Northern Rockfish
GOA Groundfish Plan Team

Ben Williams

November, 2026

ben.williams@noaa.gov



NOAA FISHERIES

GOA Northern Rockfish - Update Assessment Overview

Tier 3a

- 2027 recommended ABC (4,769 t)
  - ~3% lower than 2026
- B43% stock level
- No recommended max ABC reductions

Operational Update Assessment

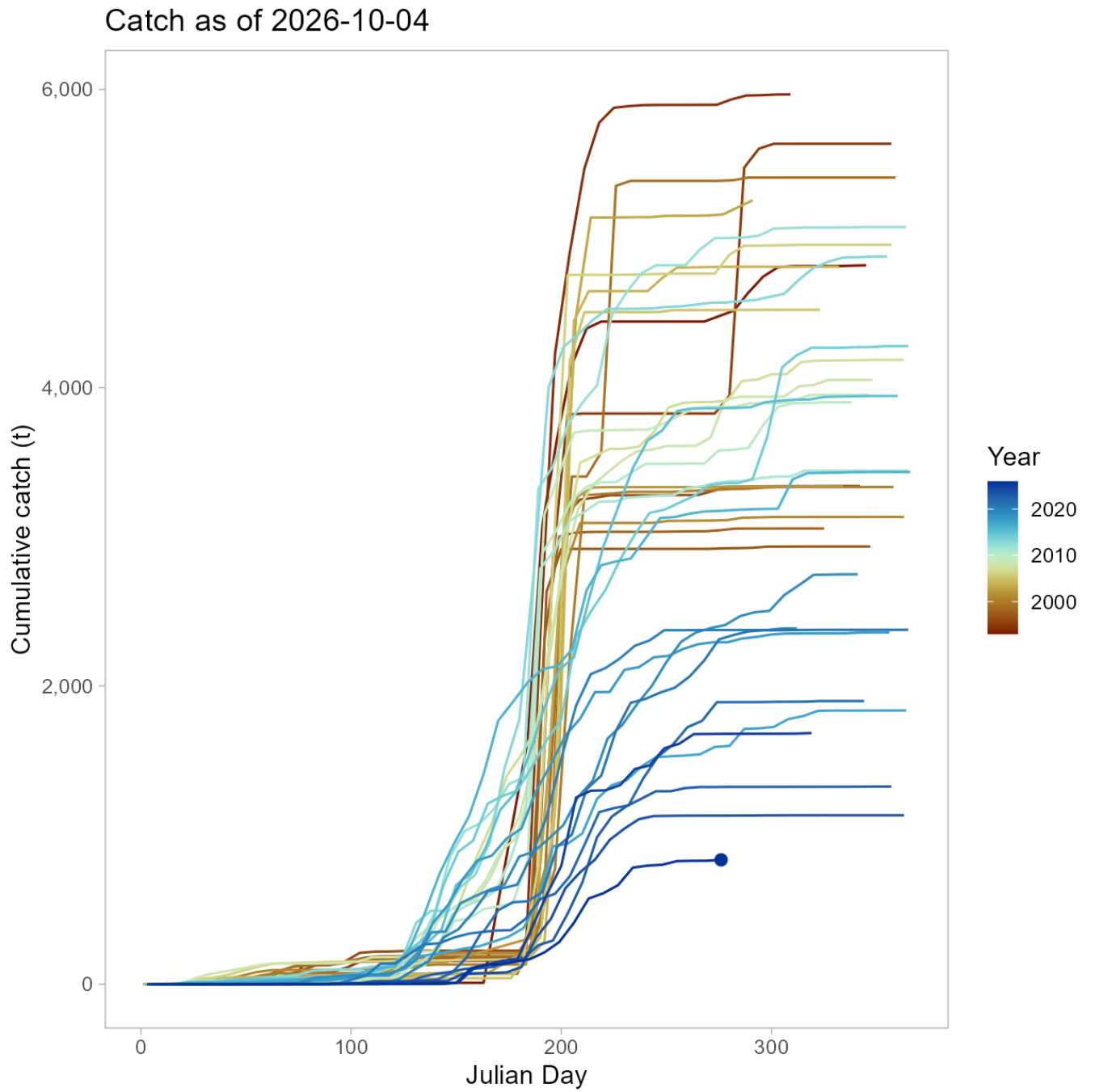
- Model 24 (RTMB)
- Only new data through 2026, no model changes

Source	Data	Years
NMFS Groundfish survey	Survey biomass	1990-1999 (triennial), 2001-2023 (biennial), **2025**
	Age composition	1990-1999 (triennial), 2003-2023 (biennial), **2025**
U.S. trawl fishery	Catch	1961-2023, **2024-2026**
	Age composition	1998-2002, 2004-2006, 2008-2022 (biennial)
	Length composition	1991-1997, 2003, 2007-2023 (biennial), **2024-2025**

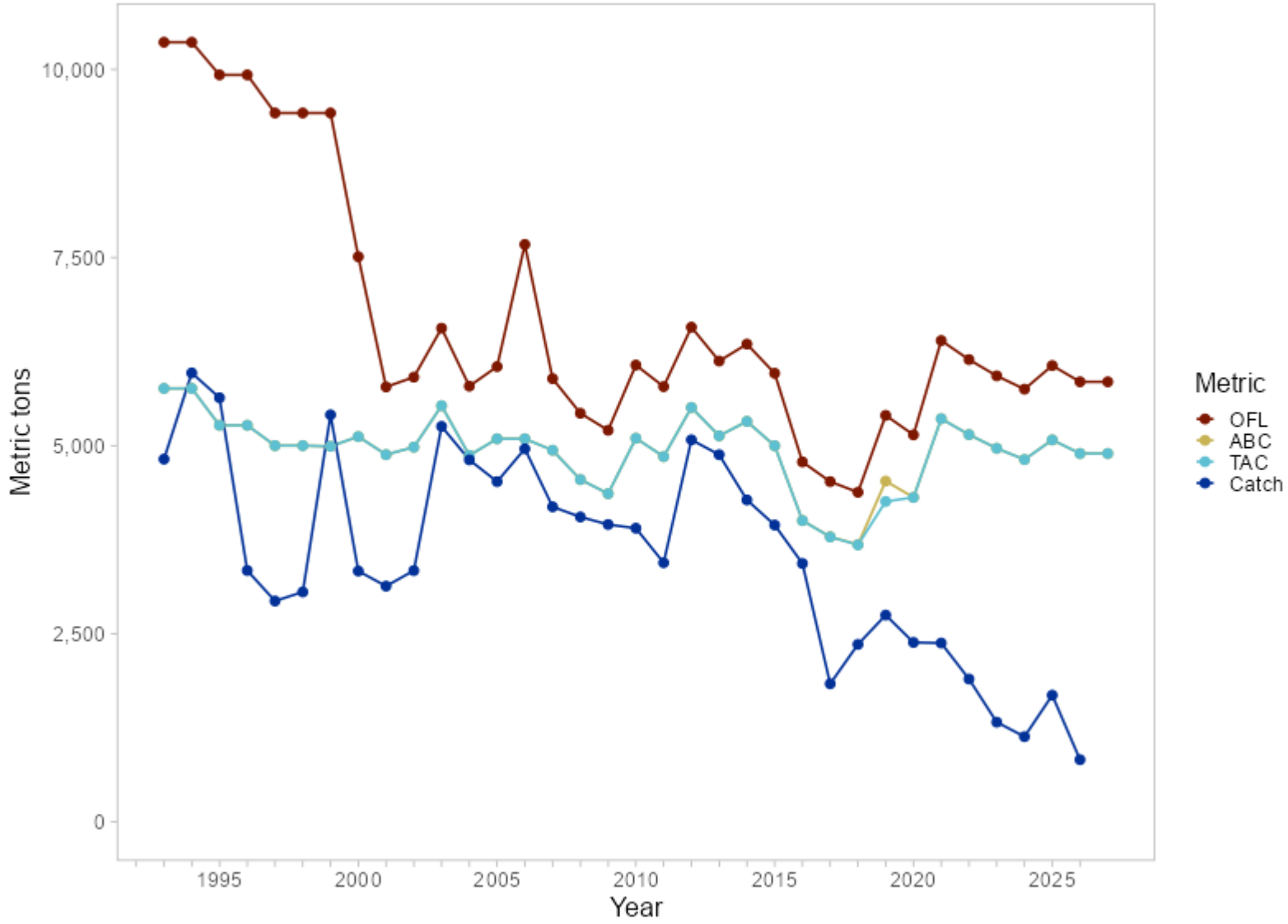


Inputs
Catch

- Substantial decrease in catch in recent years (partially due to market conditions)
- Plot shows 1993-2026

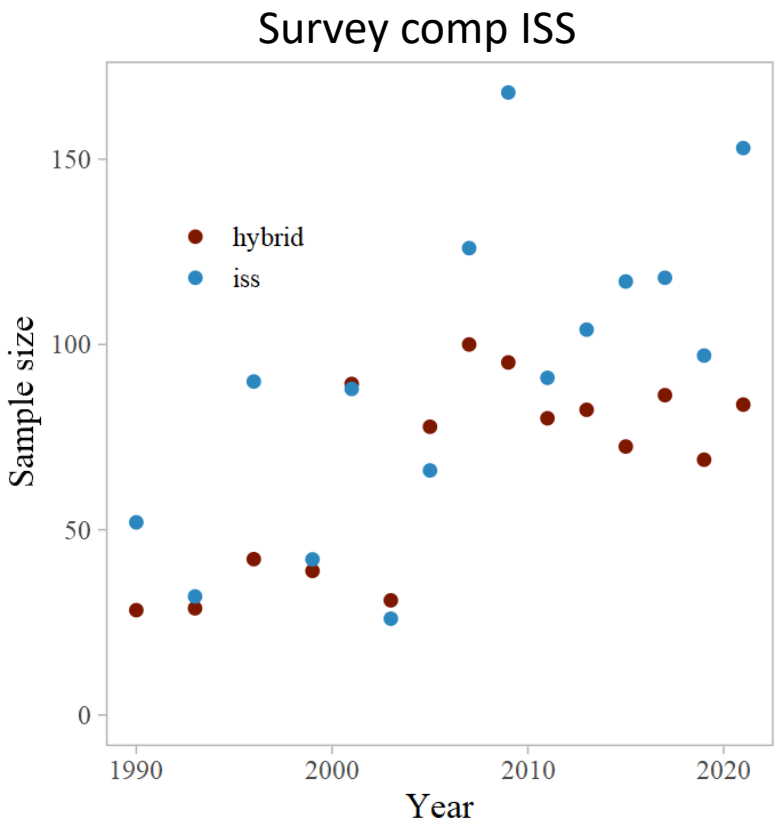


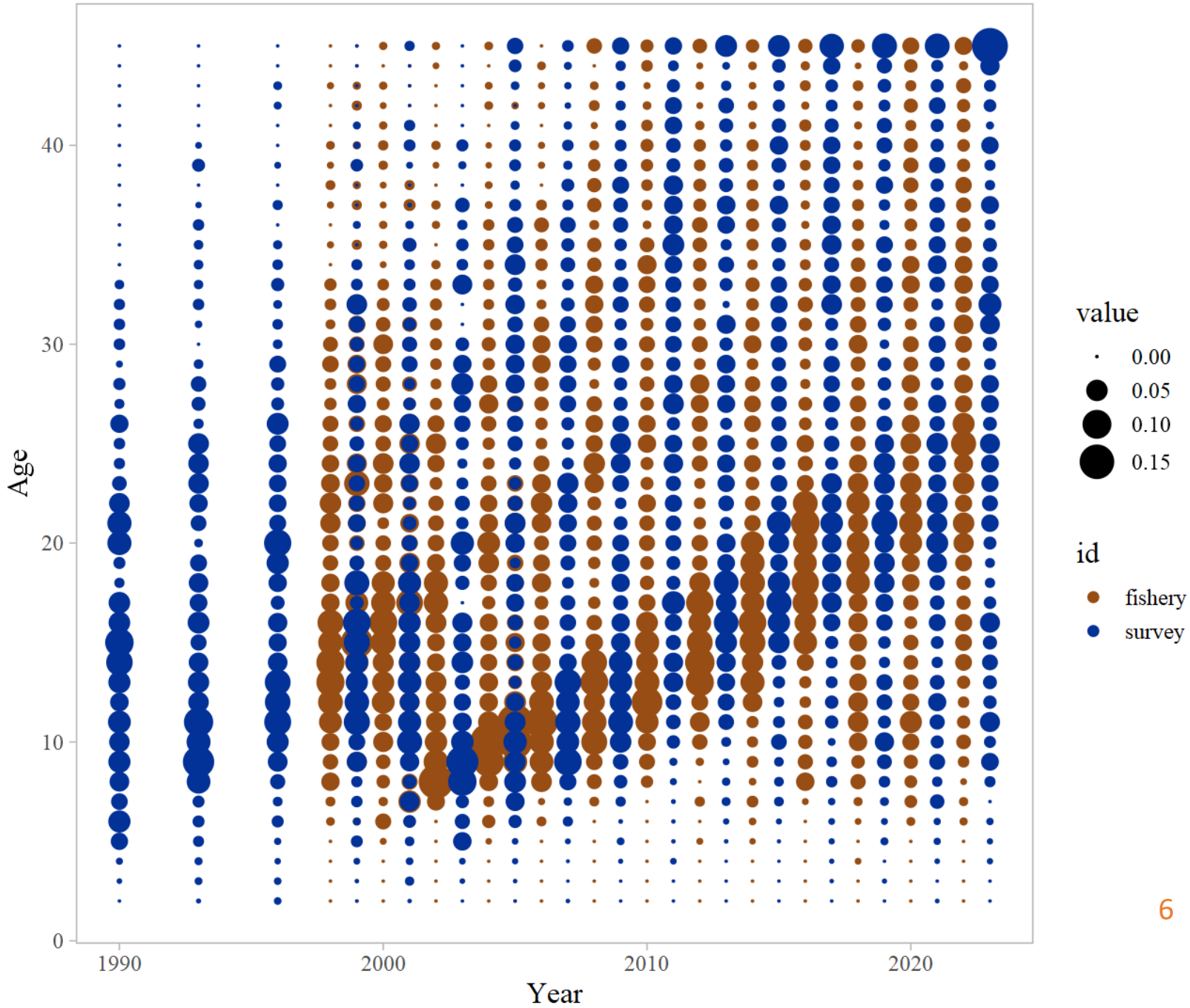
Inputs
Catch



Inputs
age composition

Data weighting: 0.5

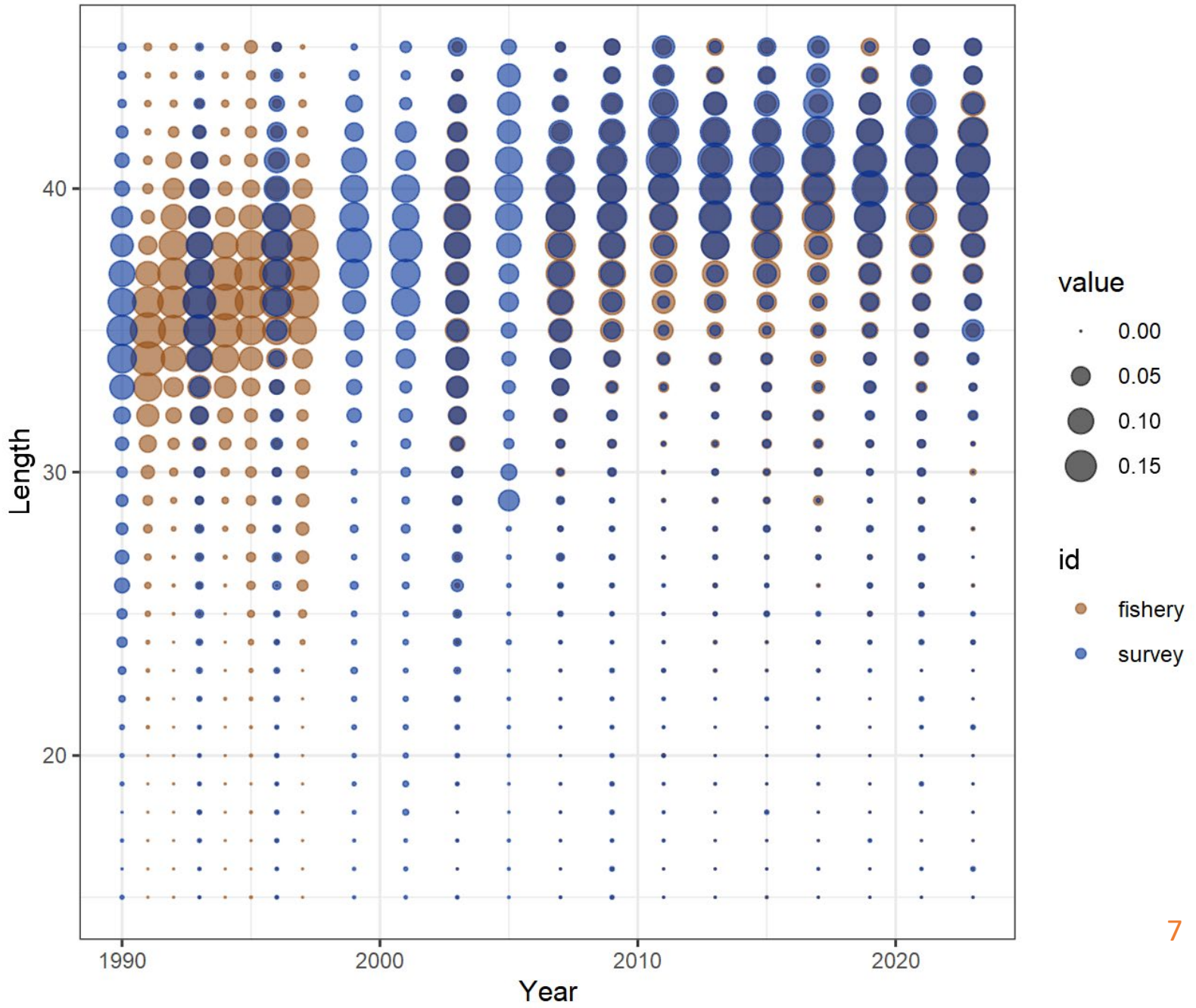




Inputs
size composition

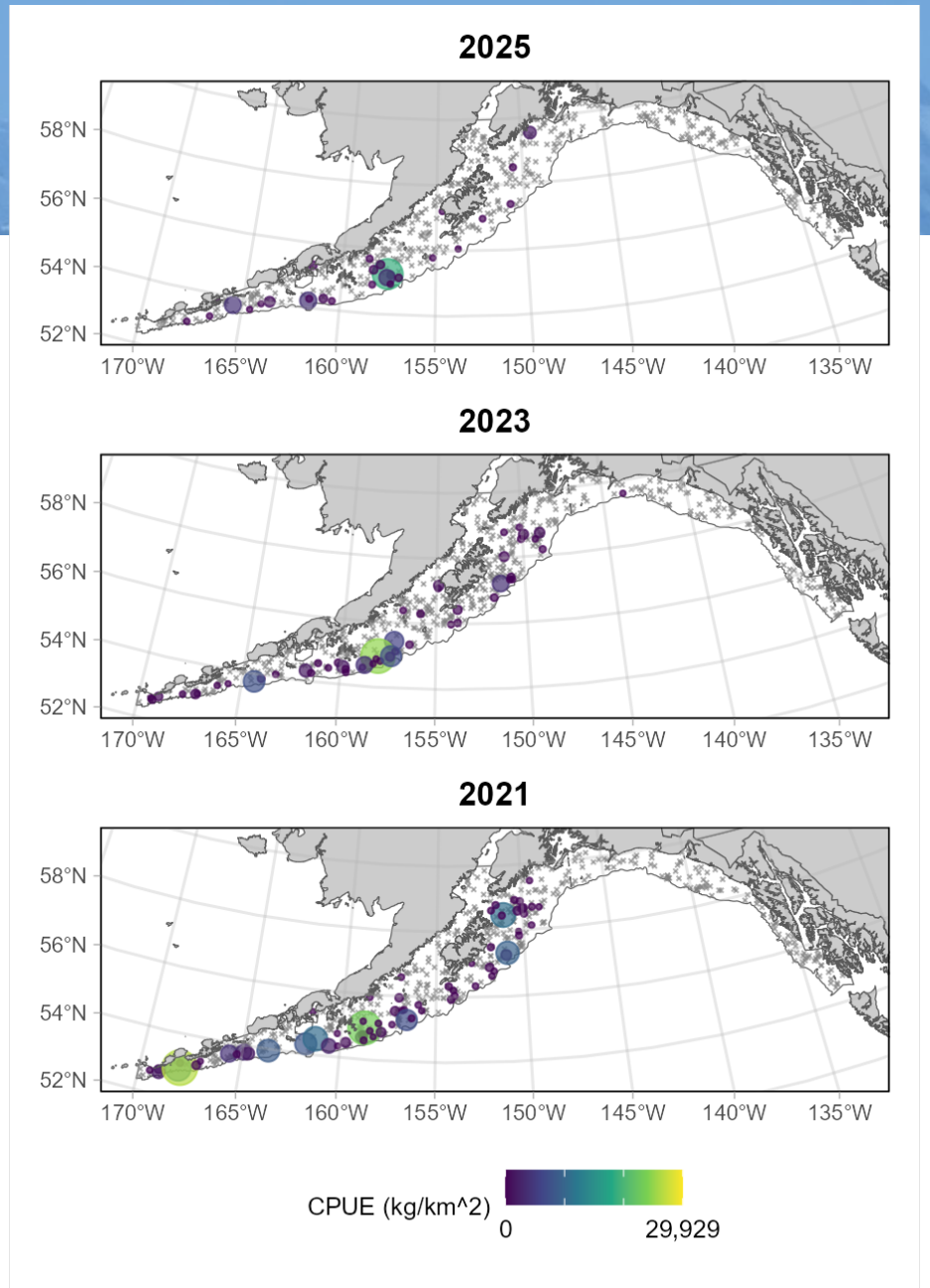
Survey size compositions are not used in the model

Data weighting: 0.5



Survey - biomass

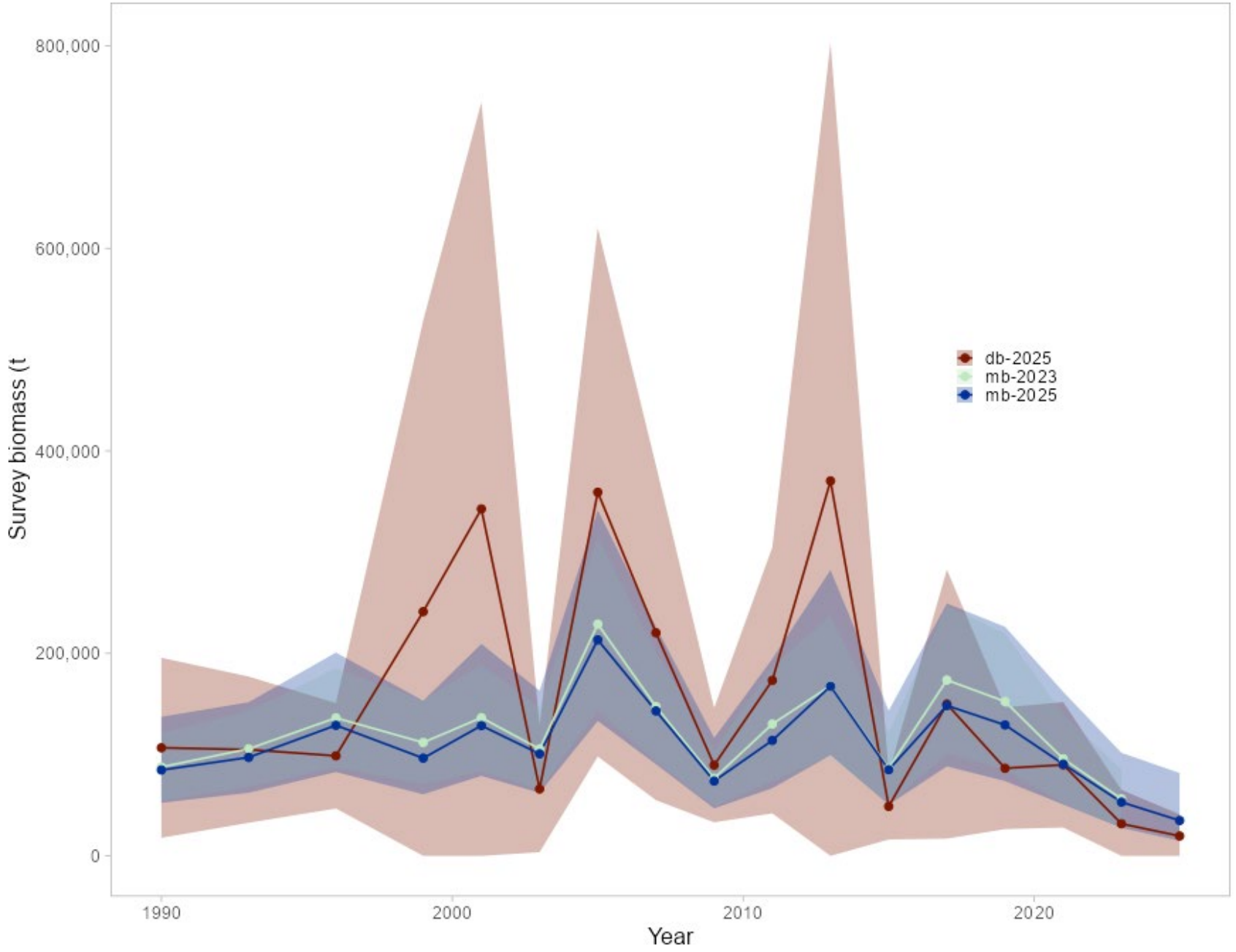
Patchy distribution, trawl survey has had variable effectiveness (or large population swings?)



Survey - biomass

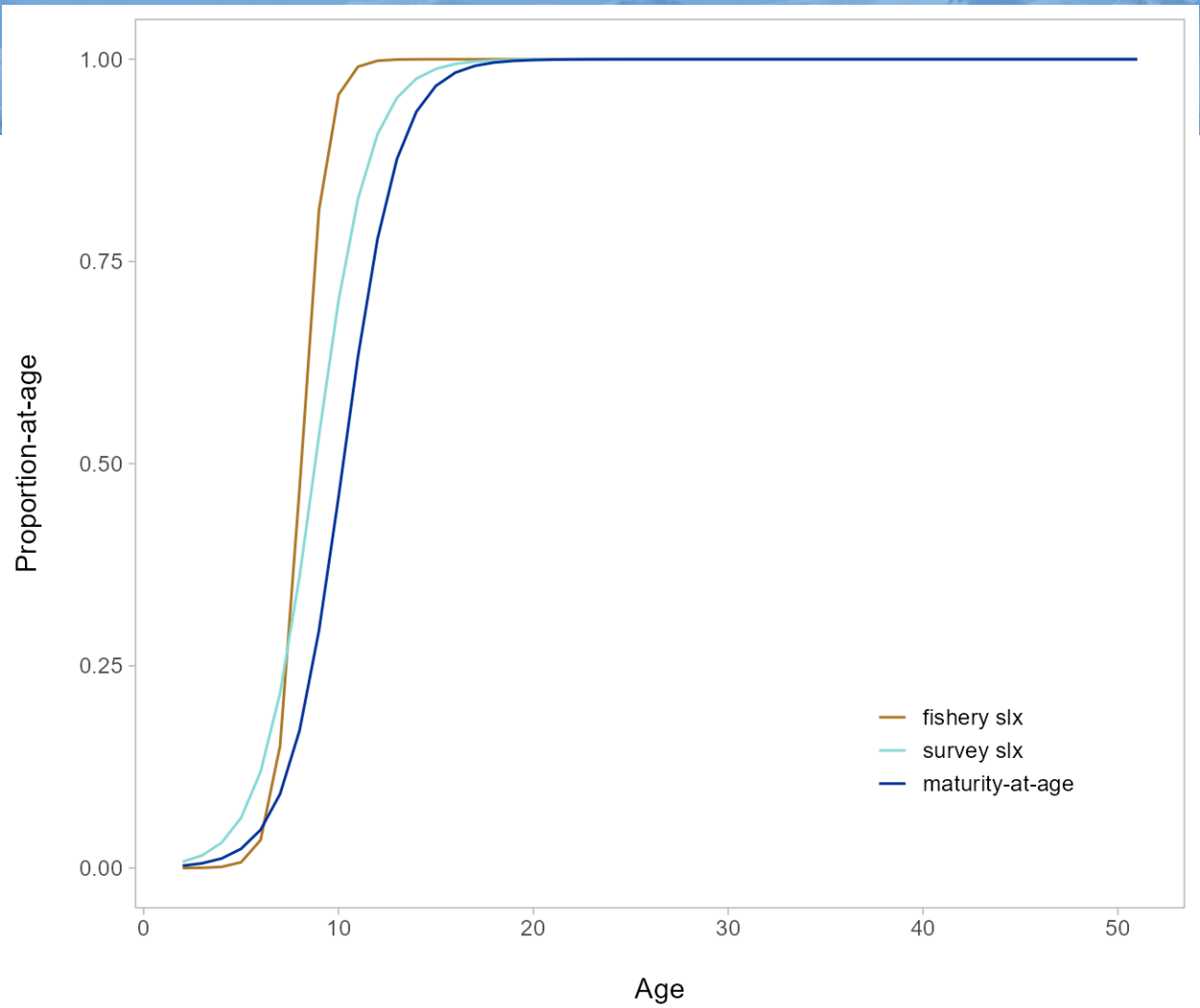
Data weighting: 0.25

Changed from design-based to VAST-based in 2018
sdmTMB in 2025

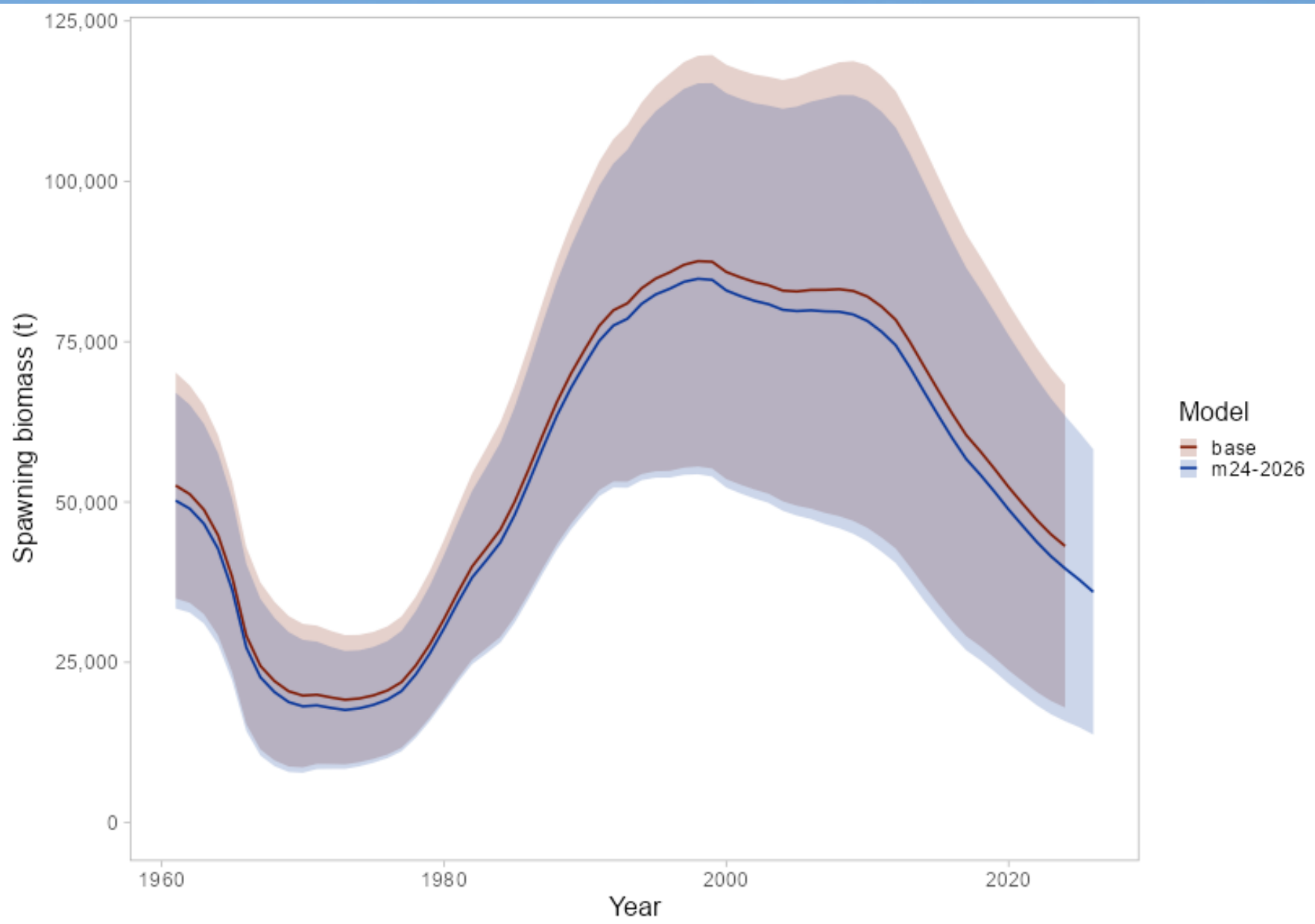


Maturity & SLX

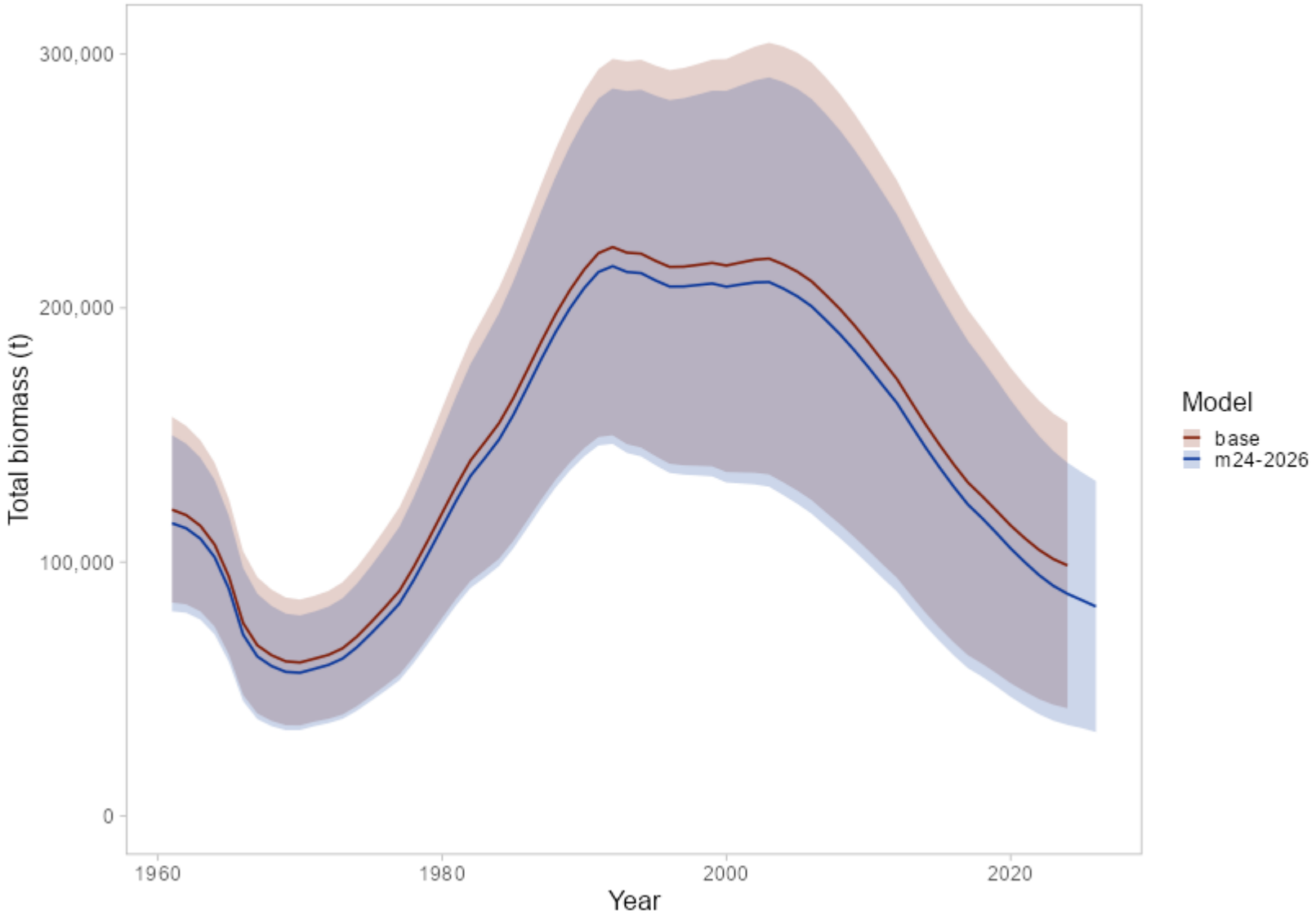
Logistic selectivity



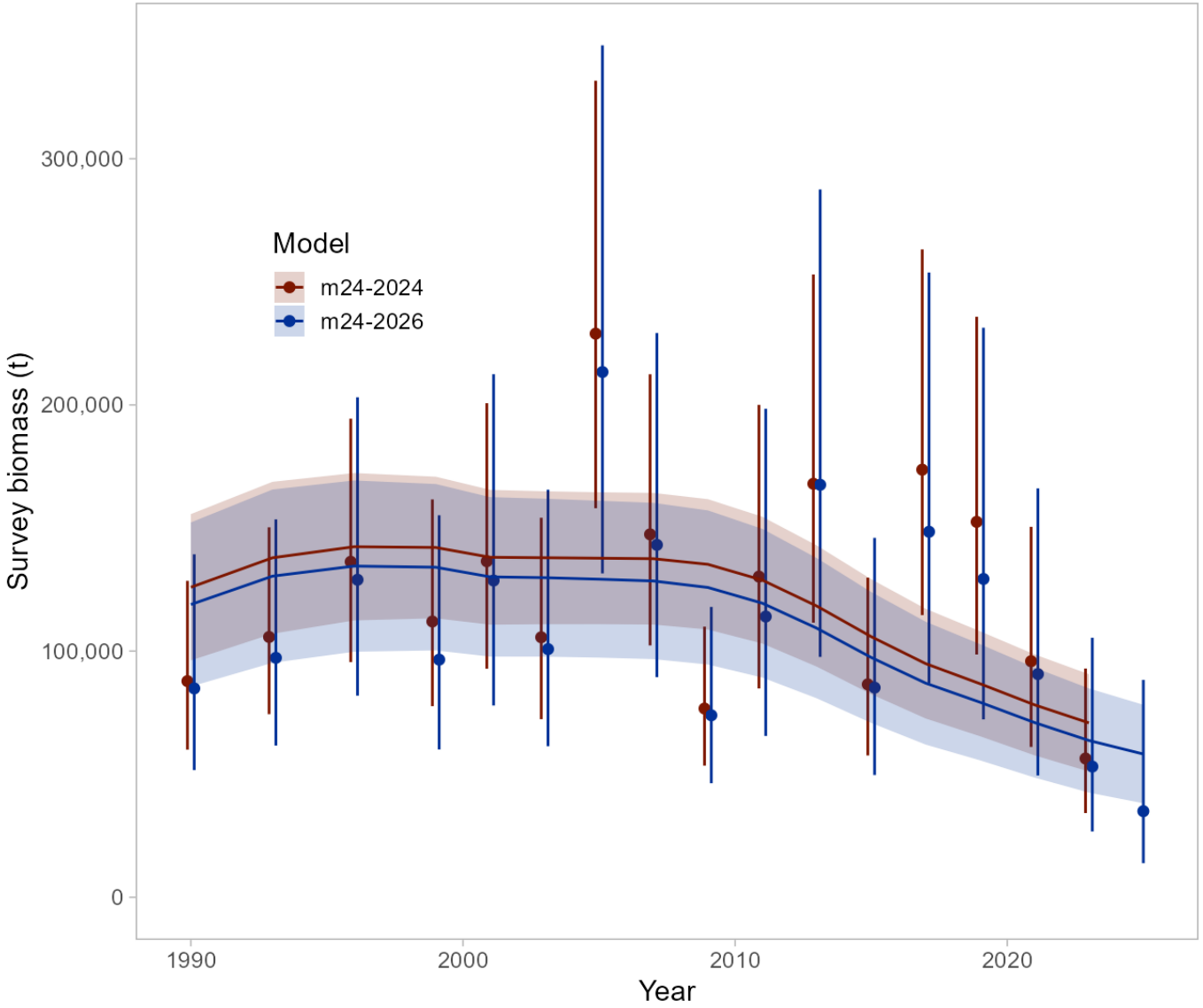
Spawning Biomass



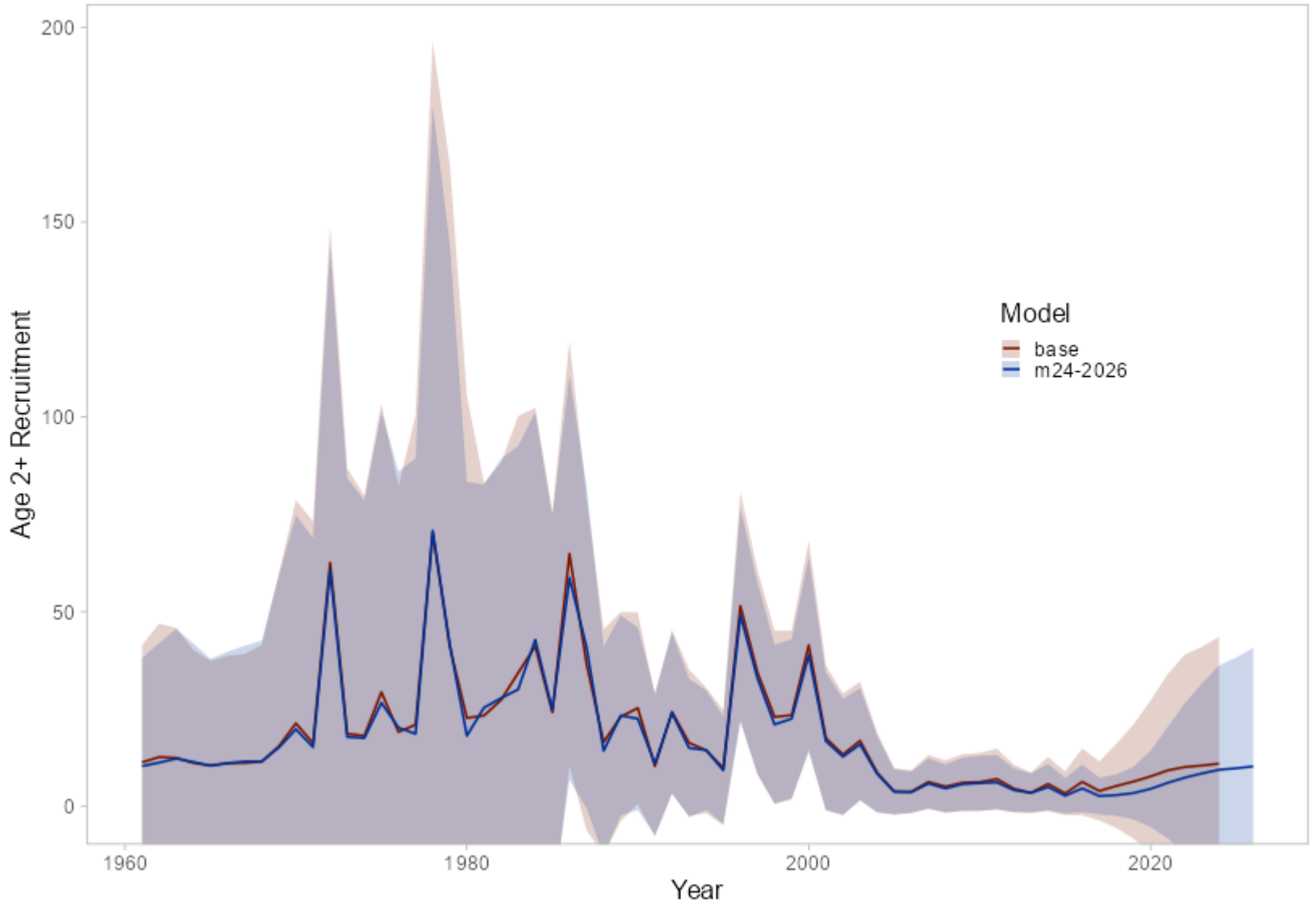
Total Biomass



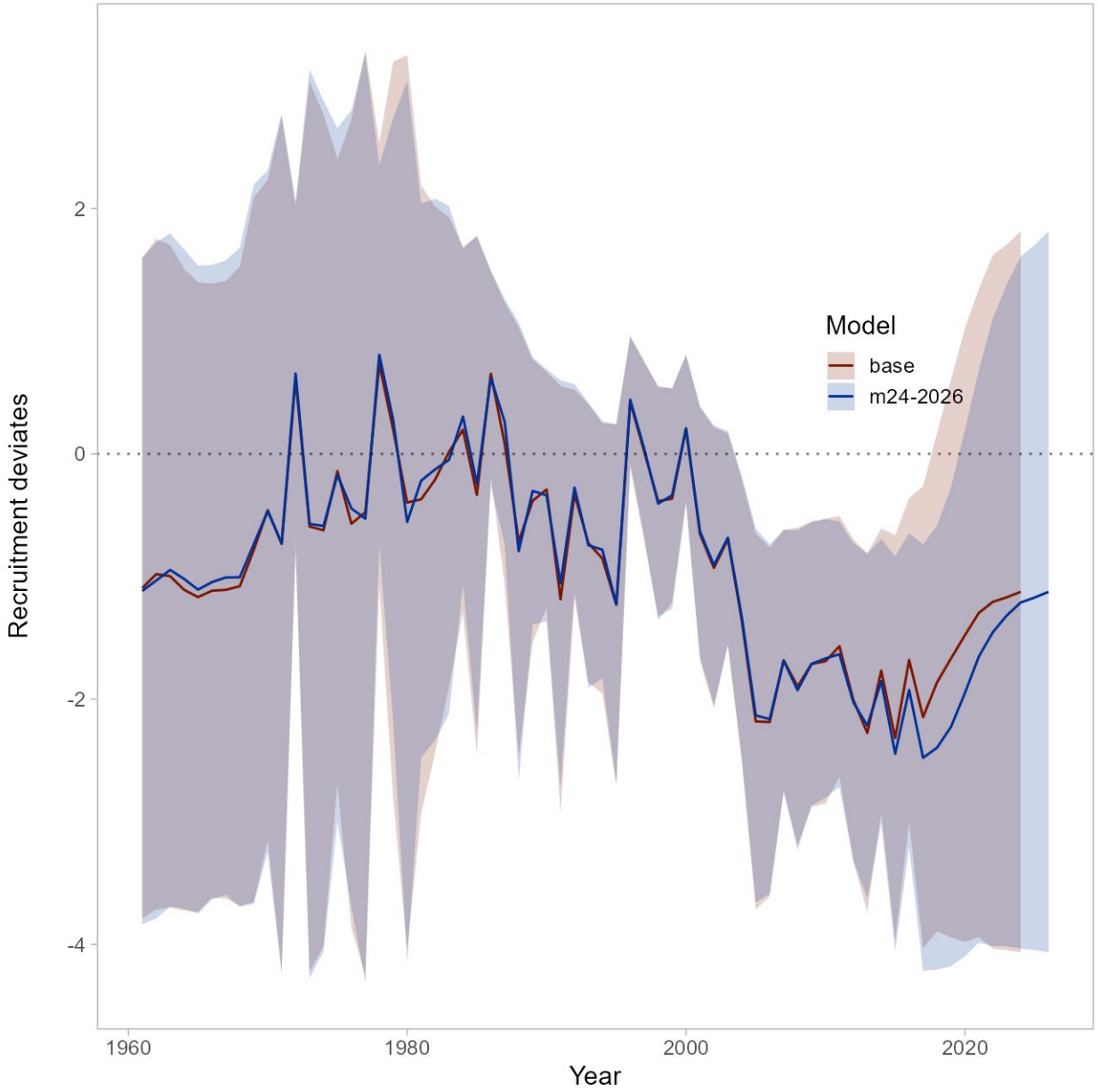
Model Fit
Survey biomass



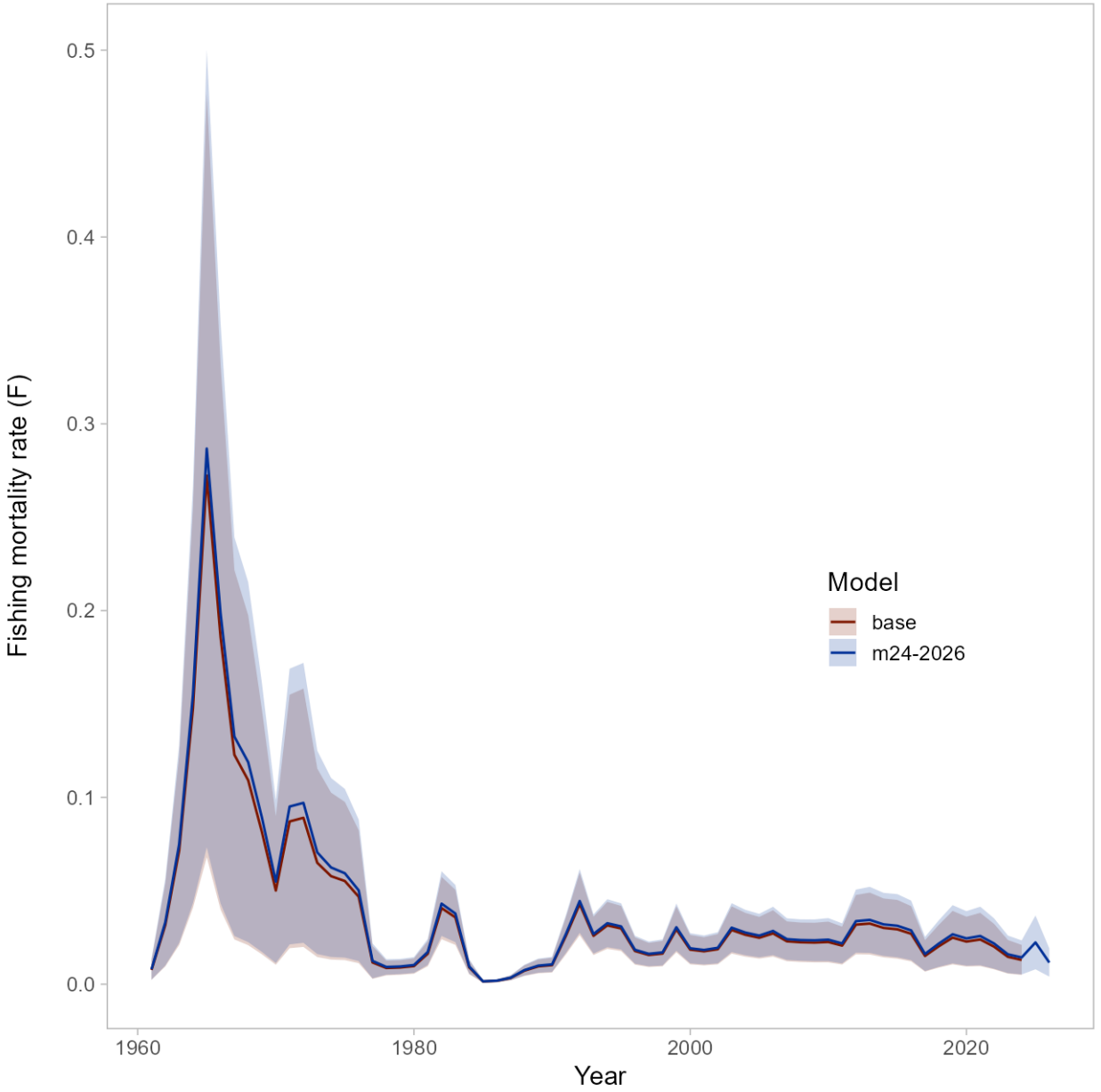
Age 2+ Recruitment



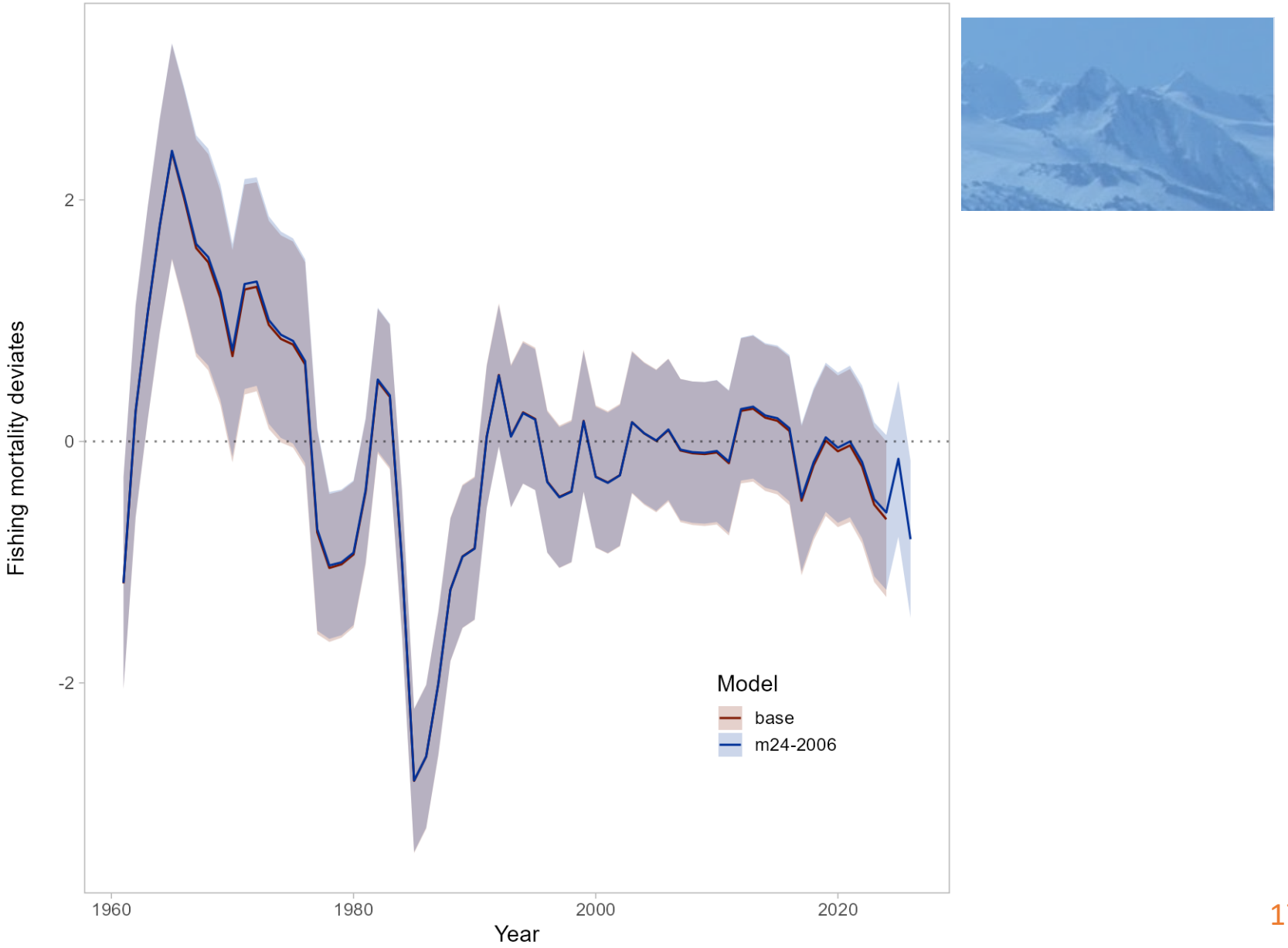
Age 2+ Recruitment devs



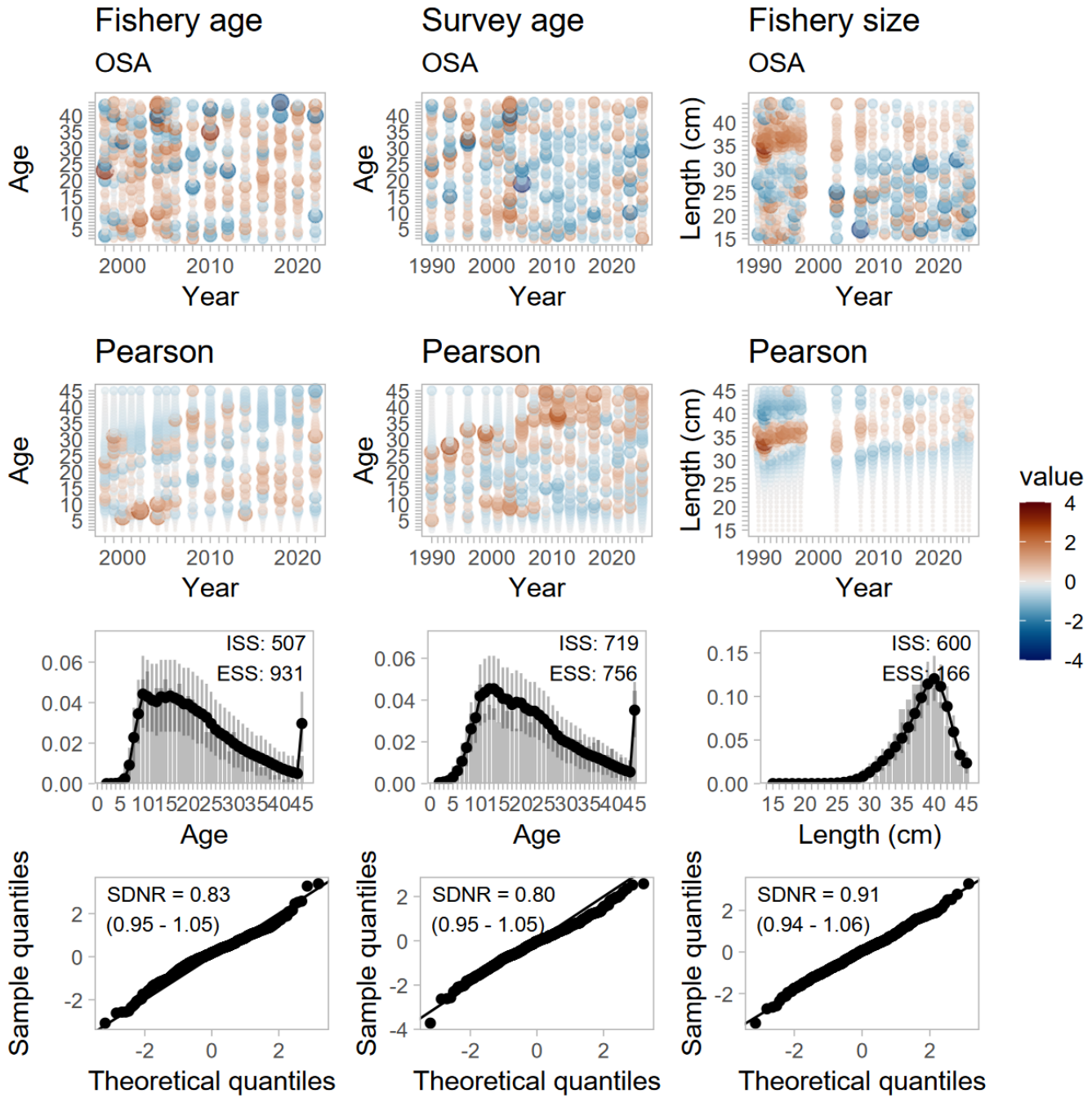
Fishing mortality



Fishing mortality devs

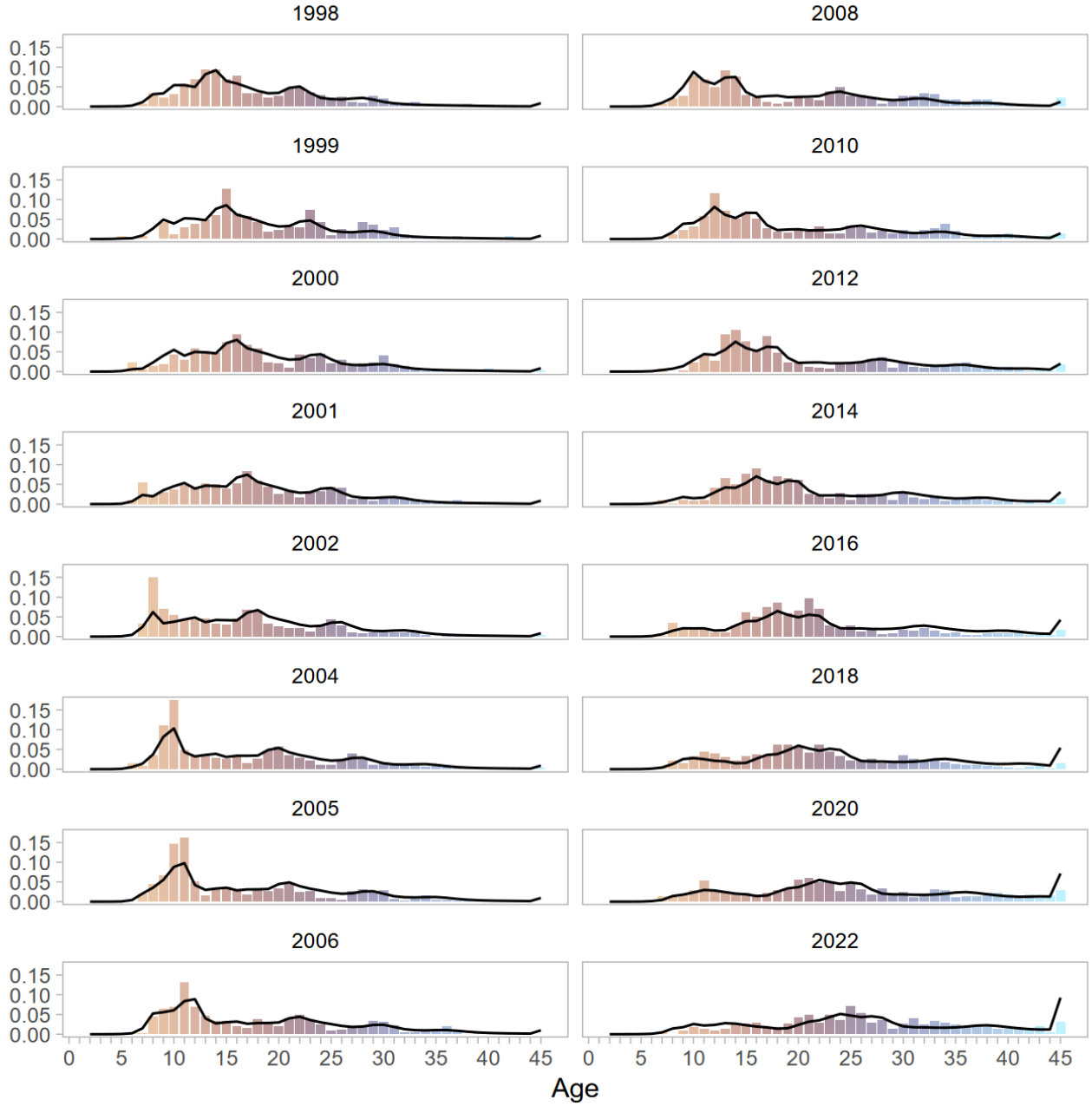


Comp fits


Fishery age
OSA
Survey age
OSA
Fishery size
OSA
Age
Length (cm)
Year
Pearson
value
4
2
0
-2
-4
ISS: 507
ESS: 931
ISS: 719
ESS: 756
ISS: 600
ESS: 166
Age
Length (cm)
Sample quantiles
Theoretical quantiles
SDNR = 0.83
(0.95 - 1.05)
SDNR = 0.80
(0.95 - 1.05)
SDNR = 0.91
(0.94 - 1.06)

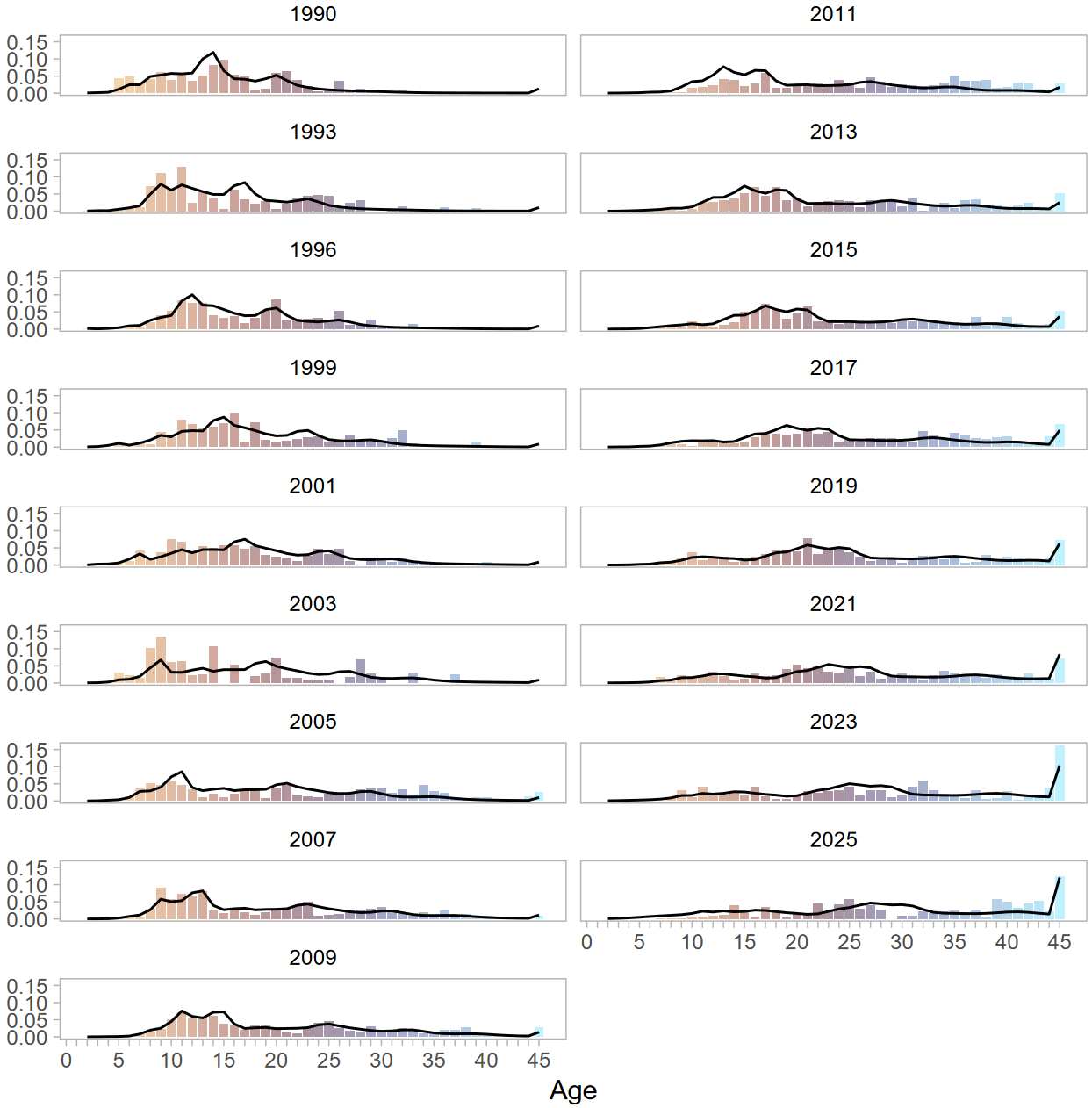
Model Fit (m24) Fishery age

Overshoots plus group, particularly in more recent years



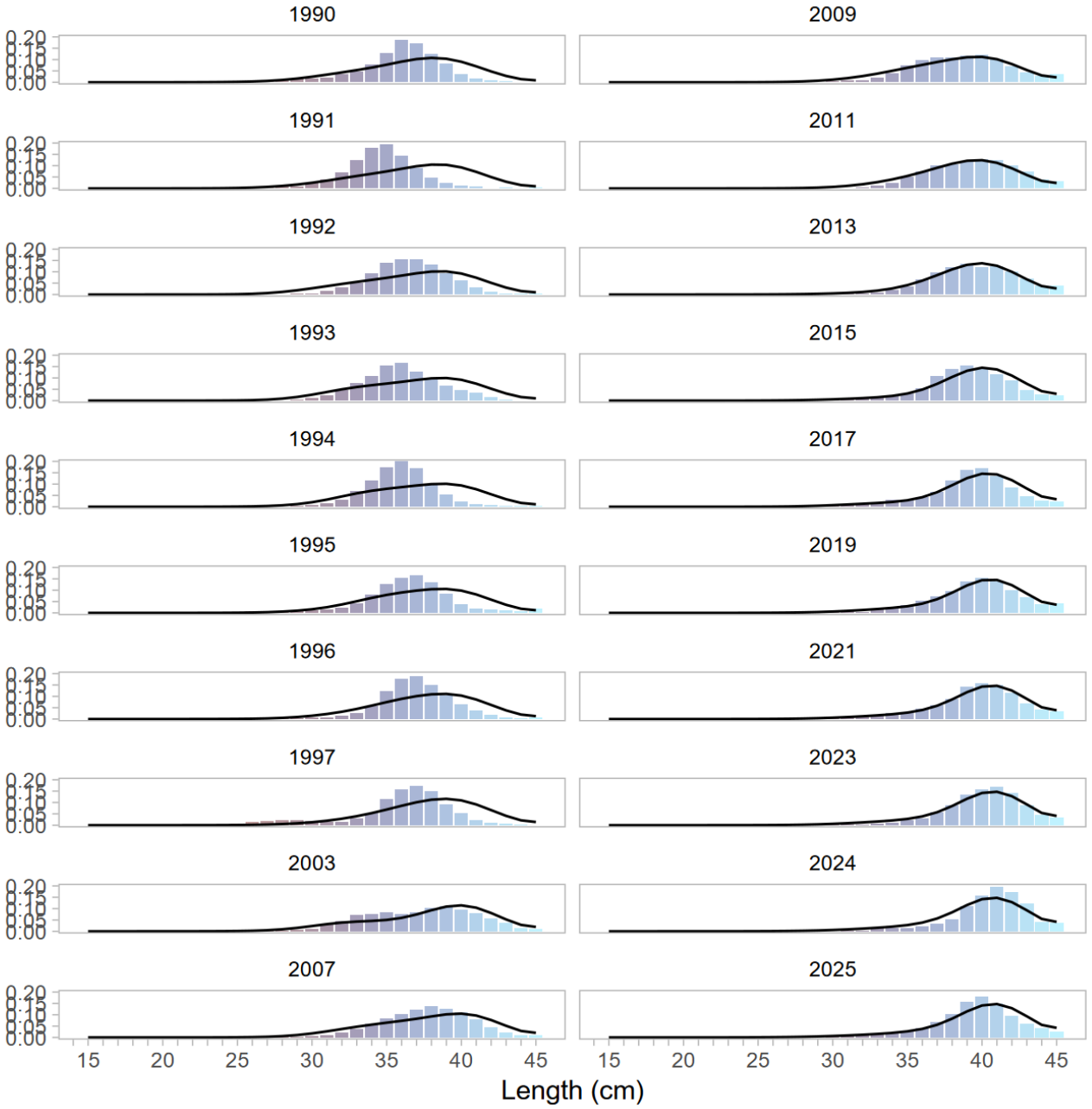
Model Fit (m24)
Survey age

Overshoots ages 10-20, particularly in earlier years
Undershoots plus group, particularly in some recent years

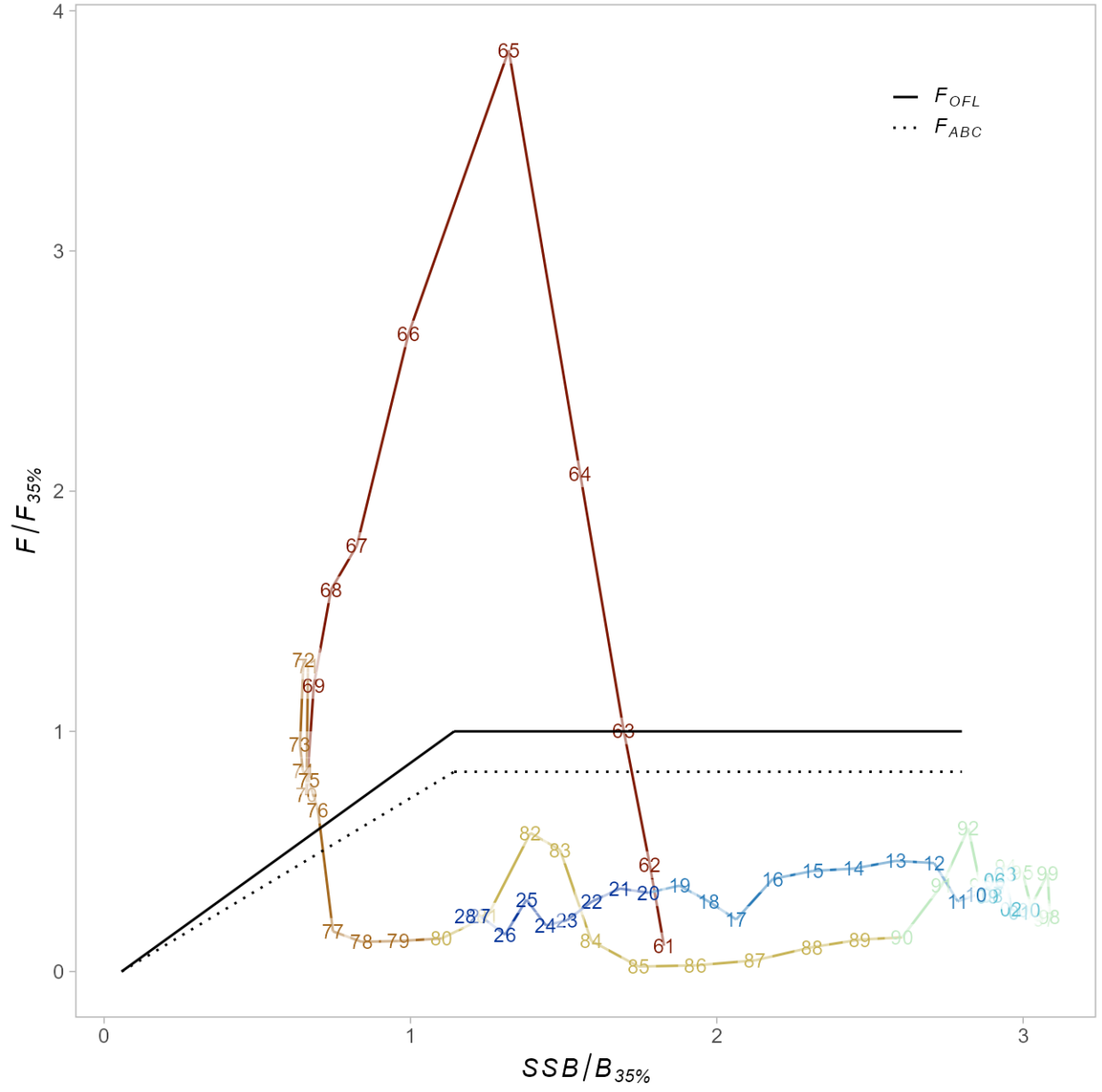


Model Fit (m24)
Fishery length

Poor fits to 1990s data

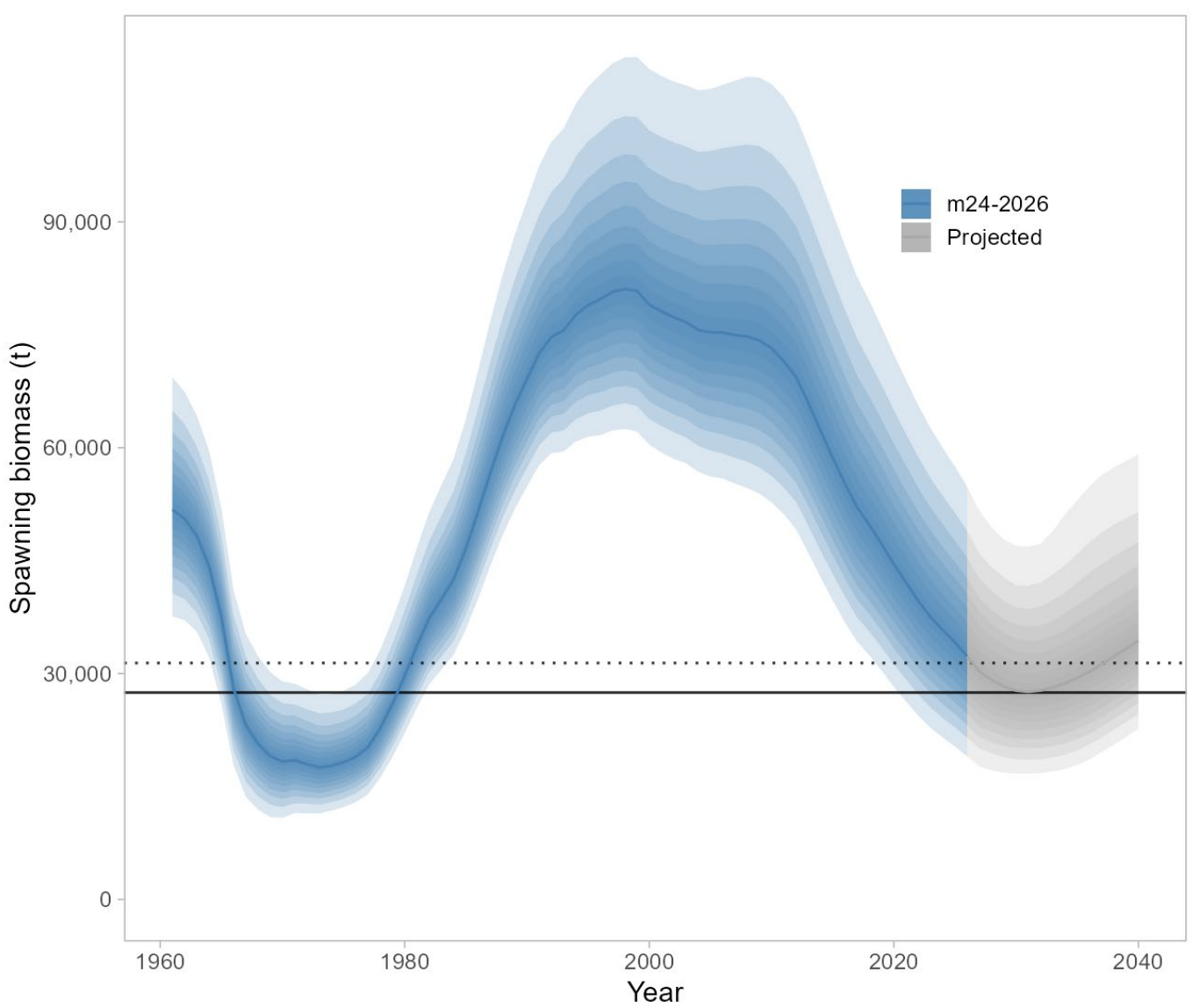


Model Fit (m24)
Phase Plane



Model Fit (m24) Projection

MCMC credible intervals – each shade is 10% of the posterior distribution



Model comparisons - Likelihood

Likelihood	Base*	M24-2026
Catch	0.0907	0.073
Survey	6.0219	8.112
Fish age	40.1766	45.196
Survey age	69.1597	72.936
Fish size	67.9073	61.345
Recruitment	8.6402	9.662
F regularity	5.4574	5.593
SPR penalty	0.0000	0.000
M prior	0.0140	0.025
q prior	0.0520	0.104
Objective function	197.520	203.045

*Base model shows 2024 results

Model comparisons - Outputs

Parameter/Estimate	Base*	M24-2026
M	0.059	0.059
q	0.865	0.815
Log mean recruitment	3.504	3.503
Log mean F	-3.584	-3.649
A50 fishery	8.237	8.128
Delta fishery	1.919	1.875
A50 survey	9.094	8.830
Delta survey	4.319	4.058
Total biomass	95,559	90,674
Spawning biomass	39,462	37,429
OFL	5,935	5,592
FOFL	0.074	0.074
ABC	4,972	4,686
FABC	0.061	0.061

Risk Table

Assessment-related considerations	Population dynamics considerations	Environmental/ ecosystem considerations	Fishery Performance
Level 1: No increased concerns	**Level 2**: Substantially increased concerns	Level 1: No increased concerns	Level 1: No increased concerns

Assessment – Changing from a design-based model to a VAST-based estimate has made the survey biomass estimates more realistic (less overall fluctuation) though the model continues to fit these data poorly. Continued length composition issues.

Population dynamics – consistent low recruitment, skip spawning has been observed for this stock, levels unknown

Environmental - environmental mechanisms for changes in survival and productivity of dusky rockfish remain unknown, though indication that structural epifauna habitat may be decreasing

Fishery performance - catches are well below ABC

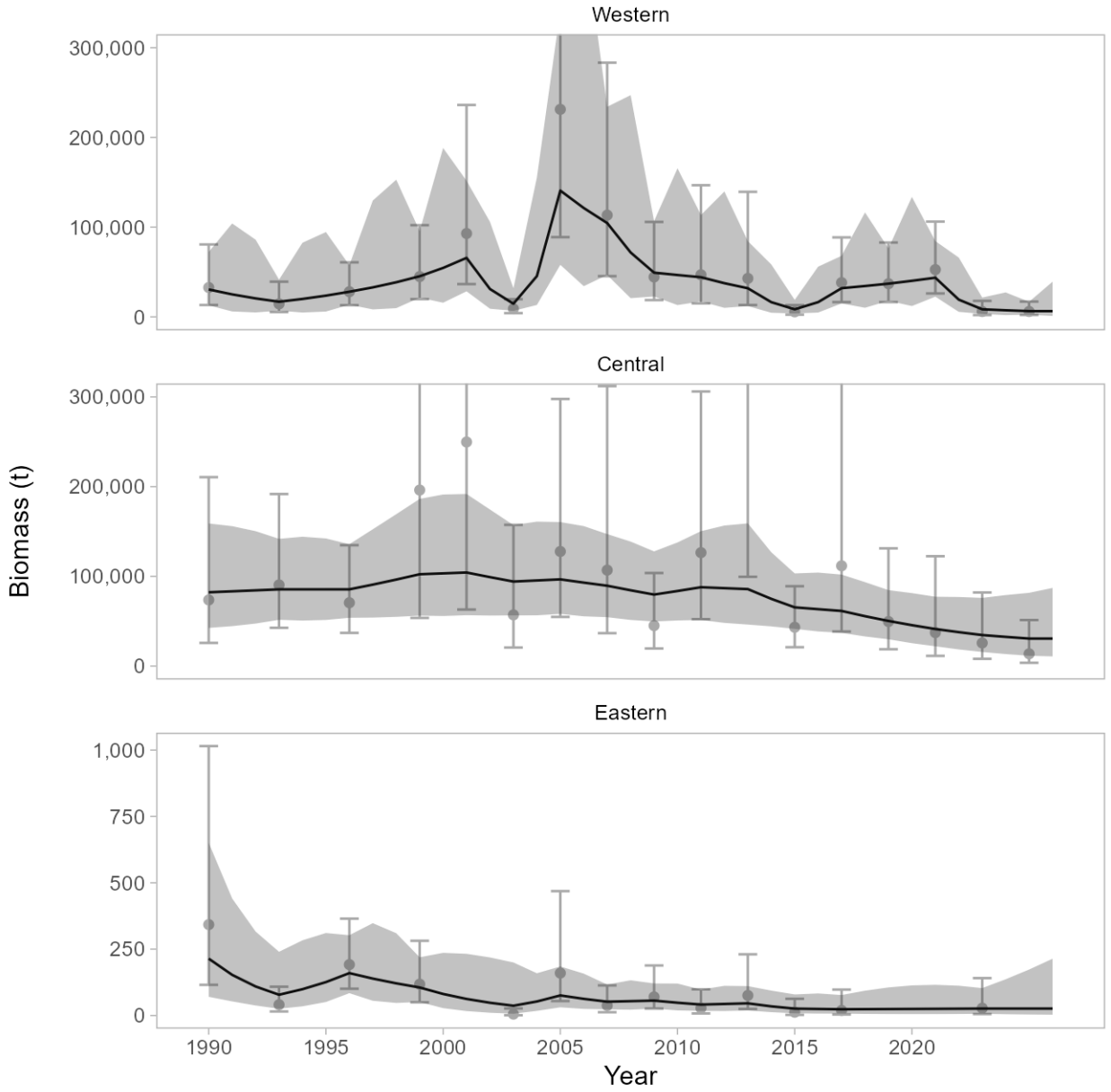
Harvest Recommendat

Quantity/Status	As estimated or specified in 2024 for: 2025	2026	As estimated or *recommended this* year for: 2027*	2028*
M (natural mortality)	0.059	0.059	0.059	0.059
Tier	3a	3a	3a	3a
Projected total (age 2+) biomass (t)	96,967	95,374	81,448	80,547
Projected female spawning biomass (t)	40,392	38,675	33,762	32,433
$B_{100\%}$	84,695	84,695	78,509	78,509
$B_{40\%}$	33,878	33,878	31,404	31,404
$B_{35\%}$	29,643	29,643	27,478	27,478
F_{OFL}	0.074	0.074	0.075	0.075
$maxF_{ABC}$	0.062	0.062	0.062	0.062
F_{ABC}	0.062	0.062	0.062	0.062
OFL (t)	6,064	5,848	**5,699**	5,636
*max*ABC (t)	5,077	4,896	4,769	4,716
ABC (t)	5,077	4,896	**4,769**	4,716

Status	As determined in 2024: 2023	2024	As determined *this* year for: 2025	2026
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

Apportionment

- Eastern GOA is allocated 1t which is moved to OROX
- Design-based survey biomass w/random effects (REMA)



Apportionment

	BRD Apportionment				
	17.28%	82.70%	0.02%		
Year	Western	Central	Eastern	ABC (t)	OFL (t)
2027	824	3,944	1	4,769	5,699
2028	814	3,901	1	4,716	5,636

Future research

- Data Gaps and Future Research Priorities
  - We have no information on larval, post-larval, or early-stage juvenile northern rockfish
  - Habitat requirements are either unknown or anecdotal – research to identify HAPC
  - Aging is a continual issue (challenging to age well) **FT-NIRS potential**
  - Reproductive biology is poorly understood, skip spawning has been observed – the spatial and temporal extent of skip spawning should be a research priority
  - Exploration of data weighting, possibly the inclusion of a variance inflation parameter to increase the variance on VAST estimated trawl surveys
  - Explore time varying selectivity, or possibly length-based early selectivity, and size-at-age matrix

QUESTIONS?



CONTACT:

ben.williams@noaa.gov