

2026 BSAI Pacific ocean perch Assessment

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Overall summary

- Update assessment; alternative models not considered
- 2026 survey biomass is 20% lower than 2024 estimate
- 2027 recommended ABC of 33,640 t (8% decrease from 2026 ABC).
- Sensitivity runs exploring fits to the composition data
- Assessment-related concerns noted in risk table.
- Replaced “subarea ABCs” with “BRDs”

BSAI POP Outline

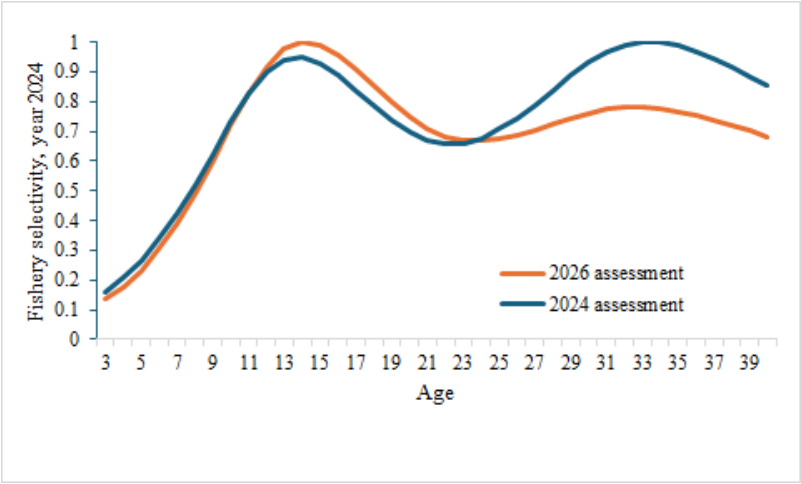
1) SSC, Plan Team comments
2) Catch information
3) Fishery and survey data
4) Model diagnostics, and sensitivity runs
5) Model fits to data
6) Risk table
7) Management recommendations

SSC and Plan Team comments

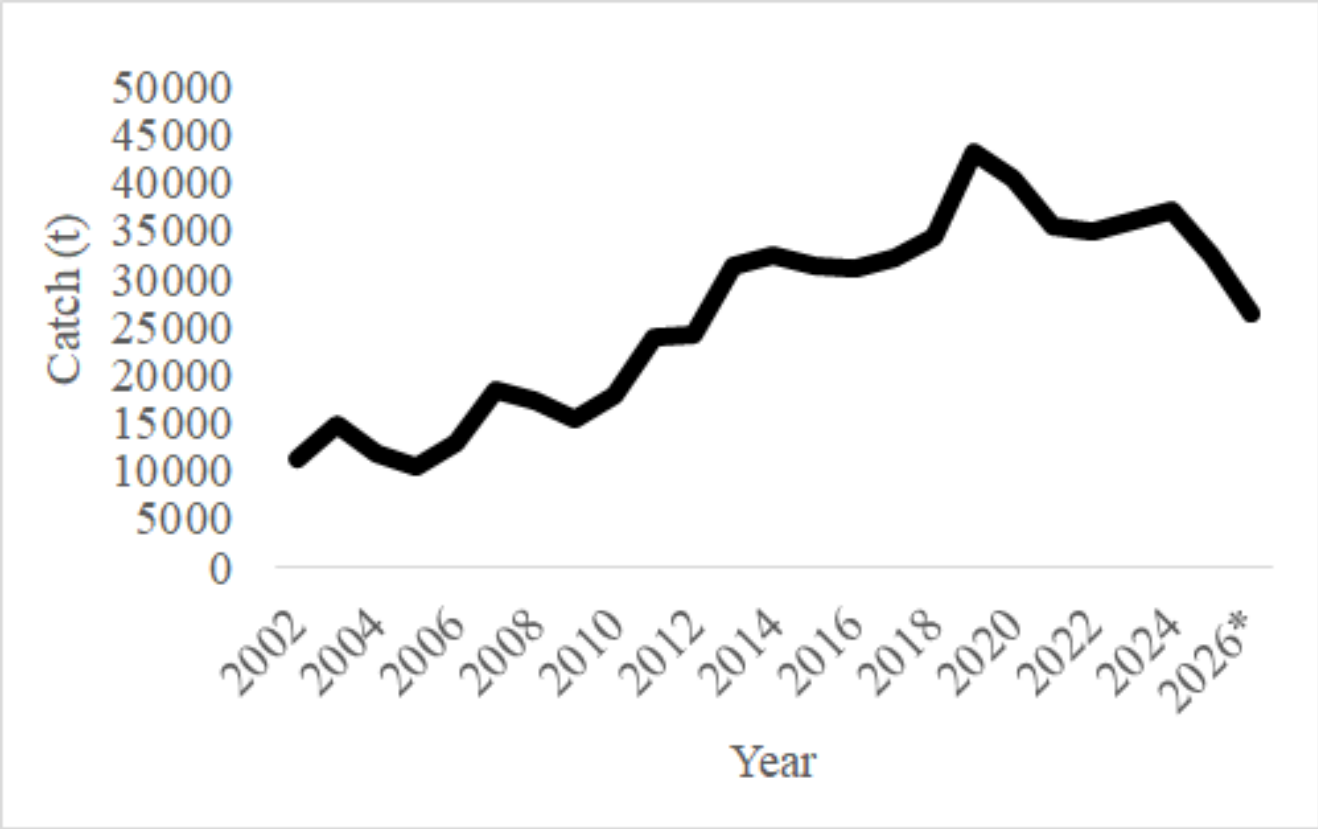
- (SSC, December 2024) *The SSC recommends that the authors . . . include a discussion of stock structure in the assessment*
- Genetic information has been long-standing component of “Stock Structure” section of Introduction. Palof et al (2011) showed significant structure based on microsatellite DNA. Spatial patterns in size composition and size at age are examined in this assessment.

SSC and Plan Team comments

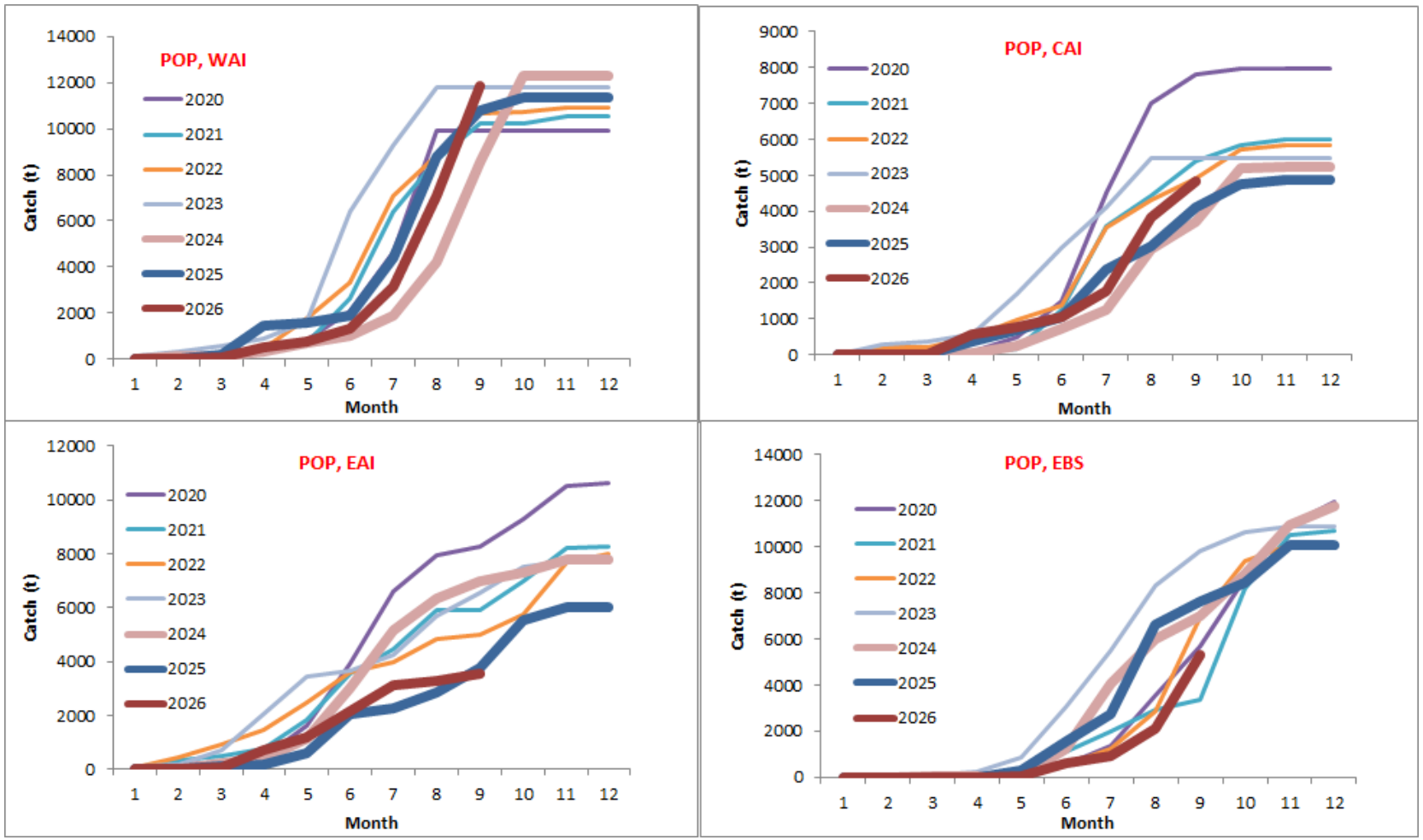
- (SSC, December 2024) *The SSC recommends that the authors . . . consider the plausibility of the bimodality in the fishery selectivity*
- With the updated data, the degree of bimodality appears top be diminished



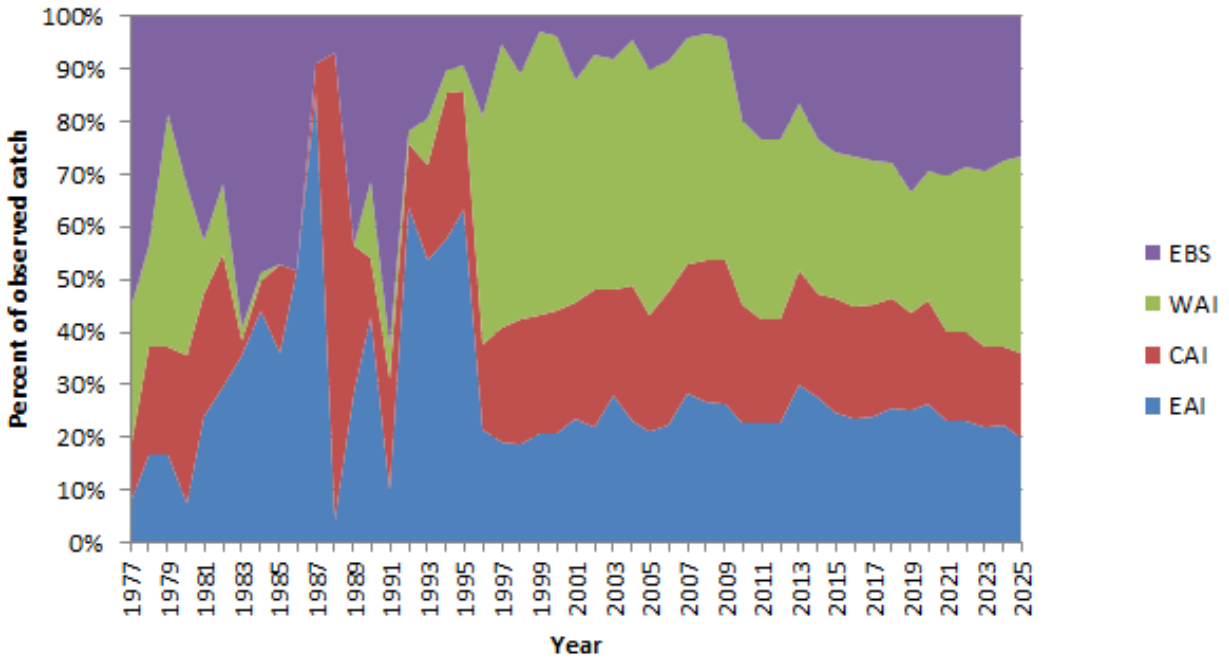
BSAI catch peaked in 2019, declined last few years (2026 through October 10)



BSAI POP catch by month and area, 2020-2026



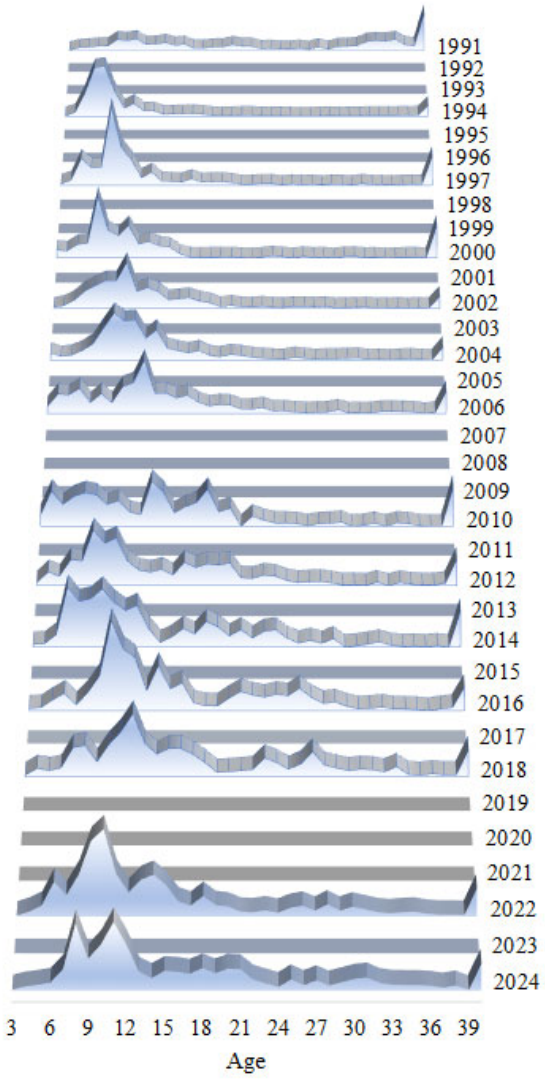
Observed catch by BSAI subarea



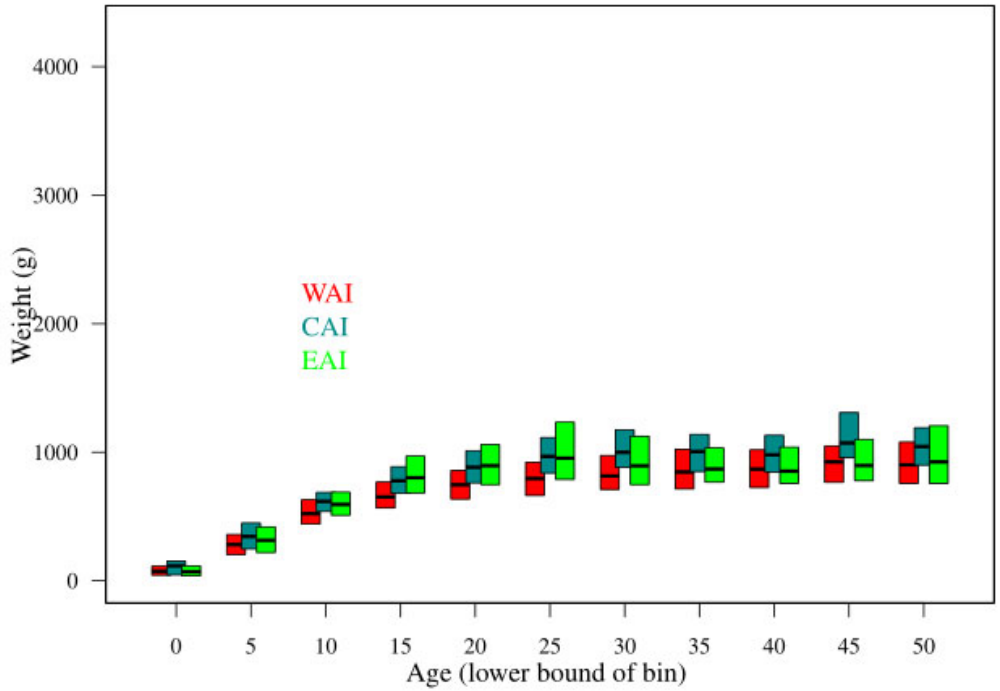
Data in assessment model

Source	Data	Years
AI Survey	Biomass estimates	1991, 1994, 1997, 2000, 2002, 2004, 2006, 2010, 2012, 2014, 2016, 2018, 2022, 2024, **2026**
	Age composition	1991, 1994, 1997, 2000, 2002, 2004, 2006, 2010, 2012, 2014, 2016, 2018, 2022, **2024**
	Length composition	**2026**
EBS Slope Survey	Biomass estimates, and age compositions	2002, 2004, 2008, 2010, 2012, 2016
Fishery	Catch	1960-**2026**
	Age composition	1981-82, 1990, 1998, 2000-2009, 2011, 2013, 2015, 2017, 2019, 2020, 2021, 2023
	Size composition	1964-72, 1983-1984, 1987-1989, 1991-1997, 1999, 2010, 2012, 2014, 2016, 2018, 2022, **2024-2025**

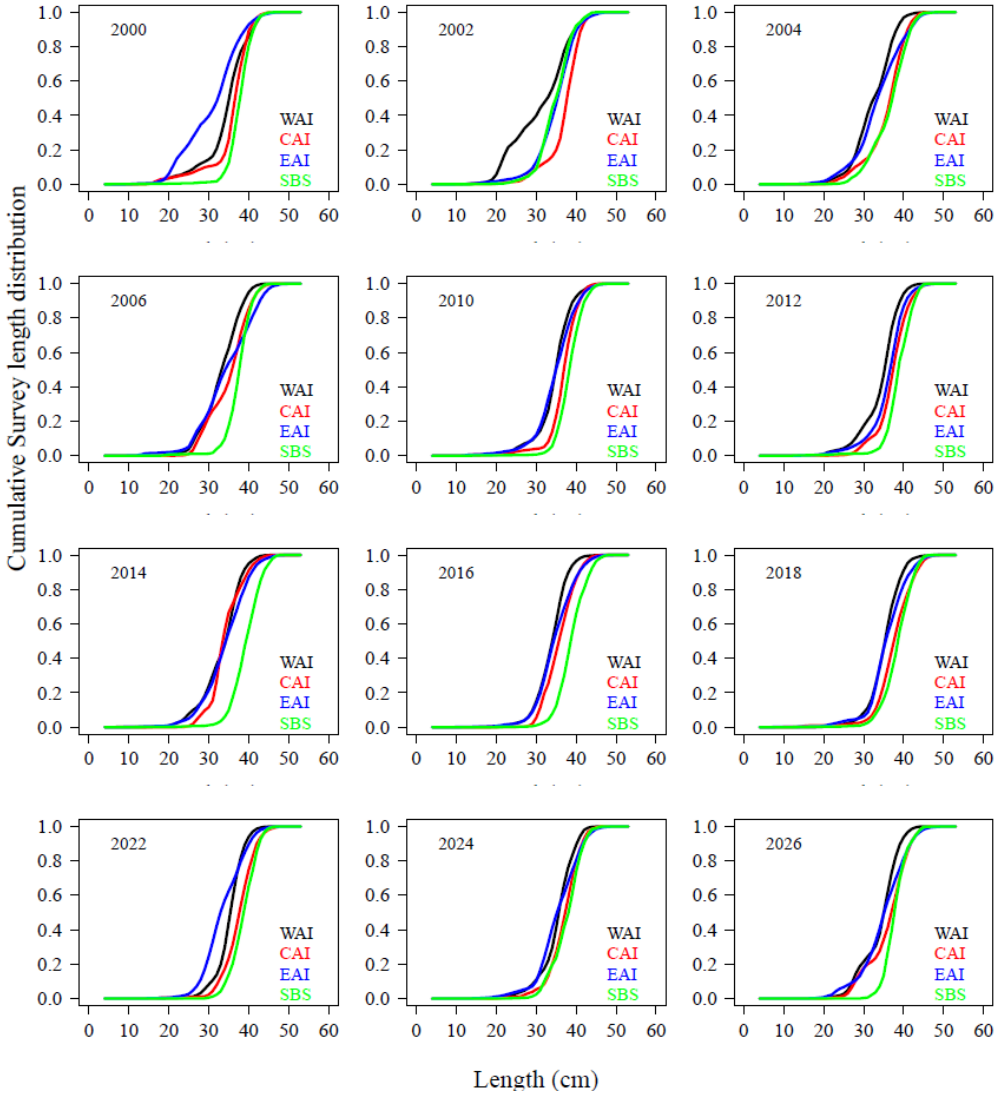
POP AI survey age composition data



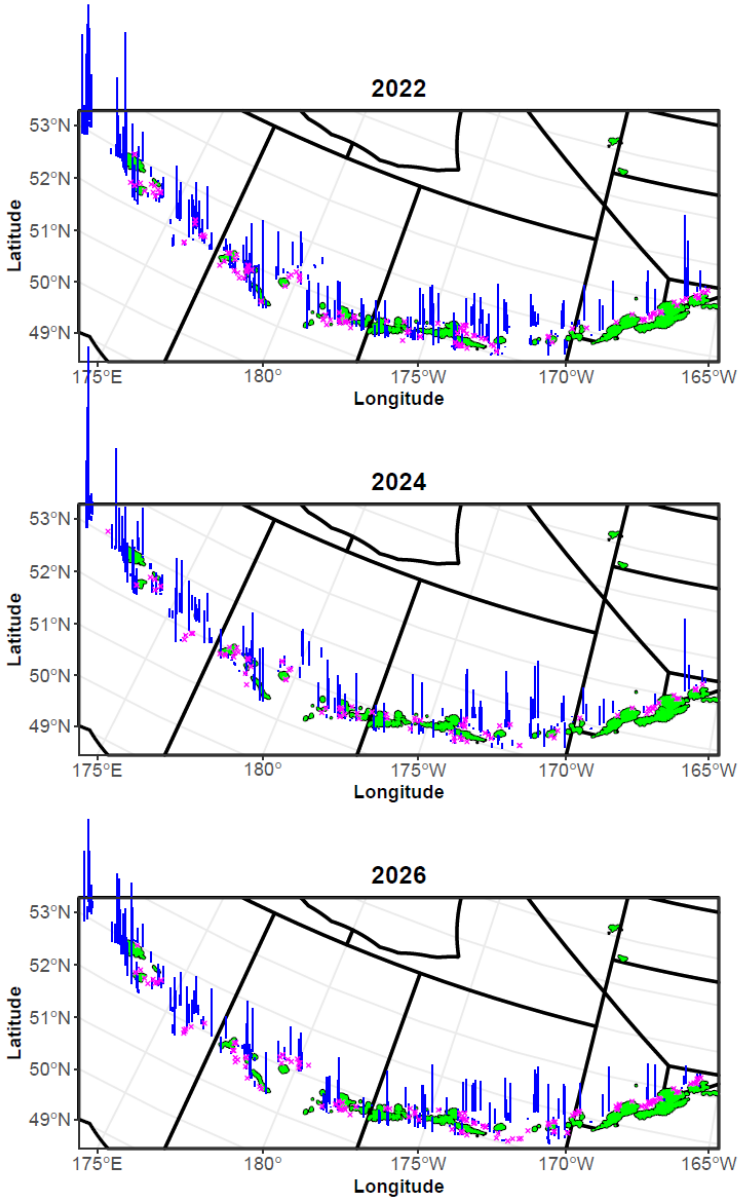
Information relating to stock structure– mean size by area (from AI survey data)



Information relating to stock structure– size composition by area (from AI survey data)

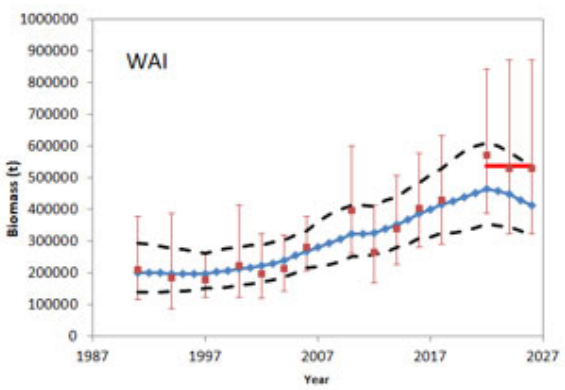


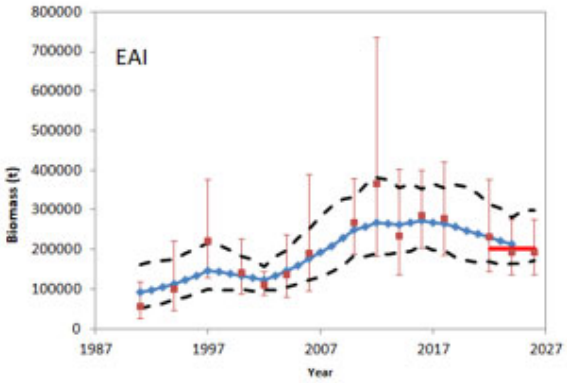
Survey CPUE, 2022 – 2026 AI surveys

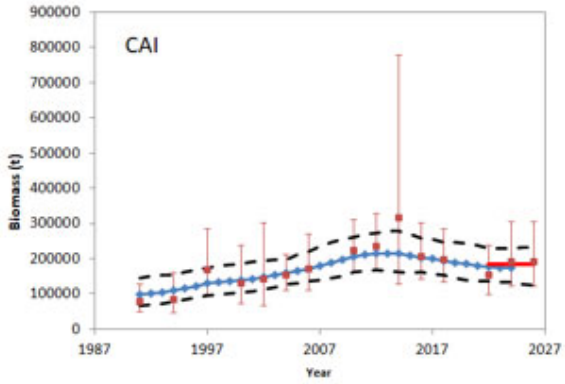


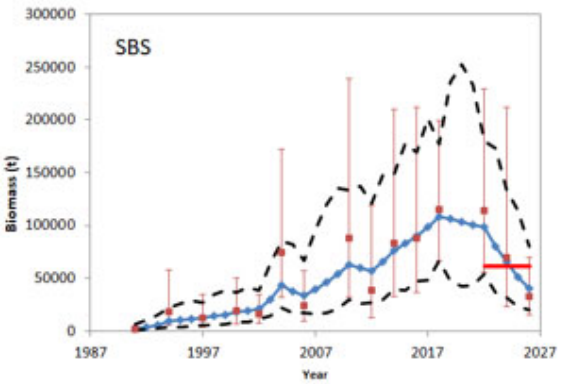
Year	Western	Central	Eastern	southern BS	Total AI survey
2022	570,272 (0.20)	153,147 (0.23)	232,021 (0.25)	113,738 (0.37)	1,069,179 (0.13)
2024	529,334 (0.26)	191,364 (0.24)	193,387 (0.18)	69,550 (0.62)	983,636 (0.16)
2026	362,175 (0.17)	153,794 (0.24)	236,615 (0.17)	32,854 (0.40)	785,438 (0.11)

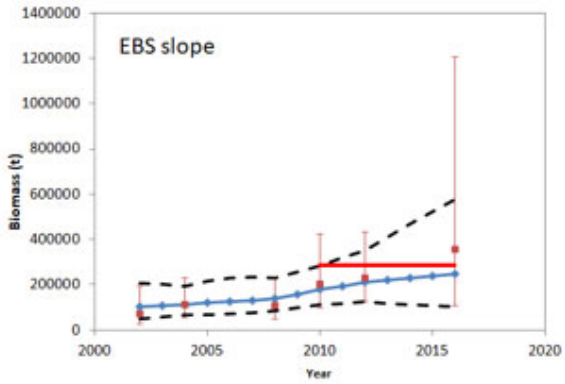
Smoothed survey time series by subarea



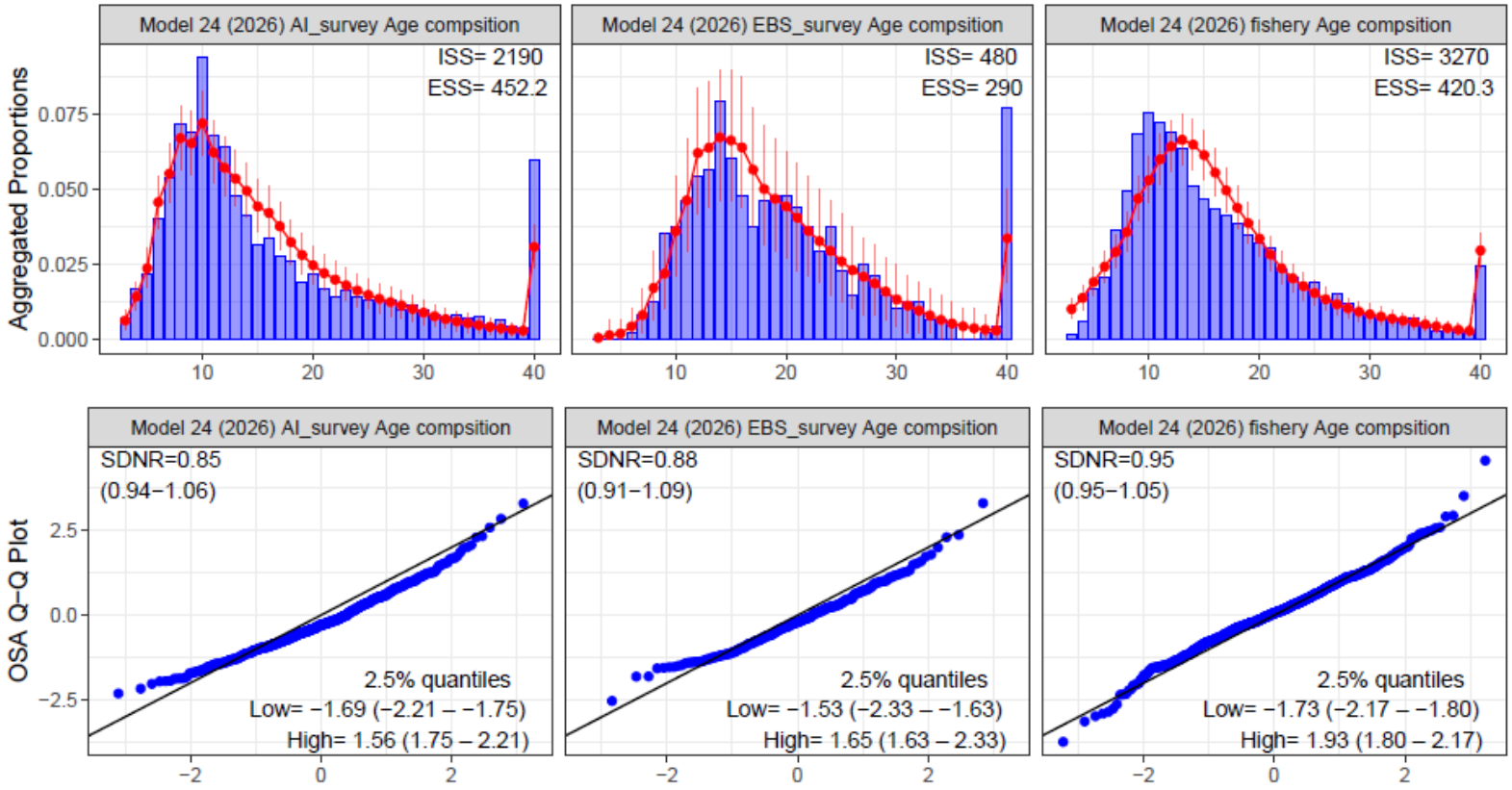




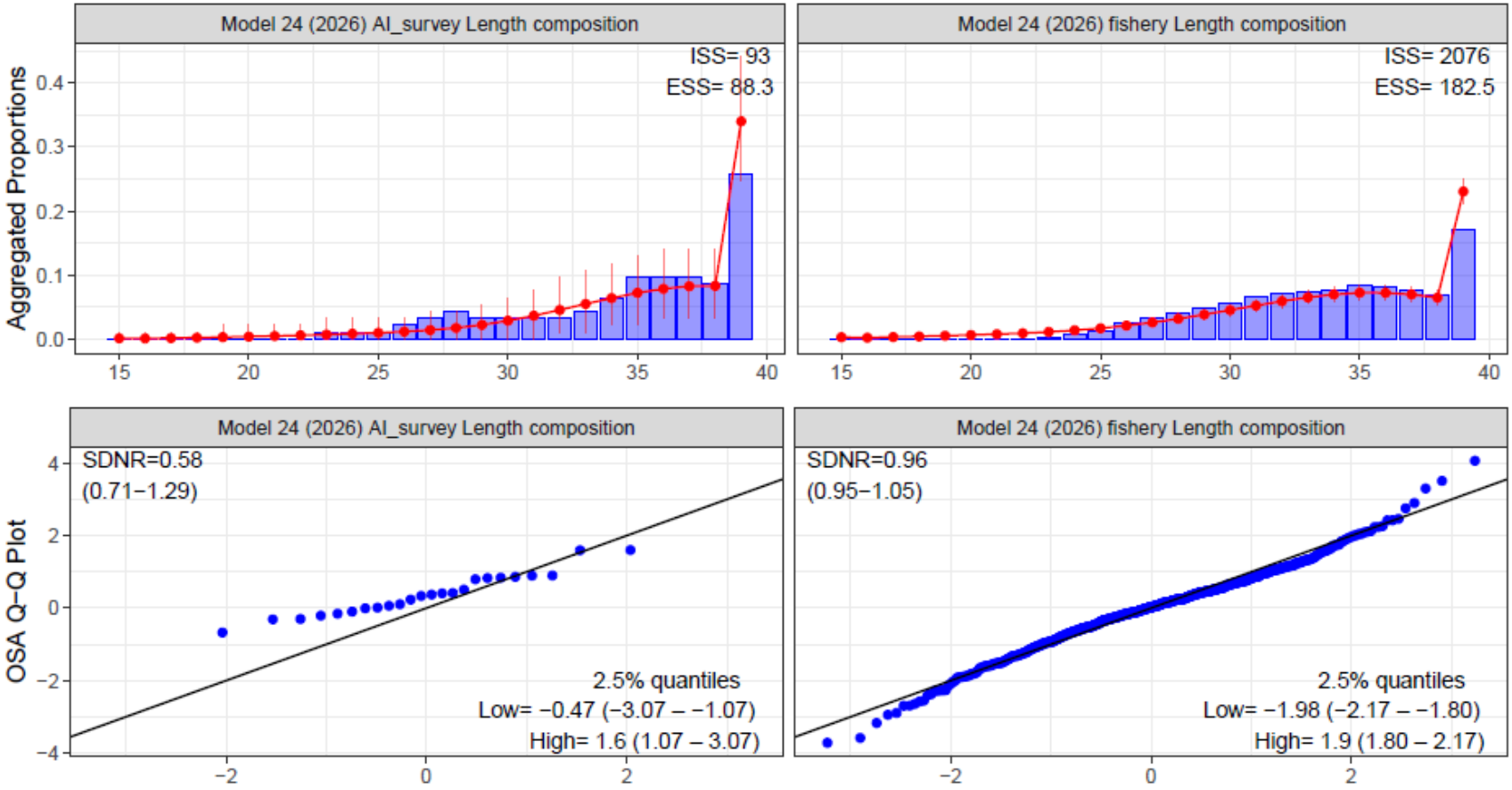




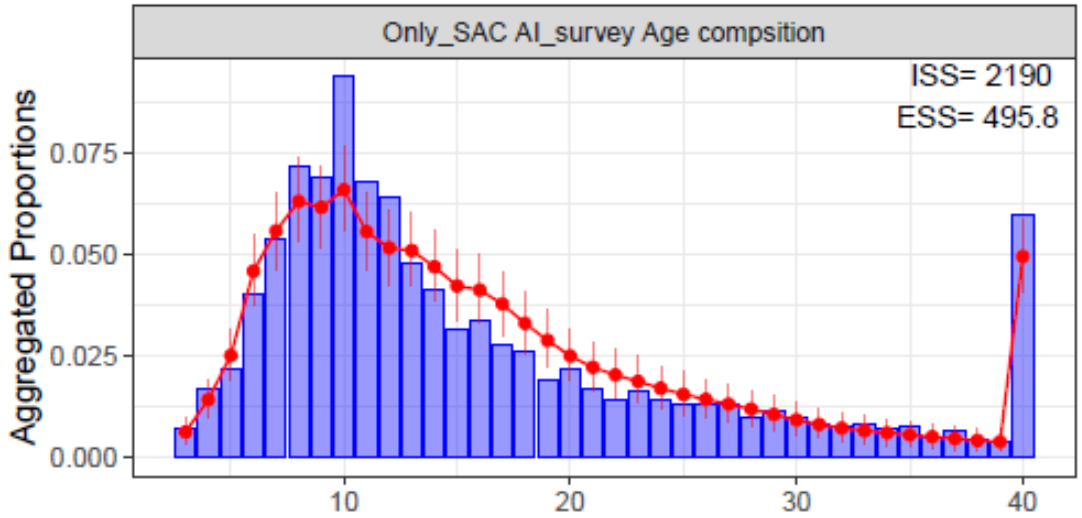
Aggregate fit to the age comps



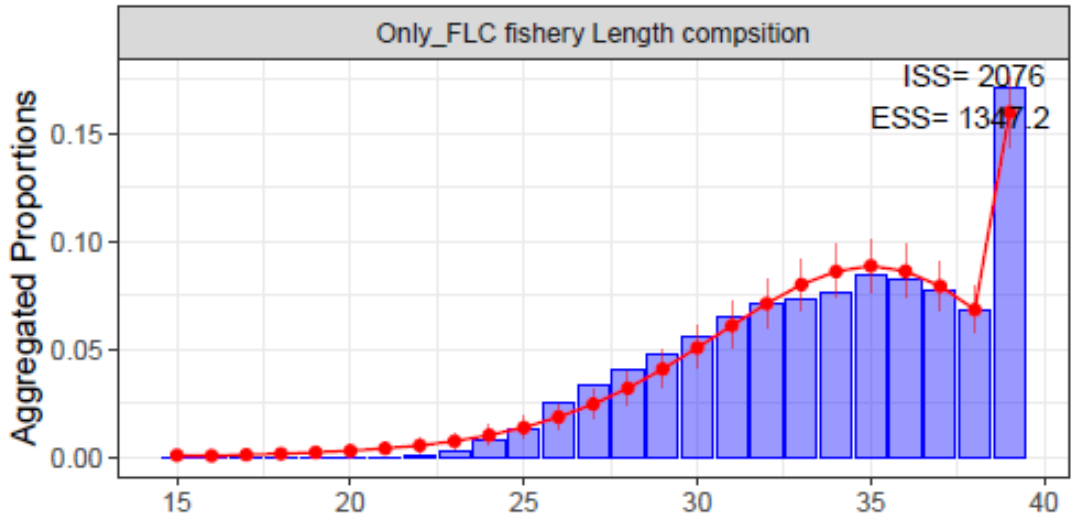
Aggregate fit to the length comps



Sensitivity analyses – only fit a single composition data set



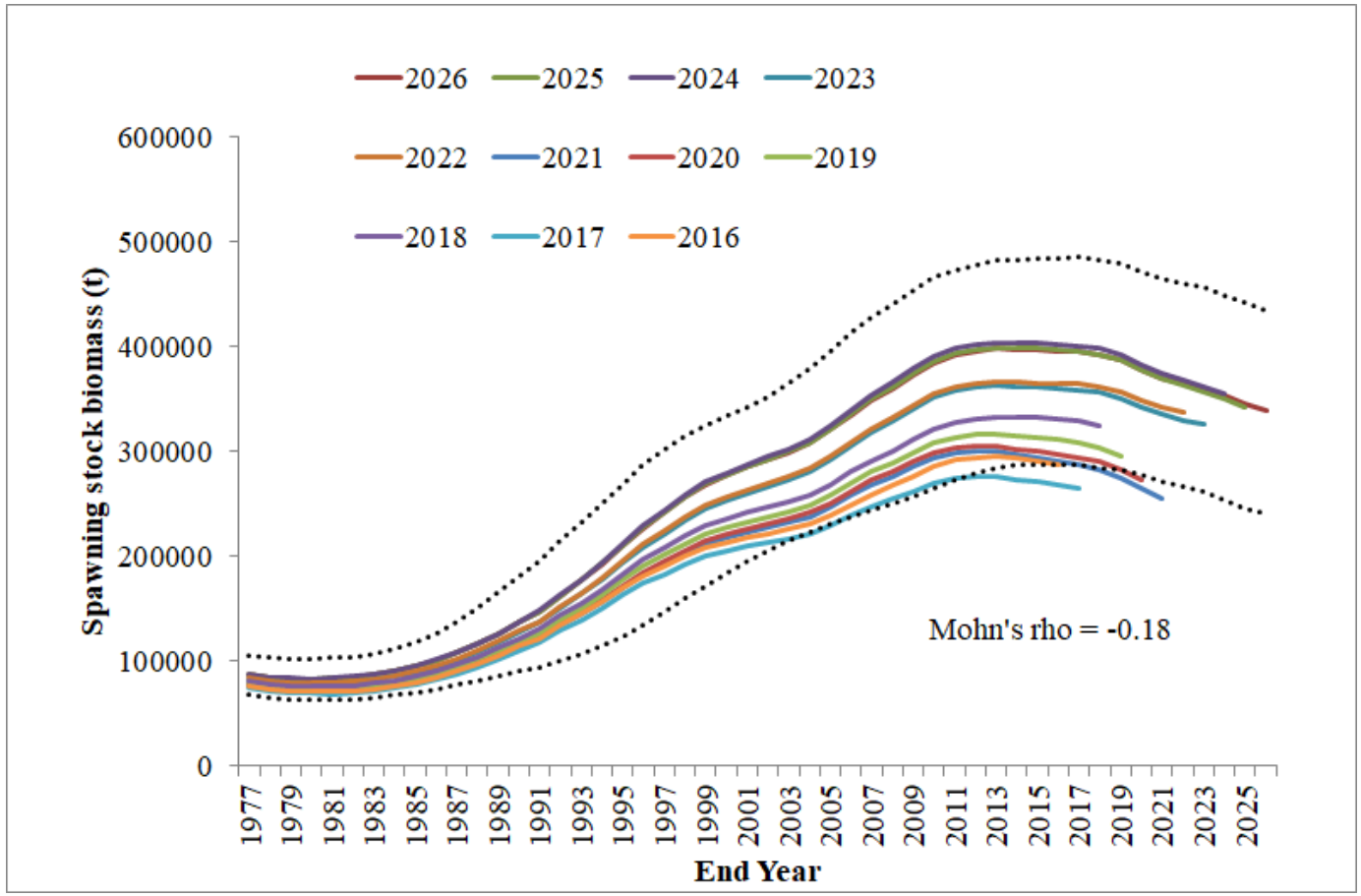
"Only SAC" – only fitting the AI survey age composition



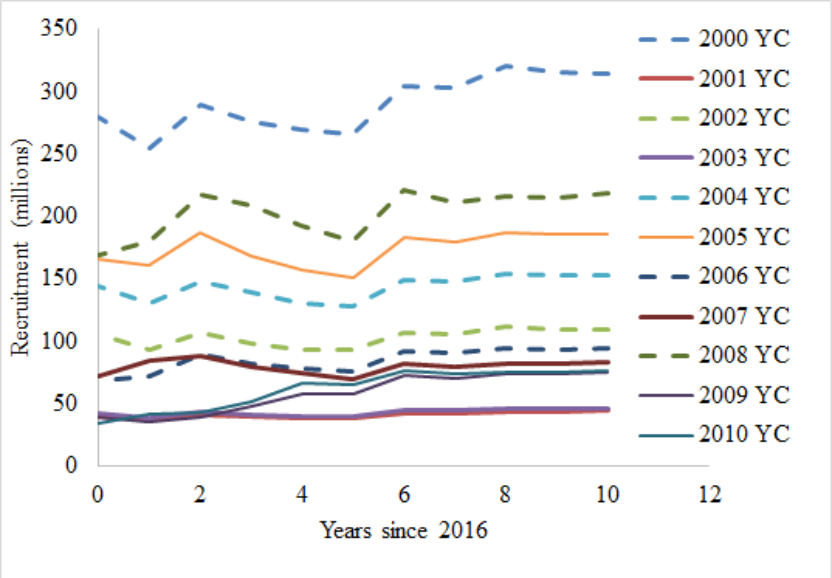
"Only FLC" – only fitting the fishery length composition

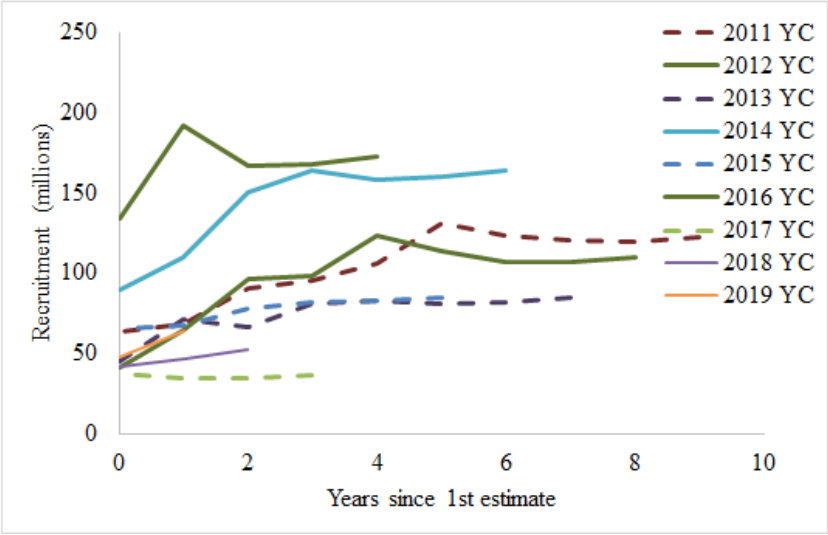
These runs show better fits to the plus group, indicating that the fits to the plus group are influenced by conflicts between data sets

Retrospective pattern in SSB

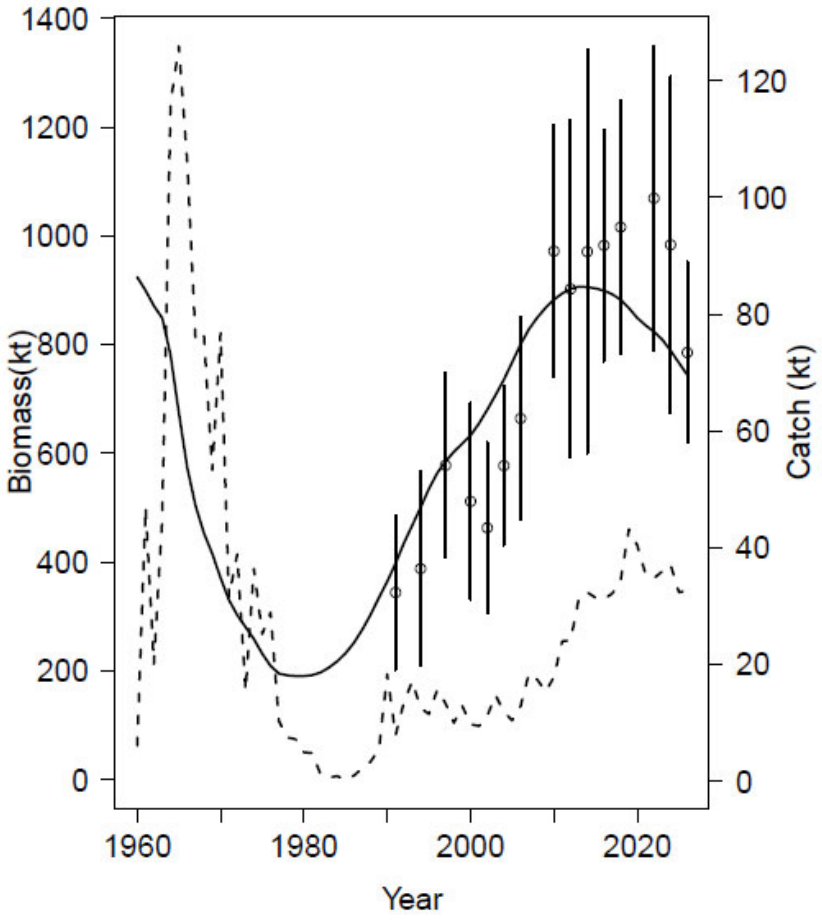


Retrospective pattern in estimated recruitments

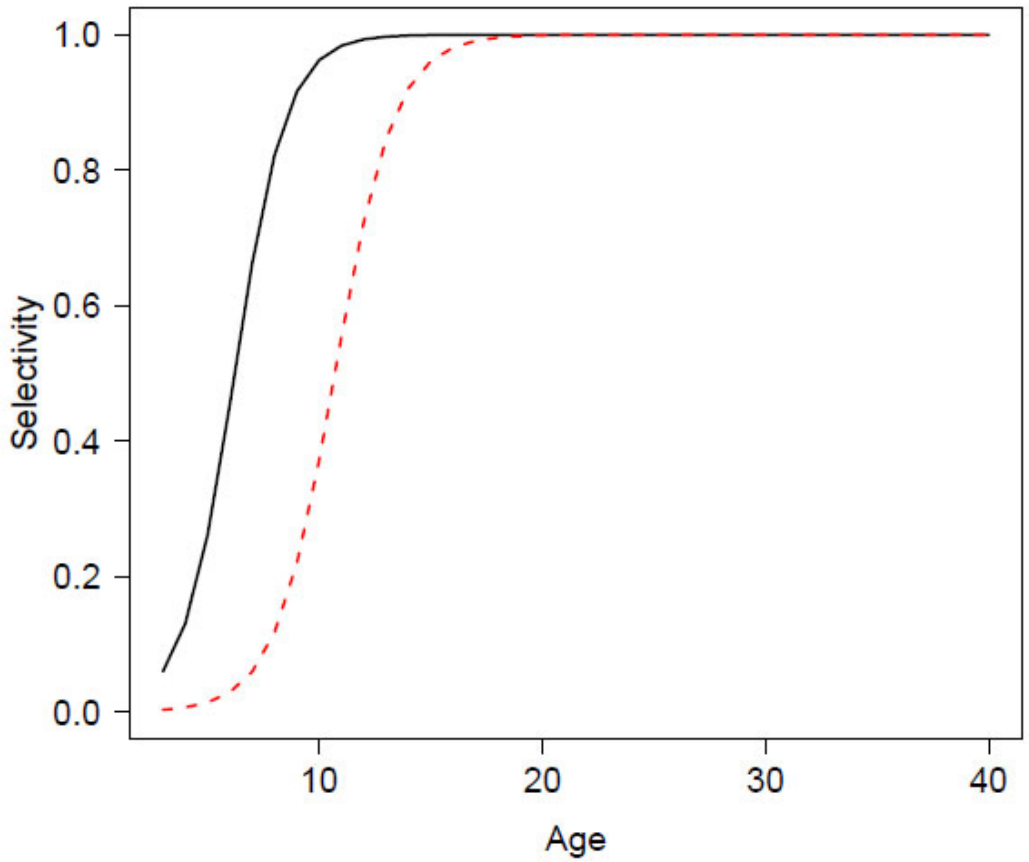




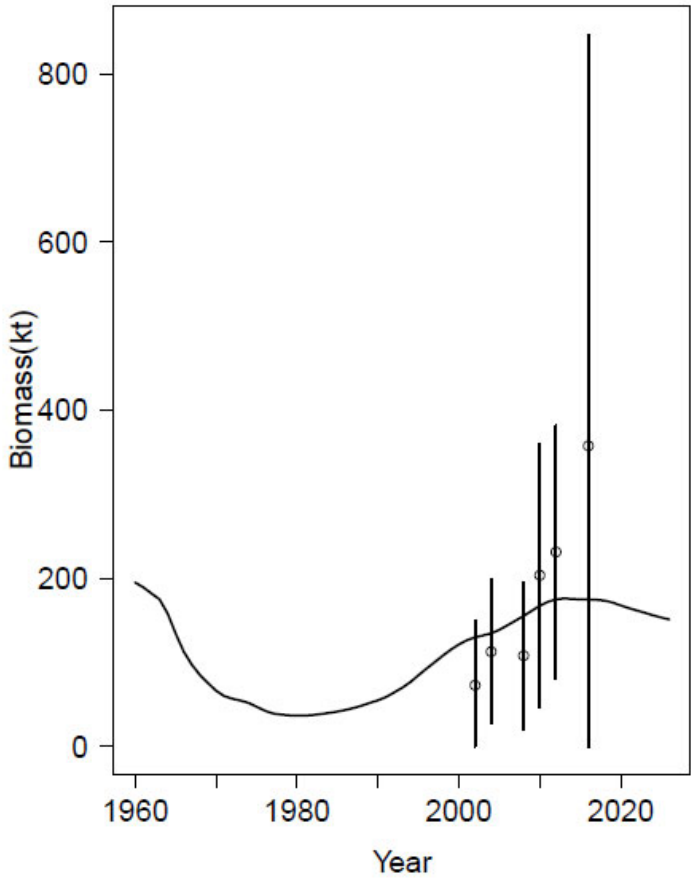
Fit to the AI survey



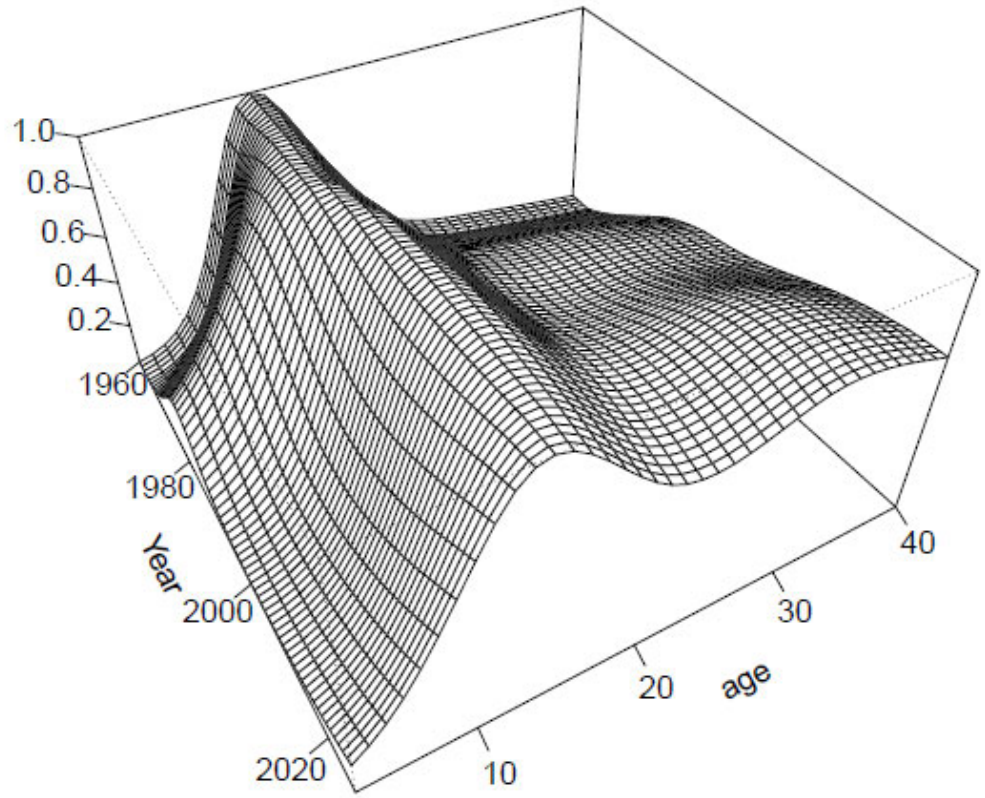
EBS and AI survey selectivity



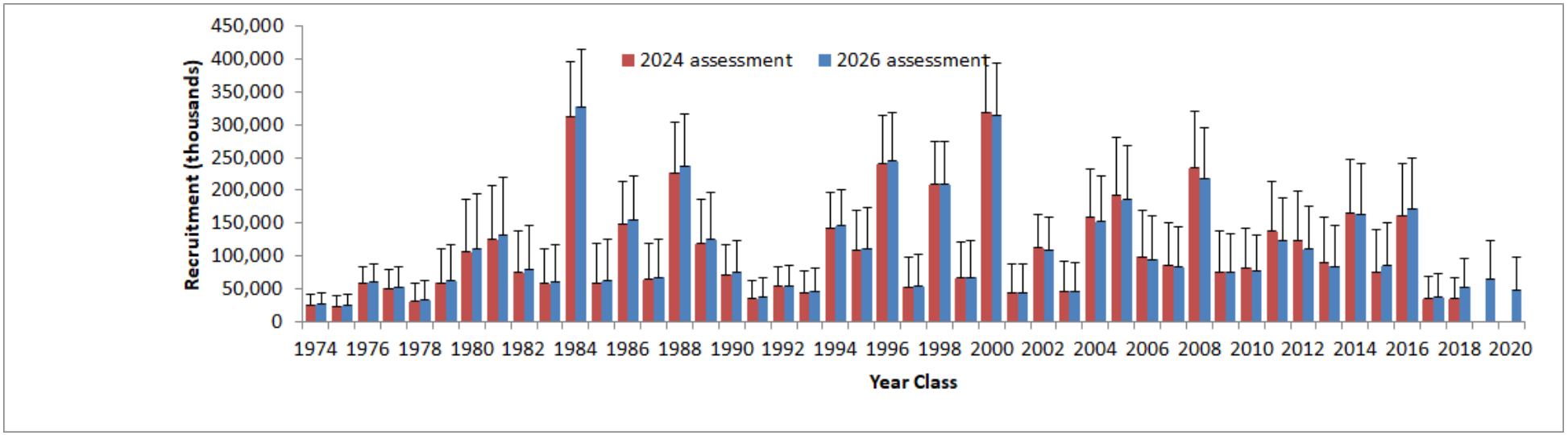
Fit to the EBS survey index



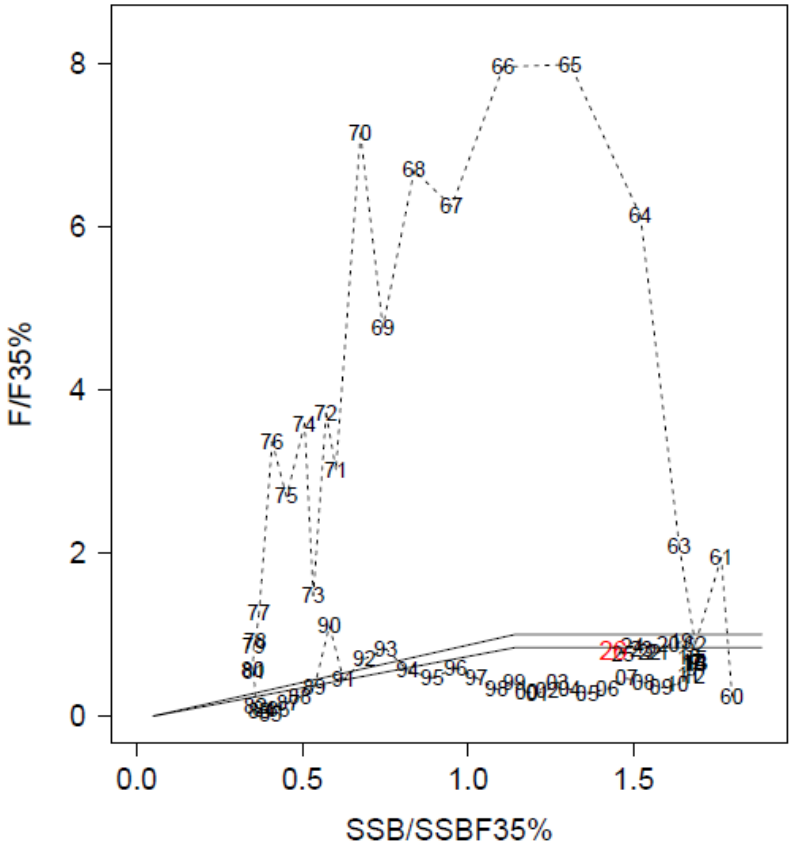
Fishery selectivity

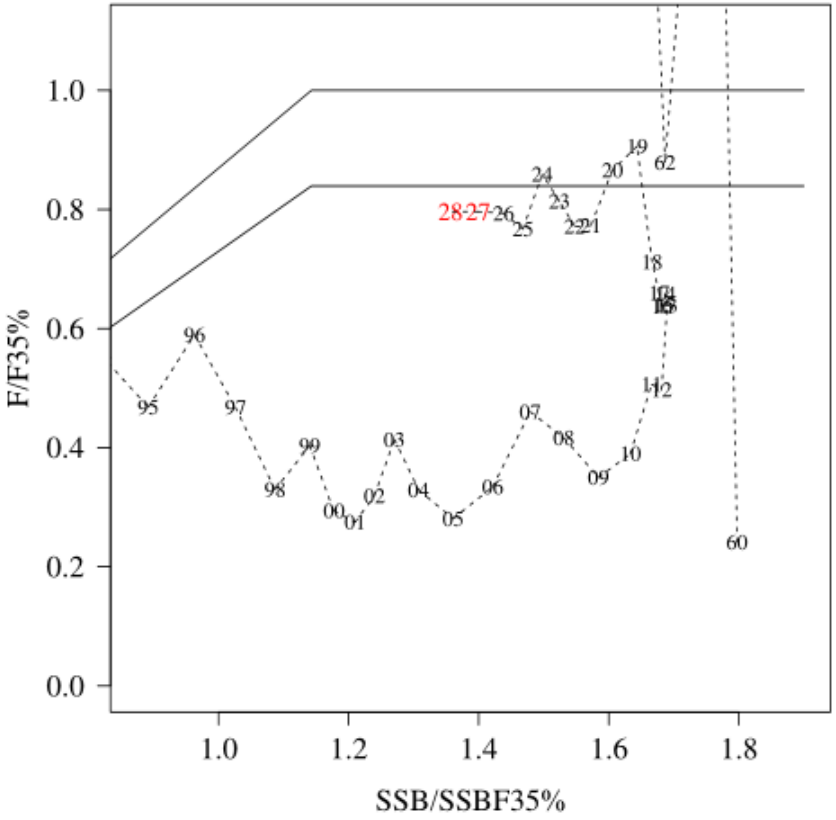


BSAI POP recruitment



Phase plane plot





Risk table considerations

- Assessment considerations: “data-inputs: biased ages, missing year of data including skipped surveys, lack of fishery-independent trend data; model fits: poor fits to fits to fishery or survey data, inability to simultaneously fit multiple data inputs; model performance: poor model convergence, multiple minima in the likelihood surface, parameters hitting bounds; estimation uncertainty: poorly-estimated but influential year classes; retrospective bias in biomass estimates.

- Level 2: Increased concern. Strong retrospective bias that could represent model misspecification, but population dynamics and/or observational processes have not been identified. Poor residual pattern in fitting most recent AI survey biomass estimates.

Risk table considerations

- Population dynamics considerations: “decreasing biomass trend, poor recent recruitment, inability of the stock to rebuild, abrupt increase or decrease in stock abundance.

- Level 1: Stock trends are typical for the stock; recent recruitment is in the normal range.

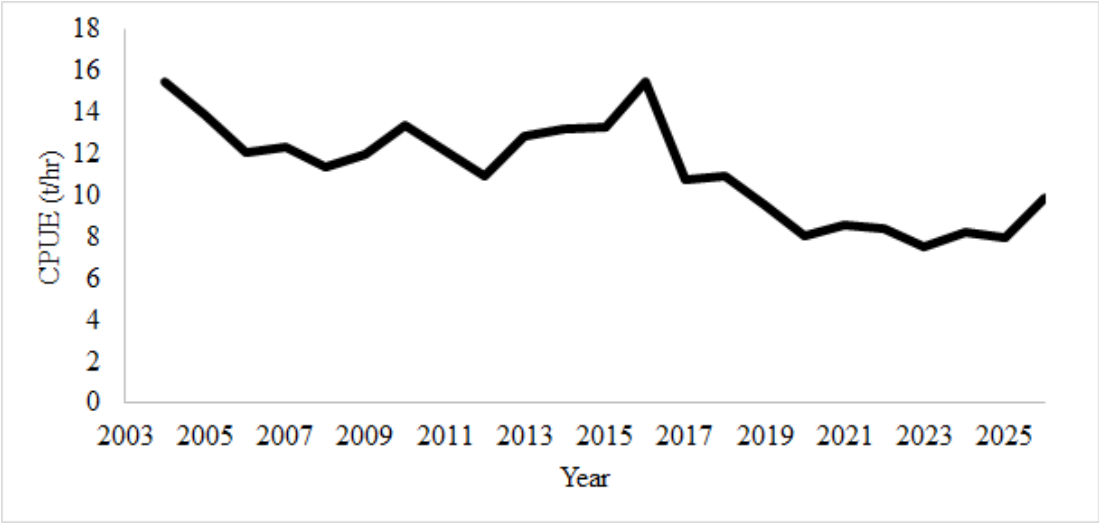
Rapid increase in the stock between 2006-2010 is somewhat unusual, although there is precedence for the stock rebuilding quickly from periods with strong recruitments. Recruitments for several recent year classes have been lower.

Risk table considerations

- Environmental/ecosystem considerations: "*Biomass continues to be high, bottom temperatures decreased from peak in 2016 except western Aleutians, but POP did occupy warmer waters in 2026. An early bloom in April 2026 may have decreased available zooplankton. The adult fish condition near 1 SD below the 1994-2012 mean is thought to be due to the increased biomass and competition with other planktivorous fish.* "

- Level 1: Normal.

Fishery CPUE



Tons/hr, from tows targeting POP based on haul species composition. Source: North Pacific Groundfish Observer Program.

Risk table considerations

- Fishery performance considerations: “fishery CPUE is showing a contrasting pattern from the stock biomass trend, unusual spatial pattern of fishing, changes in the percent of TAC taken, changes in the duration of fishery openings.”

- Level 1: No apparent fishery/resource-use performance and/or behavior concerns.

  Fishery CPUE was relatively stable from 2004-2016. A decline in CPUE has occurred from 2017-2023, and has since increased. Declines in CPUE may be related to changes in fishing practices to better avoid bycatch stocks.

Reference points and ABCs

Quantity	As estimated or specified in 2024 for: 2025	2026	As estimated or recommended this year for: 2027	2028
M (natural mortality rate)	0.051	0.051	0.050	0.050
Tier	3a	3a	3a	3a
Projected total (age 3+) biomass (t)	847,803	832,388	786,919	772,777
Female spawning biomass (t)				
Projected	352,503	344,463	329,342	319,340
$B_{100\%}$	681,381	681,381	672,556	672,556
$B_{40\%}$	272,552	272,552	269,022	269,022
$B_{35\%}$	238,483	238,483	235,395	235,395
F_{OFL}	0.072	0.072	0.073	0.073
$maxF_{ABC}$	0.060	0.060	0.061	0.061
F_{ABC}	0.060	0.060	0.061	0.061
OFL (t)	44,594	43,084	39,897	38,809
maxABC (t)	37,375	36,578	33,640	32,722
ABC (t)	37,375	36,578	33,640	32,722
Status	As determined in 2024 for: 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

Recommended 2027 BSAI ABCs and OFLs

BSAI ABC: 33,640 t (decrease from 2026 ABC of 36,578 t)

BSAI OFL: 39,897 t (decrease from 2026 OFL of 43,084 t)

Spatial apportionments

Spatial apportionment from 2024 assessment)

ABC apportionments

	Area				
	WAI	CAI	EAI	SBS	EBS slope
2024 smoothed biomass estimate	506,358	182,590	206,200	86,457	245,954
percentage	41.2%	14.9%	16.8%	7.0%	20.0%

Spatial apportionment from 2026 assessment)

	Area				
	WAI	CAI	EAI	SBS	EBS slope
2026 smoothed biomass estimate	412,586	169,289	227,406	40,669	245,935
percentage	37.7%	15.4%	20.8%	3.7%	22.4%

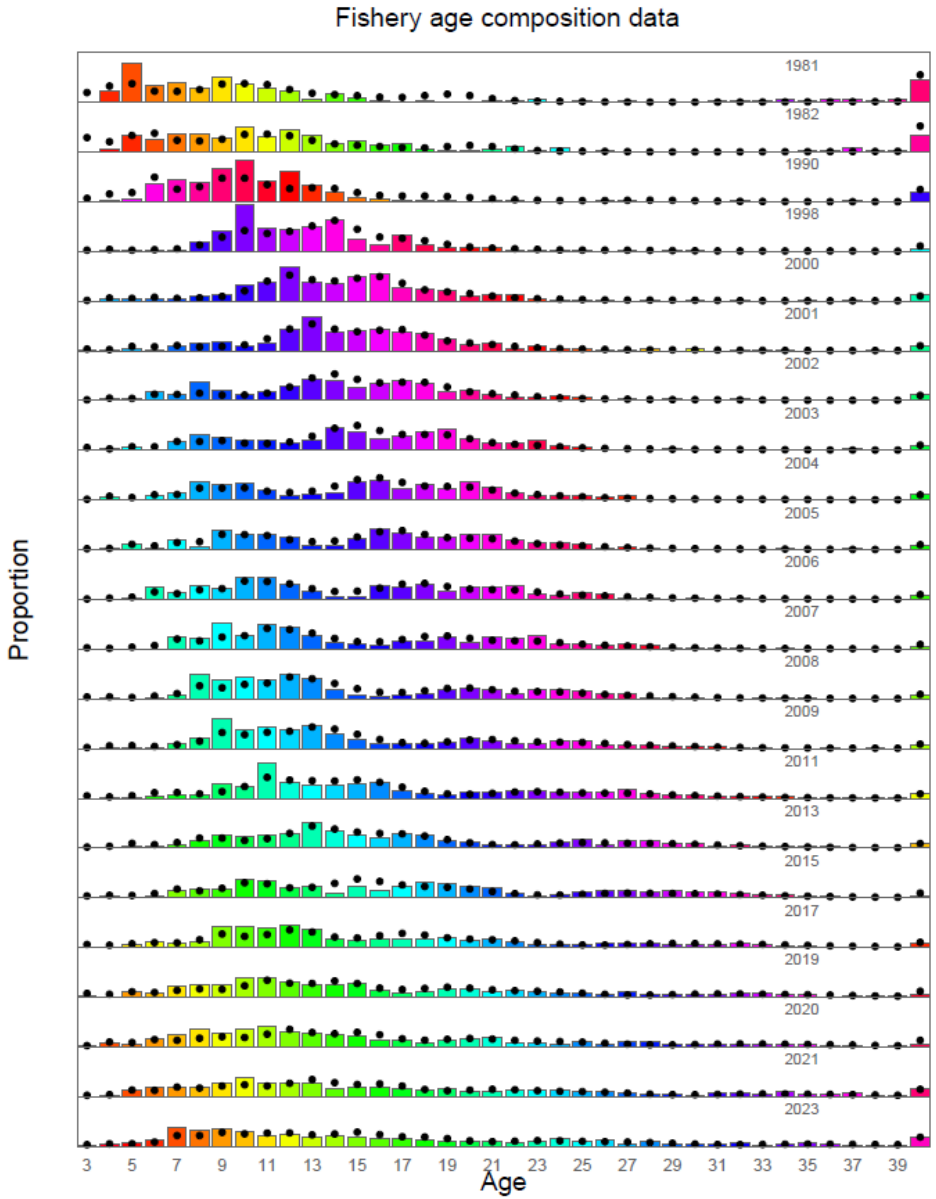
Subarea past ABCs and recommended BRDs

Area	Year	Age 3 Bio (t)	OFL	ABC	subarea ABC	BRD	TAC	Catch[1]
BSAI	2025	847,803	44,594	37,375			33,458	22,283
	2026	832,388	43,084	36,578			33,490	20,686
	2027		39,897	33,640				
	2028		38,809	32,722				
Eastern Bering Sea	2025				10,121		10,121	10,085
	2026				9,905		9,905	5,713
	2027					8,780		
	2028					8,540		
Eastern Aleutian Islands	2025				6,278		6,278	6,031
	2026				6,144		6,144	3,821
	2027					6,997		
	2028					6,806		
Central Aleutian Islands	2025				5,559		5,559	4,889
	2026				5,441		5,441	4,996
	2027					5,181		
	2028					5,039		
Western Aleutian Islands	2025				15,417		11,500	11,363
	2026				16,058		12,000	11,869
	2027					12,682		
	2028					12,337		

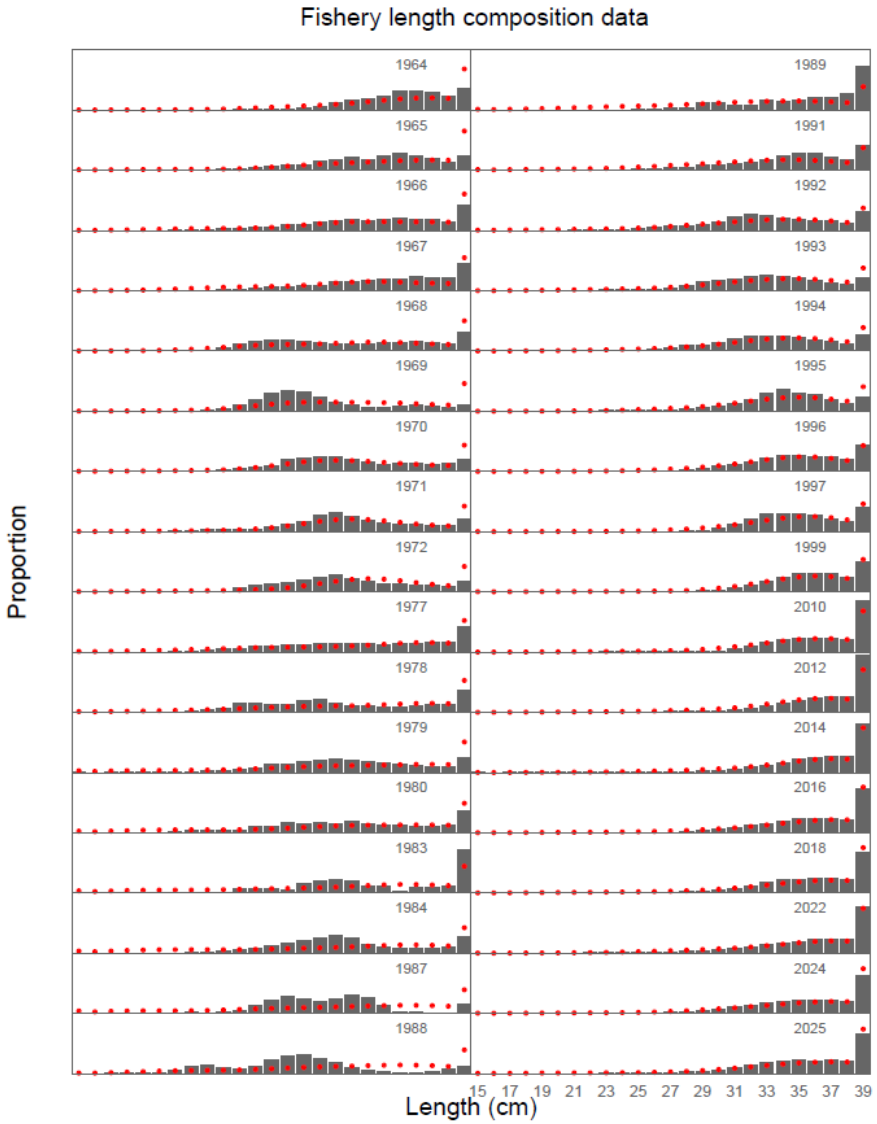
Conclusions

- Continued high abundance of POP, but the 2026 AI survey and recent biomass estimates are declining
- Additional diagnostics have contributed to our understanding of the conflicts between the data sets
- Statistical estimation of ageing error (i.e., Punt method) would be useful

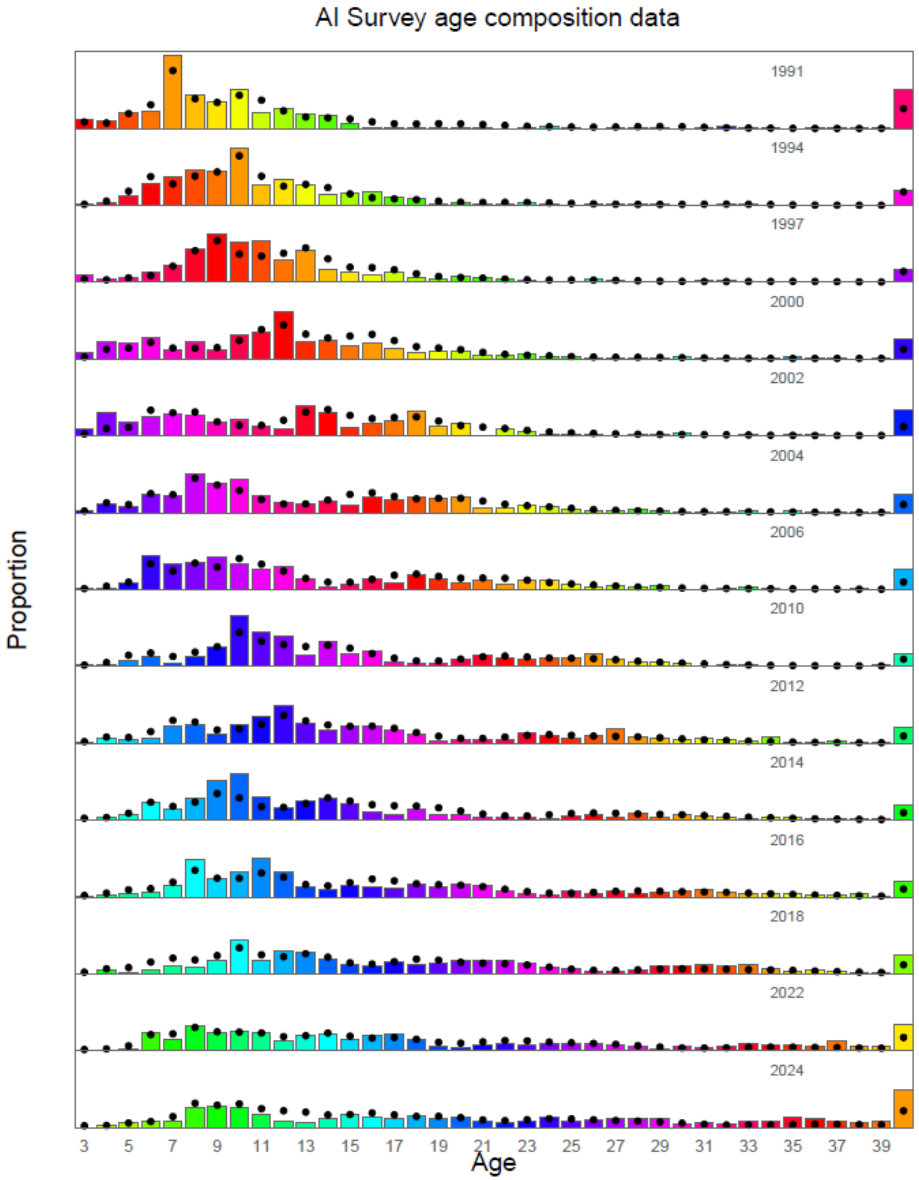
BSAI fishery age composition



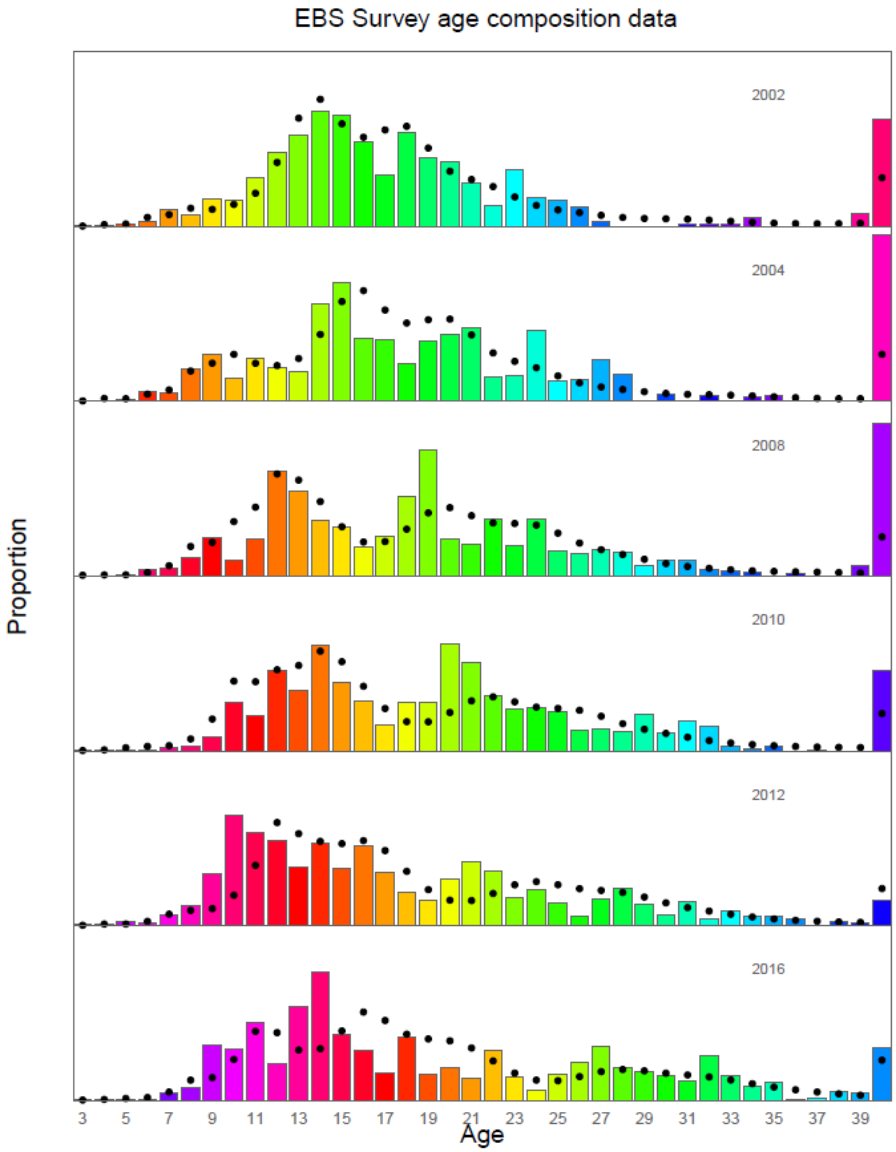
Fishery length composition



AI survey age composition



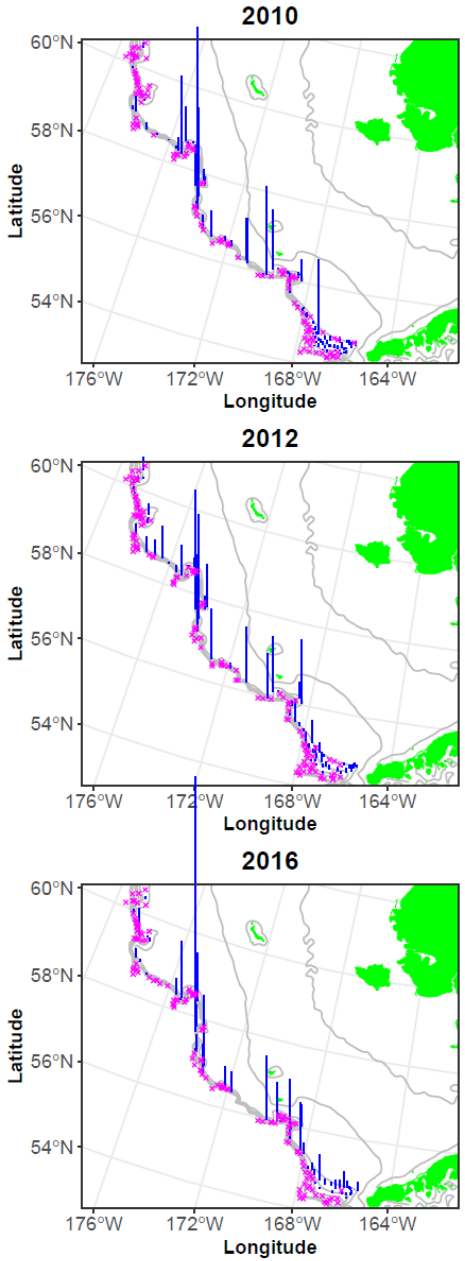
EBS survey age composition



Not a great fit to the EBS survey age compositions

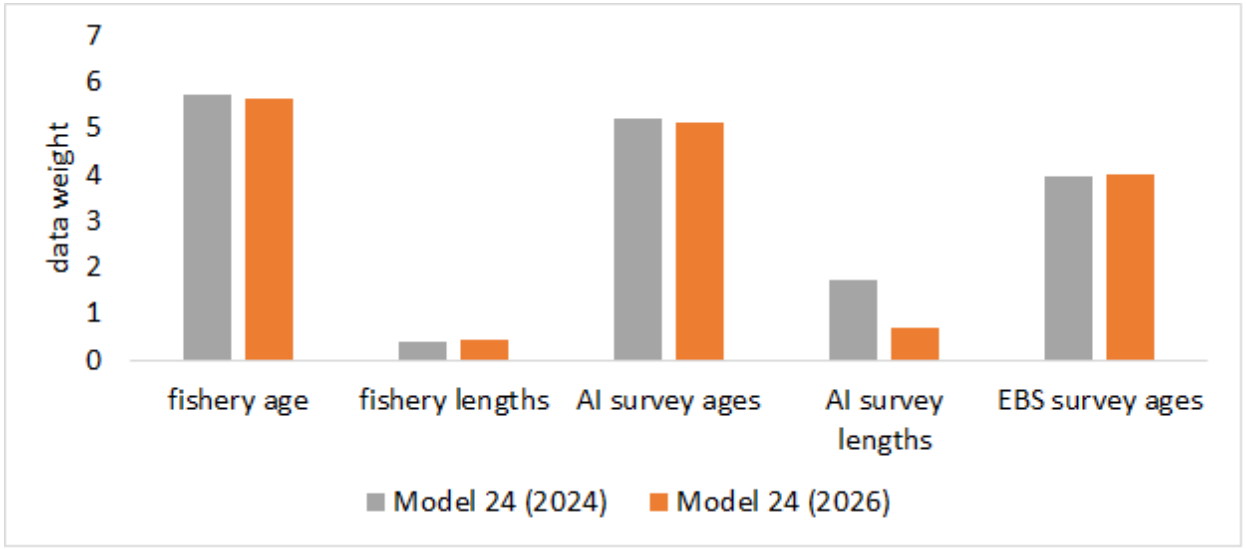
2000 year class is strong in the AI age data, not so much in the EBS data

Survey CPUE, 2010 – 2016 EBS surveys

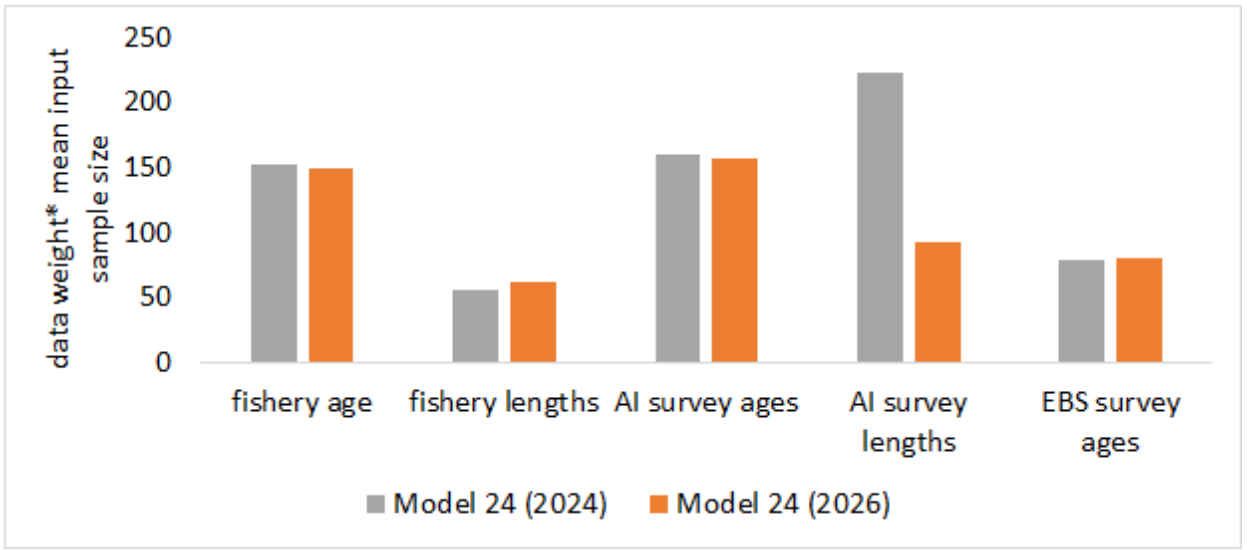


Year	EBS slope survey
2002	72,676 (0.53)
2004	112,582 (0.38)
2008	107,891 (0.41)
2010	203,460 (0.38)
2012	231,220 (0.33)
2016	357,379 (0.68)

Age/length composition weights



Data weights



(Data weights) *
(mean input sample size)