SST
- ***Changes in the input data***
  - Catch updated through 6 October 2022
  - Length compositions updated: longline and trawl fisheries, GOA bottom trawl and longline surveys
  - Longline survey RPWs (2021/2022) and trawl survey biomass values (2021) 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 18*)
  - New model (Model 22) with an additional observation error term estimated for both the AFSC longline survey and bottom trawl survey is recommended

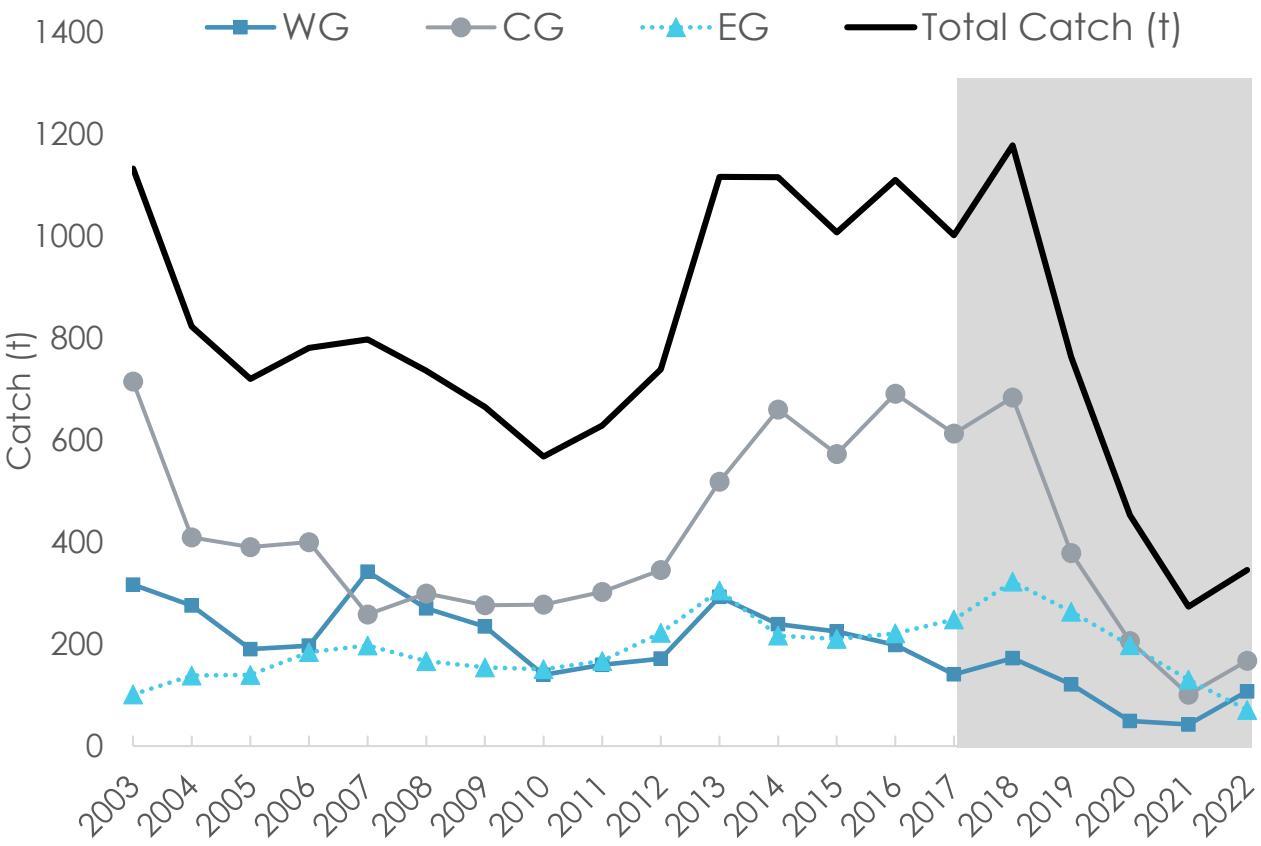
CURRENT STATUS - CATCH

Area	2022 ABC	2022 TAC	2022 OFL	2022 Catch
Western	352	352		107
Central	910	910		167
Eastern	691	691		71
TOTAL	1,953	1,953	2,604	345*

*Catch as of Oct 6, 2022

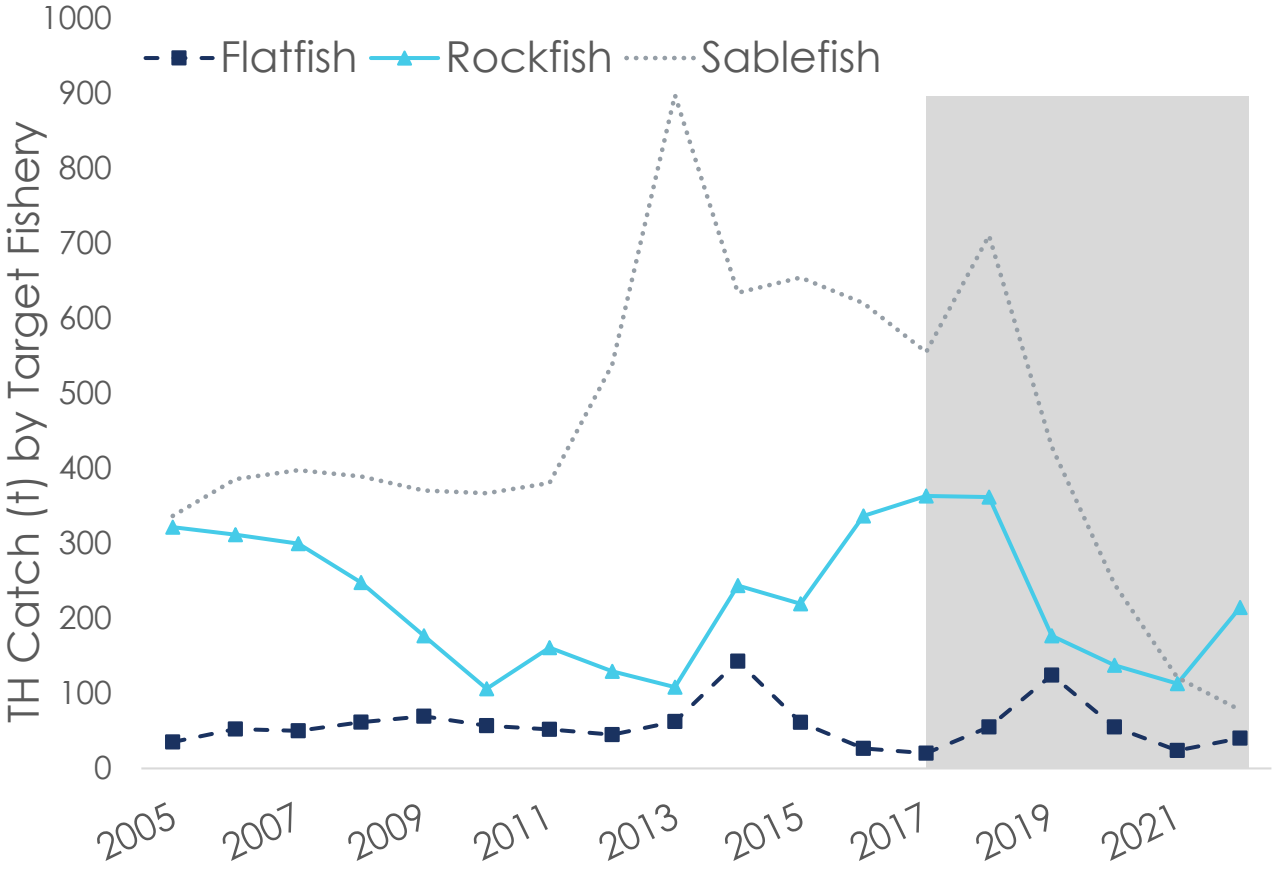
- 2022 catch is up 26% from 2021
- This is ~18% of gulfwide ABC

TH CATCH – BY AREA



- Total catch increased in 2022 (~26%)
- Slight increase in W/CGOA

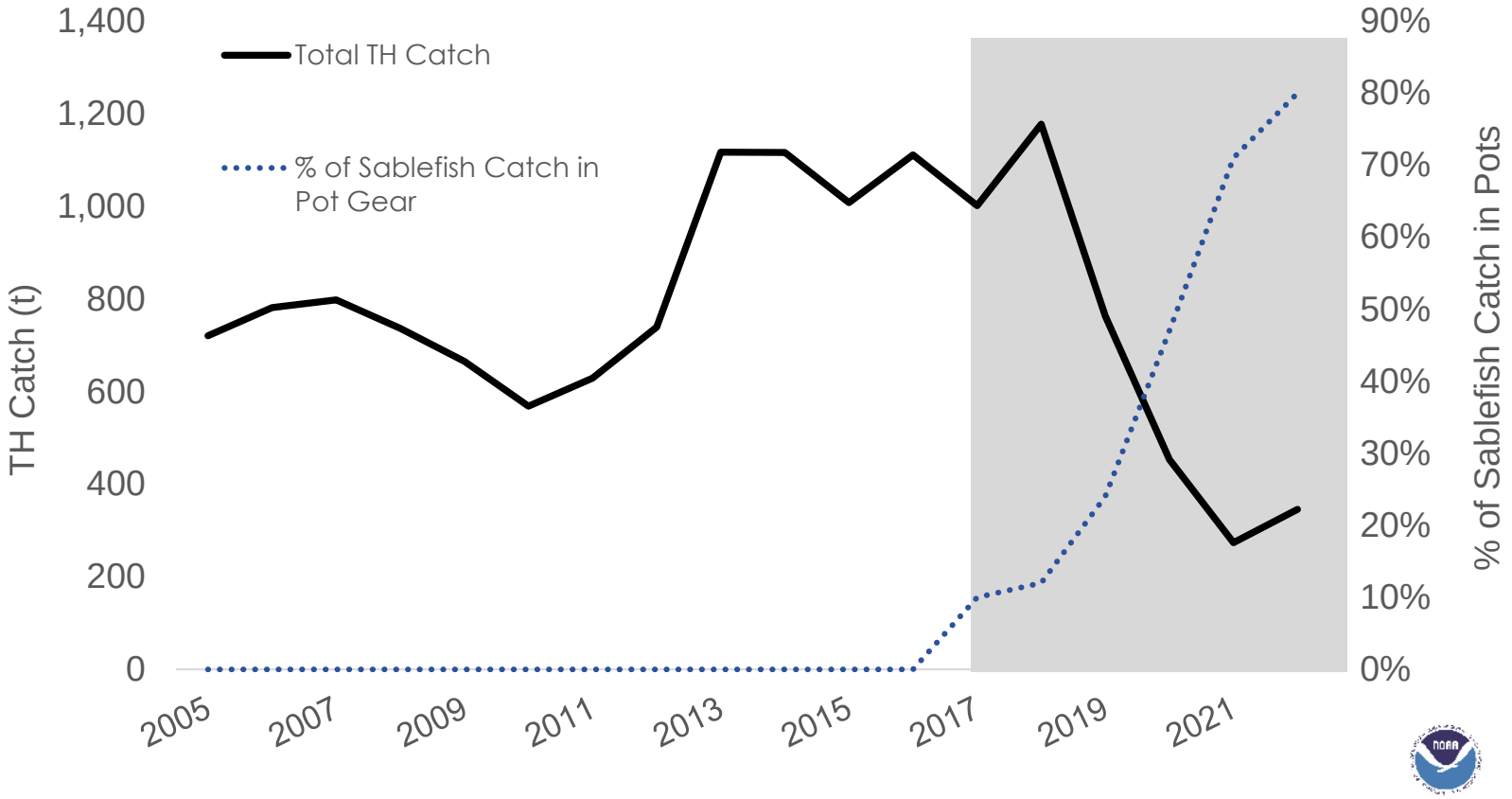
TH CATCH – BY TARGET FISHERY



- Slight increase of catch in rockfish fishery in 2022
- Significant decrease of catch in the sablefish fishery

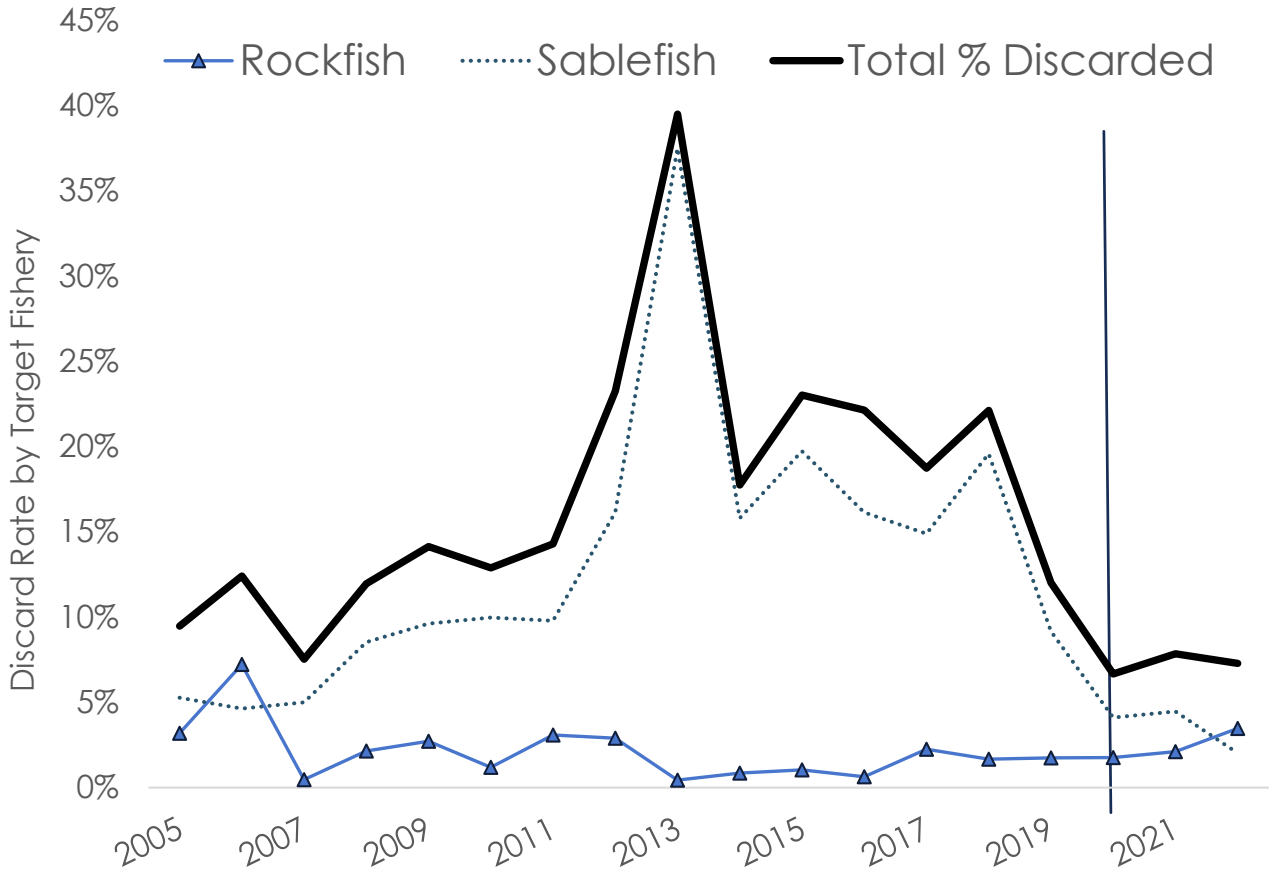
SSC/PT COMMENT

"The SSC supports the GOA GPT recommendations to … investigate potential shifts in gear or fishing behavior in thornyhead habitat as a possible cause of the decrease in catch." (SSC, Dec 2020)



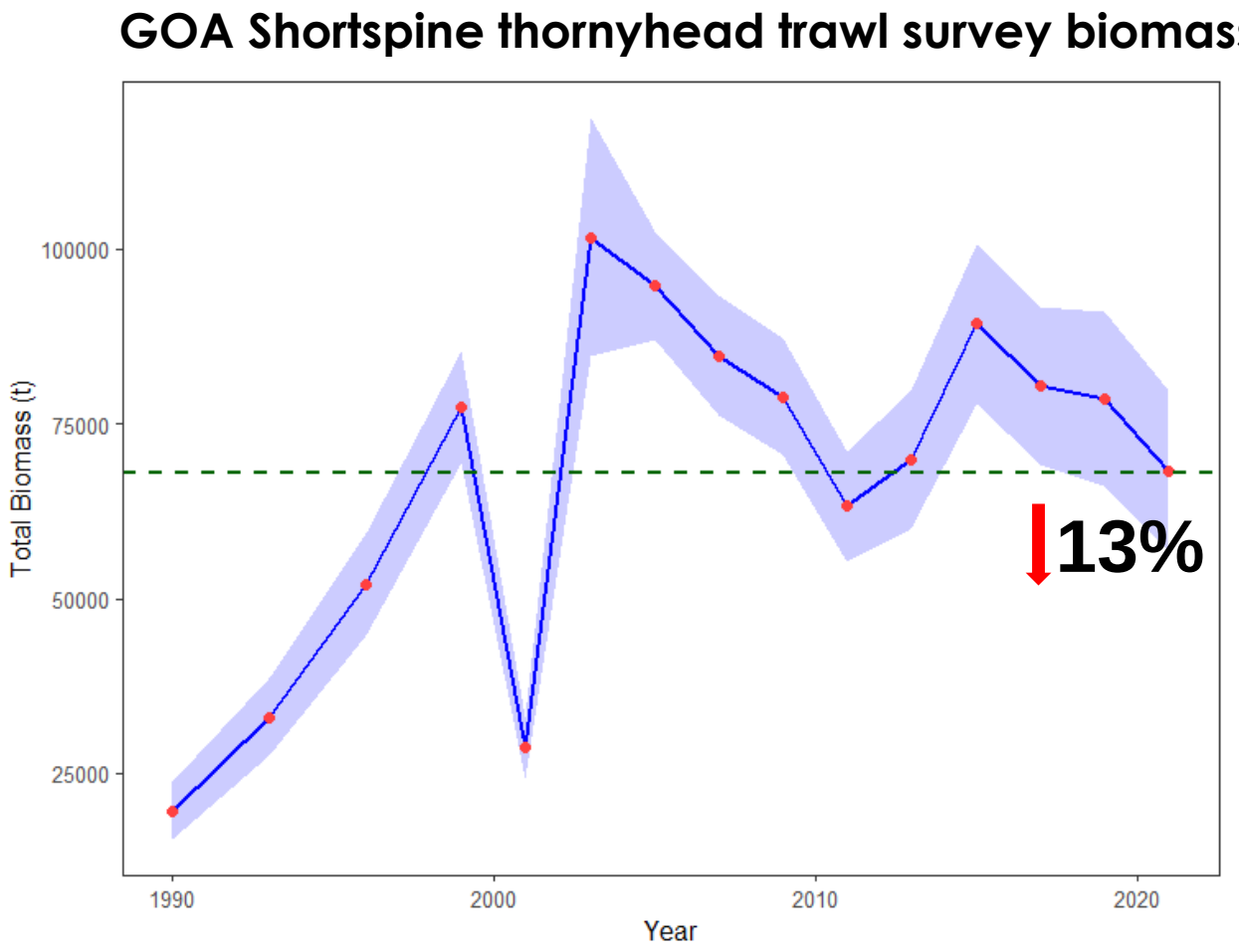
TH DISCARDS - BY FISHERY

"…The SSC appreciates any information the author can provide related to the amount of discard expected under the newly implemented full-retention regulation." (SSC, Dec 2020)



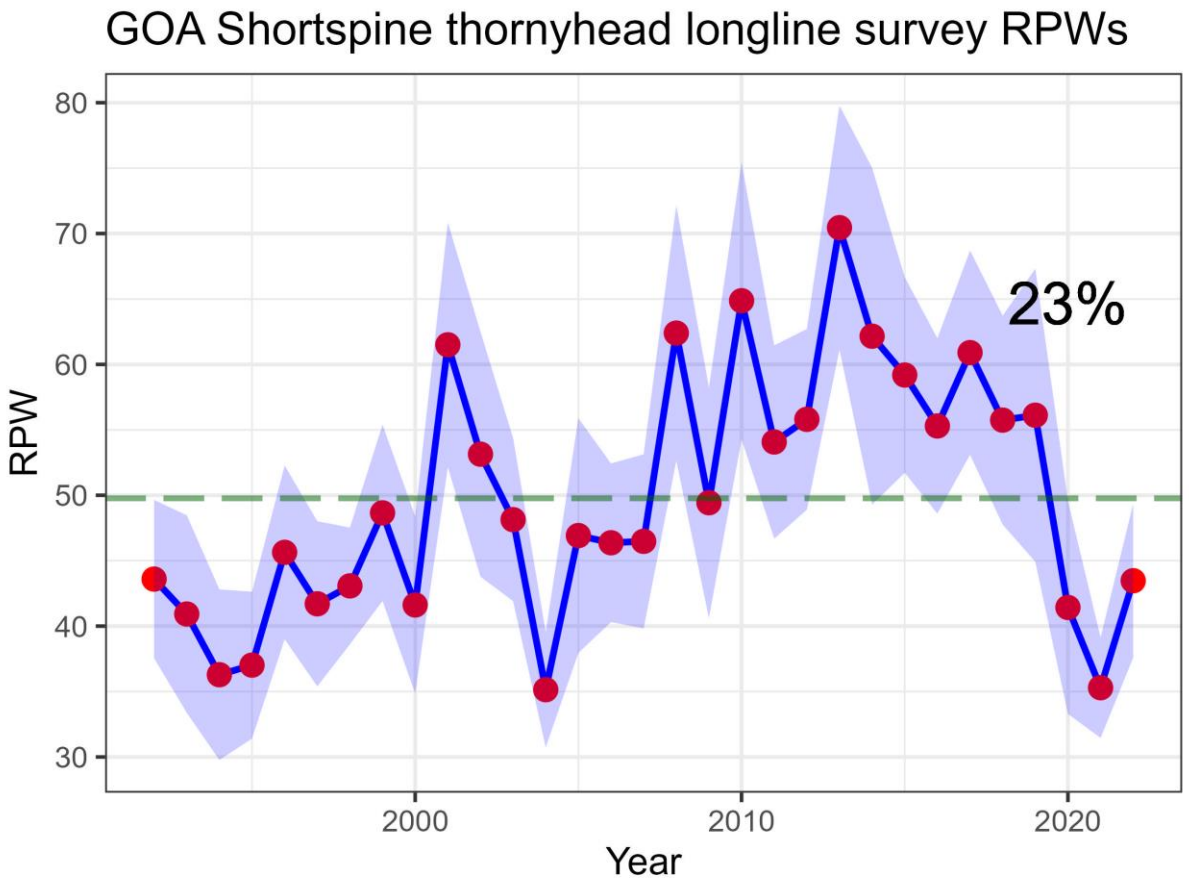
- Total discard rate has shown decreasing trend
- Discards increased slightly in rockfish fishery in 2022

SURVEY DATA – TRAWL SURVEY BIOMASS



- TH biomass down in all areas
- 1984 and 1987 biomass values removed from assessment model in 2022

SURVEY DATA – LONGLINE SURVEY RPWS



- TH RPWs increased in 2022, still below time series mean
- Decreased in W/CGOA, increased in EGOA

MODELS - OVERVIEW

"The Team recommended discontinuing the misspecified status quo model (Model 18) and bringing forward both the corrected model (Model 18*) and the model with observation error on both the BTS and LLS (Model 22) for the November assessment." (Plan Team, Sept 2022)

Model case	Description
18*	Model 18.1 accepted in 2018 with coding error corrected, run using the rema package
22	Model 18* with additional observation error estimated for each survey (bottom trawl and longline), run using rema package

MODEL - RESULTS

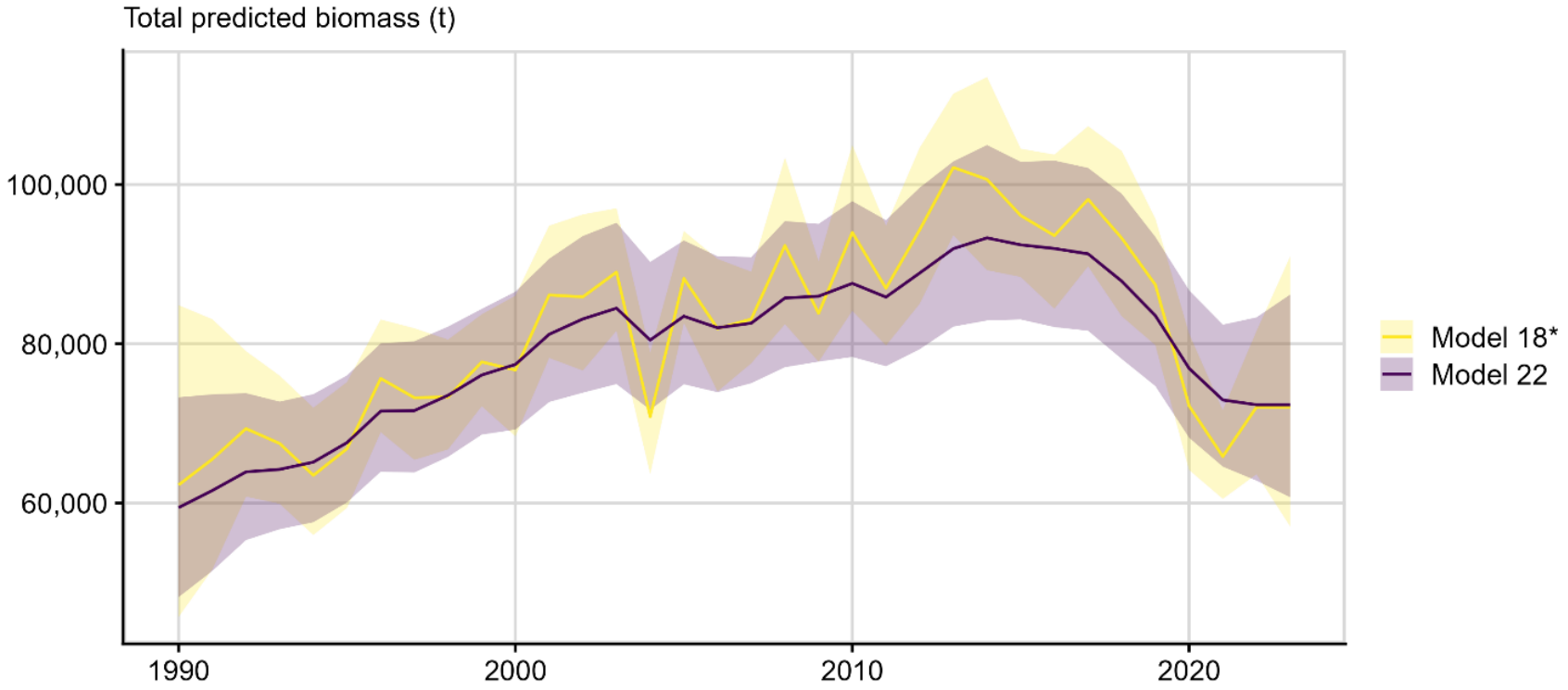
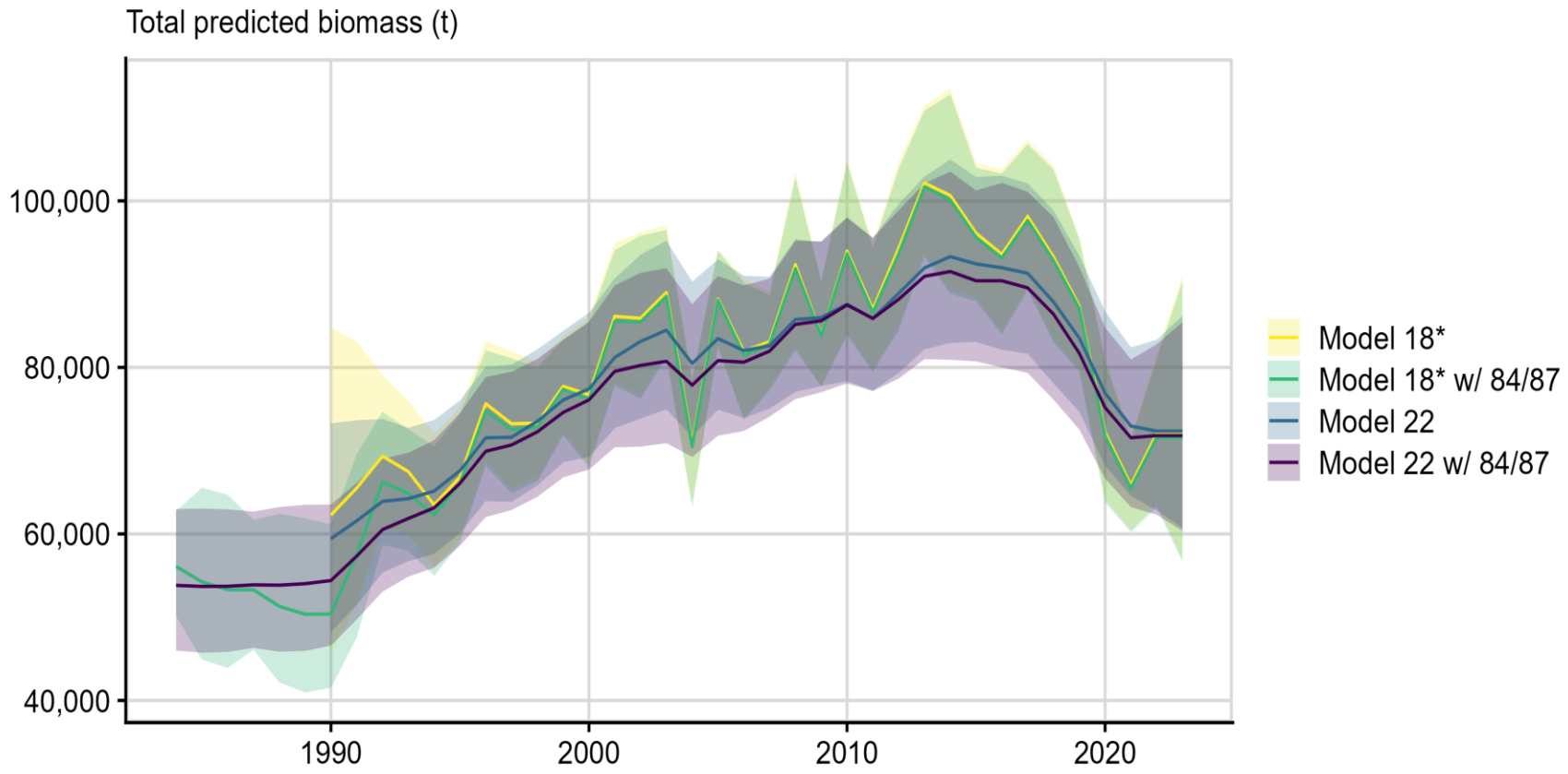


Figure 15-8.--Total Gulfwide biomass estimates (t) of shortspine thornyhead rockfish from the random effects model (solid lines with 95% confidence intervals in shaded regions) for Model 18* (yellow), the status quo model, and Model 22 (purple), the recommended model that includes additional observation error terms.

SSC/PT COMMENTS

"The Team recommended excluding BTS data from 1984 and 1987 due to different survey methodology and to continue utilizing a two-survey model." (Plan Team, Sept 2022)



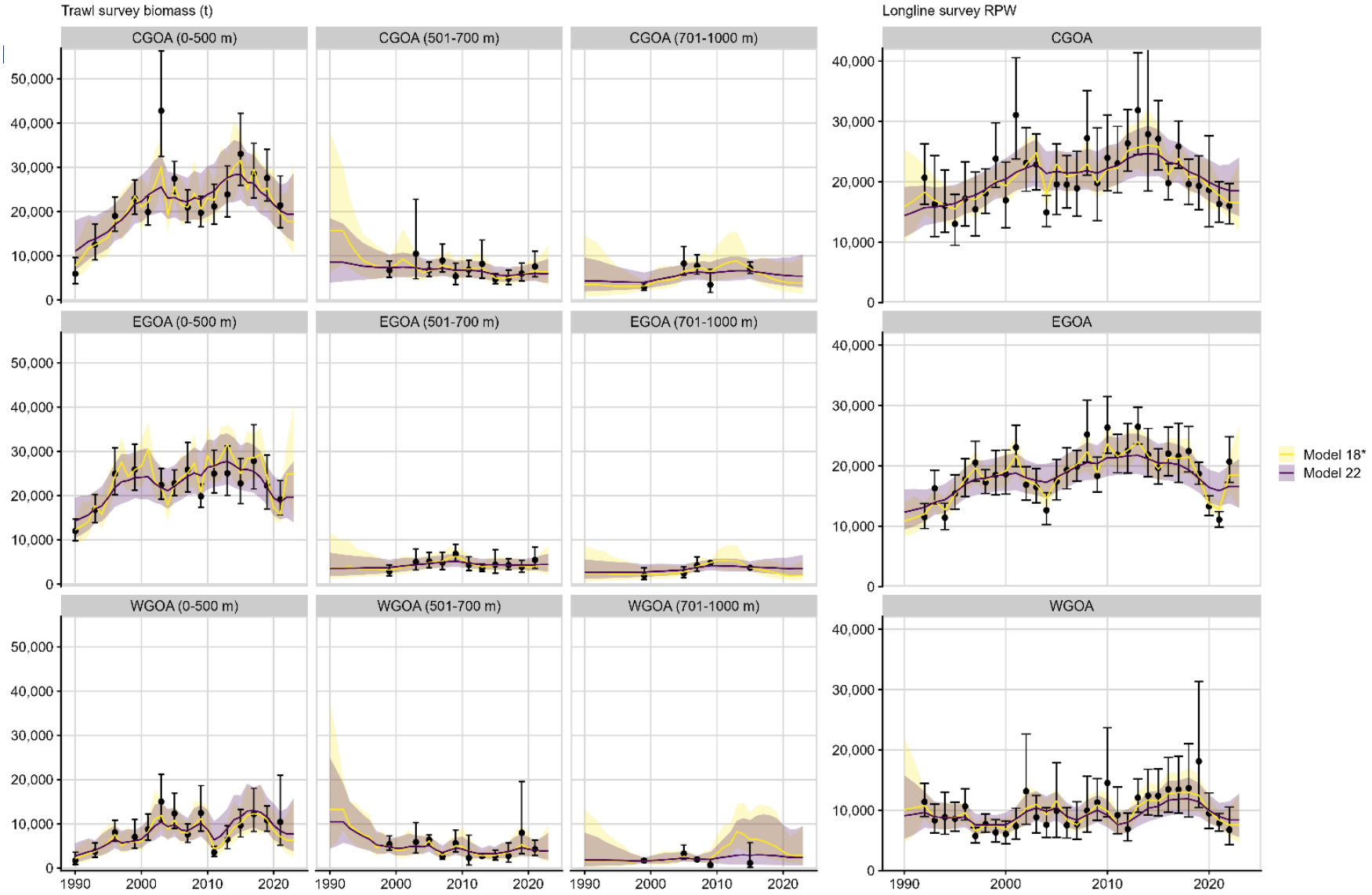


Figure 15-7.-- Biomass estimates (t) of SST by survey, area, and depth stratum used in the random effects models from the bottom trawl survey (left panels) and longline survey (right panels). Filled black circles with error bars are survey produced estimates fit to the random effects model for the status quo Model 18* (yellow), and the recommended Model 22 (purple).

GOA TH RECOMMENDATIONS

- Model 22
- Recommendations for 2023 (Tier 5):
  - $F_{OFL} = M = 0.03$
  - *B* (exploitable biom.) = 72,349 t
  - **OFL** =72,349 x 0.03 = **2,170 t**
  - $F_{ABC} = 0.75 * M = 0.0225$
  - **ABC** = 72,349 x 0.0225 = **1,628 t**

    (↓17% from 1,953 t in 2022)

GOA TH - AREA ALLOCATION

GOA Area	2023 Biomass (t)	Percent of Total Biomass	Area ABC Apportionment (t)	% Change from 2022 Apportionment
Western	13,944	19%	314	↓ **11%**
Central	30,810	43%	693	↓ **24%**
Eastern	27,595	38%	621	↓ **10%**
Gulfwide Total	**72,349**	**100%**	**1,628**	↓ **17%**

TH - RISK TABLE

Assessment-related considerations	Population dynamics considerations	Environmental/ ecosystem considerations	Fishery Performance considerations
Level 1 • Large annual changes in biomass but low CVs	**Level 1** • Little to no information on the population dynamics • No alarming or sudden changes in population abundance from available biomass data	**Level 1** • Prey availability avg. for adults • No indication of change in predation & competition • Lack of understanding of the effects of environmental change on the survival and productivity	**Level 1** • Non directed fishery species • Low stable catch historically below the TAC

GOA TH - RECOMMENDATIONS

Quantity	As estimated or specified last year for:		As estimated or recommended this year for:	
	2022	2023	2023	2024
M (natural mortality rate)	0.03	0.03	0.03	0.03
Tier	5	5	5	5
Biomass (t)	86,802	86,802	72,349	72,349
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)	2,604	2,604	**2,170**	2,170
maxABC (t)	1,953	1,953	1,628	1,628
ABC (t)	1,953	1,953	**1,628**	1,628
Status	As determined *last* year for:		As determined *this* year for:	
	2020	2021	2021	2022
Overfishing	No	n/a	No	n/a

QUESTIONS?