

GOA Other Rockfish



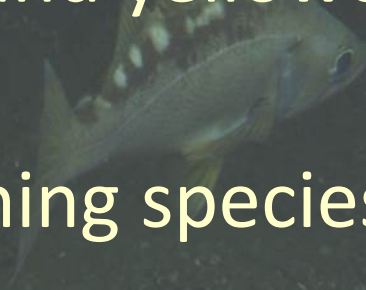
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Kristen Omori²

¹Auke Bay Laboratories

²VIMS

Other Rockfish (OROX) Complex

- Two sub-groups within the complex, based on life history, spatial distribution and fishery and survey characteristics
- **Demersal sub-group**: canary, china, copper, quillback, rosethorn, tiger and yelloweye rockfish
- **Slope sub-group**: 20 remaining species



OROX Complex

WGOA & CGOA

Aurora rockfish
 Blackgill rockfish
 Bocaccio
 Canary rockfish
 Chilipepper rockfish
 China rockfish
 Copper rockfish
 Darkblotched rockfish
 Greenstriped rockfish
 Harlequin rockfish

 Pygmy rockfish
 Quillback rockfish
 Redbanded rockfish
 Redstripe rockfish
 Rosethorn rockfish
 Sharpchin rockfish
 Shortbelly rockfish
 Silvergray rockfish
 Splitnose rockfish
 Stripetail rockfish
 Tiger rockfish
 Vermilion rockfish
 Widow rockfish
 Yelloweye rockfish
 Yellowmouth rockfish
 Yellowtail rockfish

26 Species

EGOA (WY)

Aurora rockfish
 Blackgill rockfish
 Bocaccio
 Canary rockfish
 Chilipepper rockfish
 China rockfish
 Copper rockfish
 Darkblotched rockfish
 Greenstriped rockfish
 Harlequin rockfish
 Northern rockfish
 Pygmy rockfish
 Quillback rockfish
 Redbanded rockfish
 Redstripe rockfish
 Rosethorn rockfish
 Sharpchin rockfish
 Shortbelly rockfish
 Silvergray rockfish
 Splitnose rockfish
 Stripetail rockfish
 Tiger rockfish
 Vermilion rockfish
 Widow rockfish
 Yelloweye rockfish
 Yellowmouth rockfish
 Yellowtail rockfish

27 Species

EGOA (EY/SEO)

Aurora rockfish
 Blackgill rockfish
 Bocaccio

 Chilipepper rockfish

 Darkblotched rockfish
 Greenstriped rockfish
 Harlequin rockfish
 Northern rockfish
 Pygmy rockfish

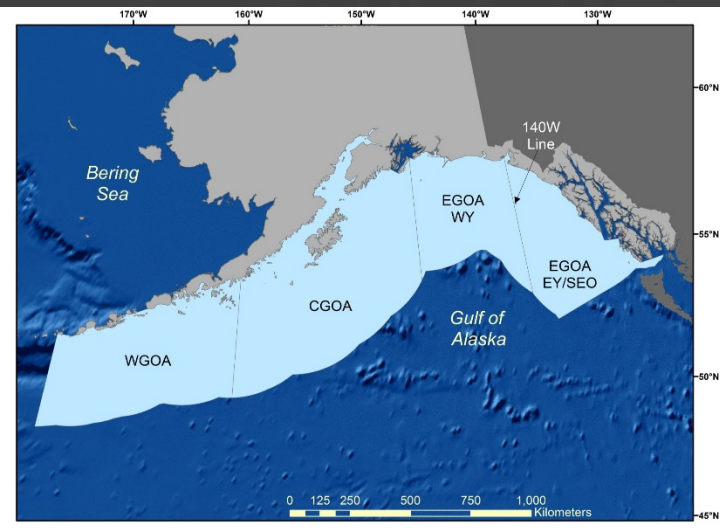
 Redbanded rockfish
 Redstripe rockfish

 Sharpchin rockfish
 Shortbelly rockfish
 Silvergray rockfish
 Splitnose rockfish
 Stripetail rockfish

 Vermilion rockfish
 Widow rockfish

 Yellowmouth rockfish
 Yellowtail rockfish

20 Species



SSC/PT Comments

Risk Tables – lots of comments

- *Opted to not update this year*
- *Included justification*

Spatial Mgmt/GOA-wide DSR

- *Deferred responding to comments pending action on Council Motion (Oct 2021)*

SSC/PT Comments

Discards as a result of full retention

- *Full retention began 2020 for hook-and-line catcher vessels*
- *Higher discard rates than expected, even assuming drop-offs*
- *AKRO and OLE are investigating, increased outreach*

SSC/PT Comments

Investigate Tier elevation for harlequin and yelloweye

- *Harlequin: age validation done, maturity study published in Sept 2021*
 - *Insufficient time to evaluate Tier 4 model*
- *Yelloweye: Need to incorporate IPHC data into RFX model, pending results of UAF student project*

SSC/PT Comments

Range expansion, update stock structure document due to aurora/shortbelly additions

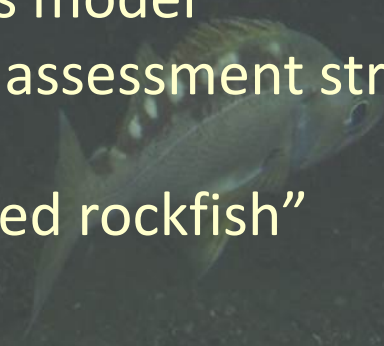
- *Aurora/shortbelly were not new additions to the complex*
- *Inclusion is not due to increased occurrences*
- *Given warming oceans, considerations of range shifts/expansions will be necessary*
 - *None of the species common in southern waters have any detectable trends in fishery or survey data*
- *Suggest delaying updating the stock structure until the spatial management is determined*

GOA Other Rockfish

- Tier 4: Sharpchin
- Tier 5: 17 slope sub-group species
- Tier 6: 7 demersal sub-group, 2 slope species

- Changes to the input data
 - Catch updated through Oct 1, 2021
 - NMFS bottom trawl survey data updated
 - Updated random effects biomass model
 - Split fractions updated to match assessment structure
 - (Thanks to Wayne!!!)
 - Reporting catch from “unidentified rockfish”

- Changes in assessment methodology
 - None



GOA Other Rockfish

- Exceeded combined Western/Central GOA ABC

Area	2021			Catch
	OFL	ABC	TAC	
WGOA/CGOA		940	940	1,048
EGOA	WY	369	369	118
	EY/SE	2,744 ^{\$}	2,744 [#]	36
Total	5,320	4,053	4,053	1,201*

*Catch as of Oct 1, 2021

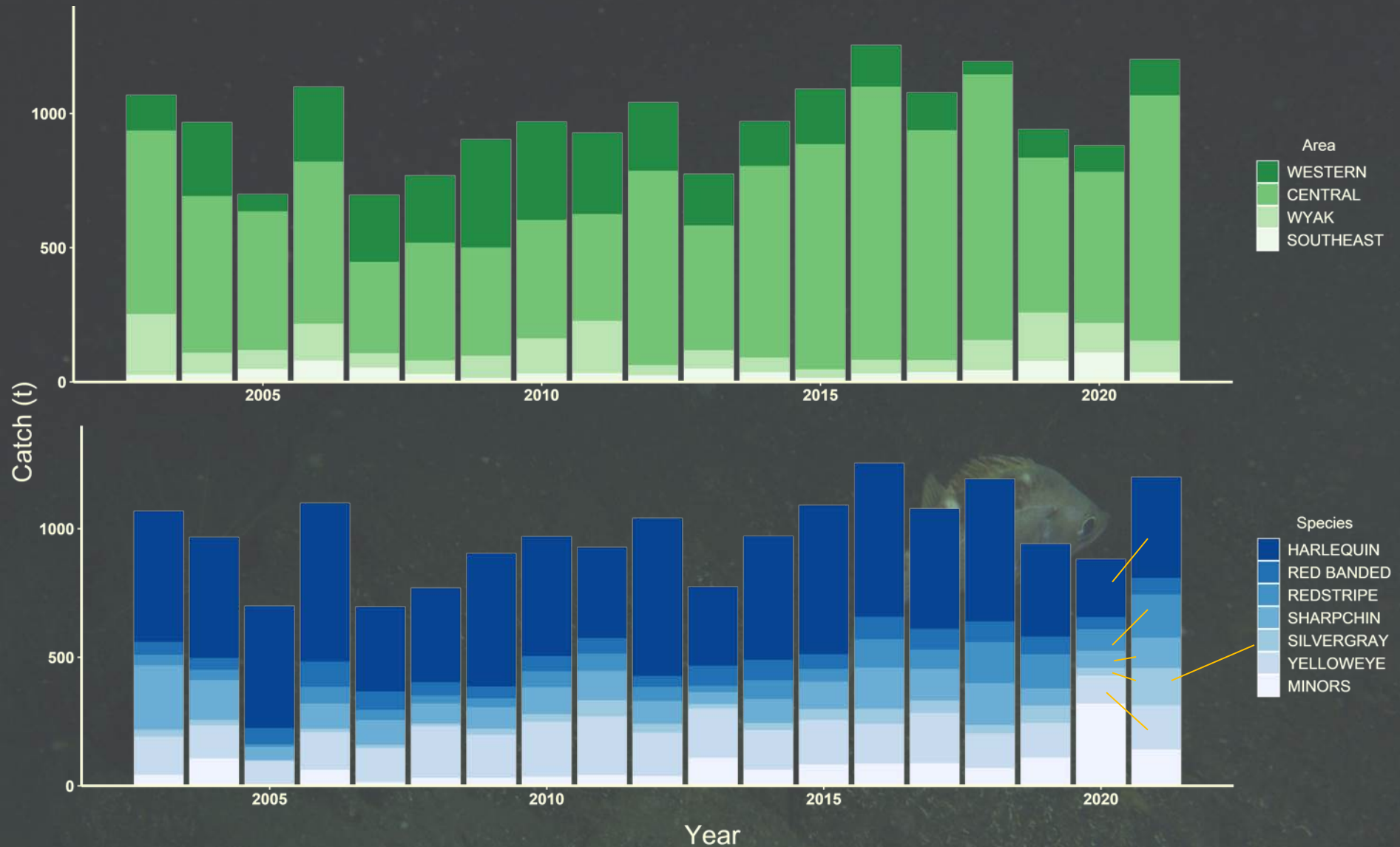
[#]historically TAC set well below ABC in EY/SE, but not for 2020/2021

^{\$}Does not include ABC from northern rockfish

Catch – W/C GOA

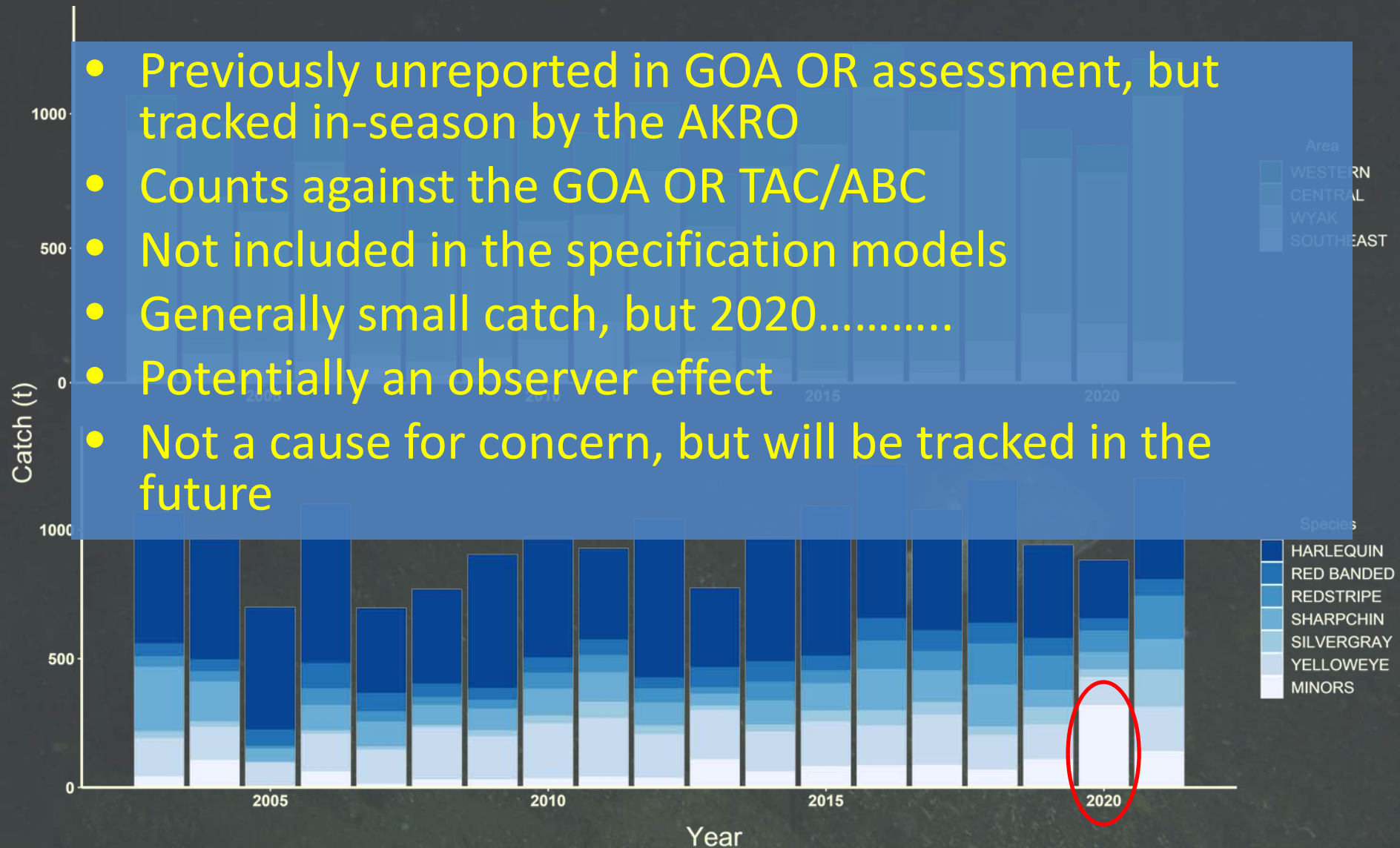


Catch – Species



Catch – Unidentified Rockfish

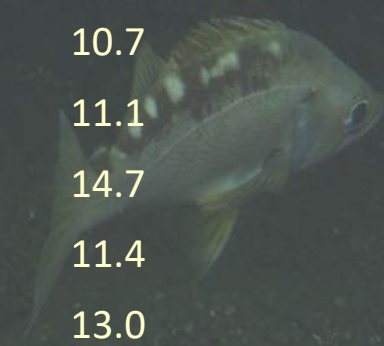
- Previously unreported in GOA OR assessment, but tracked in-season by the AKRO
- Counts against the GOA OR TAC/ABC
- Not included in the specification models
- Generally small catch, but 2020.....
- Potentially an observer effect
- Not a cause for concern, but will be tracked in the future



Catch – Inside Waters

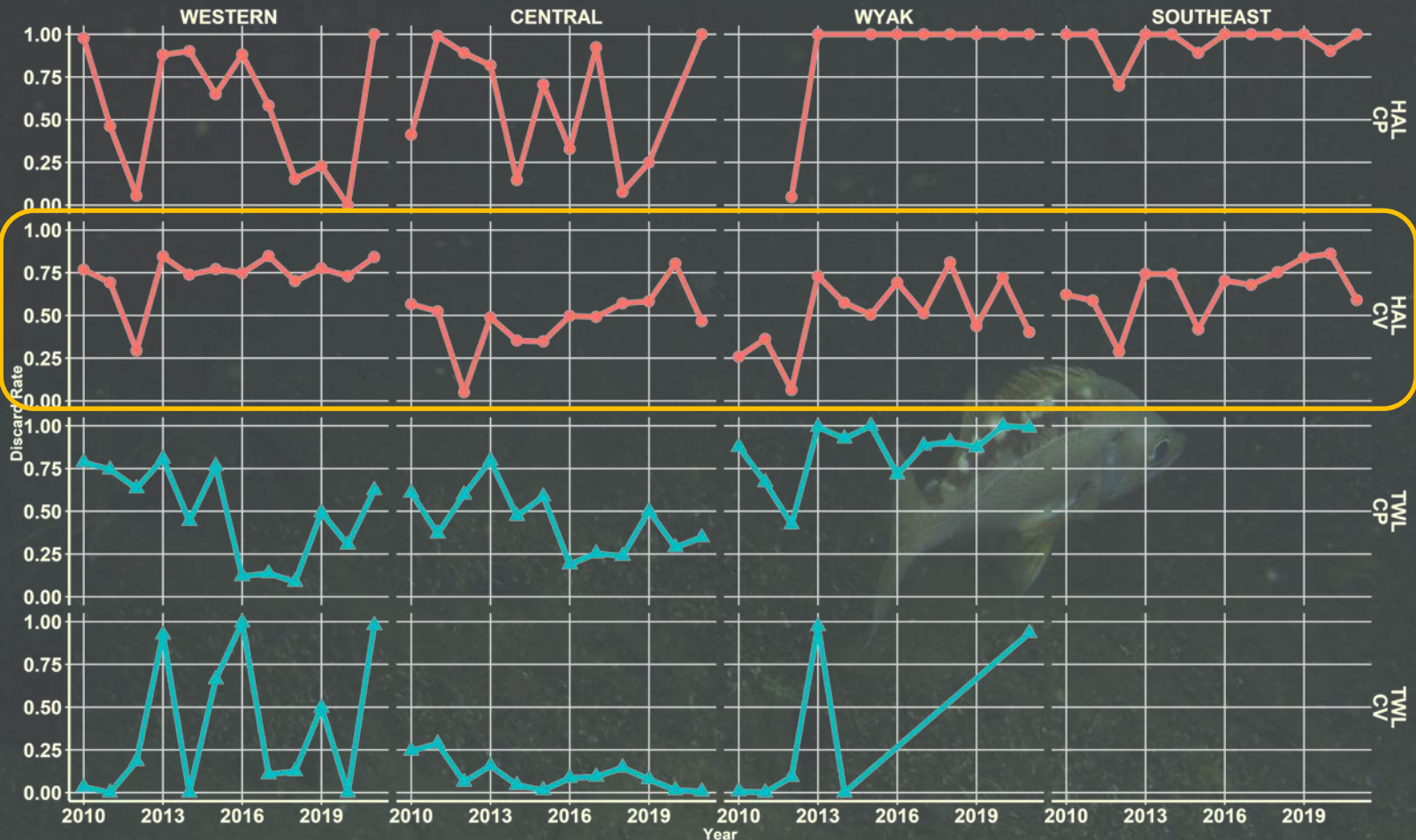
- Federal fisheries catch
- Does NOT count against ABC/TAC, but tracked in assessment
- SE does not include the DSR sub-group species
- PWS = NMFS Area 649, SE = NMFS Area 659

Year	PWS	SE
2013	19.4	14.0
2014	11.2	12.6
2015	22.3	10.7
2016	39.0	11.1
2017	9.6	14.7
2018	9.0	11.4
2019	10.7	13.0
2020	9.4	54.8
2021	14.6	7.6



Catch - Discards

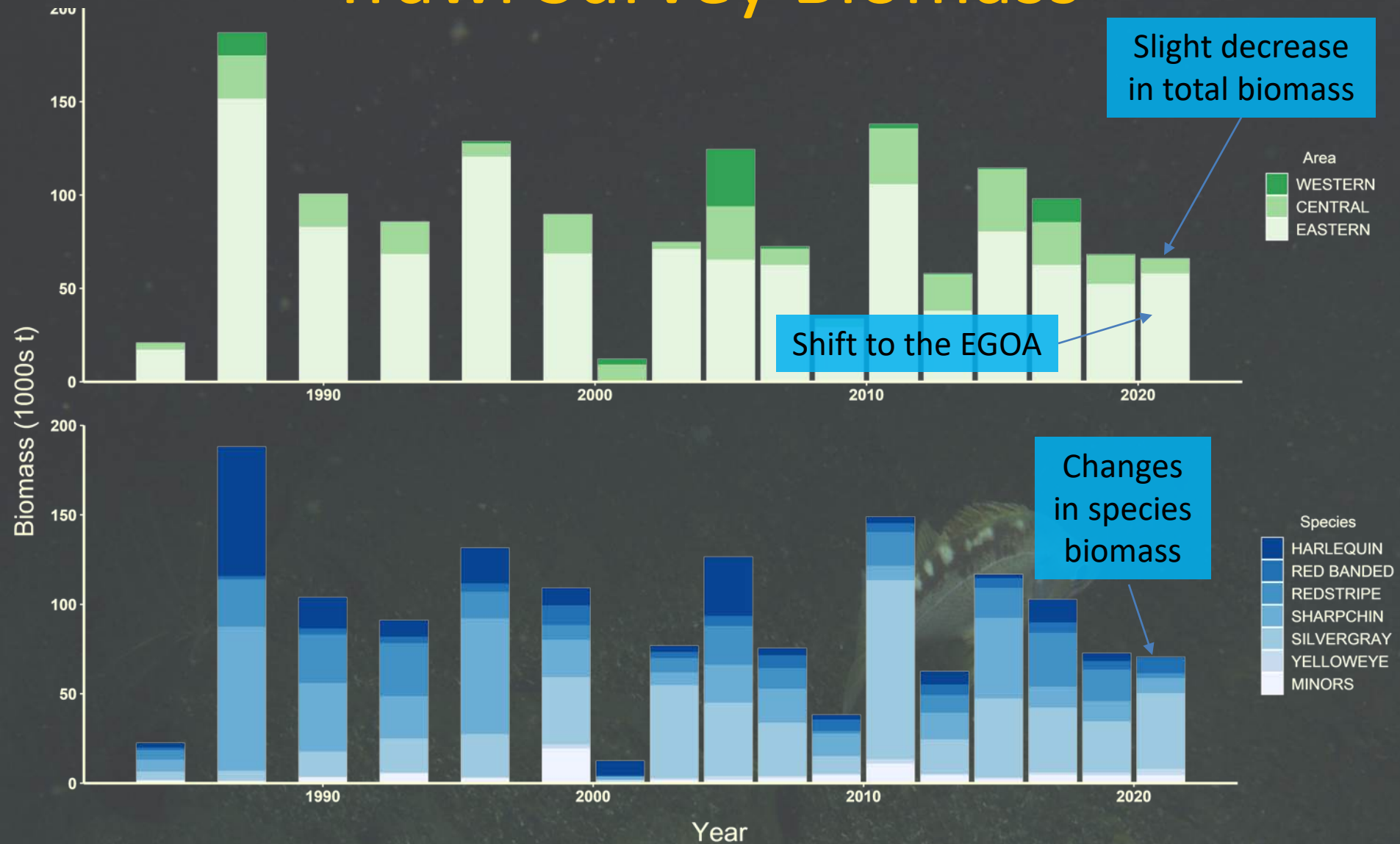
- Discard rate generally variable, but ~50% avg
- Full retention on hook-and-line CVs 2020



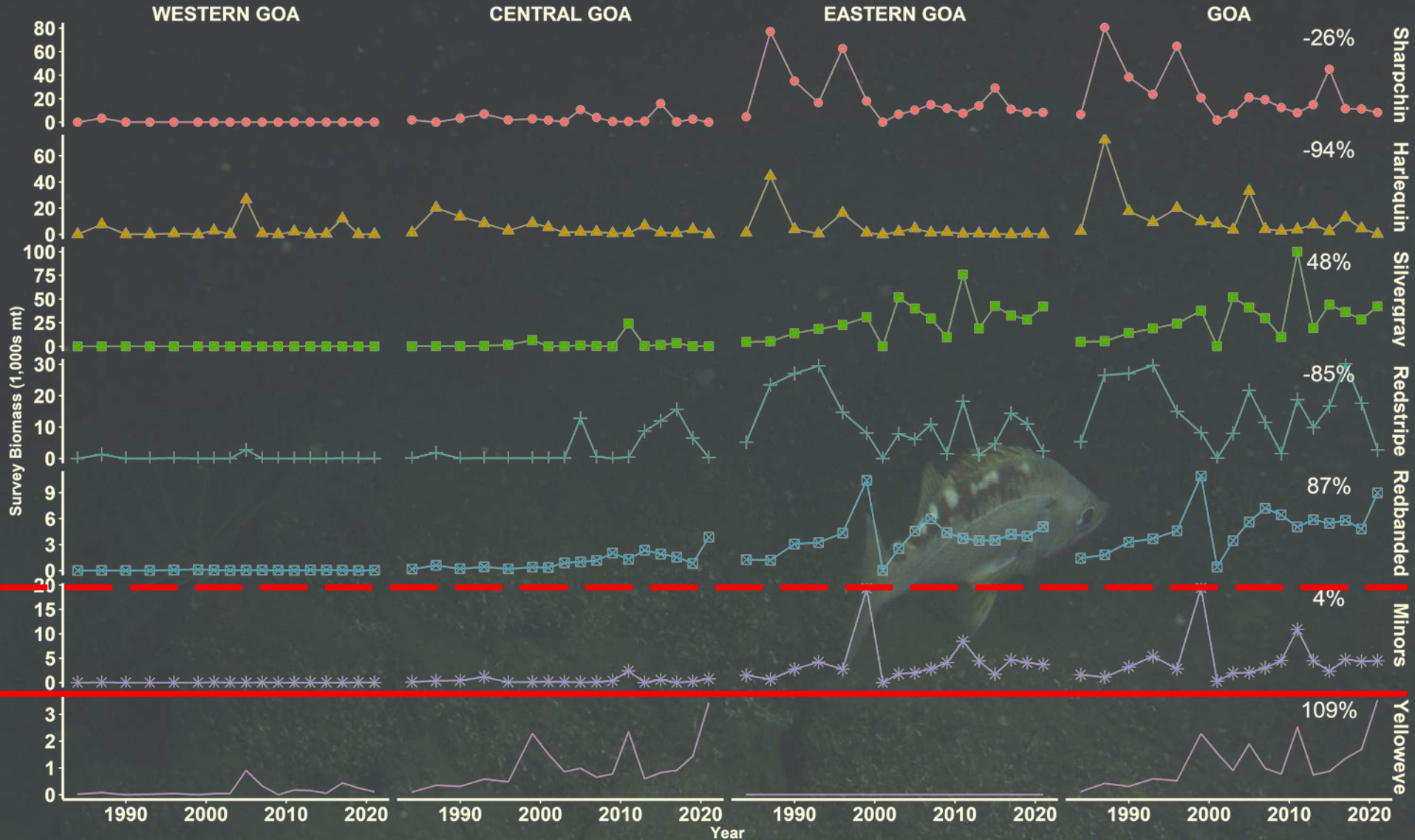
Catch – Questions??



Trawl Survey Biomass



Trawl Survey Biomass



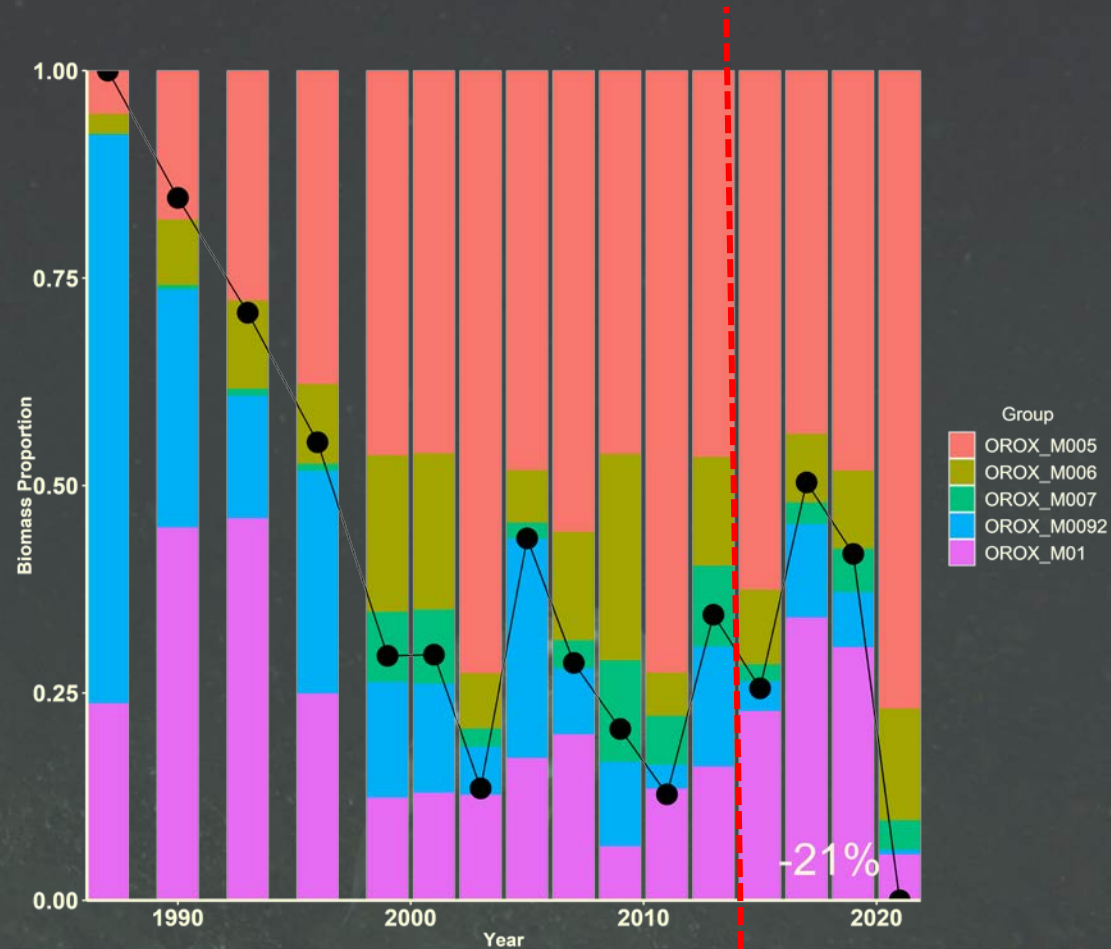
Random Effects Biomass

- Two models (all **slope sub-group** species):
 - Model 15.1 Tier 4 sharpchin rockfish
 - Model 15.1 Tier 5 – 17 species
- Both models run by area
- Tier 5 model: 6 sub models
 - All Tier 5 combined
 - Separate M grouping (5 M groups)
 - FOFL = weighted M (as per 2015 JPT framework)



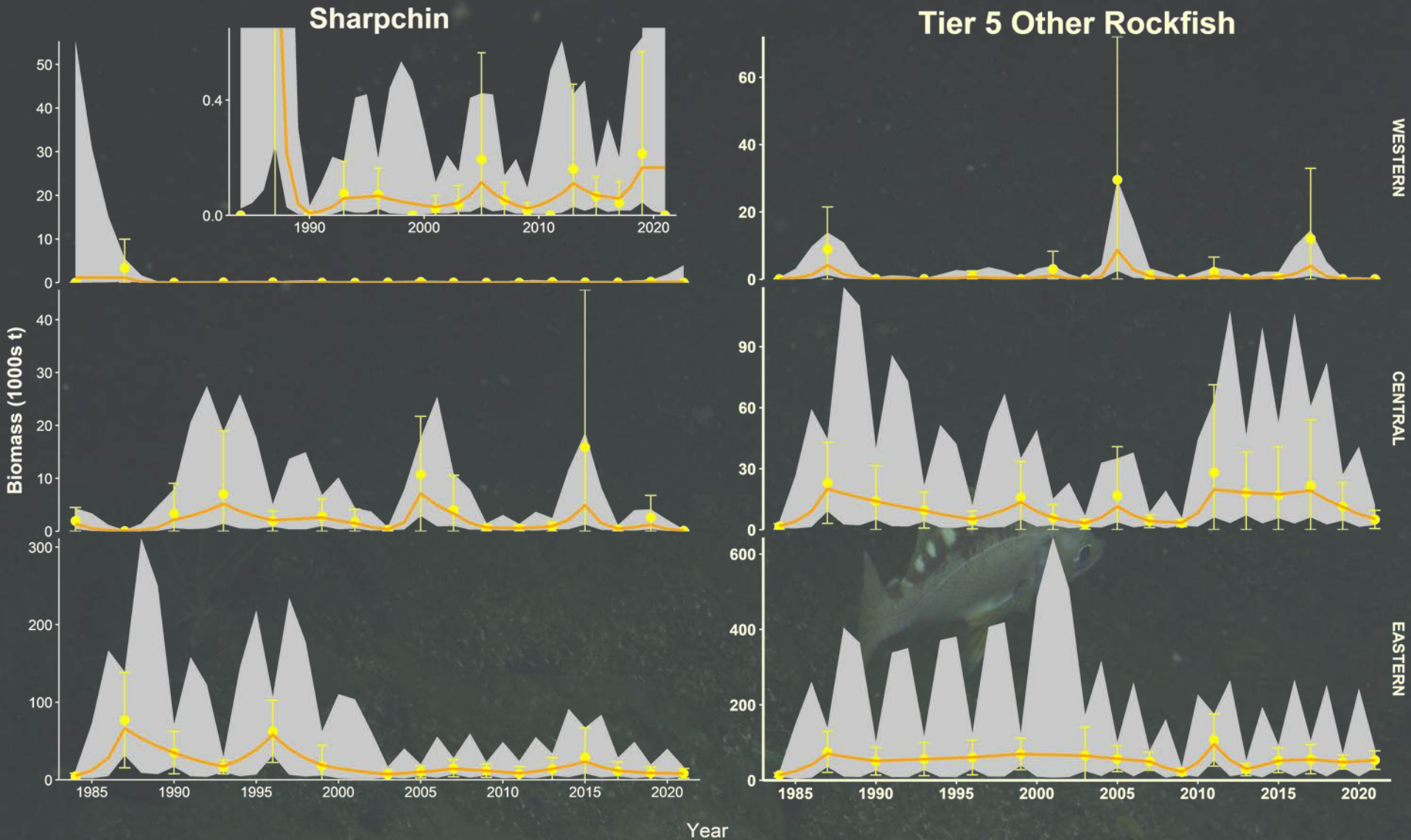
Random Effect Biomass

- 2015 first use of Weighted M
- Weighted M responsive to proportional biomass of Tier 5 species
- < high M species + and > low M species = reduced Wted M
- 2019 WtM = 0.070
- 2021 WtM = 0.055



Years prior to 2015 are what the WtM would have been using the same method

Random Effects Biomass



Harvest Recommendations

- Tier 4/5 status quo method (all slope sub-group)

Model	Group	Tier	2021 RE		OFL	F_{ABC}	ABC
			Biomass	F_{OFL}			
15.1	Sharpchin	4	8,638	$F_{35\%} = 0.079$	682	$F_{40\%} = 0.065$	561
15.1	M=0.05 Group	5	41,719				
	M=0.06 Group	5	7,292				
	M=0.07 Group	5	1,941				
	M=0.092 Group	5	303				
	M=0.1 Group	5	2,996				
	Tier 5 Biomass	5	58,687	$F = \text{Wted } M = 0.055$	3,228	$F_{ABC} = 0.75 * F_{OFL}$	2,421
Total Tier 4/5 Gulf Wide					3,910		2,982

Harvest Recommendations

- Tier 6 status quo method
 - All of the demersal sub-group
 - Two slope sub-group species

Maximum Catch (t) 2013-2016

Tier 6 Model 17.1	Western GOA	Central GOA	West Yakutat	E Yak/Southeast
aurora rockfish	0	0.05	0	0
canary rockfish	<0.01	1.15	0.04	NA
China rockfish	0.02	0.83	0.05	NA
copper rockfish	<0.01	0.19	0.01	NA
quillback rockfish	0.63	24.53	1.17	NA
rosethorn rockfish	0.02	0.68	0.62	NA
Shortbelly rockfish	0	0	0	0
tiger rockfish	0.70	3.60	0.13	NA
yelloweye rockfish	48.75	117.17	33.70	NA
Total Tier 6 ABC = 0.75* OFL		152		28
Total Tier 6 OFL			236	

Harvest Recommendations

Model	Tier	2021 Random Effects Biomass	F_{OFL}	OFL	F_{ABC}	ABC
15.1	4	8,638	$F_{35\%} = 0.079$	682	$F_{40\%} = 0.065$	561
15.1	5	58,687	$F_{OFL} = Wted$ $M = 0.055$	3,228	$F_{ABC} =$ $0.75 * F_{OFL}$	2,421
17.1	6			236		180
All Tiers Combined				4,146		3,162

22% Decrease Overall

Area Allocation

Current (2022 – 2023)

Full Complex	W GOA	Central GOA	Eastern GOA		Total
			West Yakutat	E Yakutat/ Southeast	
Area ABC (t)	396		312	2,454	3,162
OFL (t)					4,146

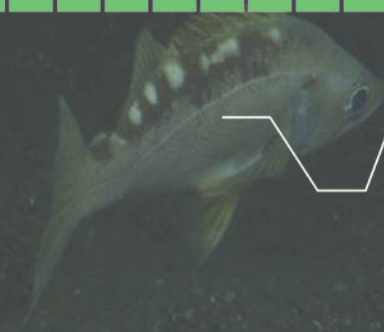
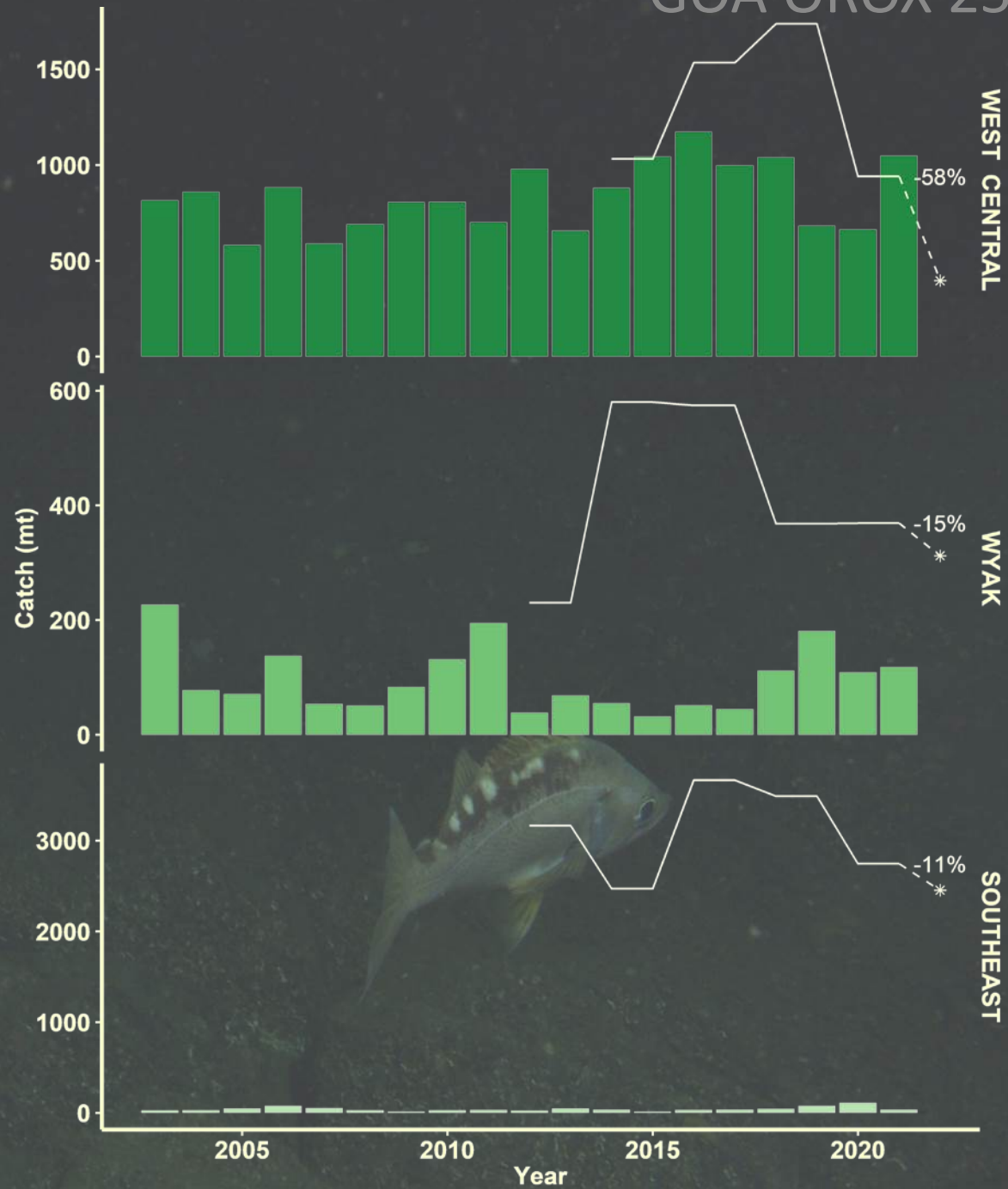
Previous Assessment

Full Complex	W GOA	Central GOA	Eastern GOA		Total
			West Yakutat	E Yakutat/ Southeast	
Area ABC (t)	940		369	2,744	4,053
OFL (t)					5,320

Catch and ABCs

2022

Area	OFL	ABC
WGGOA/ CGOA		396
EGOA		312
WY		2,454
EY/SE		3,162
Total	4,146	3,162



Risk Table

Not updated in this assessment

1. We do not recommend a reduction from the maxABC.
2. The OR complex consists of up to 27 data-limited species. With a complex of this size, a risk table is not informative if it encompasses all of the species.
3. It is difficult to identify a single primary/dominant species, as it changes between assessments. It would be untenable to complete a risk table for each of the 6 primary species.
4. The six primary species are varied in their life histories, fishery characteristics, survey data availability and would be difficult to combine into a single meaningful risk table.
5. If a single species were selected, data are sparse at the individual species level to inform species specific risk tables.
6. Much of the environmental data is borrowed from proxy species or generalizations that may not be informative for all of the species in the complex.

Questions?



Happy Retirement Wayne!

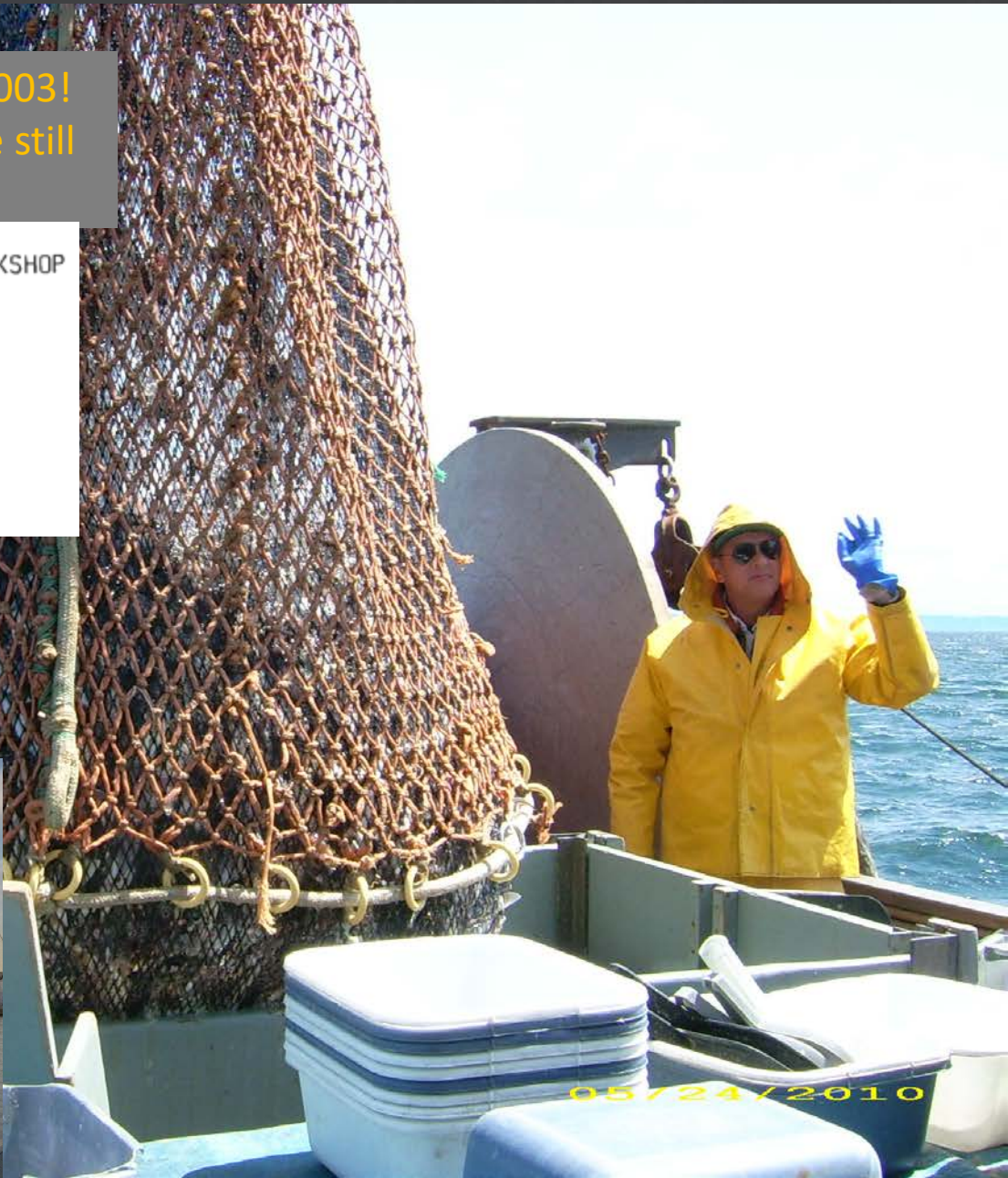
Thanks for being patient with me since 2003!
Your experience and fantastic records are still
needed for the next WGC

PROCEEDINGS OF THE 1983 WESTERN GROUND FISH WORKSHOP

Asilomar Conference Center
Pacific Grove, California
January 10-12, 1983



F/V Chasina



Extra slides



Random Effects Biomass

Workflow A – 2015 PT method	Workflow B – Common Method
<p>Step 1: <i>Calculate M-group biomass/variances using haul-level data</i></p> <p>Step 2: Run RE model for each group</p> <p>Step 3: <i>Calculate a weighted-average of M</i></p> <p>Step 4: repeat Steps 1 and 2 for full complex</p> <p>Step 5. <i>Calculate complex ABCs and OFLs using the weighted-average M and complex biomass</i></p>	<p>Step 1: <i>Sum species-level GAP estimates to get M-group biomass/variances</i></p> <p>Step 2: Run RE model for each group</p> <p>Step 3: Calculate M-group ABCs and OFLs for each M-group</p> <p>Step 4: <i>Calculate complex ABCs and OFLs summing M-group ABCs and OFLs</i></p>

Risk Table - 2019

Assessment-related considerations

Level 1: Typical to moderately increased uncertainty/min or unresolved issues in assessment.

Assessment Considerations

- Bycatch only, limited life history information, mismatch of biomass/catch, poor survey sampling.
- Typical concerns for this complex



Risk Table - 2019

Assessment-related considerations	Population dynamics considerations
Level 1: Typical to moderately increased uncertainty/min or unresolved issues in assessment.	Level 1: Stock trends are typical for the stock; recent recruitment is within normal range.

Population Dynamics

- Biomass is characterized by large inter-survey swings and trends are difficult to detect.
- Typical for this complex



Risk Table - 2019

Assessment-related considerations	Population dynamics considerations	Environmental/ecosystem considerations
Level 1: Typical to moderately increased uncertainty/min or unresolved issues in assessment.	Level 1: Stock trends are typical for the stock; recent recruitment is within normal range.	Level 1: No apparent environmental/ecosystem concerns

Environmental/Ecosystem Considerations (provided by Ellen Yasumiishi)

- Limited information for rockfish, especially this complex
- Indicators are unclear, some above others below average, all based on other species.

Risk Table - 2019

Assessment-related considerations	Population dynamics considerations	Environmental/ecosystem considerations	Fishery Performance considerations
Level 1: Typical to moderately increased uncertainty/min or unresolved issues in assessment.	Level 1: Stock trends are typical for the stock; recent recruitment is within normal range.	Level 1: No apparent environmental/ecosystem concerns	Level 1: No apparent fishery/resource-use performance and/or behavior concerns

Fishery Performance

- No directed fishing, spatial mismatch between biomass and catch
- Recent increase in retention, however, not indicative of increased catch or targeting

