Thornyhead Complex
GOA Groundfish Plan Team

November, 2026

Kevin Siwicke and Katy Echave

NOAA FISHERIES

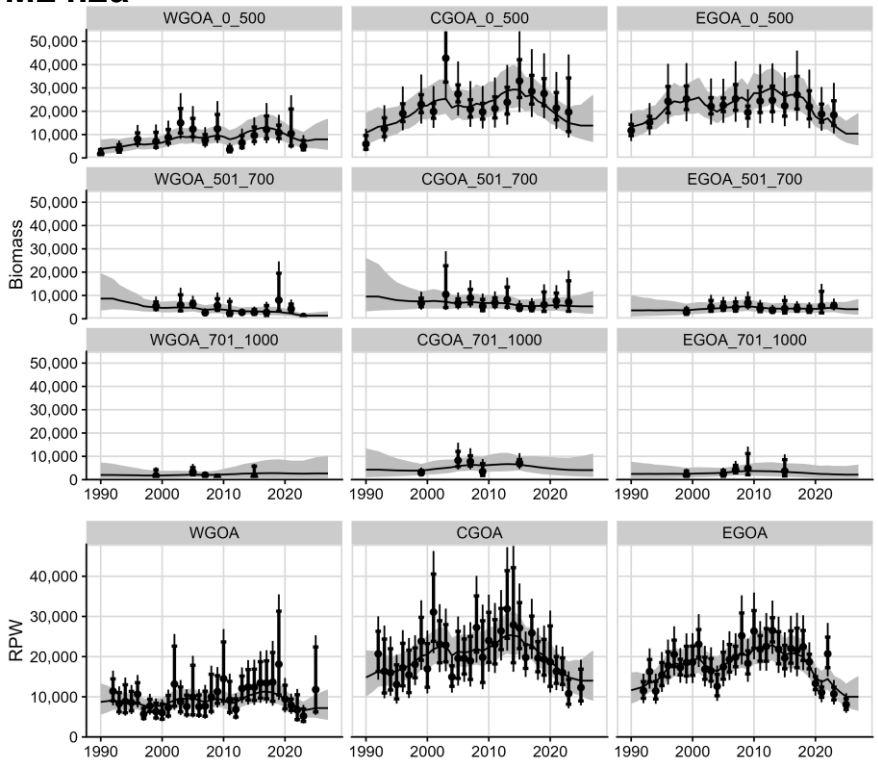


GOA Thornyhead Complex (Tier 5)
Overview

- Thornyhead complex
  - Shortspine thornyhead (longspine thornyhead make up ~2% of complex biomass but not in model)
- Previously accepted model (M24.2, continuity is **M24.2a** with *rema* package update)
  - Trawl and longline surveys (REMA: 1 proc. err., 1 scaling parameter *q*, and 2 extra survey obs. err.)
  - 3 regions (W,C, and E)
  - 3-trawl depth strata (0-500m, 501-700m, and 701-1000m) from 90, 93, 96, and biennial from 99 to 23
  - Longline index from 150 to 1000m (1992 to 2023, 2025)
- Alternative model (**M26**)
  - Trawl and longline surveys (REMA: 1 proc. err., 1 scaling parameter *q*, and 2 extra survey obs. err.)
  - 3 regions (W,C, and E)
  - **2-trawl depth strata (0-700m, and 701-1000m) from 99 and biennial from 03 to 25**
  - Longline index from 150 to 1000m (1992 to 2023, 2025)
- New data
  - 2025 trawl (biomass estimate only in M26) and longline (biomass index in both M24.2a/M26) surveys

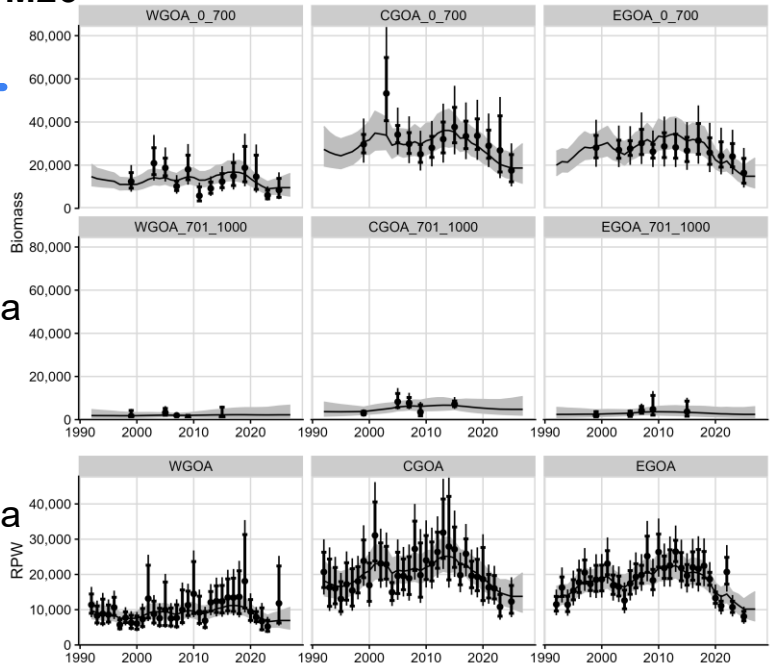
Transition from M24.2a to M26

M24.2a



Combine depths, delete 90, 93, 96, and 01 trawl

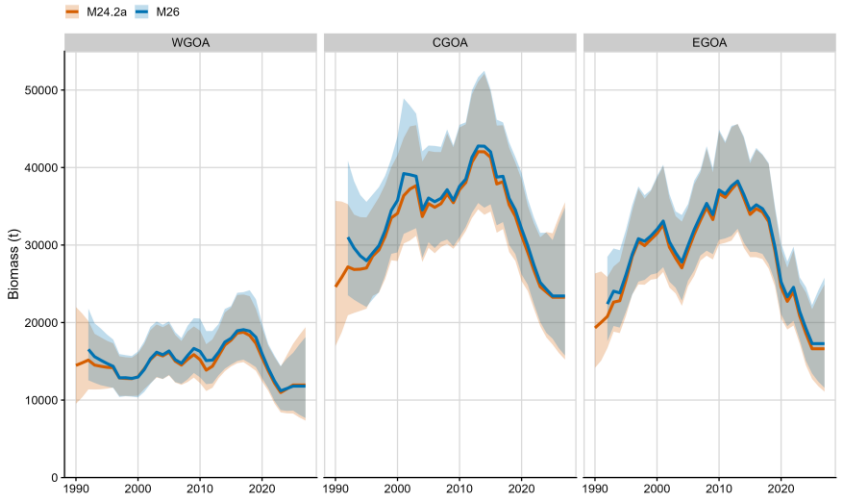
M26



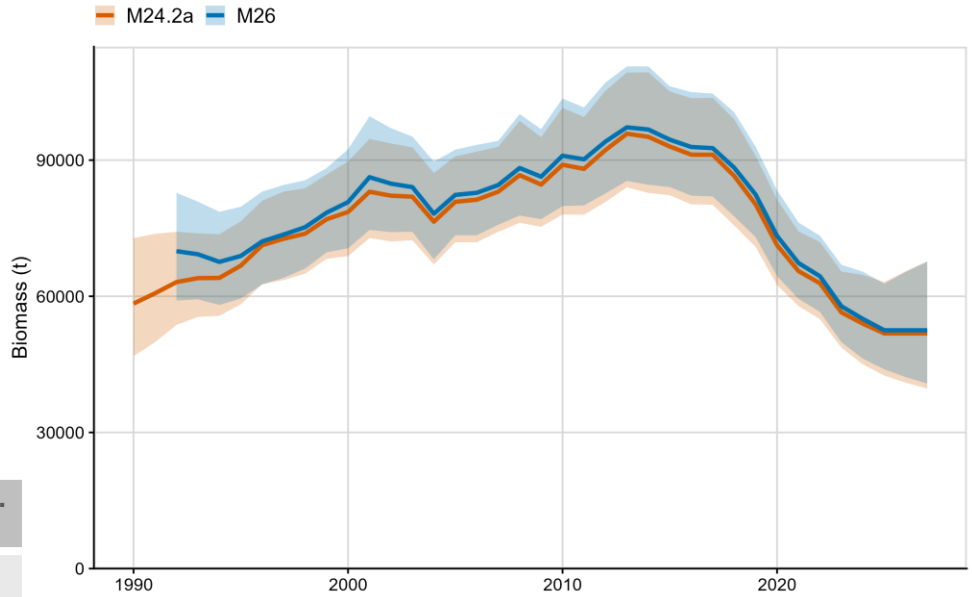
Same data

Same data

Transition from M24.2a to M26



Model	Proc. Error	*q*	BTS+ Obs. Err.	LLS+ Obs. Err.
M24.2a	0.16	0.60	0.14	0.07
M26	0.13	0.59	0.10	0.07



Summary of Results

Quantity	As estimated or *specified in 2024* for: 2025	2026	As estimated or *recommended this* year for: 2027	2028
M (natural mortality rate)	0.03	0.03	0.03	0.03
Tier	5	5	5	5
Biomass (t)	59,459	59,459	52,513	52,513
F_{OFL}	0.03	0.03	0.03	0.03
$maxF_{ABC}$	0.0225	0.0225	0.0225	0.0225
F_{ABC}	0.0225	0.0225	0.0225	0.0225
OFL (t)	1,784	1,784	**1,575**	1,575
maxABC (t)	1,338	1,338	1,182	1,182
ABC (t)	1,338	1,338	**1,182**	1,182
Status	As determined in 2024 for: 2023	2024	As determined *this* year for: 2025	2026
Overfishing	No	n/a	No	n/a

Results and Recommendations

Management Advice and Biologically-informed Recommended Distributions (BRDs)

- F_{OFL} = 0.03; F_{ABC} = 0.0225
- Recommend Model 26 (includes 2025 and future trawl estimates)
- Declining trend in both surveys despite low exploitation rate
- Risk Table (1, 1, 1, 1)
  - Recommend ABC = maxABC
- Questions on uncertainty in BRD
  - MC simulation on mean/var in log space?
  - MVN with covariance structure from REMA output, RPW, biomass?
  - Provide estimate/CI of regional proportions?

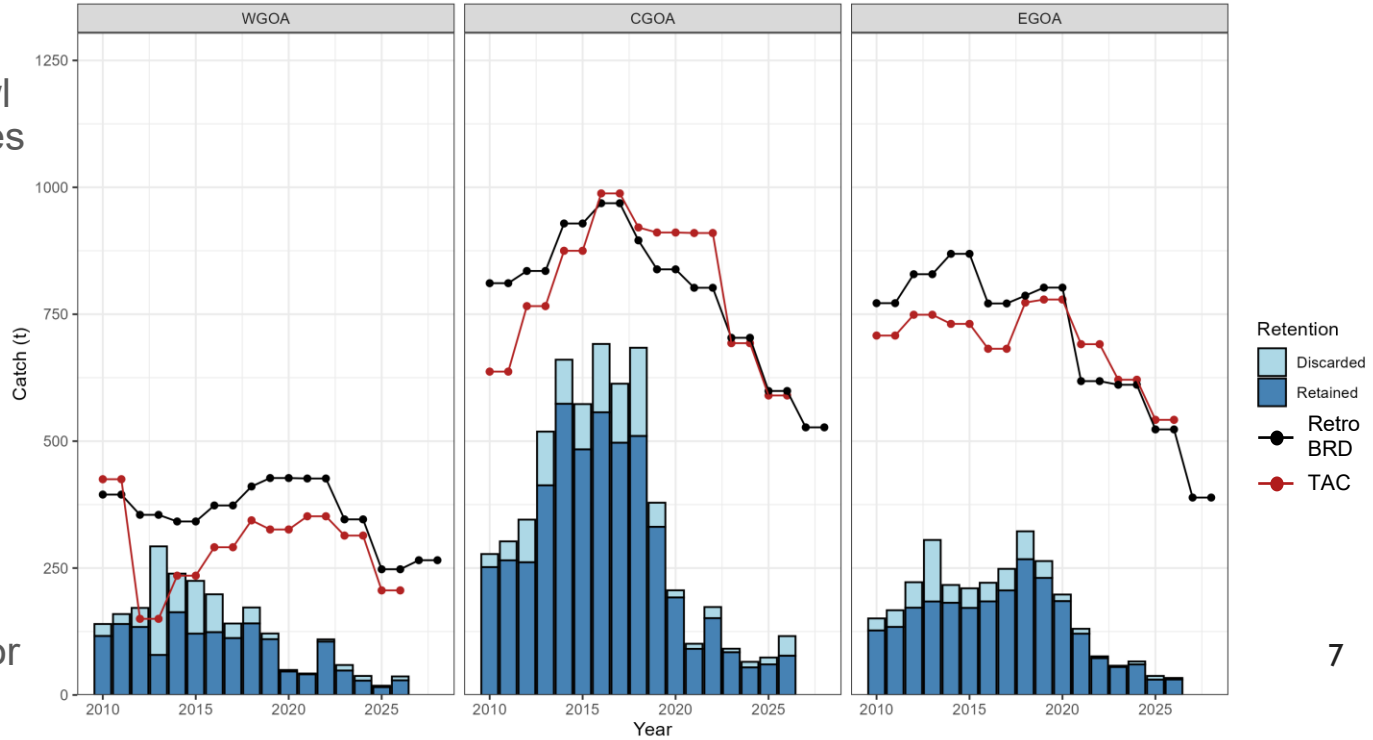
Model	2027 Biomass	OFL	ABC	Change from last
M24.2a	51,821	1,555	1,166	-13%
M26	52,513	1,575	1,182	-12%

Model	Area	2027 Biomass	BRD	Change from last
M26	WGOA	11,799	266	29%
M26	CGOA	23,431	527	-11%
M26	EGOA	17,284	389	-28%

Catch, TAC, and BRDs past/present
Through 10/1/26

BRD/TAC basis:

- 2004 to 2011, last 2 trawl survey biomass estimates
- 2012 to 2015, added extrapolation for trawl survey 701-1000m
- 2016 to 2018 random effects model with trawl survey (3 depth strata)
- 2019 added longline survey index
- 2023 *rema* package
- 2027 from 3 to 2 depth strata (Model 26, used for retro BRDs)



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.

Contact: kevin.siwicke@noaa.gov