

Thornyhead Complex GOA Groundfish Plan Team

September, 2026
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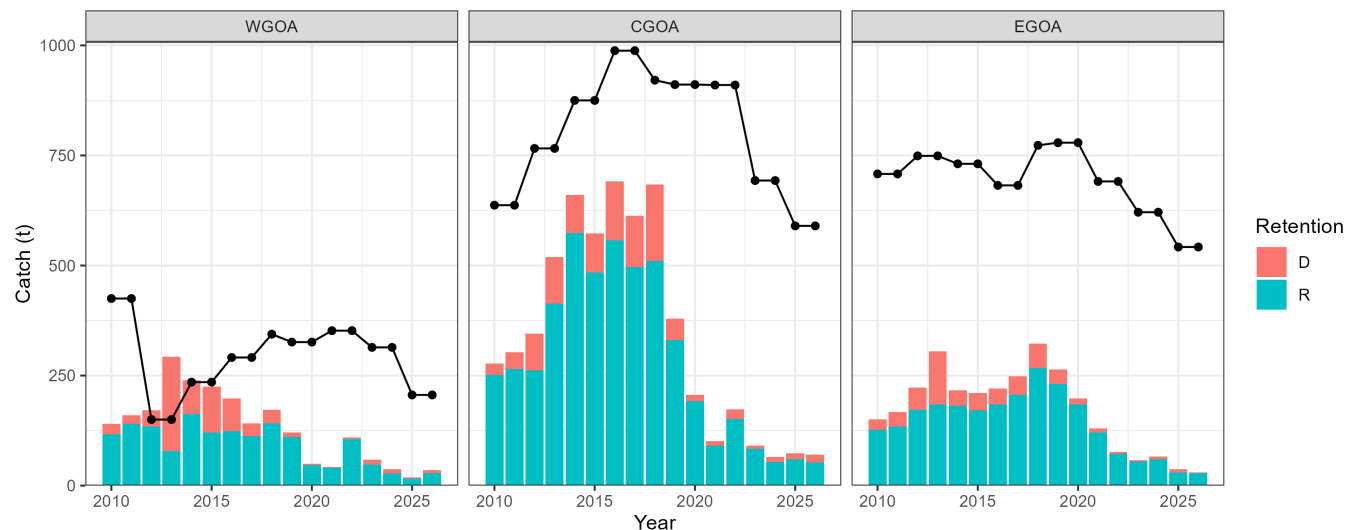


GOA Thornyhead Complex (Tier 3)

Overview

- Thornyhead complex
 - Shortspine thornyhead (longspine thornyhead in complex but not model)
- Previously accepted model (M24.2)
 - Trawl and longline surveys using *rema* (1 PE, 1 scaling parameter q , and 2 extra survey OE)
 - 3 regions (W,C, and E)
 - 3-trawl depth strata (0-500m, 501-700m, and 701-1000m)
 - Longline index from 150 to 1000m
- New data
 - 2025 trawl (biomass estimate) and longline (biomass index) surveys
- Changes in assessment methodology
 - To accommodate 2025 restratification of trawl survey, 3 options for combining 0-500m and 501-700m to 0-700m (i.e., 3 depth strata to 2 depth strata)
 - Must choose a new model as the previously accepted model cannot be updated with new data

Catch Update Through 8/25/26

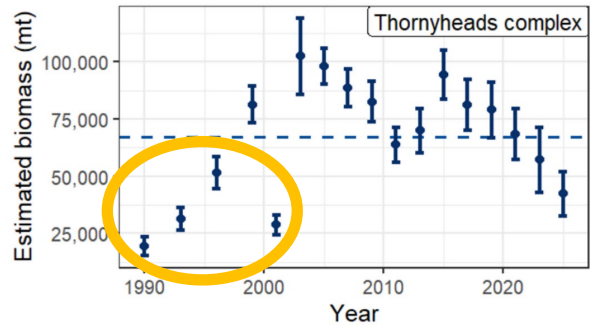


- ABC (black points and line) are not being caught
- Catches remain low following transition from hook and line to pots for sablefish

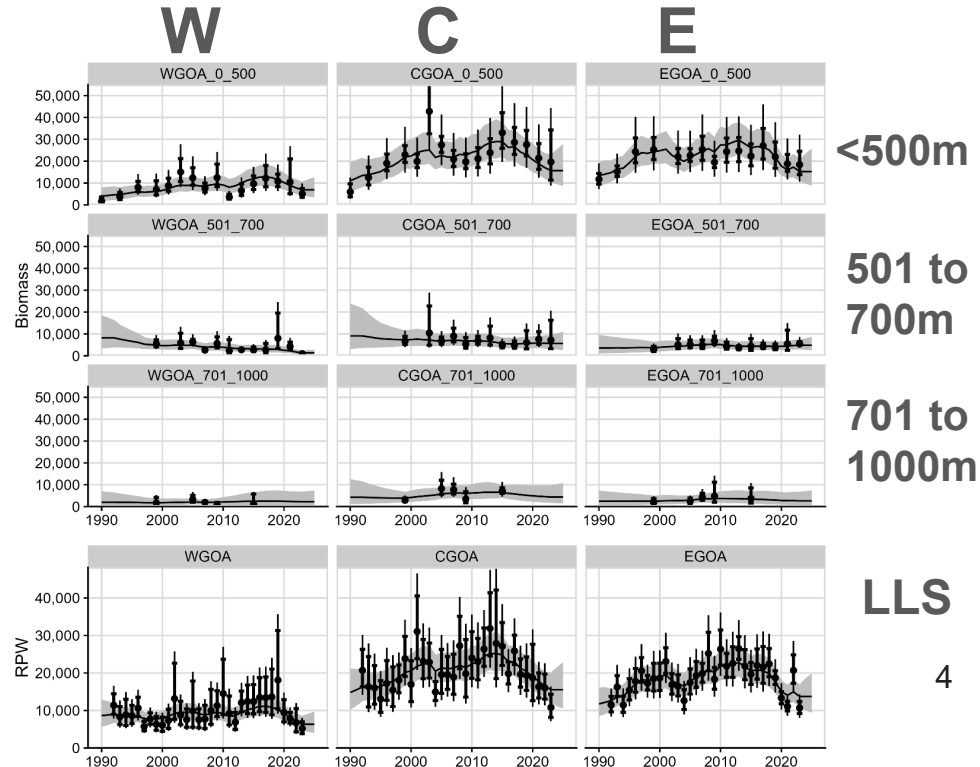
Status quo

Why is the trawl survey depth stratified in this assessment?

From '25 PT trawl survey:



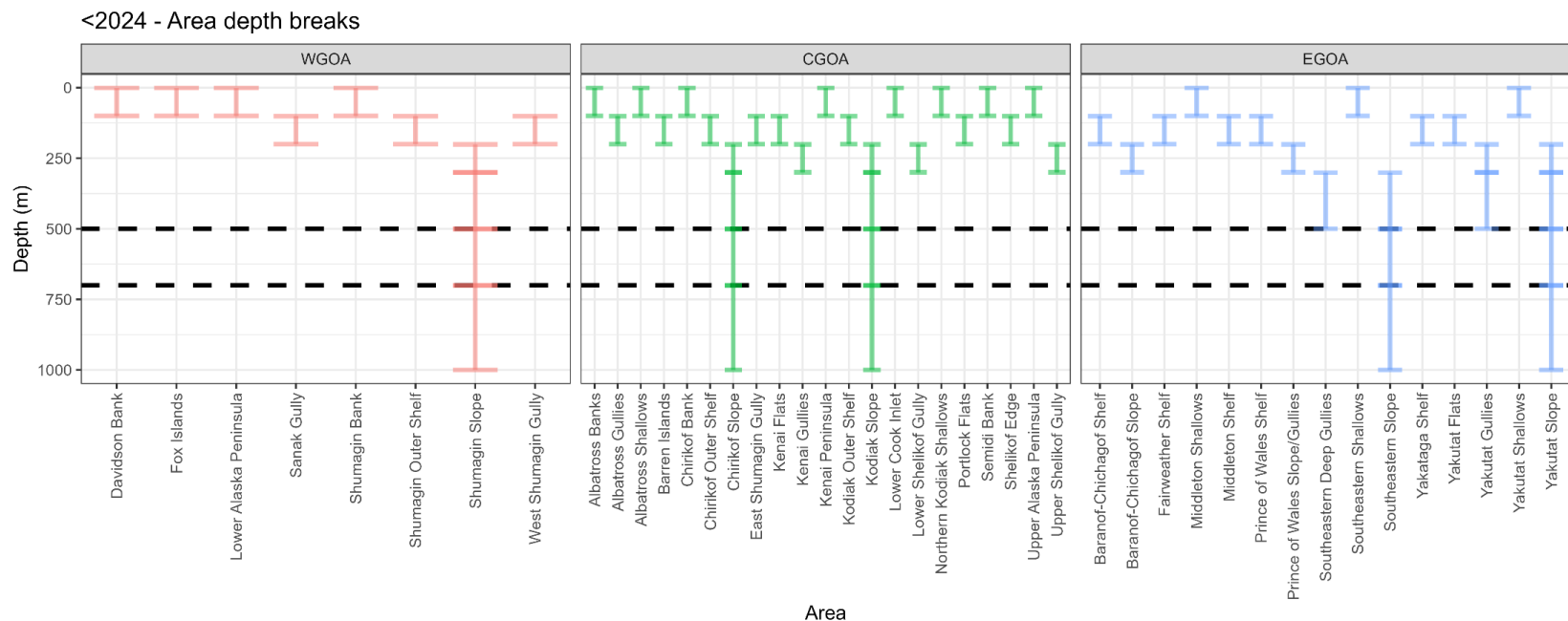
- Biomass depth stratified to accommodate missing years
- Longline survey 150-1000m, no changes
- Changes from GOA trawl restratification in 2025 require new depth strata.



GOA Trawl Survey

Prior to Restratification (59 strata)

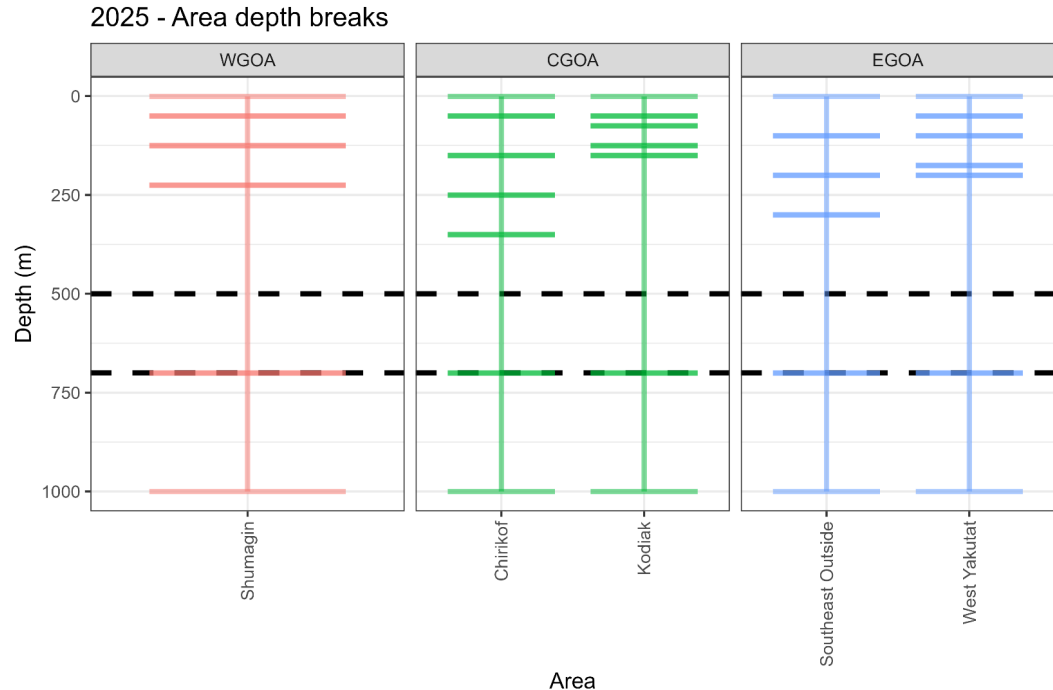
- Depth breaks consistent (500/700 m) across areas



GOA Trawl Survey

Post Restratification (28 strata)

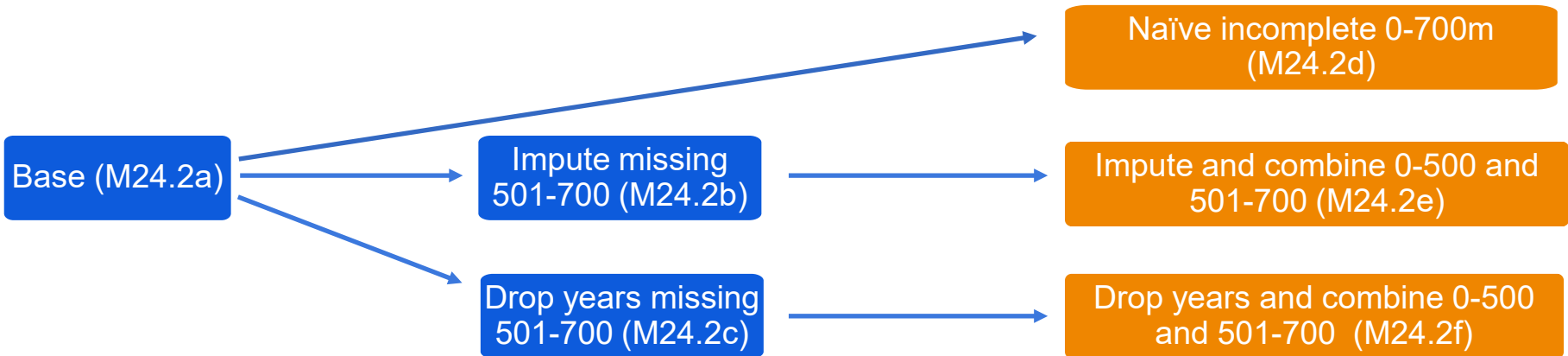
- No longer depth breaks at 500 m, which impacts treatment of past years with biomass estimates for 0-500 but not 501-700
- >700m not sampled in 2025, and likely not in future



Bridging models for post-restratified trawl data

Combine 0-500m and 501-700m

W(0-500m)	C(0-500m)	E(0-500m)	}	W(0-700m)	C(0-700m)	E(0-700m)
W(501-700m)	C(501-700m)	E(501-700m)		W(701-1000m)	C(701-1000m)	E(701-1000m)
W(701-1000m)	C(701-1000m)	E(701-1000m)				
(1990 to 2023)				(1990 to 2025+)		



Bridging models for post-stratified trawl data

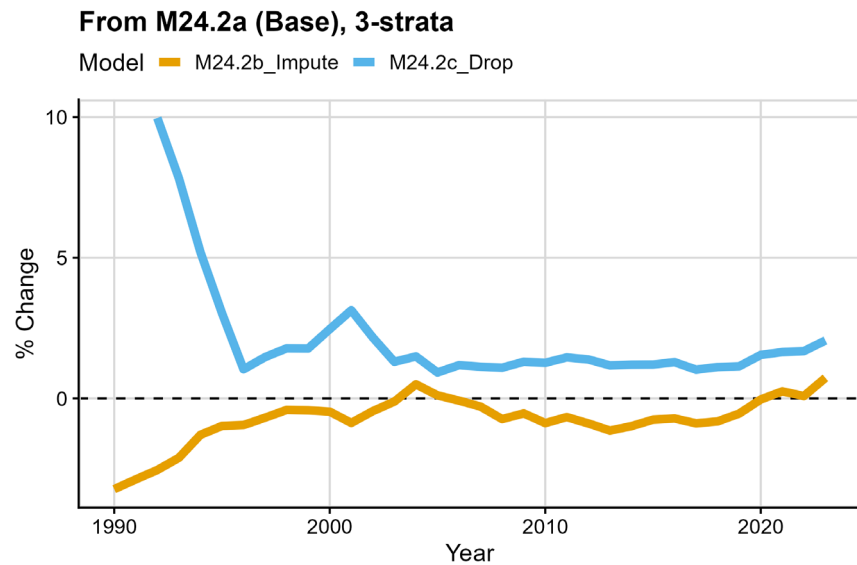
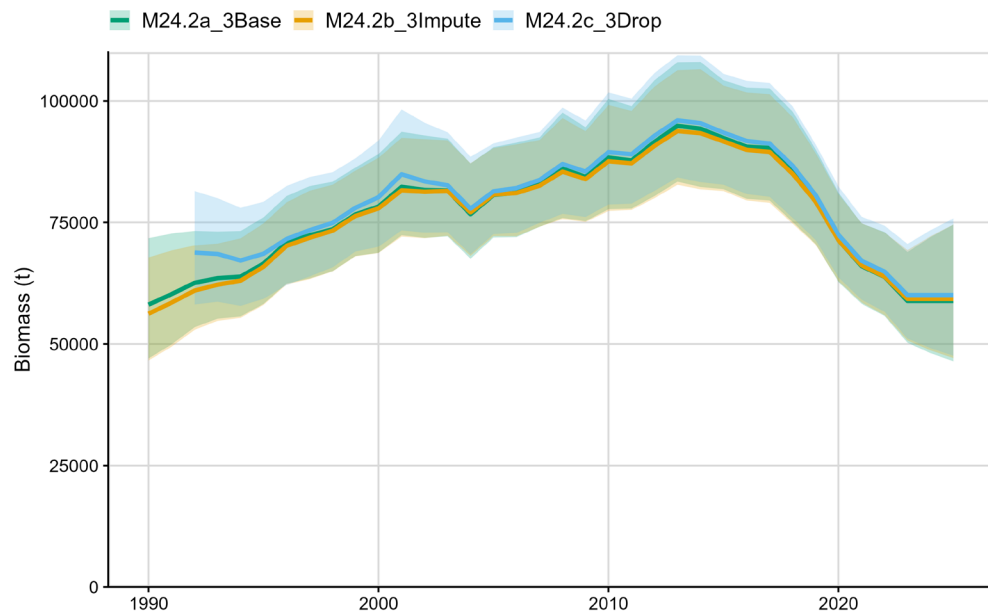
Combine 0-500m and 501-700m

1. 3-depth strata to 2023
 - a. 'Base' (M24.2a *rema* update of base model M24.2)
 - b. 'Impute' missing 501-700m (M24.2b)
 - Use area/strata mean value with large CV = 0.5
 - c. 'Drop' years with missing 501-700m
2. 2-depth strata to 2023
 - a. Base ('naïve') ignore missing 501-700m (M24.2d)
 - b. 'Impute' missing 501-700m (M24.2e)
 - c. 'Drop' years with missing 501-700m (M24.2f)
3. Add 2025 data (2-depth strata only) to M24.2d, M24.2e, and M24.2f



Bridging models for post-stratified trawl data

3-depth strata to 2023



- Little difference in recent years
 - LLS drives biomass estimates when earlier years are dropped

Bridging models for post-stratified trawl data

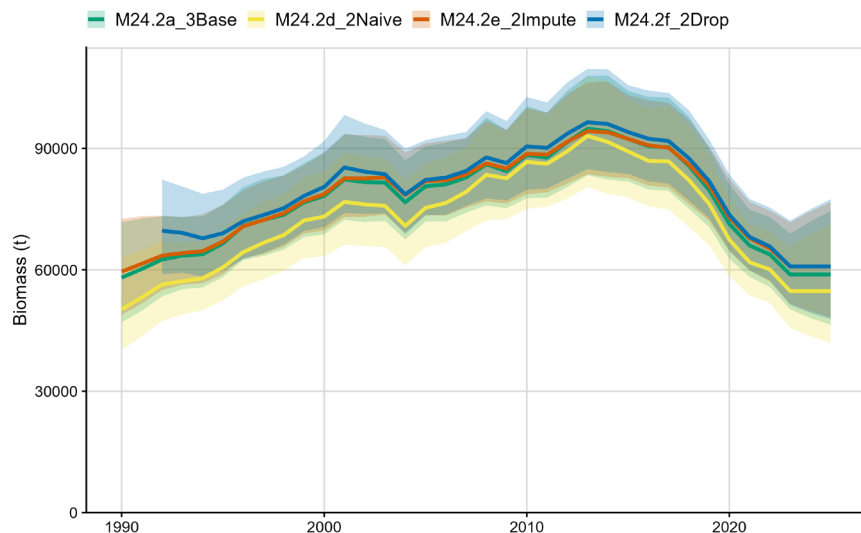
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 - b. 'Impute' missing 501-700m (M24.2e)
 - c. 'Drop' years with missing 501-700m (M24.2f)
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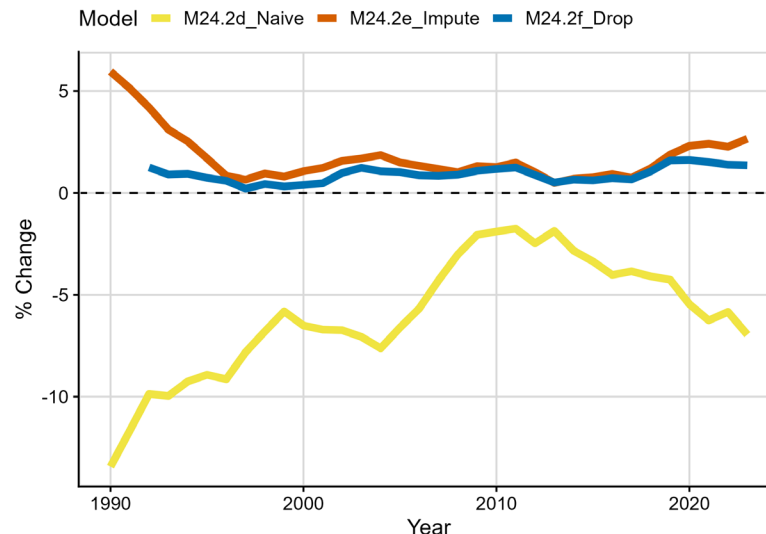


Bridging models for post-stratified trawl data

2-depth strata to 2023



From 3 to 2 trawl depth strata



- Naïve M24.2d leads to drop in estimated biomass
 - Don't recommend pursuing
- Going from 3 to 2 strata slightly increases estimated biomass for M24.2e and M24.2f

Bridging models for post-stratified trawl data

Combine 0-500m and 501-700m

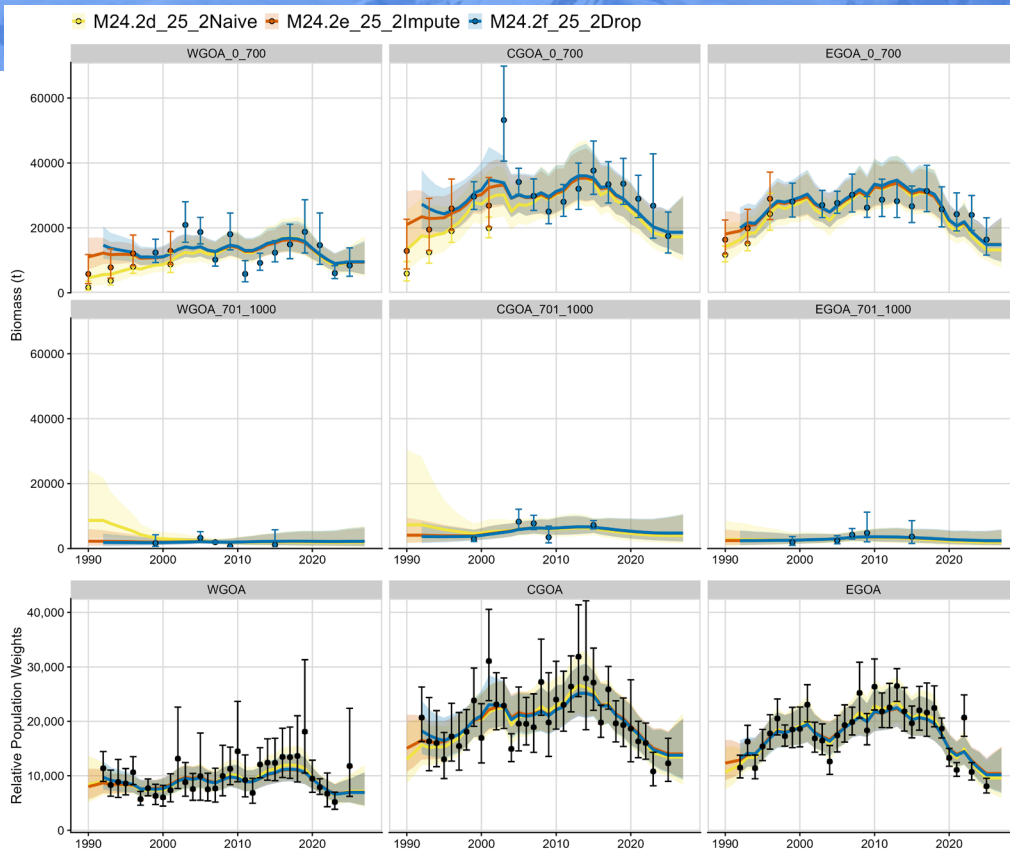
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Bridging models for post-stratified trawl data

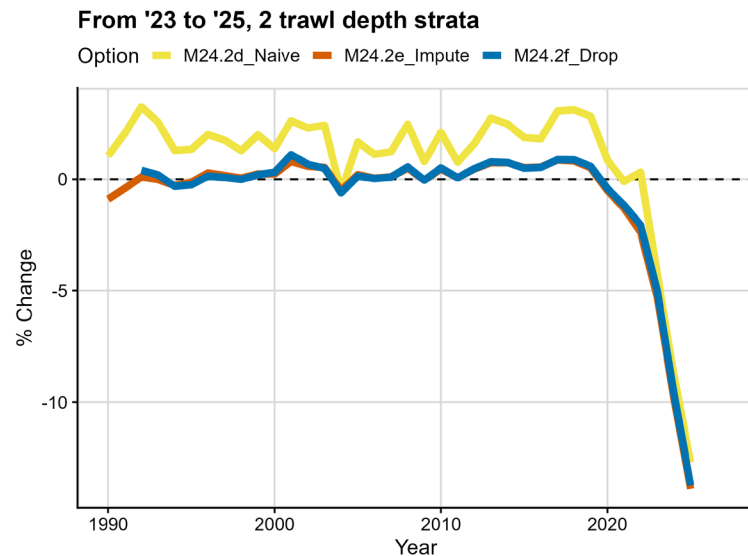
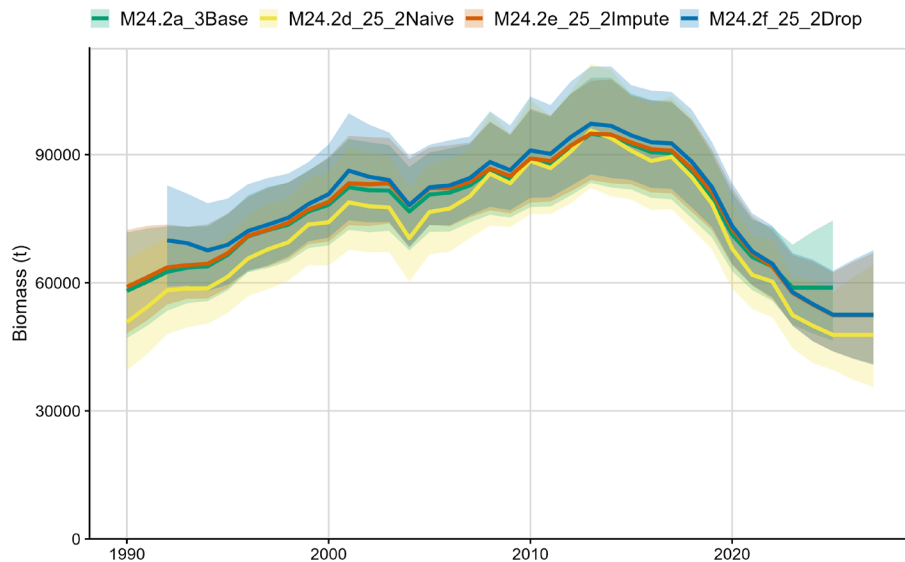
2-depth strata to 2025

- Survey estimates from 2025 varied
 - WGOA, both increased
 - CGOA, trawl down longline up
 - EGOA, both decreased



Bridging models for post-stratified trawl data

2-depth strata to 2025



- All models estimate declines of >10% with addition of 2025 from previous runs
 - Imputation/dropping estimates are nearly identical while naïve model estimate is lower

Recommendations for 2026

Management Advice and Biologically-informed Recommended Distributions (BRDs)

Model	2027 Biomass	OFL	ABC	Change from '26
M24.2d	47,797	1,434	1,075	-20%
M24.2e	52,401	1,572	1,179	-12%
M24.2f	52,513	1,575	1,182	-12%

Model	Area	2027 Biomass	BRD	Change from '26
M24.2d	WGOA	11,347	255	24%
M24.2d	CGOA	21,264	478	-19%
M24.2d	EGOA	15,185	342	-37%
M24.2e	WGOA	11,641	262	27%
M24.2e	CGOA	23,389	526	-11%
M24.2e	EGOA	17,371	391	-28%
M24.2f	WGOA	11,799	265	29%
M24.2f	CGOA	23,431	527	-11%
M24.2f	EGOA	17,284	389	-28%

- Recommend M24.2f because no imputation, though M24.2e nearly identical

Questions?

Thanks to all the vessels, crews, and biologists from the GAP bottom trawl survey and MESA longline survey for collecting and processing this data.



Extra slide: parameter estimates

Model	Strata	Final Year	BTS Data	PE	q	BTS+OE	LLS+OE
M24.2*	3	2023	All	0.15	0.60	0.25	0.14
M24.2a	3	2023	All	0.15	0.61	0.14	0.07
M24.2b	3	2023	Impute	0.14	0.61	0.14	0.08
M24.2c	3	2023	Drop	0.14	0.59	0.15	0.07
M24.2d	2	2023	Naive	0.14	0.64	0.18	0.07
M24.2e	2	2023	Impute	0.11	0.60	0.09	0.08
M24.2f	2	2023	Drop	0.12	0.59	0.10	0.07
M24.2d	2	2025	Naive	0.16	0.63	0.16	0.06
M24.2e	2	2025	Impute	0.12	0.60	0.09	0.07
M24.2f	2	2025	Drop	0.13	0.59	0.10	0.07

Extra slide: model validation

- Estimation of extra observation errors by survey allows for reasonable process error estimates but leads to identifiability issues.
- Instead of estimating extra observation errors, considering using a minimum CV on survey estimates or setting a prior on the process error to keep it within expectation for thornyhead life history.

Extra slide: model-based index

- Explore using sdmTMB with depth as a covariate.
- Of particular interest with the restratification, as 2025 decrease could be more tied to survey changes than true decline.

