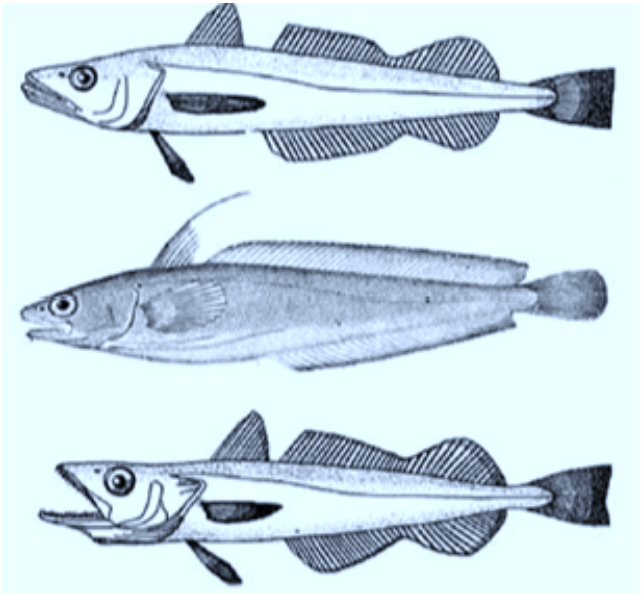
2027-2031 Small-Mesh Multispecies OFLs and ABCs

Assessment update; fishery performance; risk factor scoring

WHITING PLAN DEVELOPMENT TEAM

SCIENTIFIC AND STATISTICAL COMMITTEE
OCTOBER 28, 2026
BOSTON, MA AND WEBINAR



STOCKS (4)

- Northern silver hake
- Southern whiting (silver and offshore hakes)
- Northern red hake
- Southern red hake

TERMS OF REFERENCE

- Consider the results of the NEFSC 2026 data updates for northern silver hake, southern whiting, northern red hake, and southern red hake, and information provided by the Council's Small-Mesh Multispecies PDT.
- Recommend OFLs and ABCs for these four stocks for fishing years (FY) 2027 – 2031 that will prevent overfishing, be consistent with the Council's ABC control rule and rebuilding plans, and consider the Council's Risk Policy.

PRESENTATION OVERVIEW

- Small-mesh management background and specifications framework
- Fishery performance report and risk policy factor data highlights
- Silver Hake
  - Assessment overview
  - Northern silver hake (OFL & ABC)
  - Southern whiting (OFL & ABC)
- Red Hake
  - Assessment overview
  - Northern red hake (ABC only)
  - Southern red hake (ABC only)

Acknowledgements: Whiting PDT
Larry Alade, Kris Winiarski
Staff: Andrew Applegate, Emily Bordell, Mark Grant

2027-2031 SPECIFICATIONS CONTROL RULE & FRAMEWORK

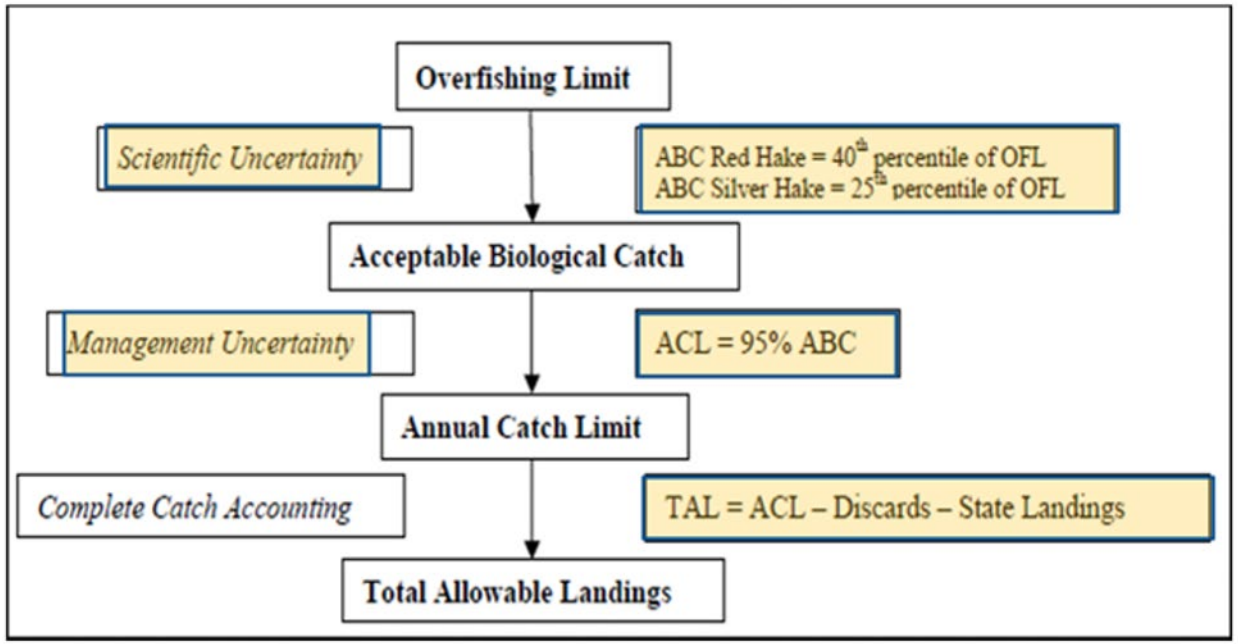
Silver hake control rule:

- OFL based on 1973-1982 MSY proxy
- ABC based on P*=25% application

Red hake control rule:

- OFL unknown; AIM assessment rejected
- ABC based on an ad hoc reference period
  - 1981-1994 Northern red hake
  - 2001-2019 Southern red hake

Specifications framework



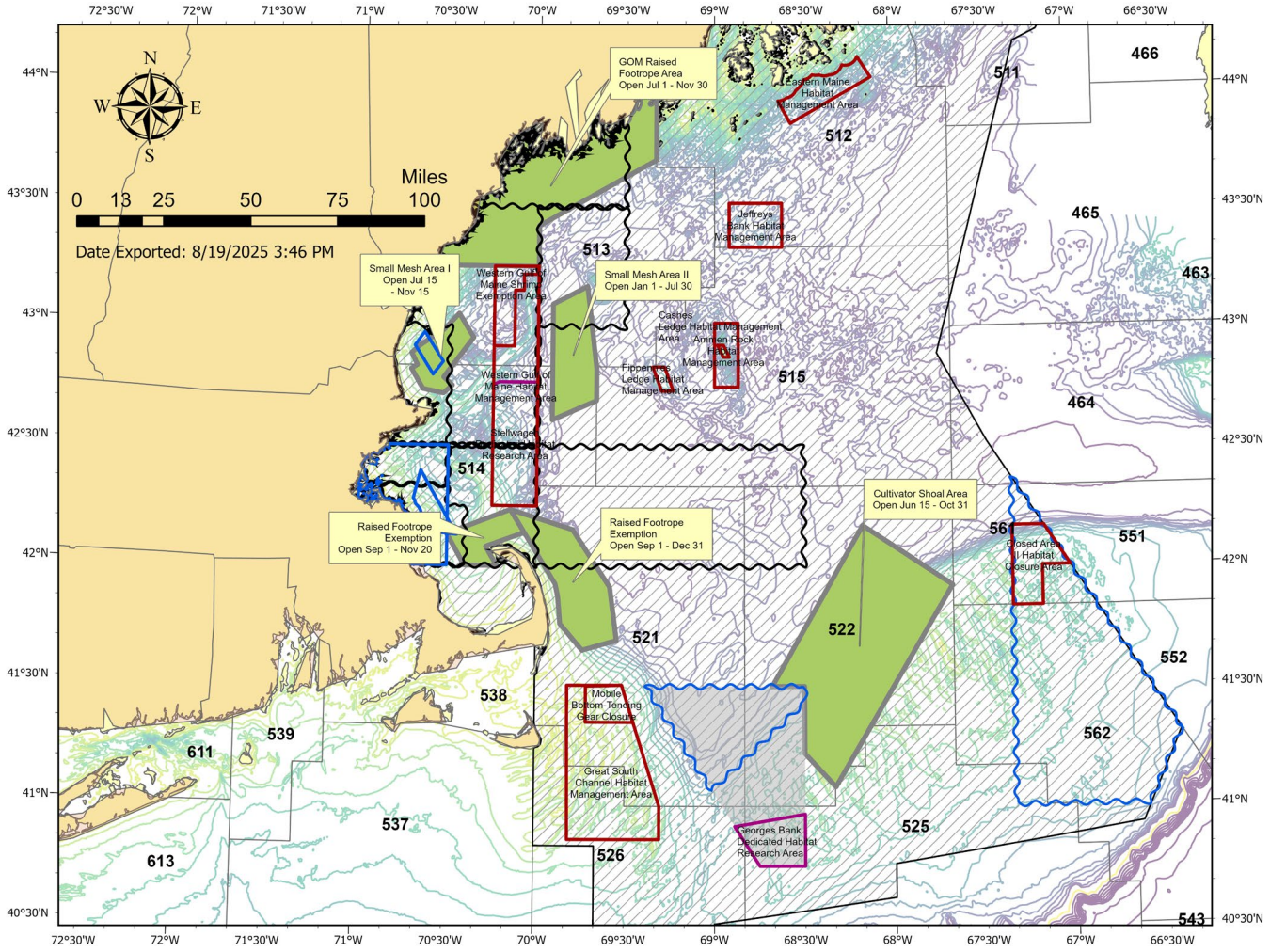
2.5 Brief Management Background

Small-mesh exemption areas in the Gulf of Maine and on Georges Bank shown in green with open season labels. Northern management area statistical areas are shown in light grey shading. The GOM/GB regulated mesh area is hatched. Habitat management areas and groundfish closure areas are also shown as an outline.

Northern area exemption calendar

	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Cultivator		June 15 – October 31										
GOM* Grate			July 1 – November 30									
Small I				July 15 – November 15								
Small II	– June 30								January 1 –			
Cape Cod RFT†					Sept 1 – Nov 20							
					September 1 – December 31							

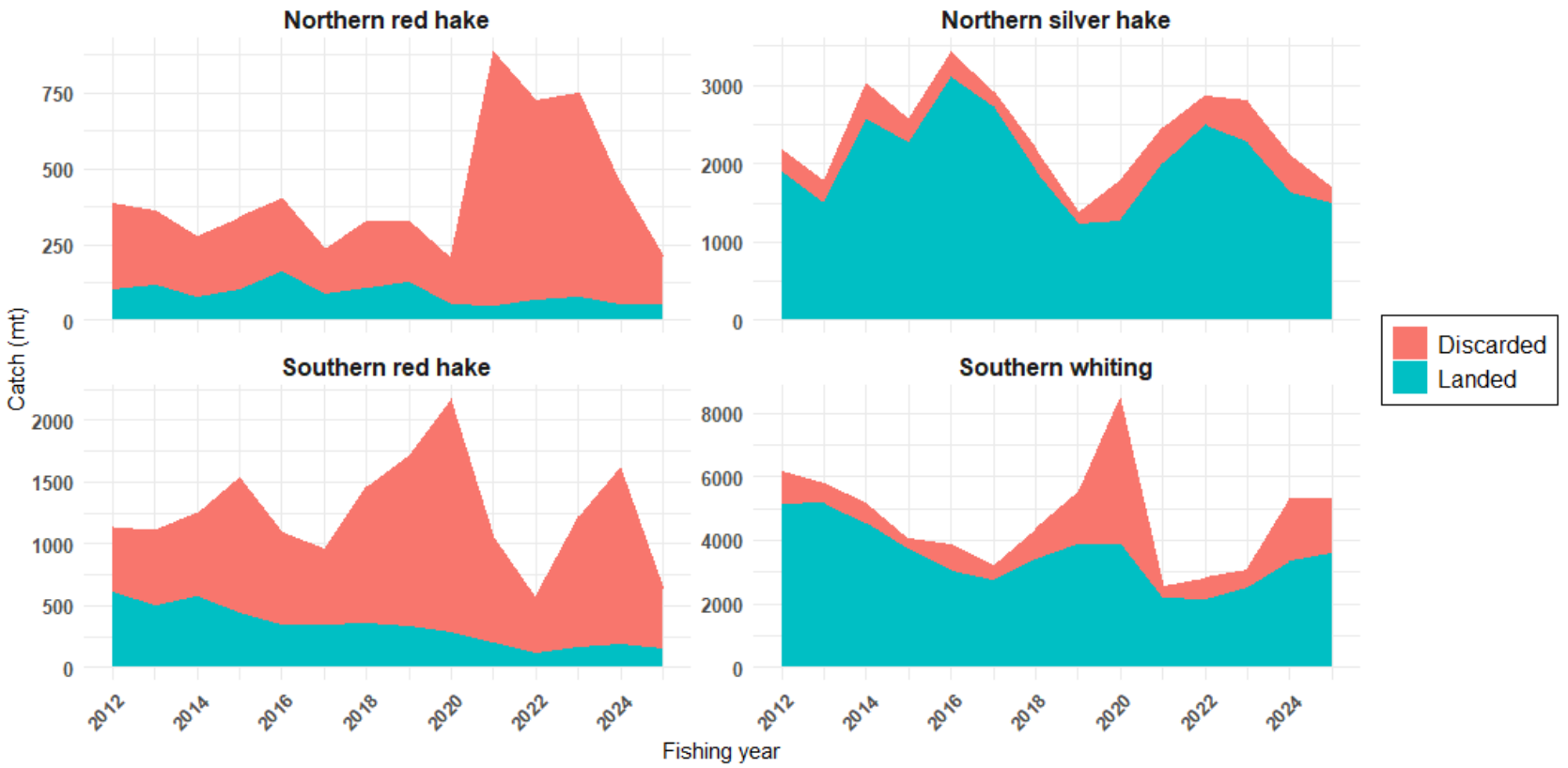
Small-mesh exemption areas with groundfish and habitat management areas



3.1 Updated catch history by stock

- Full range of reported landings updated via CAMS
- Estimated discards for 2018 to 2025 update via CAMS

Catch history by disposition and stock



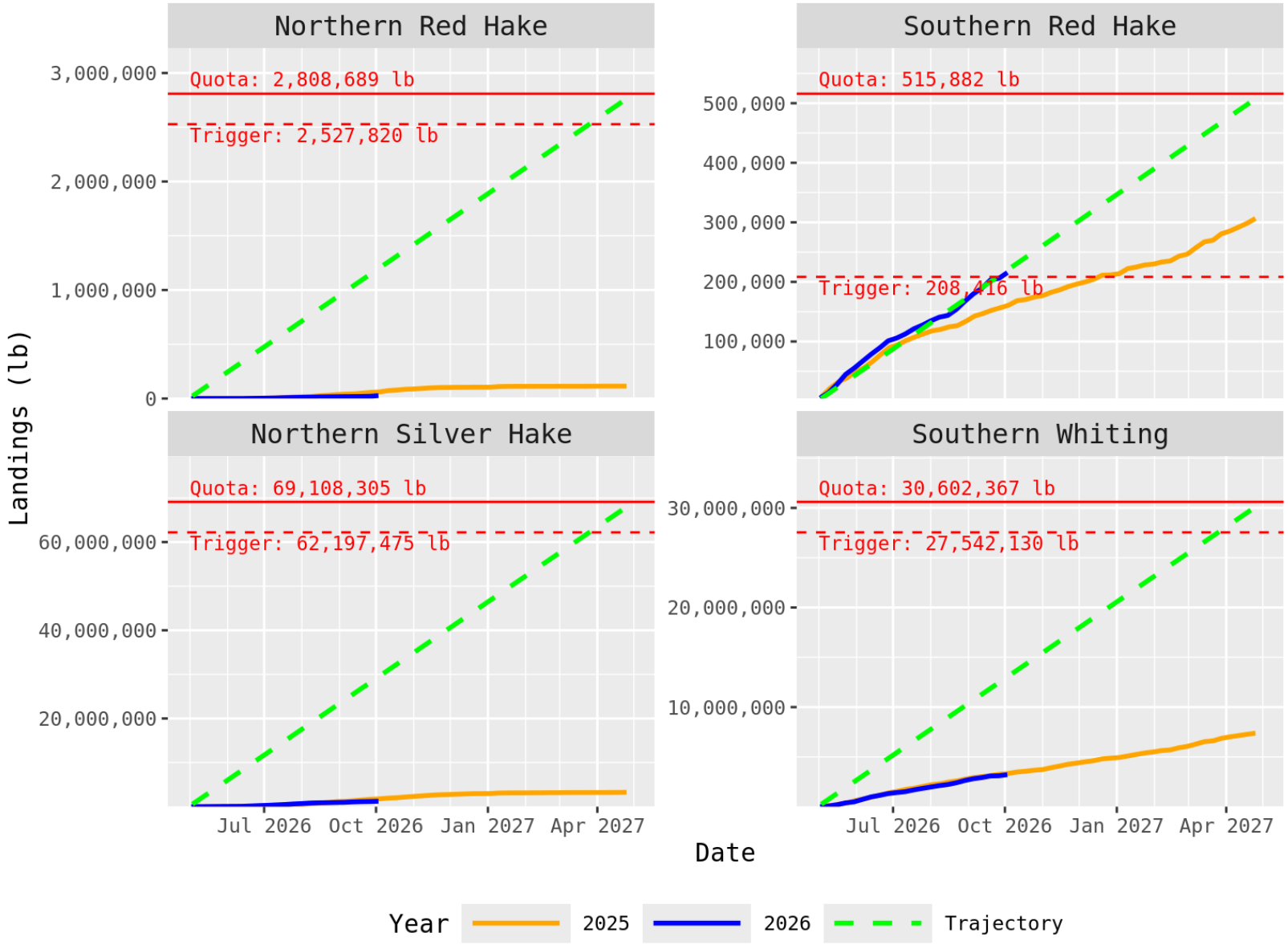
3.11 Utilization, 2012-2025

Trend in specifications, catch, and utilization by stock



3.12 2026 Landings monitoring - TAL trigger

- YTD landings are running about the same as they were in fishing year 2025
- Except southern red hake landings are tailing off and remain below the TAL trigger.
- Southern red hake landings are not tailing off as they did in the prior year and are approaching the TAL trigger, potentially on track to reach the quota
- Data acquired Oct 8, 2026



Current year quota plot

- Landings for all stocks have declined. More stable in recent years, but were lowest in FY 2025
- Most silver hake landings were caught in the southern area, the proportion shifts to the north in recent years.
- Red hake landings come primarily from the southern area, but have been significantly declining in both stock areas.

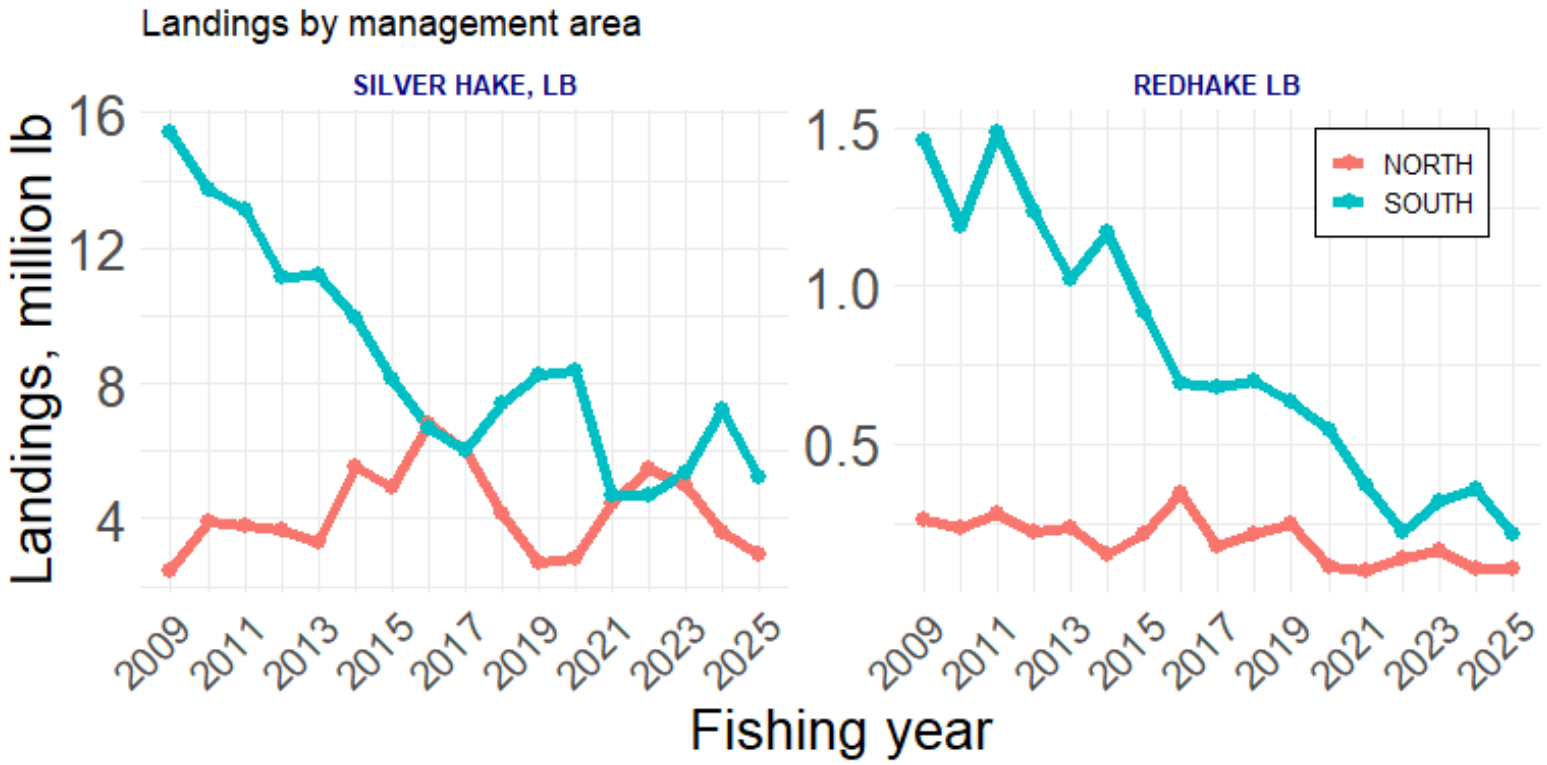


Figure 1: Landings by management area (Silver hake LEFT, Red hake RIGHT)

Alternative risk policy plot with quartiles.

The PDT uses the quartiles for the last five years for risk-factor scoring. The quartile values are calculated from the plotted time series, excluding the last five years.

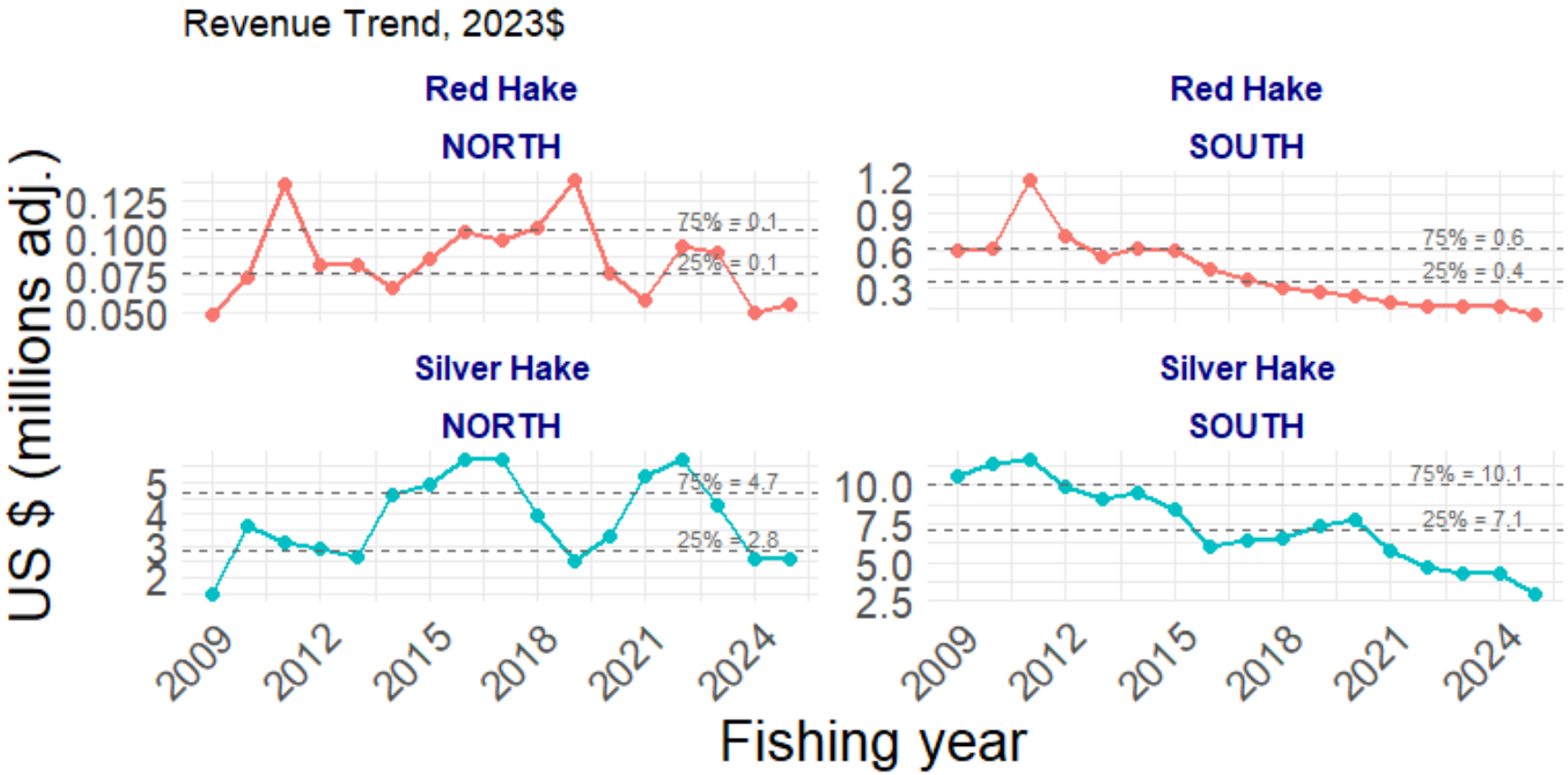


Figure 3: Revenue trends by species (Silver hake LEFT, Red hake RIGHT)

Considerable decline in whiting and red hake price since 2021.

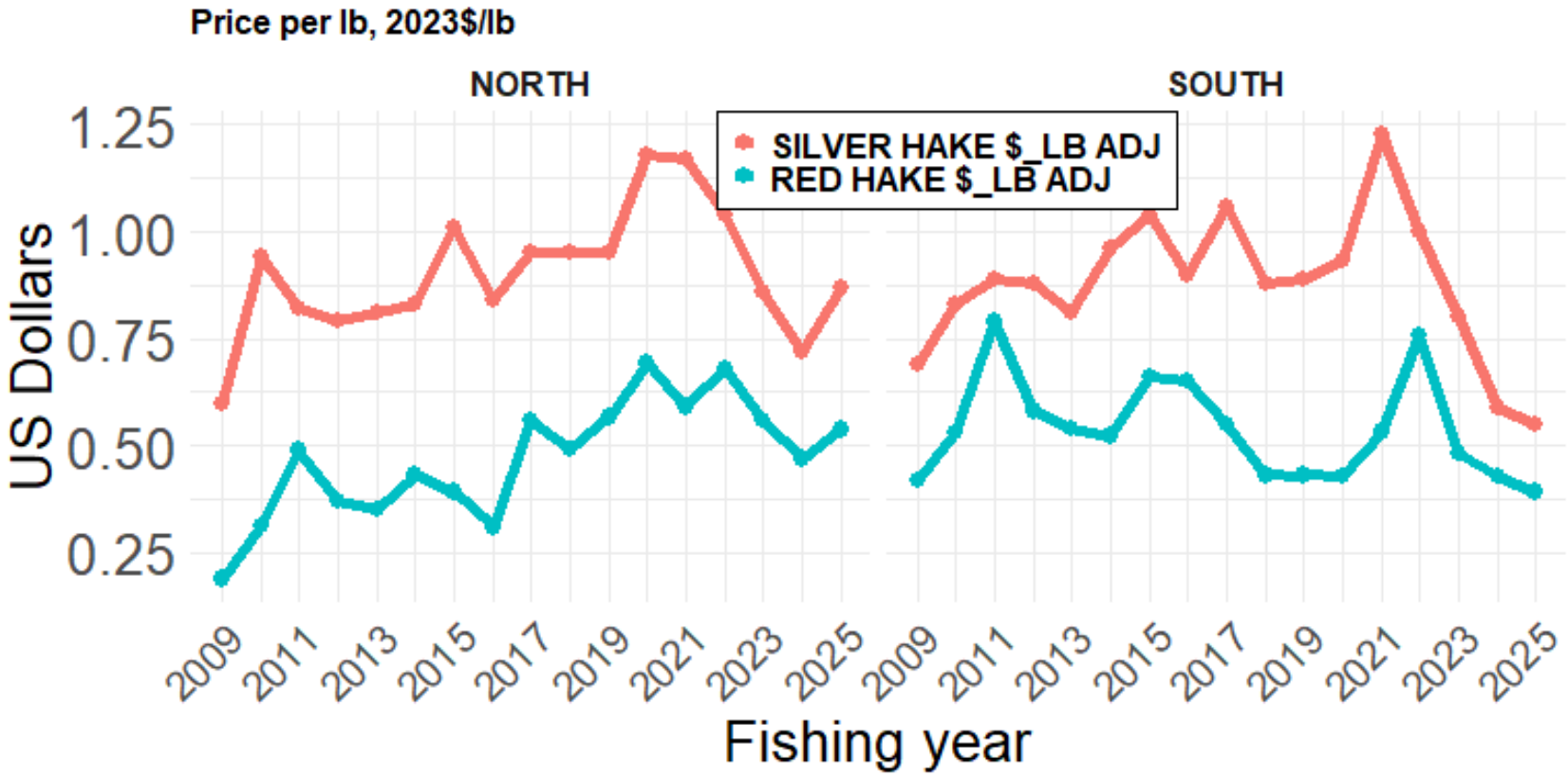
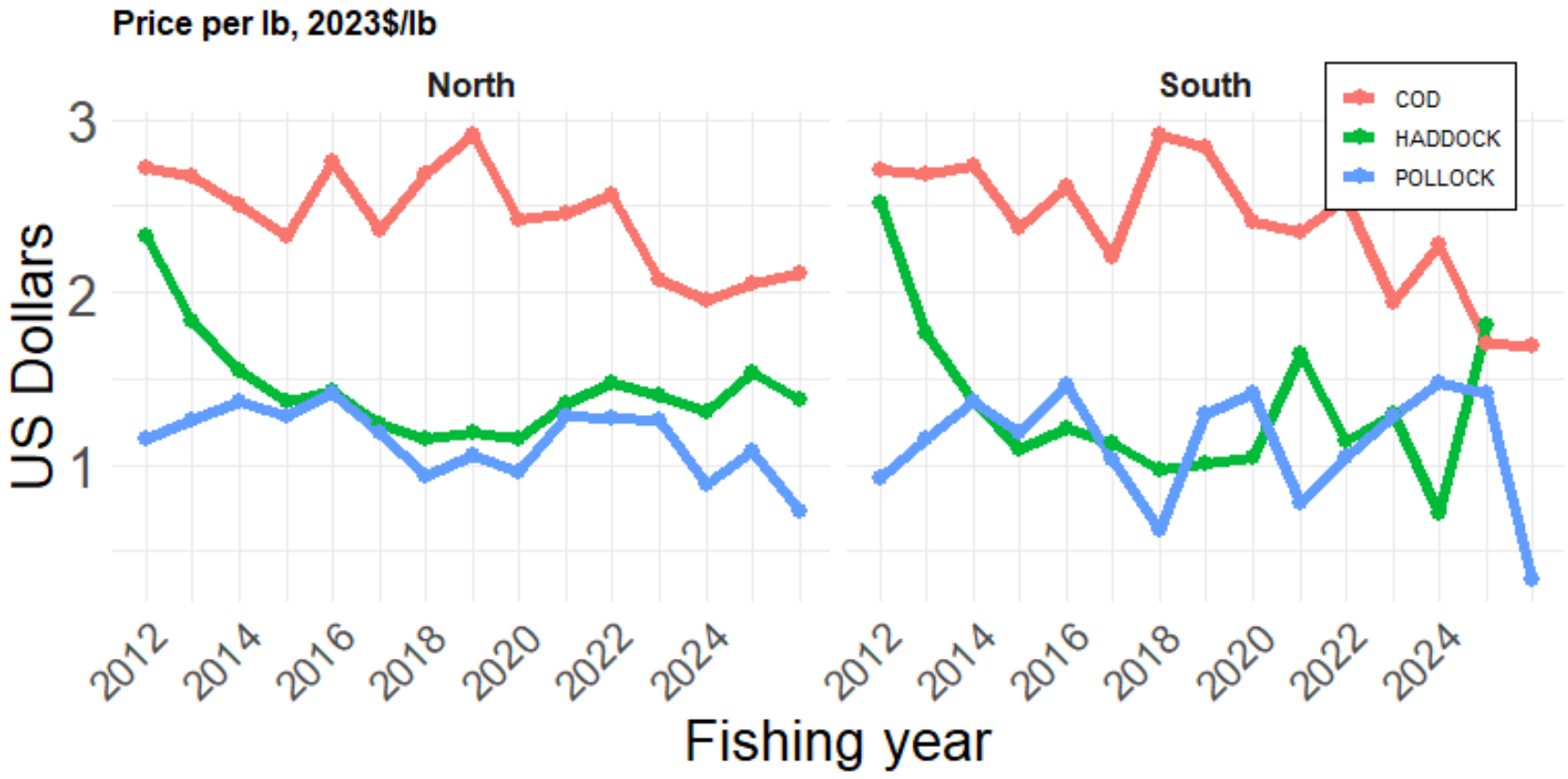


Figure 5: Small-mesh multispecies price trends

- General decline in commonly landed NER finfish prices in both regions, with a significant decline in cod price since 2018 from the southern area.
- Steady decline in monkfish and haddock prices in both regions.
- Slight cod price increase for 2025 in the northern area; 2025 haddock price spike in the south (possibly low amount of landings)

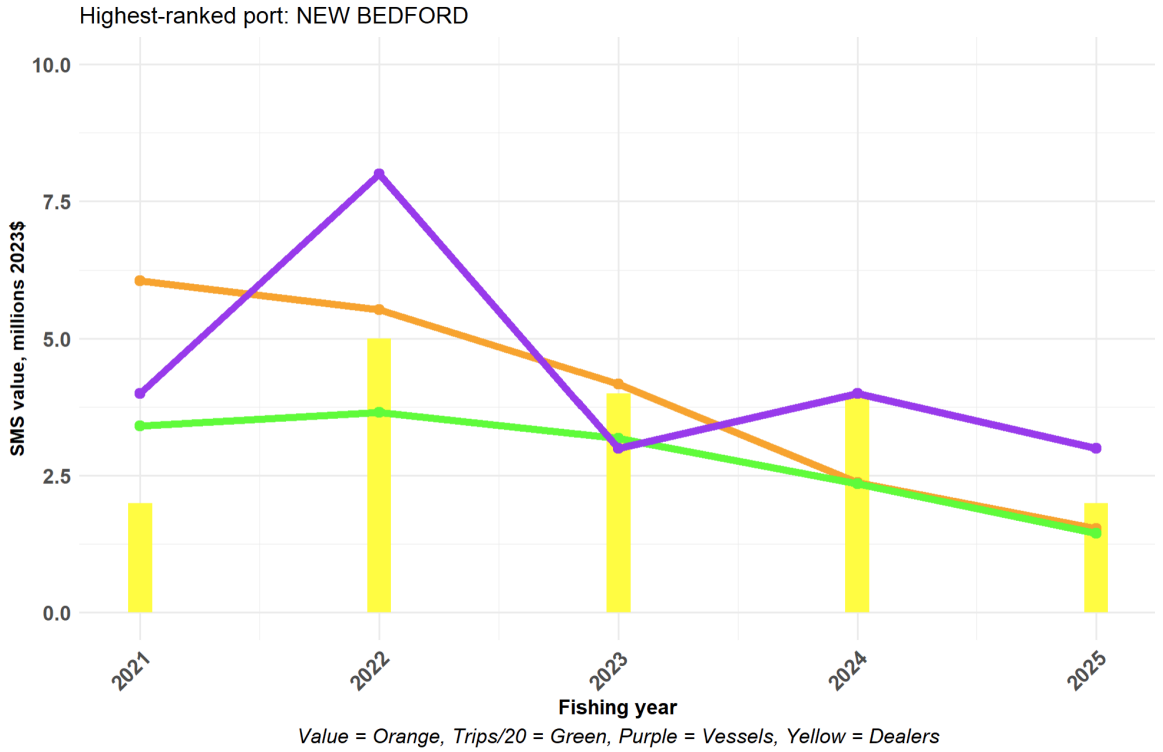


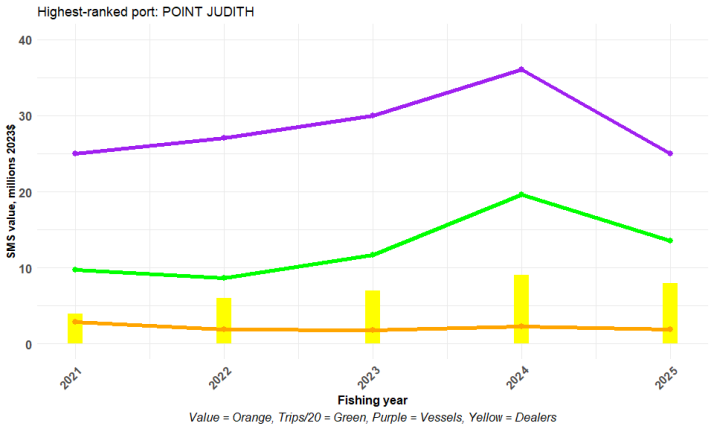
Trends in fish prices by management area.
‘ANGLER’ = Monkfish

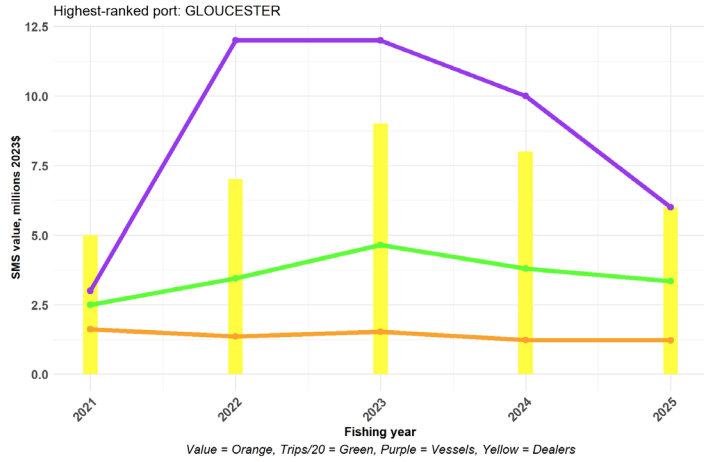
State	Port	Trips	Days absent	Crew days	Vessels	Ave length	Age	SMS Value (2023$)	Discards	SMS_Discards	Dealers
MA	NEW BEDFORD	112	399	600	4	82	43	3,929,277	927,967	280,311	3
RI	POINT JUDITH	379	703	1,371	29	68	45	2,149,037	1,523,841	234,437	7
MA	GLOUCESTER	71	517	685	9	78	29	1,392,412	1,416,109	396,231	7
NY	MONTAUK	50	420	359	9	69	40	790,746	563,407	73,722	8
MA	BOSTON	11	45	43	3	67	32		71,282	6,521	<3
CT	NEW LONDON	7	105	114	<3	47	30		188,098	66,858	<3
NY	HAMPTON BAYS	7	9	18	3	55	27	59,477	20,806	628	3
CT	EAST HAVEN	5	24	24	<3	69	40		40,700	9,214	<3

Commercial fishery activity

- **5.1 Relative SMS activity trends in top 3 ports**
- NEW BEDFORD
- POINT JUDITH
- GLOUCESTER







Port indices

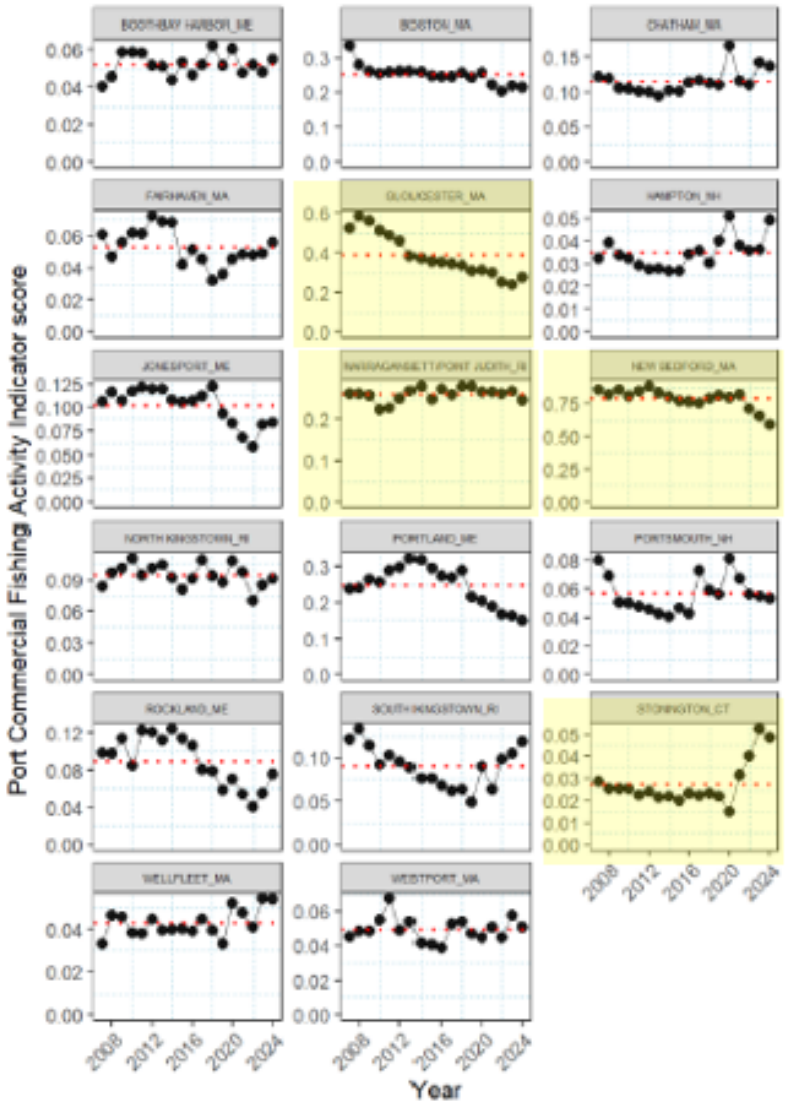
2. Fishing Communities – Of New England ports identified in the PCFA analysis, are the port-level scores for a majority (mode) of ports above, neutral, or below the time-series average? (Below=1, Neutral=0, Above=-1)

Use Port Commercial Fishing Activity (PCFA) Indicator which uses NOAA data on dealers, landings, revenue, and active commercial permits to explore trends in commercial fishing activity over time. A New England specific PCFA was prepared for use in the 2026 Risk Policy by the NEFSC SSB, and selects for New England ports where lobster landings constitute <50% of total landings, with selected ports to ensure geographic representation from all New England states.

To determine a score for this question (-1, 0, +1), PCFA scores from the terminal year of the analysis (2024) were compared with the mean of the time series (2007-2024) at the port/fishing community level.

Seven ports scored below the mean in the terminal year, while 5 were neutral (difference of less than .01), and 5 were above the mean. Since the mode of the number of ports was 7, this factor question will be scored as a 1 for all stocks scored and to which the Risk Policy is applied in 2026. PDTs should not deviate from this at this time.

Figure 4 - PCFA Indicator Scores for 2026 Risk Policy. Red dashed line in time-series mean (2007-2024).

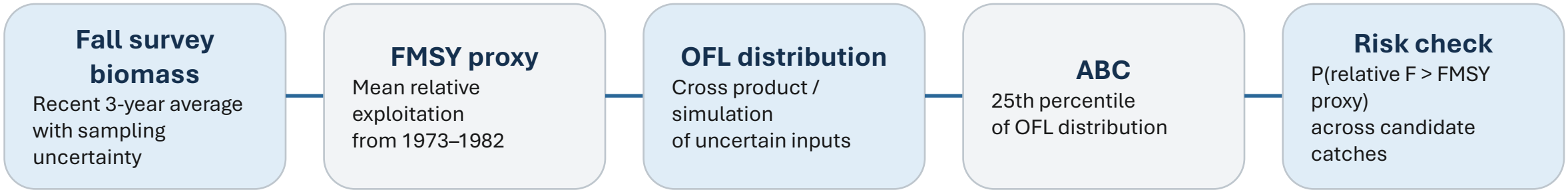


SILVER HAKE ASSESSMENT METHODS

Model	Empirical; relative exploitation applied to 3-year average current survey biomass
Stock Status	Both stocks: Not overfished; overfishing not occurring
Rebuilding	None
Uncertainties	MSY-proxy period may be outdated and unrepresentative of current productivity Customary variations in survey data Missing years of survey data

1. Specification framework

From empirical stock information to catch advice



Assessment is empirical: annual relative exploitation = total catch ÷ survey biomass index.

OFL is derived by applying the FMSY proxy to recent survey biomass; uncertainty is propagated rather than using only point estimates.

The risk analysis is a complementary diagnostic: it asks how often a candidate catch would imply exploitation above the FMSY proxy.

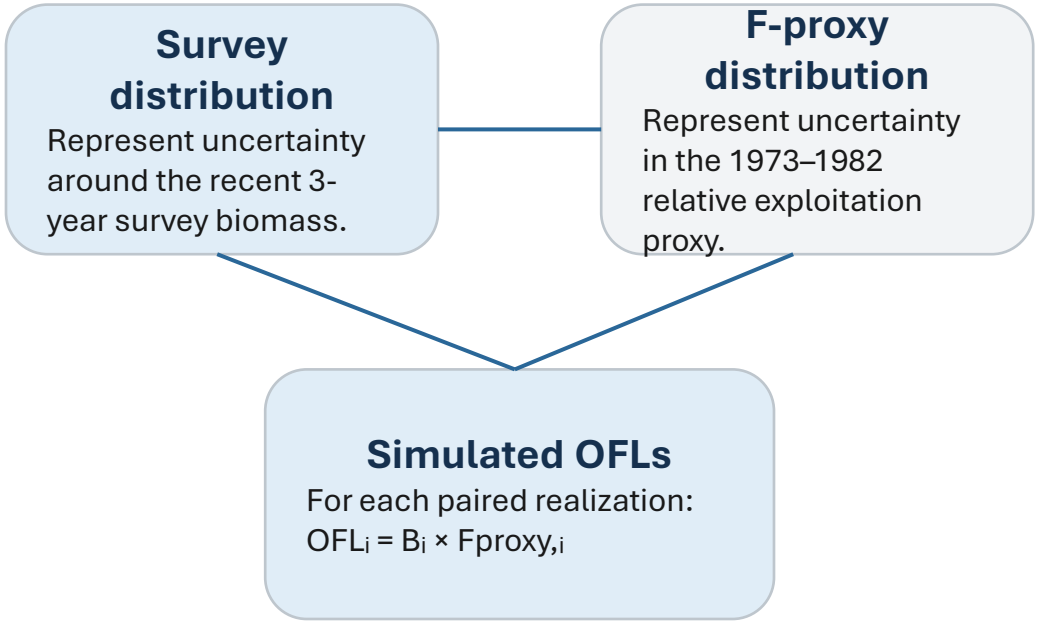
Sources: NEFMC SSC Small-Mesh Multispecies Report (Dec. 2023); Whiting PDT report to SSC (July 2011).

2. OFL: propagate uncertainty in biomass and the FMSY proxy

Point estimate

$OFL = \bar{B}_3yr \times FMSY\ proxy$

where $\bar{B}_3yr$ = recent 3-year average Fall survey biomass index
and FMSY proxy = average relative exploitation during 1973–1982



Historical Method 2 estimated OFL uncertainty from the joint/cross-product distribution of the survey index and FMSY proxy.

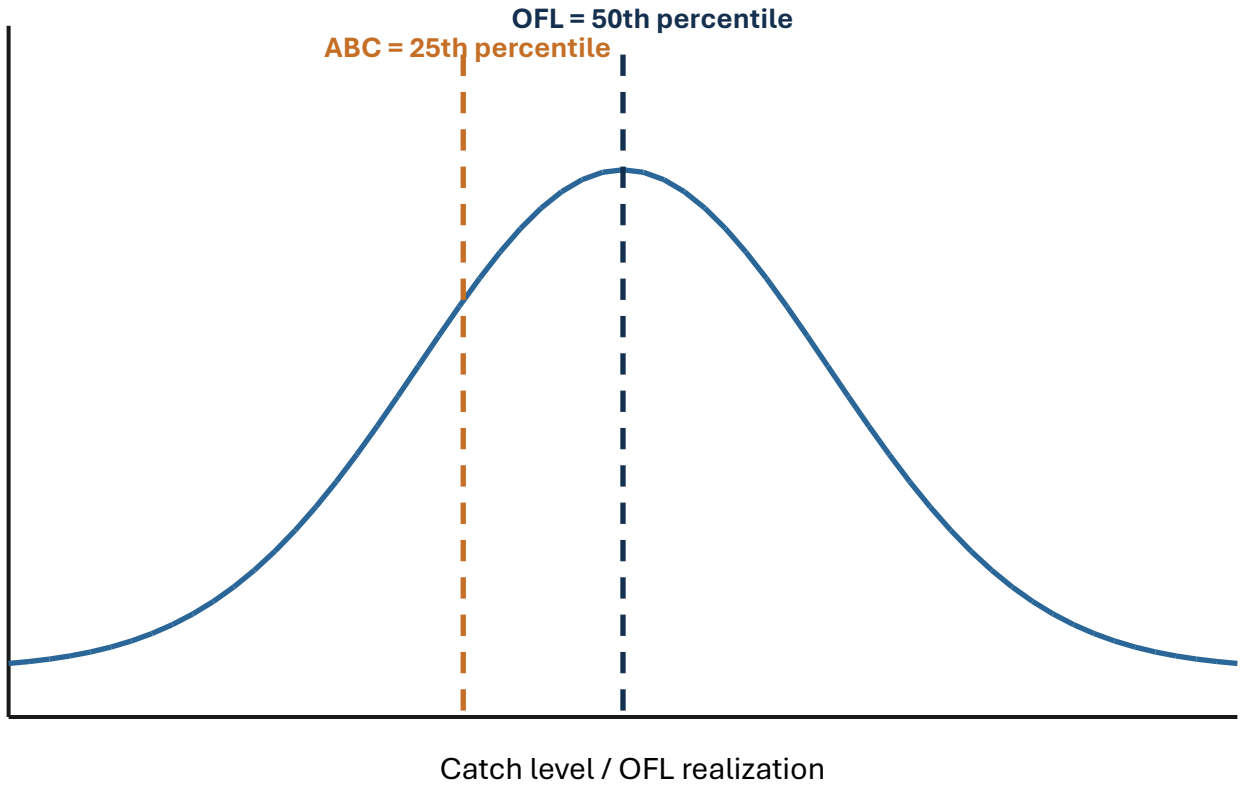
For silver hake, the FMSY-proxy uncertainty was characterized from the mean and variance of 1973–1982 exploitation ratios with a lognormal error structure.

The resulting OFL distribution carries uncertainty from both stock abundance and the exploitation reference point.

Method basis: 2011 Whiting PDT/SSC analyses; 2014 assessment-update methods presentation.

3. ABC: why the 25th percentile?

The percentile is a scientific-uncertainty buffer, not simply a fixed percentage reduction from OFL



Under the probabilistic framework, OFL is the median (50th percentile) of the OFL distribution.

Setting ABC at the 25th percentile lowers catch advice to account for scientific uncertainty; conceptually, 25% of modeled OFL outcomes lie below ABC.

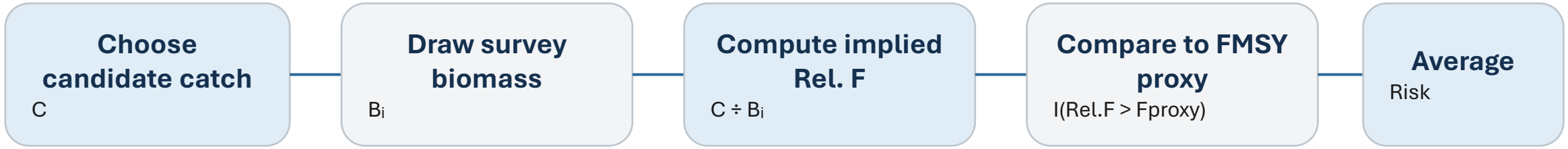
NEFMC adopted the 25th-percentile control rule for both silver hake stocks; the 2023 SSC continued to use it for FY2024–2026.

Important

The ABC/OFL ratio varies with the width and shape of the OFL distribution; it is not a constant 25% buffer.

Sources: 2012 Secretarial Amendment; NEFMC SSC Report (Dec. 2023).

5. Risk analysis: probability of exceeding the FMSY proxy



$$\text{Risk}(C) = \Sigma\ P(B_i) \times I[\ C / B_i\ >\ \text{FMSY proxy}\ ]$$

For each candidate catch, convert every survey-biomass realization into an implied relative exploitation rate.

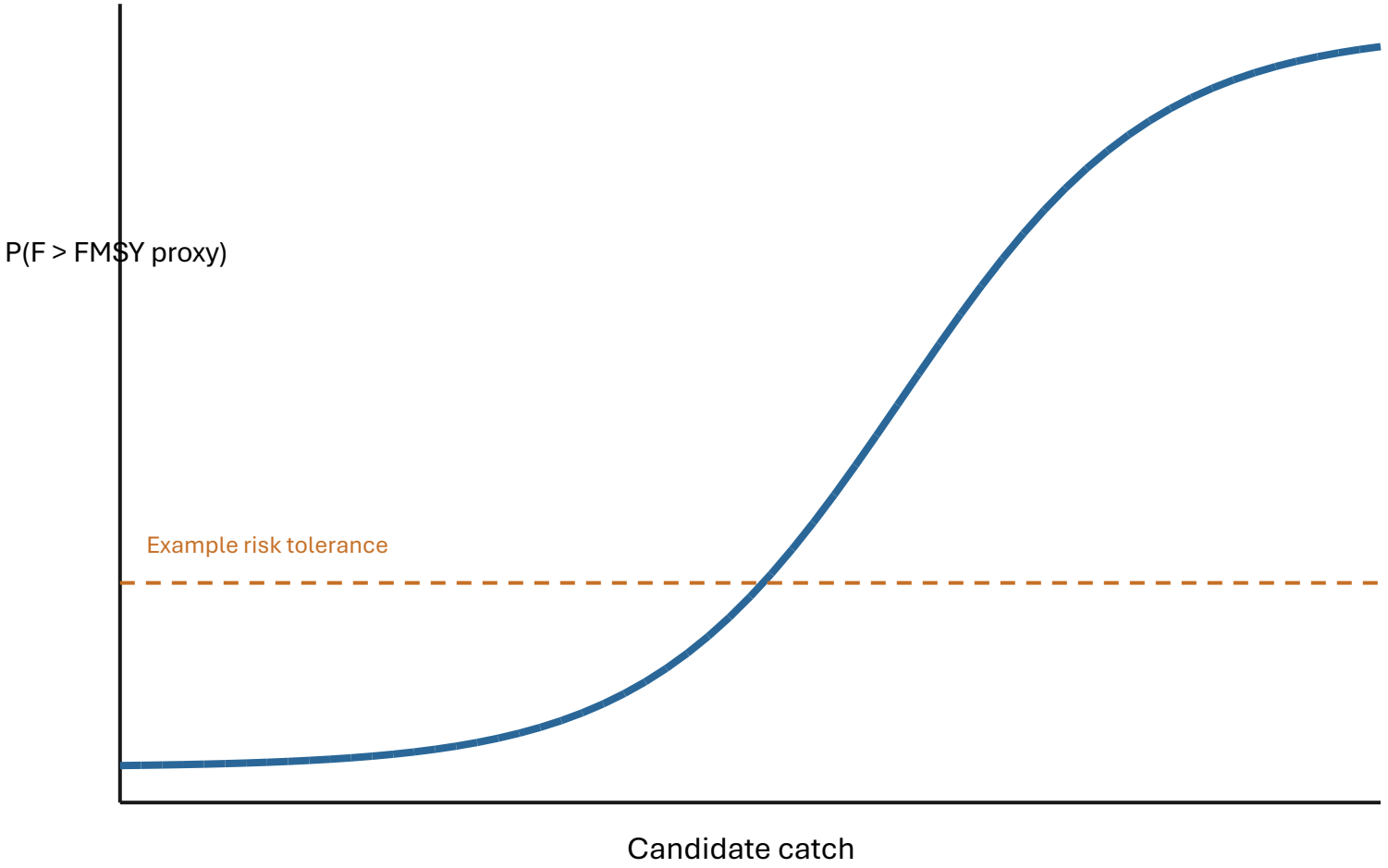
Flag realizations where implied exploitation exceeds the chosen FMSY-proxy value; weight by the probability of that survey realization.

Repeat across catch levels to produce a catch–risk curve. Historical analyses also examined uncertainty in the FMSY proxy (e.g., 25th, median, 75th percentiles).

Historical description: Whiting PDT (2011) and 2014 assessment-update methods: risk = probability implied relative F exceeds FMSY proxy.

6. How to read the catch–risk curve

Illustrative only — replace with stock-specific risk curves from the updated analysis



Low catch → most survey realizations imply exploitation below the proxy → low overfishing risk.

As catch increases, a larger fraction of plausible biomass states implies relative F above the proxy.

Use the curve to show the risk associated with the recommended ABC and with alternative catch levels.

Recommended display: mark recent catch, 25th-percentile ABC, median OFL, and any Council/SSC risk-policy reference level.

Illustrative schematic; no stock-specific values are implied.

What is new with Data Updates Since the 2023 Management Track?

- Three additional calendar years of fishery data: 2023-2025.
- Silver hake - Three additional Fall survey observations: 2023-2025, with Fall 2025 survey-performance context reviewed explicitly.
- Red hake uses both Spring and Fall survey perspectives; Spring 2023 is treated as missing because coverage was incomplete.
- Primary question: do the new observations reinforce or alter the stock picture available at the 2023 Management Track?

Silver Hake Research Recommendation

Research recommendations — lognormal Relative-F uncertainty

- The OFL distribution is sensitive to how uncertainty in the historical Relative-F proxy is represented; the active analysis uses a lognormal formulation with bias correction.
- Evaluate whether the lognormal adjustment is appropriate when converting arithmetic-scale historical Relative-F mean and variance to log-space parameters; explicitly define whether the intended central value is the median or arithmetic mean.
- Run paired bias-correction OFF vs ON sensitivities for both stocks and compare OFL median, P25 ABC, distribution width/skewness, and risk at ABC.
- Confirm analytically and by simulation that the variance transformation preserves the intended historical Relative-F mean/variance without unintentionally shifting the OFL distribution.
- Document one reproducible treatment for subsequent specification cycles and PDT/SSC review.

Decision takeaway: follow-up work should determine how lognormal parameterization and bias correction affect OFL/ABC.

NORTHERN SILVER HAKE

Northern silver hake — Fall survey

28.96 (2023) → 14.12 (2024) → 7.57 kg/tow (2025)

Survey

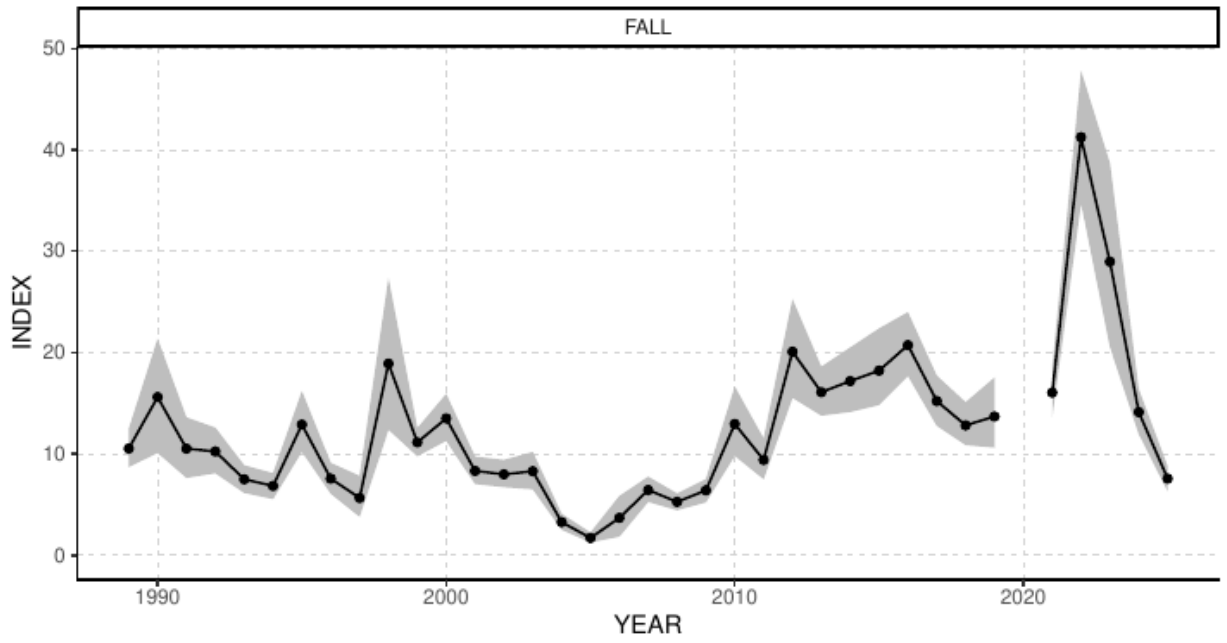


Figure 3: Bottom Trawl Survey Index of Silver Hake from 1989 through 2025. Units in Biomass (kg/tow). Gray-shaded area represents the 90% confidence interval. The survey was not conducted in Fall 2020.

2022 was an exceptional recent high (41.24 kg/tow).

The index declined in each of the next three observations.

2025 is the 2nd lowest Fall index since 2009.

The new data shift the terminal survey signal downward relative to observations in 2022.

Northern silver hake — recent size composition

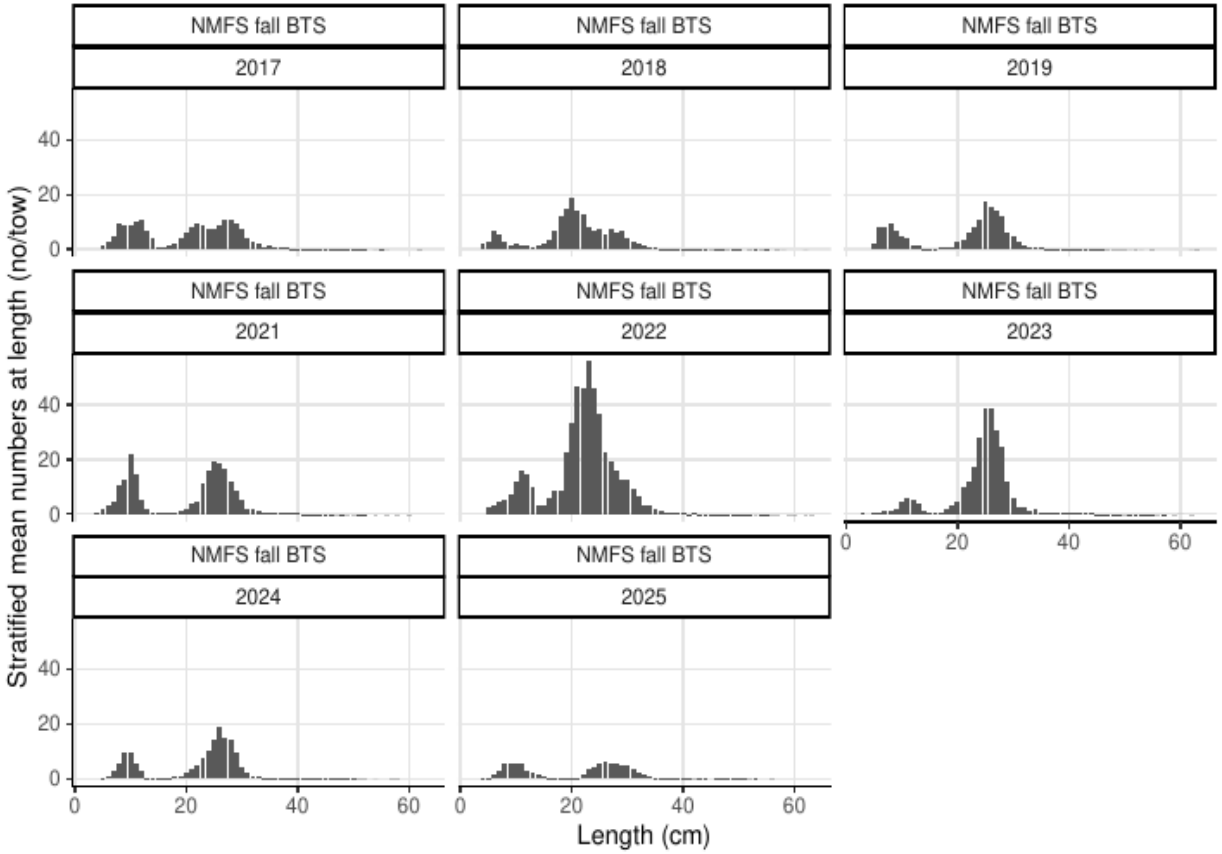


Figure 5: Stratified Mean Indices at Length for the Bottom Trawl Survey of Silver Hake from 2017 through 2025. The survey was not conducted in Fall 2020.

Strong 2022 abundance was concentrated around the mid-20 cm range.

2022 retained a clear mode near the mid-20s; abundance declined in 2024.

2025 length frequencies are substantially lower across the observed size range.

Northern silver hake — catch through 2025

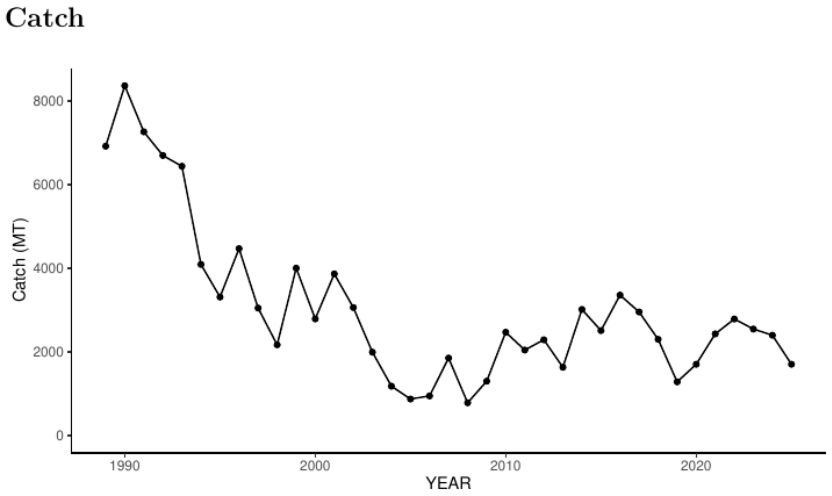
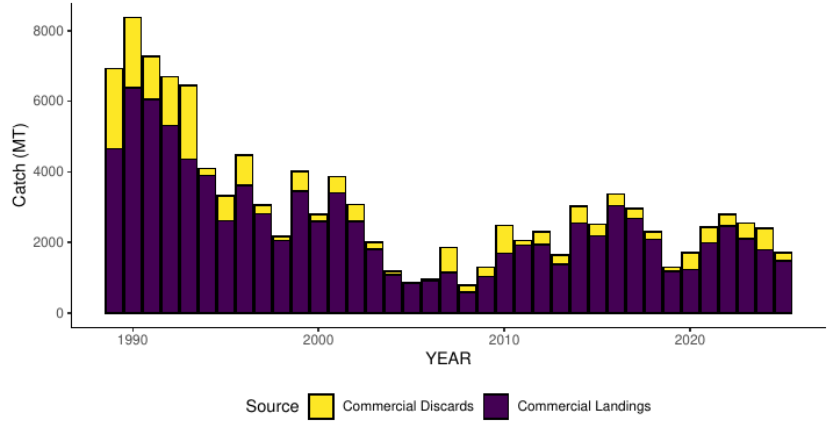


Figure 1: Total catch in metric tons (MT) of Silver Hake from calendar year 1989 through 2025. Commercial landings begin in 1989, commercial discards begin in 1989, and recreational data begins in Inf.



Total catch: 2,550 MT (2023) → 2,401 MT (2024) → 1,708 MT (2025) – 33% reduction.

Commercial landings declined from 2,105 MT to 1,469 MT.
~ -30%

Discards rose to 618 MT in 2024, then fell 61% to 239 MT in 2025.

Recent catch remains far below the high levels early in the time series.

Summary Northern silver hake — update relative to 2023

Survey: 2024 and 2025 reverse the elevated 2022-2023 signal; 2025 is substantially lower than the 2023 terminal observation.

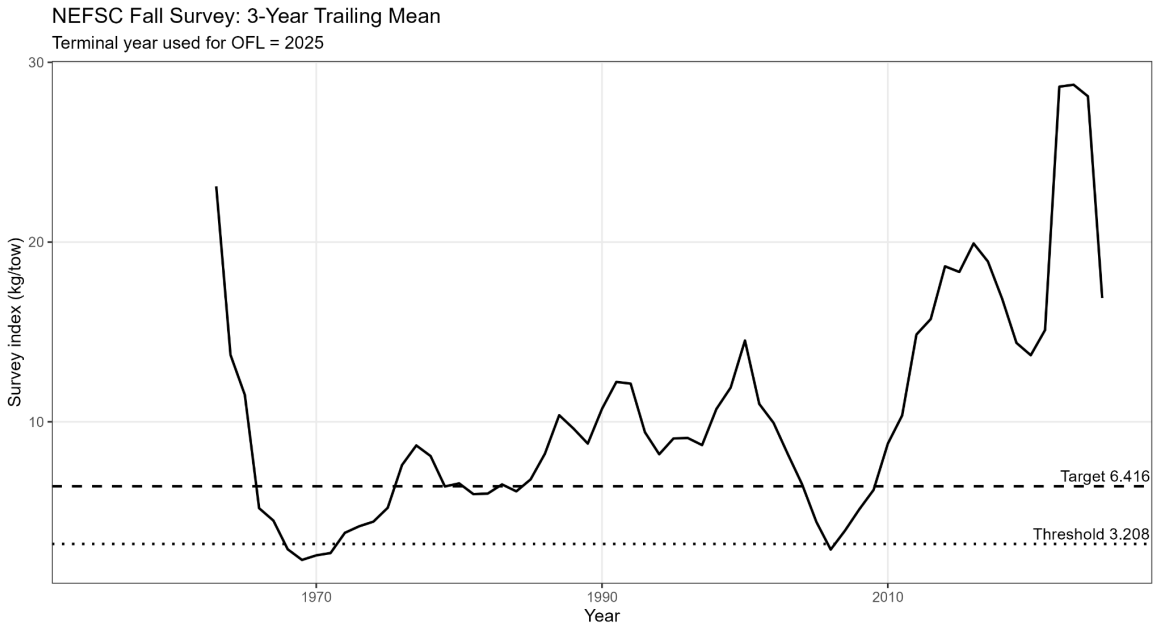
Catch: total catch declined in both 2024 and 2025; 2025 is ~33% below 2023.

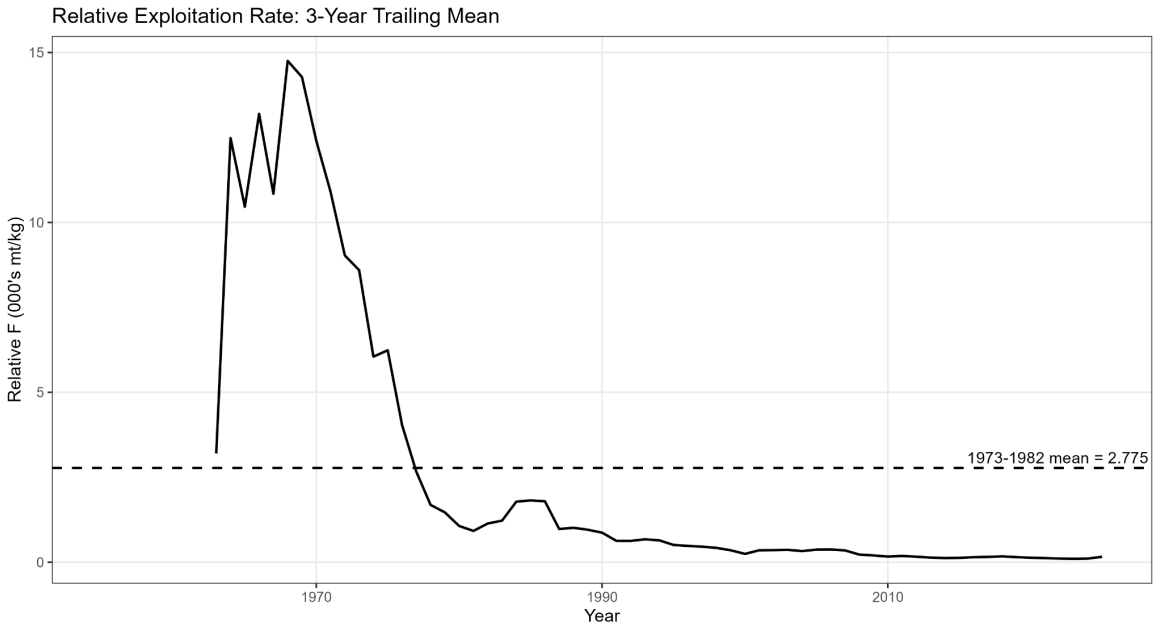
Landings and discards both fell in 2025 after the 2024 discard increase.

Synopsis: Lower terminal survey signal accompanied by lower fishery removals.

7. Survey and relative exploitation context

Recent biomass is high relative to BRPs; exploitation remains well below the historical proxy





Biomass target (1973-1982)
6.416

Biomass threshold
3.208

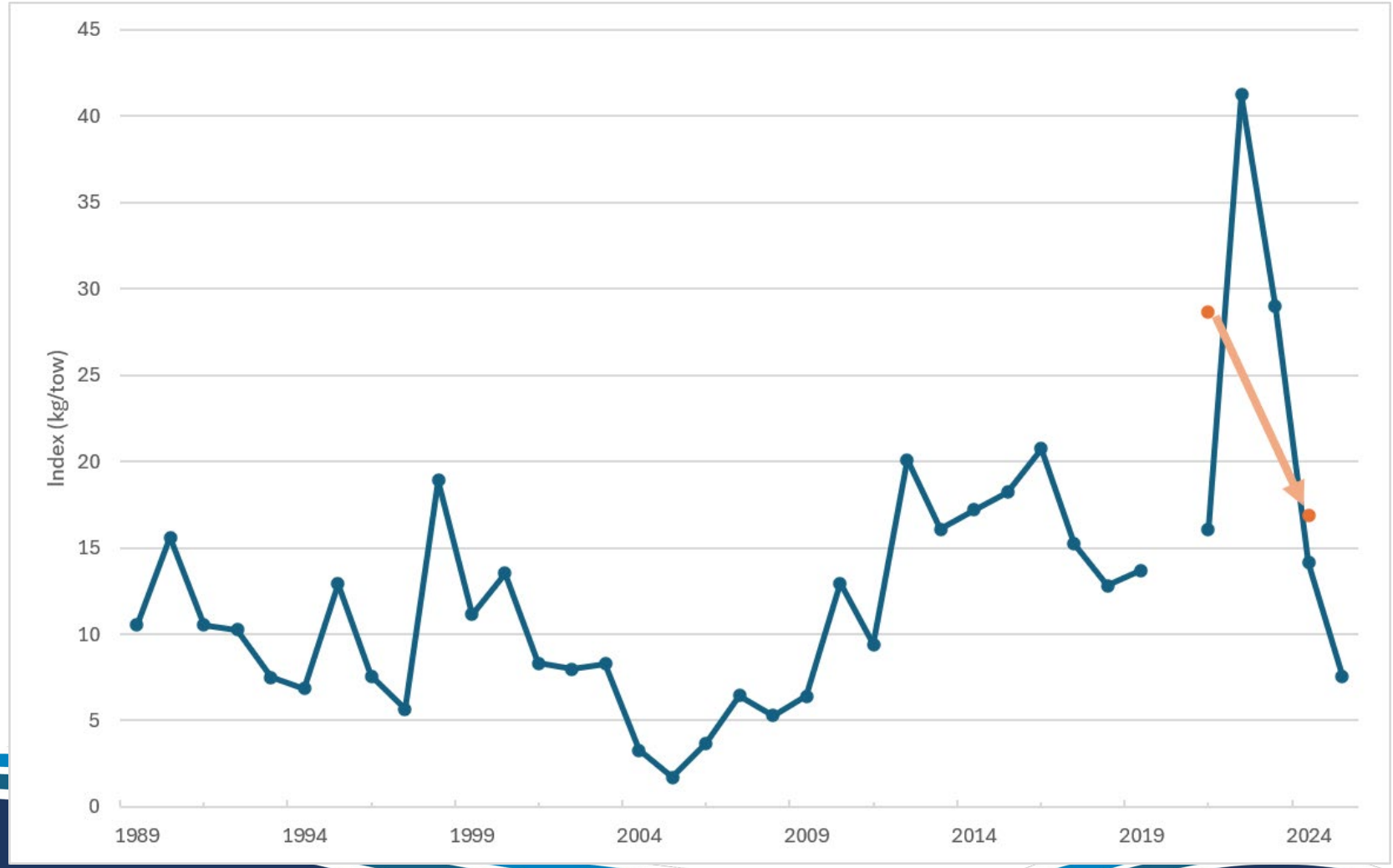
Terminal MA3
16.89

RelF proxy
2.775

Terminal MA3
0.161

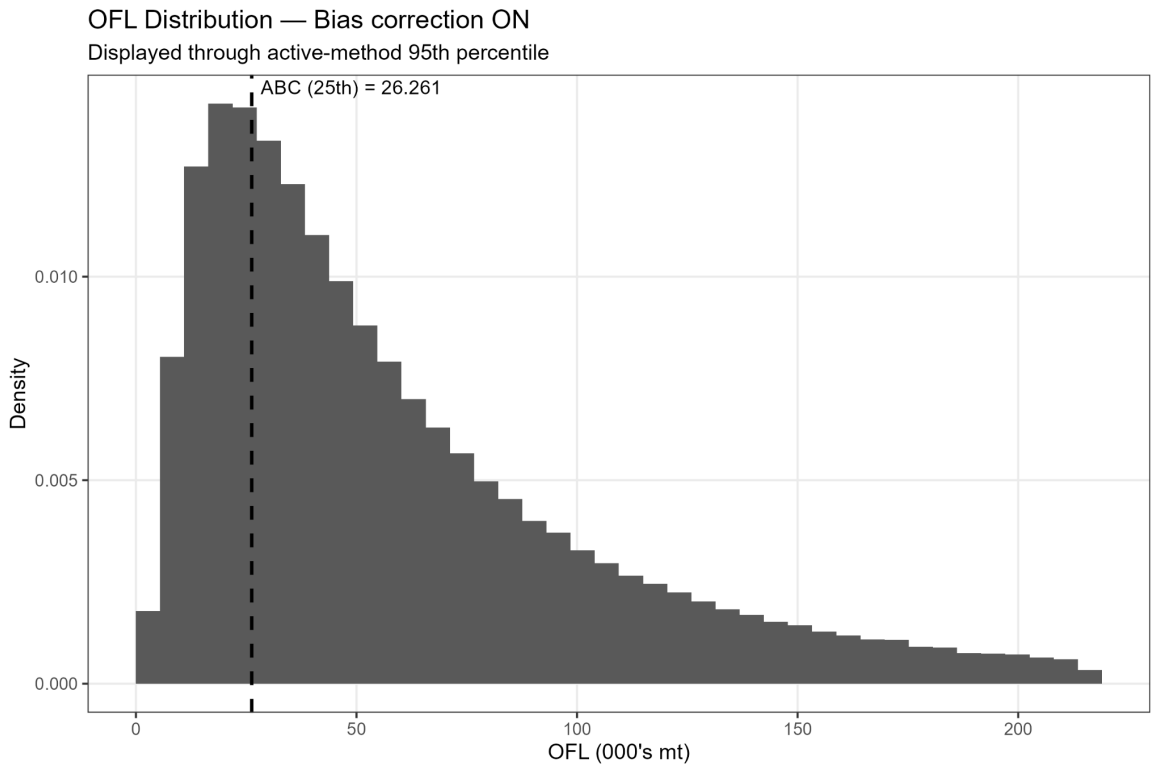
Status signal: biomass above reference levels; exploitation below proxy.

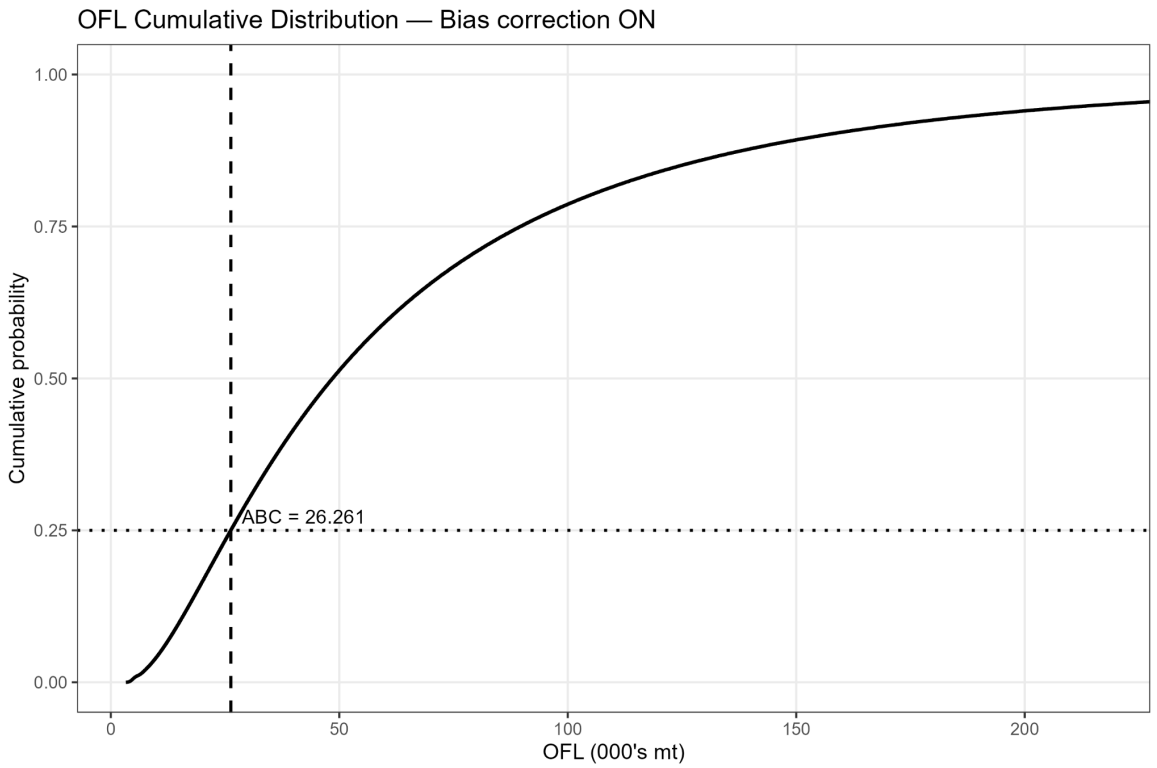
BIOMASS TREND AND CHANGE IN SOUTHERN SILVER HAKE 3-YEAR AVERAGE BIOMASS



8. OFL distribution and ABC

ABC is the 25th percentile of the joint OFL distribution



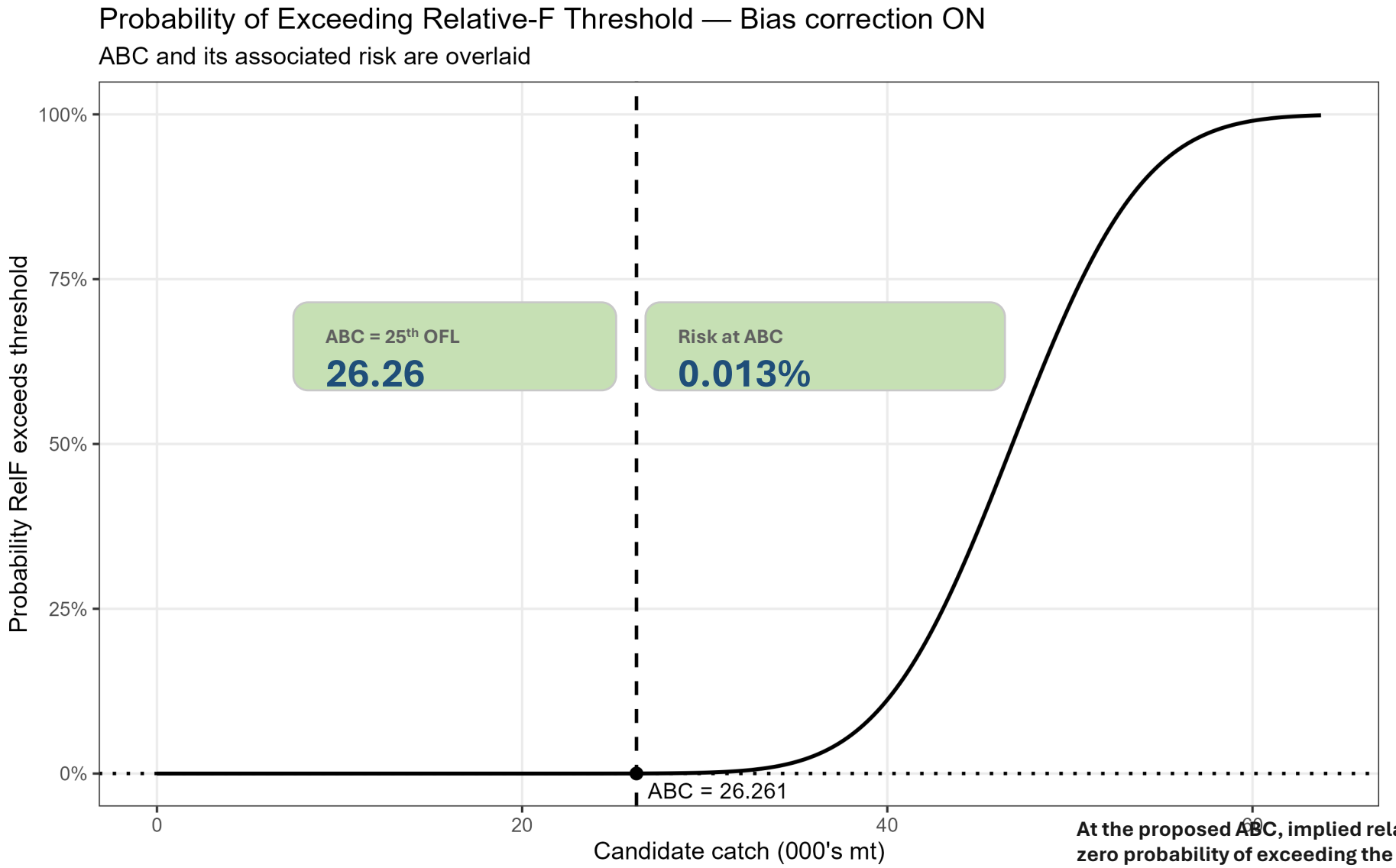


Median/OFL
48.54

P25 / ABC
26.26

9. Catch–risk curve

The risk curve is unchanged by the RelF bias-correction option; ABC location determines the associated risk



At the proposed ABC, implied relative exploitation has near-zero probability of exceeding the FMSY proxy under the survey-uncertainty risk analysis.

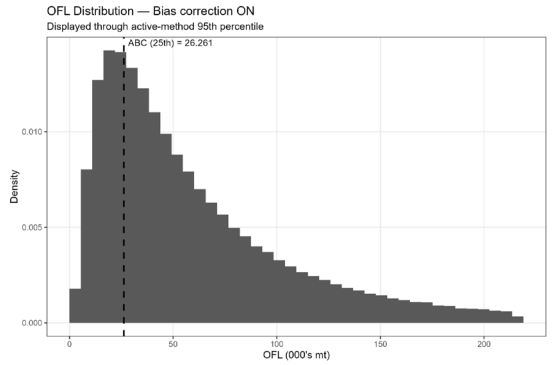
11. Northern Silver Hake Summary

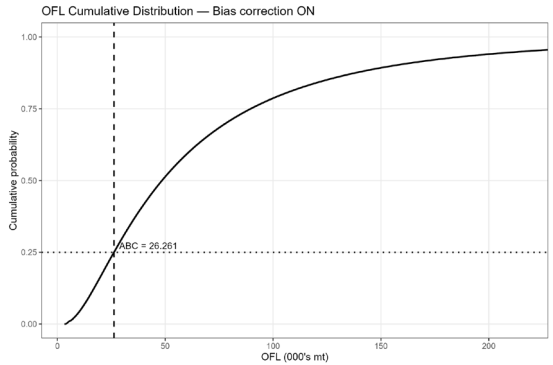
Survey trend: 3-year trailing survey index increased strongly in recent years and remains above the 1973–1982 target and 50% threshold.

Exploitation trend: relative exploitation has remained below the historical FMSY-proxy level for an extended period.

OFL/ABC: active method gives OFL = 48.54k mt and ABC = 26.26k mt using the 25th-percentile rule.

Risk: proposed ABC has essentially zero probability of exceeding the relative-F proxy when evaluated against current survey uncertainty.





6. Northern Silver Hake — updated results

2027–2031 proposed advice using updated survey, RelF, OFL distribution, and risk outputs

Terminal survey MA3
16.89 kg/tow
2023–2025

FMSY proxy / RelF threshold
2.775
1973–1982 mean

OFL median
48.54k mt
50th percentile

ABC
26.26k mt
25th percentile

ABC risk
0.01%
P(RelF > proxy)

Updated fall survey 3-year average remains above the 1973–1982 biomass target and threshold.

Relative exploitation has remained well below the historical FMSY proxy in recent years.

OFL distribution is right-skewed; ABC is set at the 25th percentile rather than a fixed percentage reduction.

Risk at the proposed ABC is essentially zero under the current survey-uncertainty risk calculation.

Metric	2021–2023 advice	2024–2026 advice	2027–2031 proposed	Change
OFL (000s mt)	43.60	58.35	48.54	-17%
ABC (000s mt)	24.38	31.03	26.26	-15%

Recommendation signal: proposed OFL and ABC are lower than the prior specification cycle, but still reflect a high recent survey index and very low risk at ABC.

Comparison of proposed specifications with status quo. OFL and ABC specifications to be set by the SSC are highlighted in blue.

Comparison of proposed specifications with 2025 catch and landings. Differences represent ratios.

Table 1. Proposed 2027-2031 OFL and ABC specifications showing the ACL and TAL that would be set after accounting for expected discards and state landings, all compared to the 2024-2026 specifications. Red hake OFLs are not estimated by the current assessment methods for the stocks. Specifications to be set by the SSC are highlighted in the blue box.

2027-2031 advice								
Stock	OFL	ABC	ACL	Discard SA	State landing:	TAL	TAL trigger %	TAL trigger
Northern red hake		5,790	5,501	87.7%	0.05%	676	0.9	609
Northern silver hake	48,540	26,260	24,947	18.6%	0.79%	20,121	0.9	18,109
Southern red hake		2,120	2,014	86.5%	1.03%	251	0.41	103
Southern whiting	96,260	53,660	50,977	32.0%	2.36%	33,466	0.9	30,120
SRH rebuilding	-	1,590	1,511			188		77
2024-2026 advice								
Northern red hake		3,129	2,973	91.1%	0.23%	1,274	0.9	1,147
Northern silver hake	79,476	40,868	38,825	19.1%	0.82%	31,347	0.9	28,212
Southern red hake		1,370	1,301	85.2%	0.72%	236	0.41	97
Southern whiting	35,419	20,149	19,142	41.2%	0.75%	13,881	0.9	12,493
Change in advice								
Northern red hake		85.0%	85.0%	-3.8%	-78.8%	-46.9%	0.0%	-46.9%
Northern silver hake	-38.9%	-35.7%	-35.7%	-3.0%	-4.0%	-35.8%	0.0%	-35.8%
Southern red hake		54.8%	54.8%	1.5%	43.0%	6.7%	0.0%	6.5%
Southern whiting	171.8%	166.3%	166.3%	-22.4%	216.2%	141.1%	0.0%	141.1%

Table 2. Comparison of proposed 2027-2031 specifications and 2023-2025 catch and landings. Catch and landings less than the proposed specifications are highlighted. Differences are the ratio between the 2027-2031 ACL and 2025 catch, or the 2027-2031 TAL and 2025 landings. Only the 2025 southern red hake landings exceeded the potential 2027-2031 TAL and in 2025 the catch did not exceed the ACL and the trigger was not enforced.

Stock	ACL	2025 catch	Difference	TAL	2025 landings	Difference2
Northern red hake	5,501	419	13.14	676	103	6.54
Northern silver hake	24,947	3,372	7.40	20,121	2,965	6.79
Southern red hake	1,511	1,217	1.24	188	283	0.66
Southern whiting	50,977	10,211	4.99	33,466	6,764	4.95

4.2 Utilization

Percent utilization of ACL and TAL (quota). All values in metric tonnes.

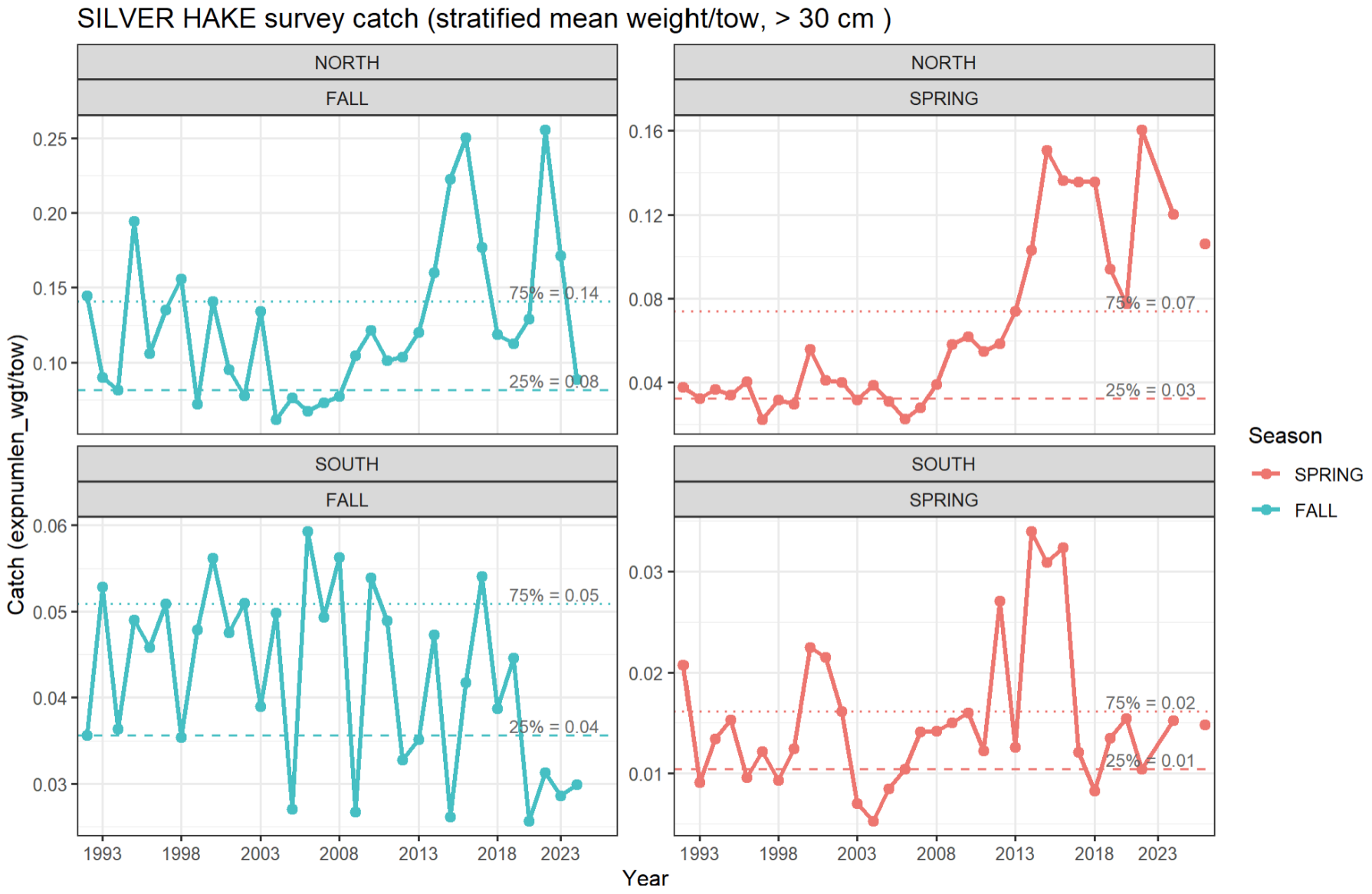
Risk policy: Quota utilization below 80% in all years

Southern red hake overfishing occurred in fishing year 2024

Fishing year	stock	ACL	Catch	Percent of ACL	TAL	Landings	Percent of TAL
2023	Northern red hake	2,973	750.8	25.3%	1,274	74.1	5.8%
2024	Northern red hake	2,973	451.2	15.2%	1,274	49.3	3.9%
2025	Northern red hake	2,973	209.5	7.0%	1,274	51.9	4.1%
2023	Northern silver hake	38,825	2,801.9	7.2%	31,347	2,264.1	7.2%
2024	Northern silver hake	38,825	2,107.5	5.4%	31,347	1,634.4	5.2%
2025	Northern silver hake	38,825	1,688.1	4.3%	31,347	1,484.6	4.7%
2023	Southern red hake	1,301	1,218.4	93.7%	234	156.9	67.1%
2024	Southern red hake	1,301	1,612.2	123.9%	234	181.7	77.6%
2025	Southern red hake	1,301	635.2	48.8%	234	153.4	65.6%
2023	Southern whiting	19,142	3,073.0	16.1%	13,881	2,484.6	17.9%
2024	Southern whiting	19,142	5,300.9	27.7%	13,881	3,325.7	24.0%
2025	Southern whiting	19,142	5,308.6	27.7%	13,881	3,565.3	25.7%

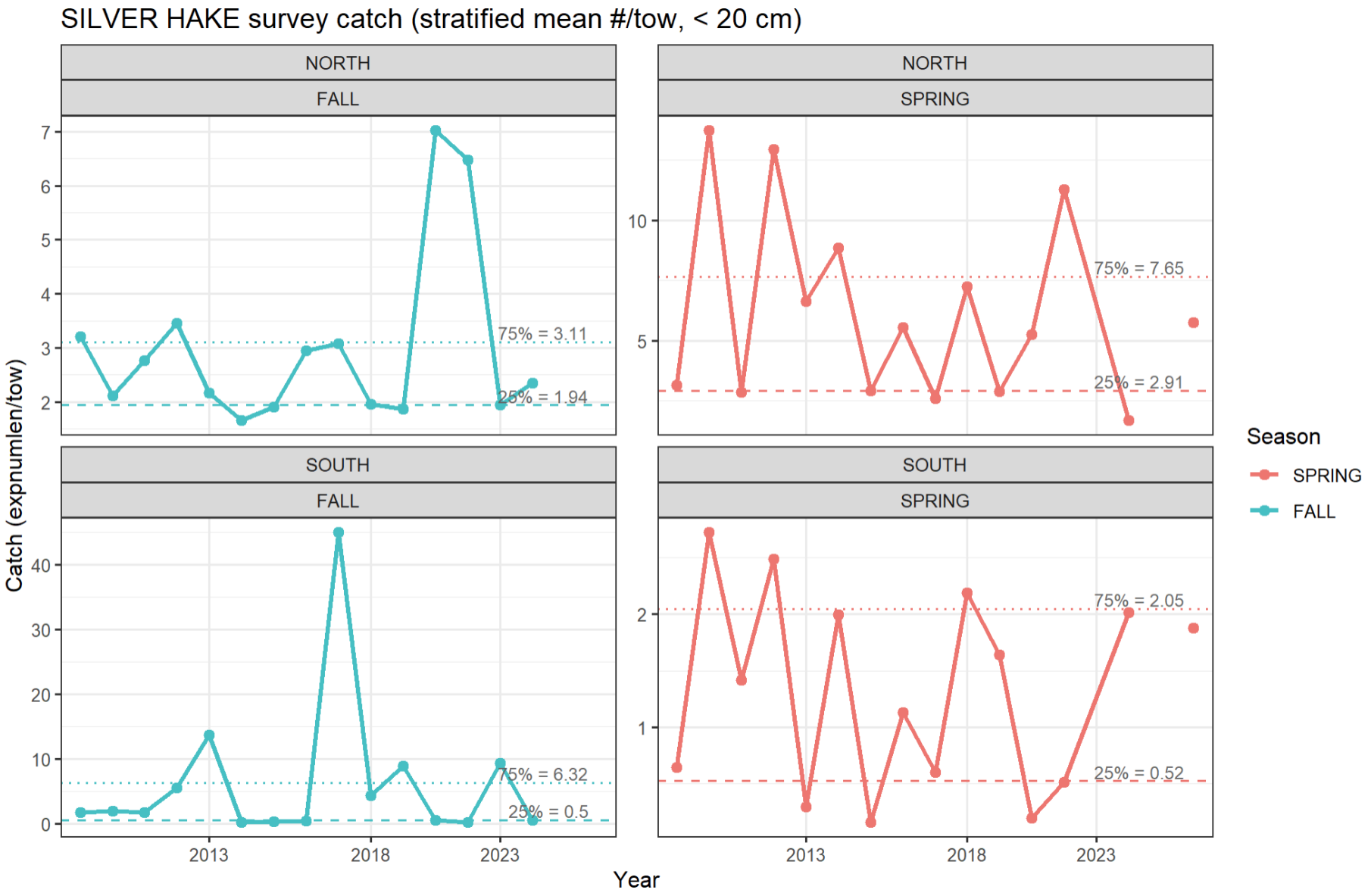
4.6 Silver hake spawning biomass

- Recent silver hake spawning biomass levels compared to time series quartiles (excluding last five years), adjusted for RV Bigelow years and converted to biomass based on accepted survey length/weight parameters..
- Recent five-year trend: – **Northern silver hake** spawning biomass above the 75th percentile for 7 of 10- observations in fall and spring and below the 25th percentile for 0 of 10 observations.
- **Southern silver hake** spawning biomass above the 75th percentile for 0 of 10 observations in fall and spring and below the 25th percentile for5 of 10 observations.



4.4 Silver hake recruitment

- Recent silver hake recruitment levels compared to time series quartiles (excluding last five years).
- Recent five-year trend: – **Northern silver hake** recruitment above the 75th percentile for 3 of 10 observations in both fall and spring; below the 25th percentile 1 of 10 observations
- **Southern silver hake** recruitment above 75th percentile for 1 of 10 observations in both fall and spring; below the 25th percentile 1 of 10 observations



Alternative risk policy plot with quartiles.

The PDT uses the quartiles for the last five years for risk-factor scoring. The quartile values are calculated from the plotted time series, excluding the last five years.

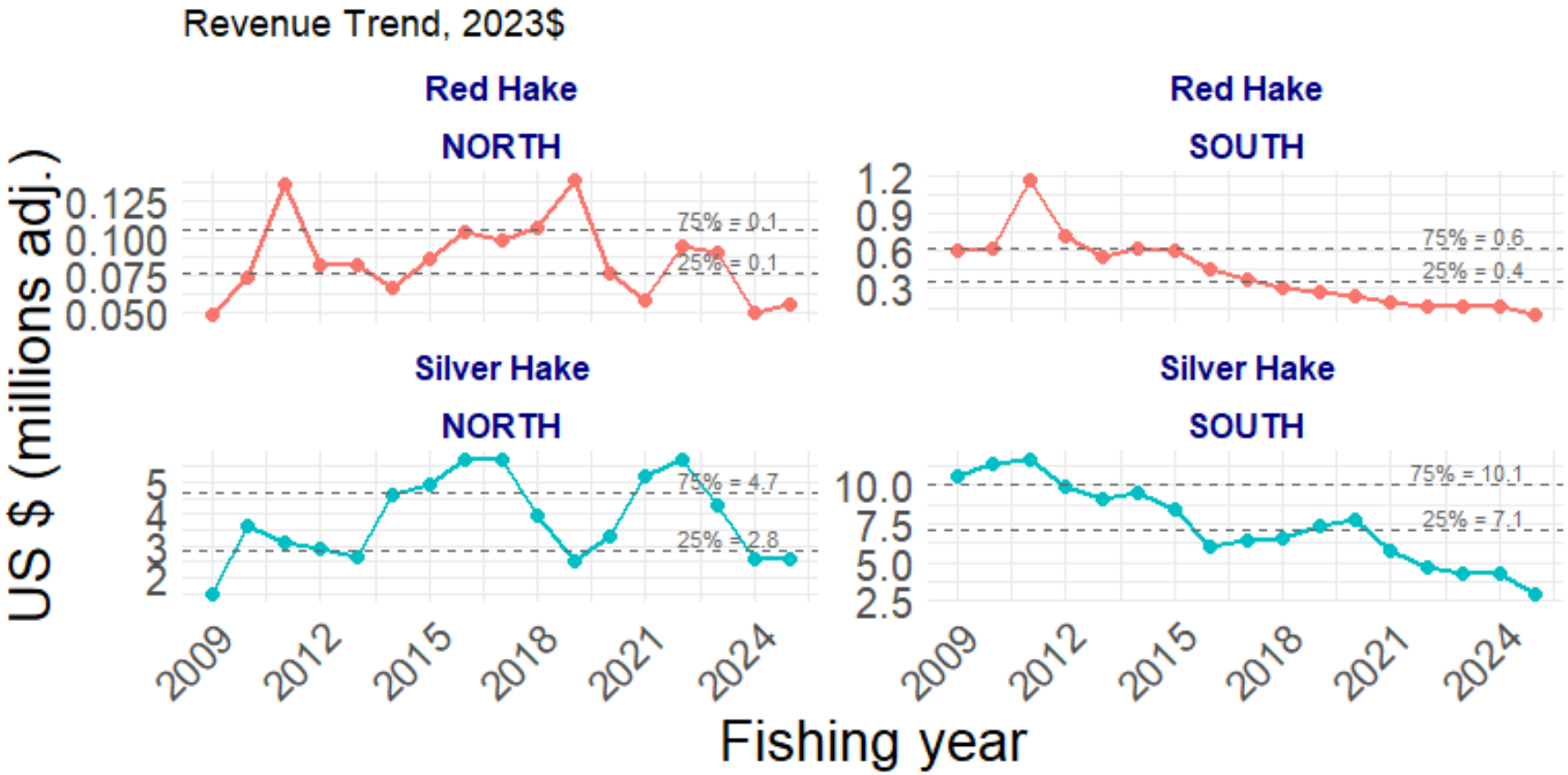
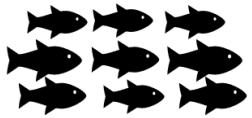
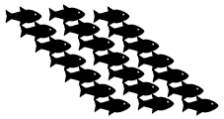
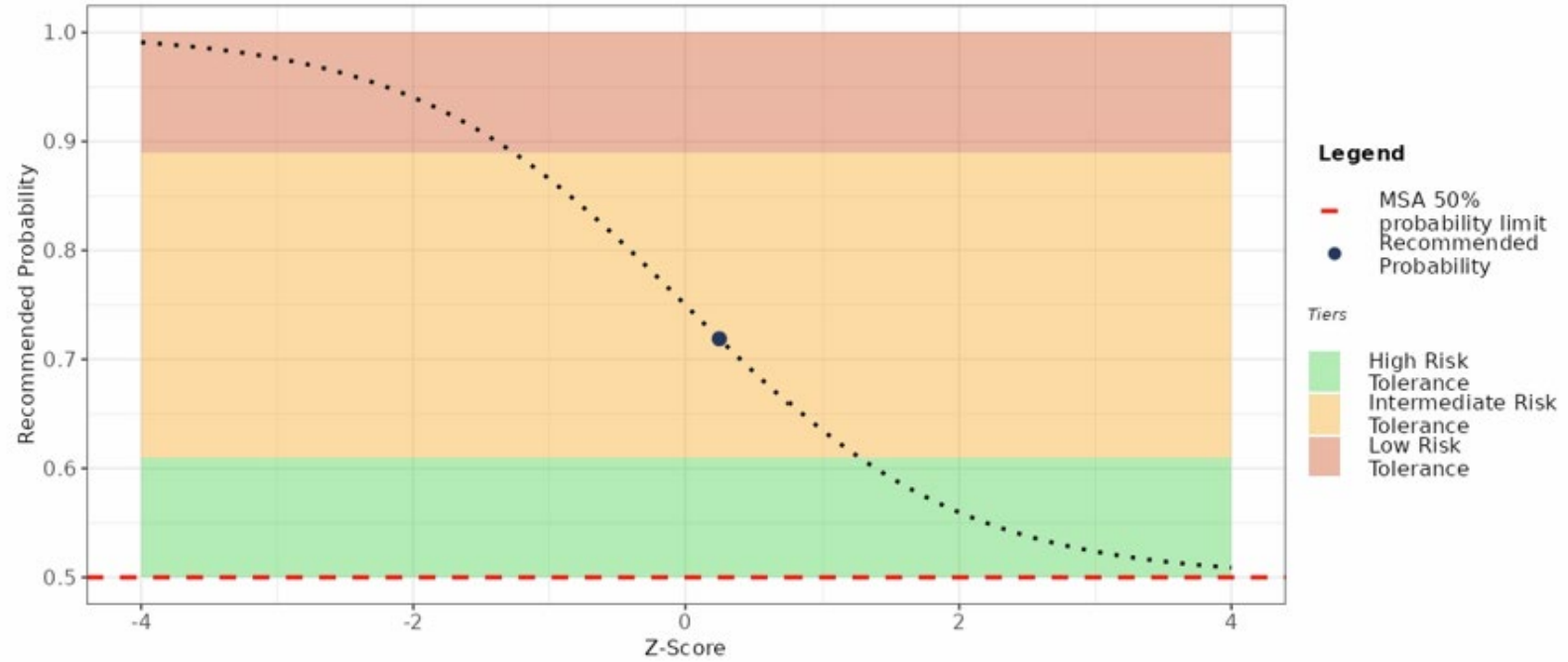


Figure 3: Revenue trends by species (Silver hake LEFT, Red hake RIGHT)

NORTHERN SILVER HAKE RISK POLICY FACTORS, SCORING, AND WEIGHTING

Factor	Weight	Score	Scoring Details
 SSB / Stock Status	0.30	0	0 of 10 (0%) below 25th percentile; 7 of 10 (70%) above 75th percentile.
 Recruitment	0.26	0	1 of 10 (10%) below 25th percentile; 3 of 10 (30%) above 75th percentile.
 Climate Vulnerability	0.19	0	Increases in productivity; deep basins Sensitivity = L ; Exposure = H ; Vulnerability = L; Directional effect = P
 Commercial Fishery Characterization	0.25	1	Utilization = 0 (5.6% ACL; 5.7% TAL); Port activity trend = 1; Revenue trend = 0; Fishery interactions = 0; AP input = 0
 Recreational Fishery Characterization	No sub-ACL	-	
			Total Z Score: 0.25

NORTHERN SILVER HAKE RISK POLICY FACTOR SCORING



The recommended probability based on the logisitic curve and the Z-score:

71.9%

Z-SCORE = 0.25 → INTERMEDIATE RISK TOLERANCE

SOUTHERN WHITING

Southern silver hake — Fall survey

1.83 (2023) → 3.54 (2024) → 2.88 kg/tow (2025)

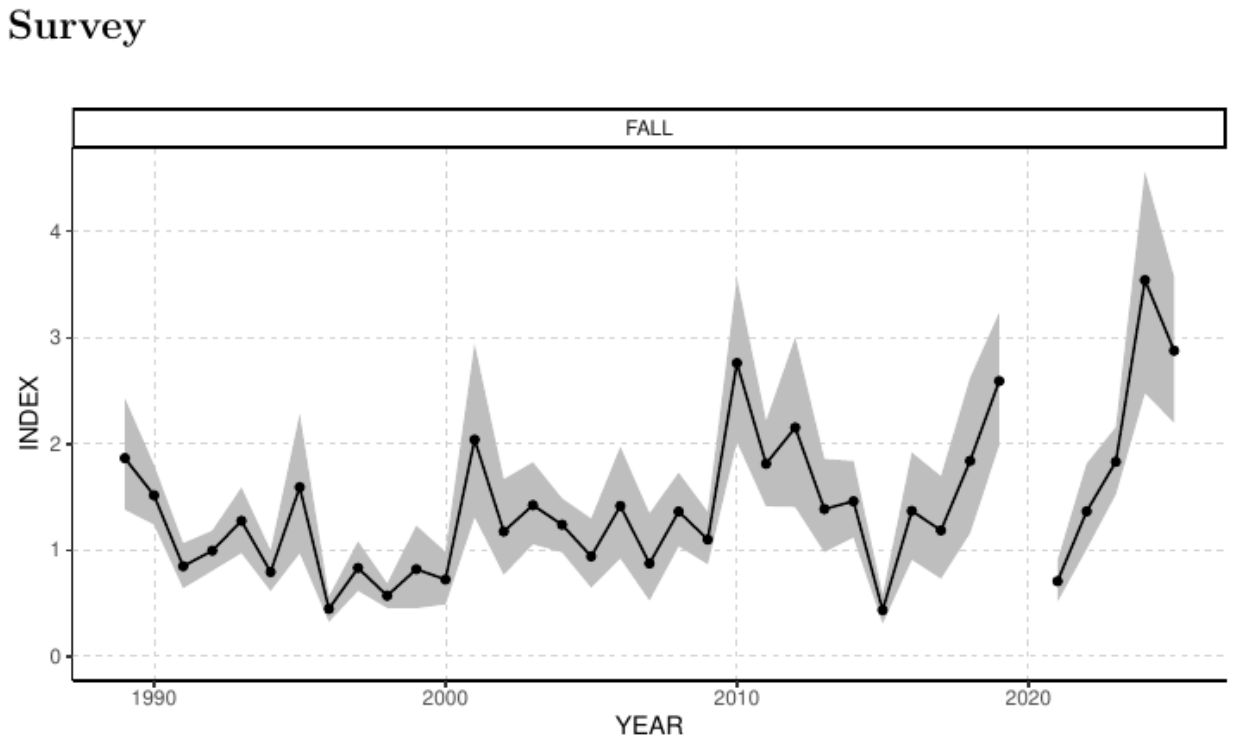


Figure 3: Bottom Trawl Survey Index of Silver Hake from 1989 through 2025. Units in Biomass (kg/tow). Gray-shaded area represents the 90% confidence interval. The survey was not conducted in Fall 2020.

Biomass increased strongly from 2023 to a recent-series high in 2024.

2025 declined from 2024 but remained above 2023 and above most historical observations.

Recent survey signal is elevated rather than declining as in the northern component.

Southern silver hake — recent size composition

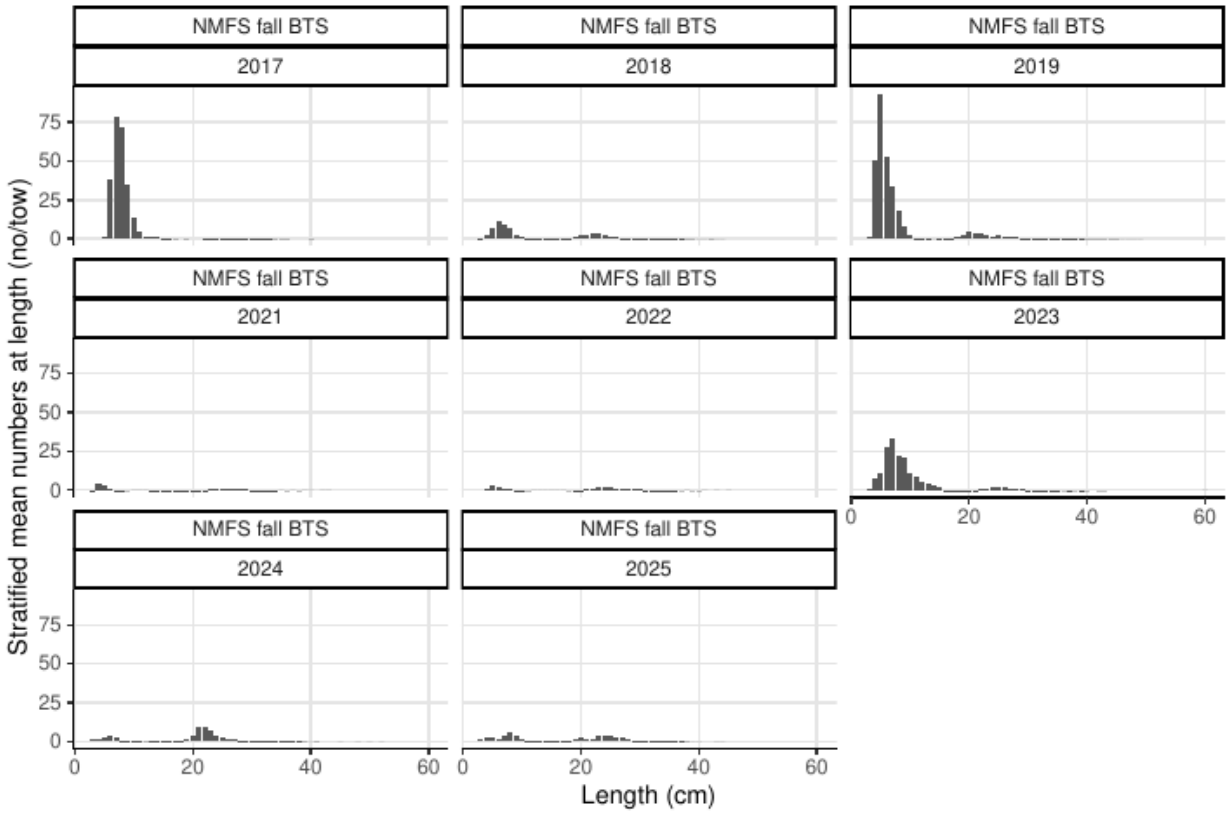


Figure 5: Stratified Mean Indices at Length for the Bottom Trawl Survey of Silver Hake from 2017 through 2025. The survey was not conducted in Fall 2020.

2023 shows a strong pulse of small fish, dominated below ~15 cm.

2024 shows broader representation around ~20-25 cm.

2025 remains broadly distributed but below the 2023 small-fish pulse.

Recent size structure suggests strong interannual variability in recruitment/cohort progression.

Southern silver hake — catch through 2025

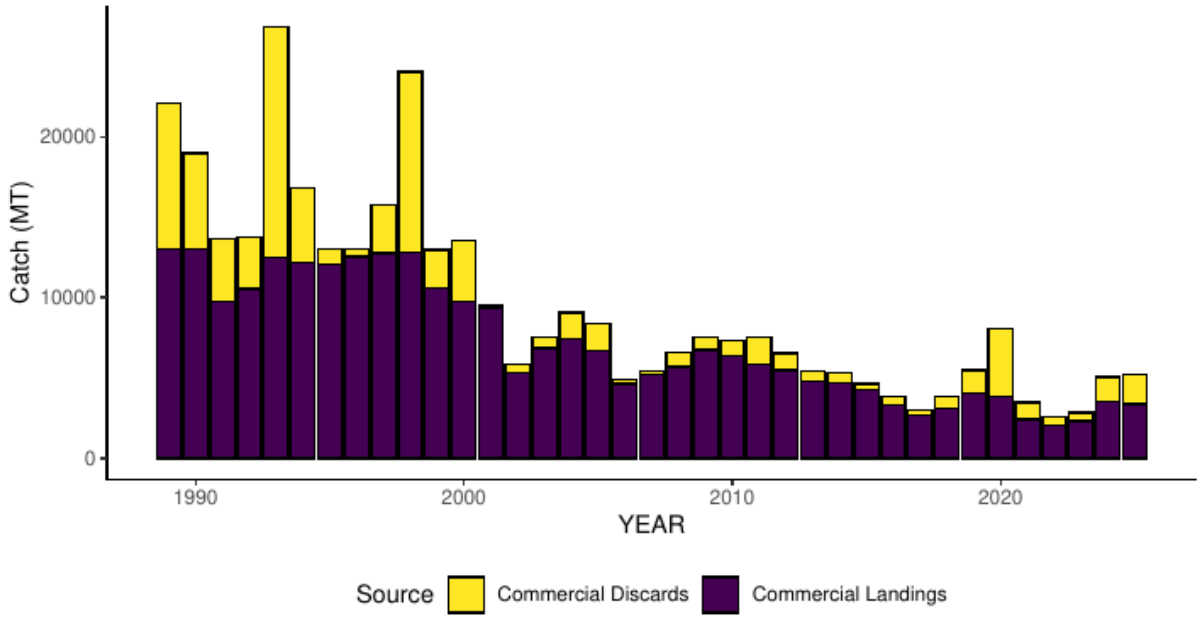


Figure 2: Landings (MT) and discards (MT) of Silver Hake from calendar year 1989 through 2025. Commercial landings begin in 1989, commercial discards begin in 1989, and recreational data begins in Inf. Due unavailable offshore hake commercial length samples in recent years, the commercial catch disaggregation from silver hake could not be estimated. However, offshore hake has accounted for only about 1% of the total catch in recent years.

Total catch: 2,832 MT (2023) → 5,040 MT (2024) → 5,236 MT (2025). ~85%

Commercial landings increased from 2,287 MT to 3,344 MT. ~ 46%

Commercial discards increased almost 3.5 times from 545 MT to 1,892 MT.

Recent catch remains below historical peaks, but the 2024-2025 increase is notable.

Summary Southern silver hake — update relative to 2023

Survey: 2024 reached a high recent level; 2025 eased but remained elevated relative to 2023. The southern terminal survey signal remains comparatively strong, contrasting with the northern component

Catch: both landings and discards increased materially in 2024-2025.

Catch caveat: recent offshore hake disaggregation could not be estimated from commercial length samples; offshore hake has represented ~1% of recent total catch.

12. Southern Silver Hake / Southern Whiting — 2027–2031 Results

Updated survey and exploitation information, OFL/ABC uncertainty, risk, and 4% offshore-hake adjustment

Terminal survey MA3	RelF proxy	Silver hake OFL	Silver hake ABC	Southern whiting ABC
2.751 kg/tow	**34.190**	**96.26k mt**	**51.60k mt**	**53.66k mt**
2023–2025	1973–1982 mean	median / P50	P25	+4% offshore hake

- Survey biomass is above the historical target (1.650) and threshold (0.825).
- Recent relative exploitation remains well below the historical FMSY proxy.
- For management, the southern silver hake ABC is increased by 4% to account for offshore hake caught and landed with silver hake.

ABC accounting

Southern silver hake P25 ABC = 51.60k mt

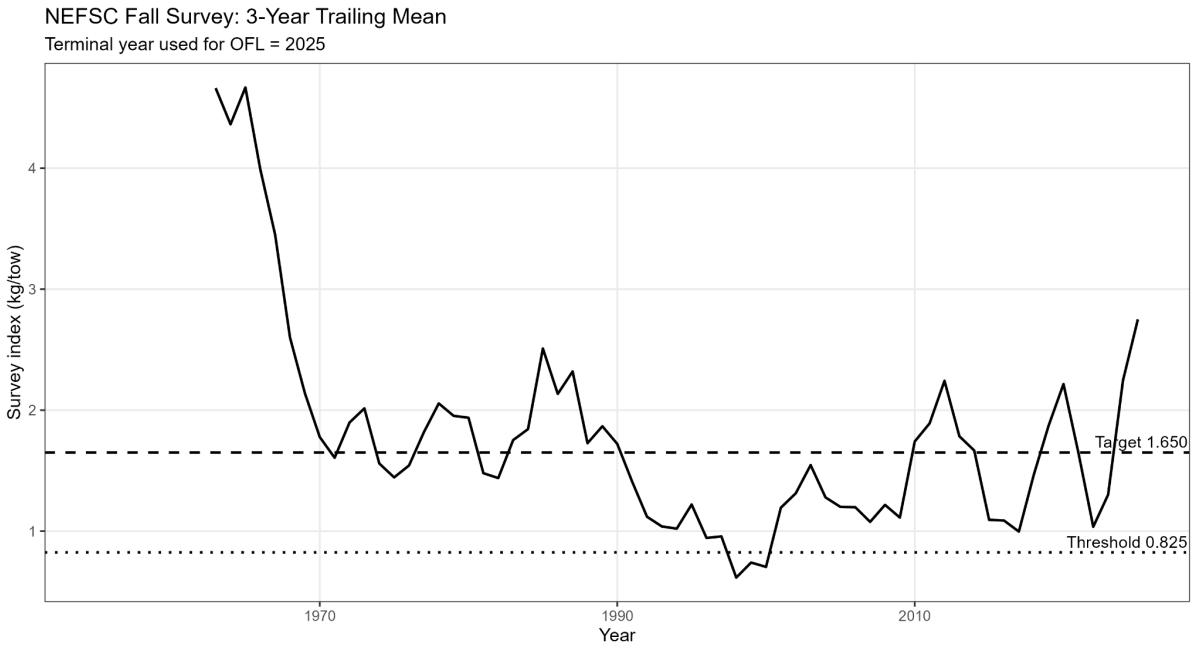
+ offshore hake (4%) = 2.06k mt

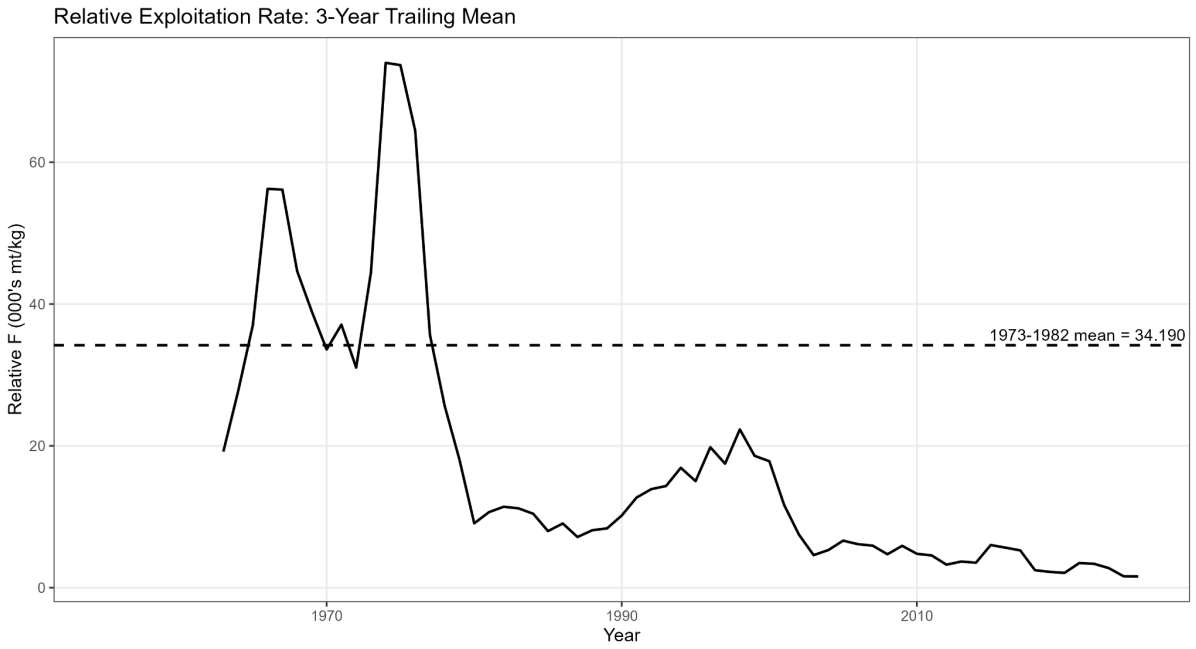
Southern whiting ABC = 53.66k mt

Bottom line: stronger recent survey biomass supports higher catch advice, while the combined southern-whiting ABC remains well below catches associated with appreciable risk.

13. Survey biomass and relative exploitation

Recent biomass is above historical reference levels while exploitation remains low





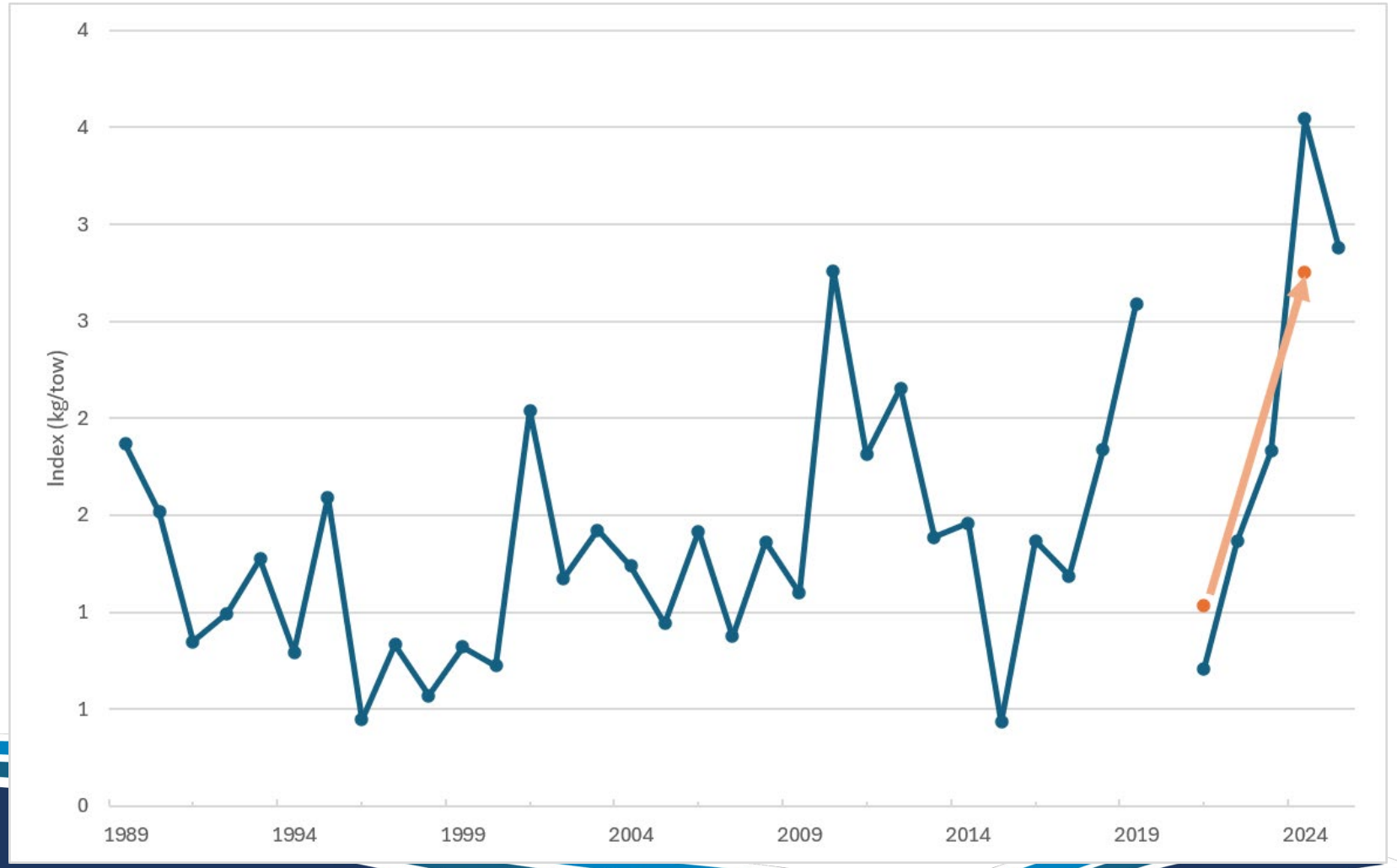
Biomass target	Biomass threshold
1.650	0.825

Terminal MA3
2.751

RelF proxy	Terminal MA3
34.190	1.596

Biomass > target;
recent RelF << proxy

BIOMASS TREND AND CHANGE IN SOUTHERN SILVER HAKE 3-YEAR AVERAGE BIOMASS



Silver hake — combined synopsis

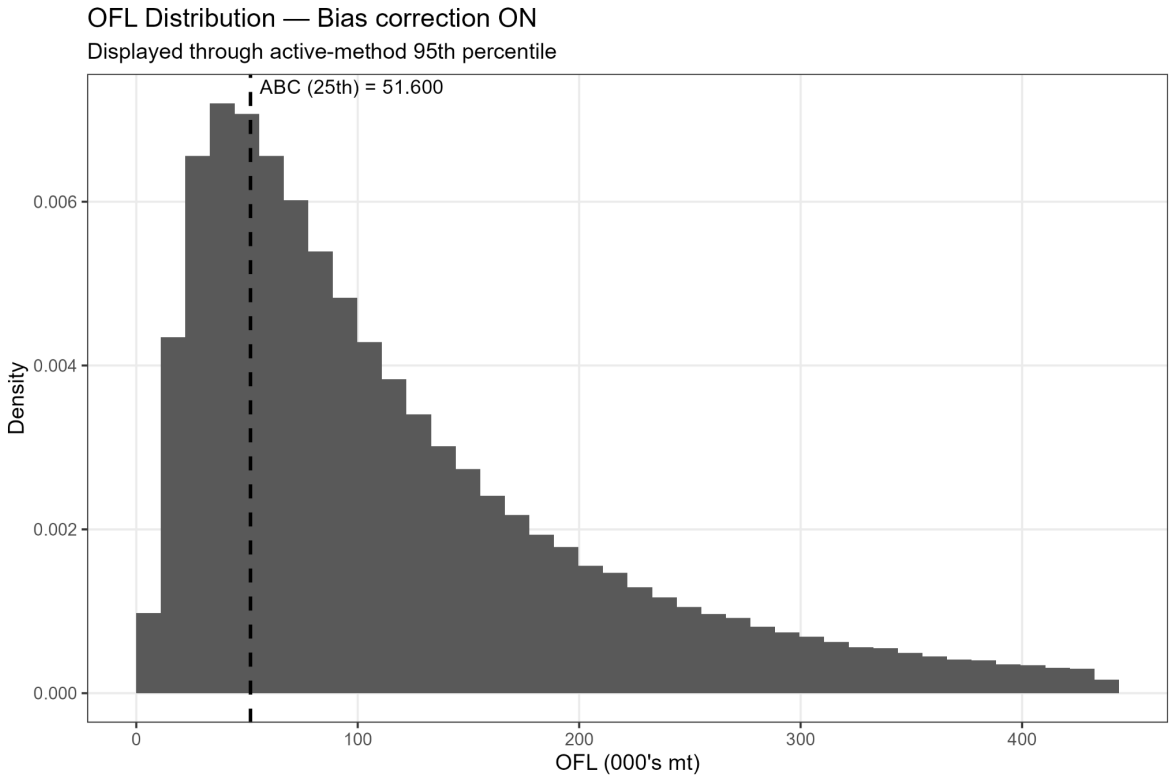
NORTH: Fall biomass declined sharply from the 2022 peak through 2025; catch also declined.

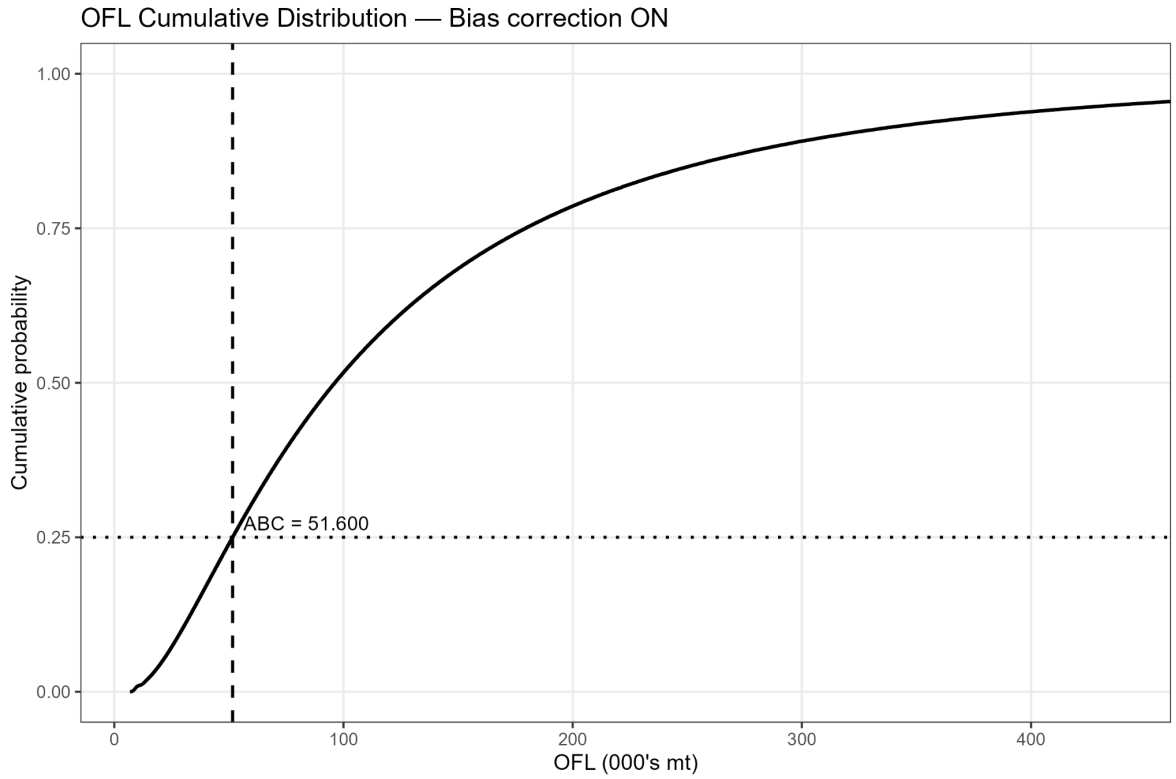
SOUTH: Fall biomass remains elevated relative to much of the series; catch and discards increased in 2024-2025.

The two stock components show contrasting recent survey trajectories.

14. OFL distribution and ABC

Scientific uncertainty is propagated through survey biomass and the RelF proxy

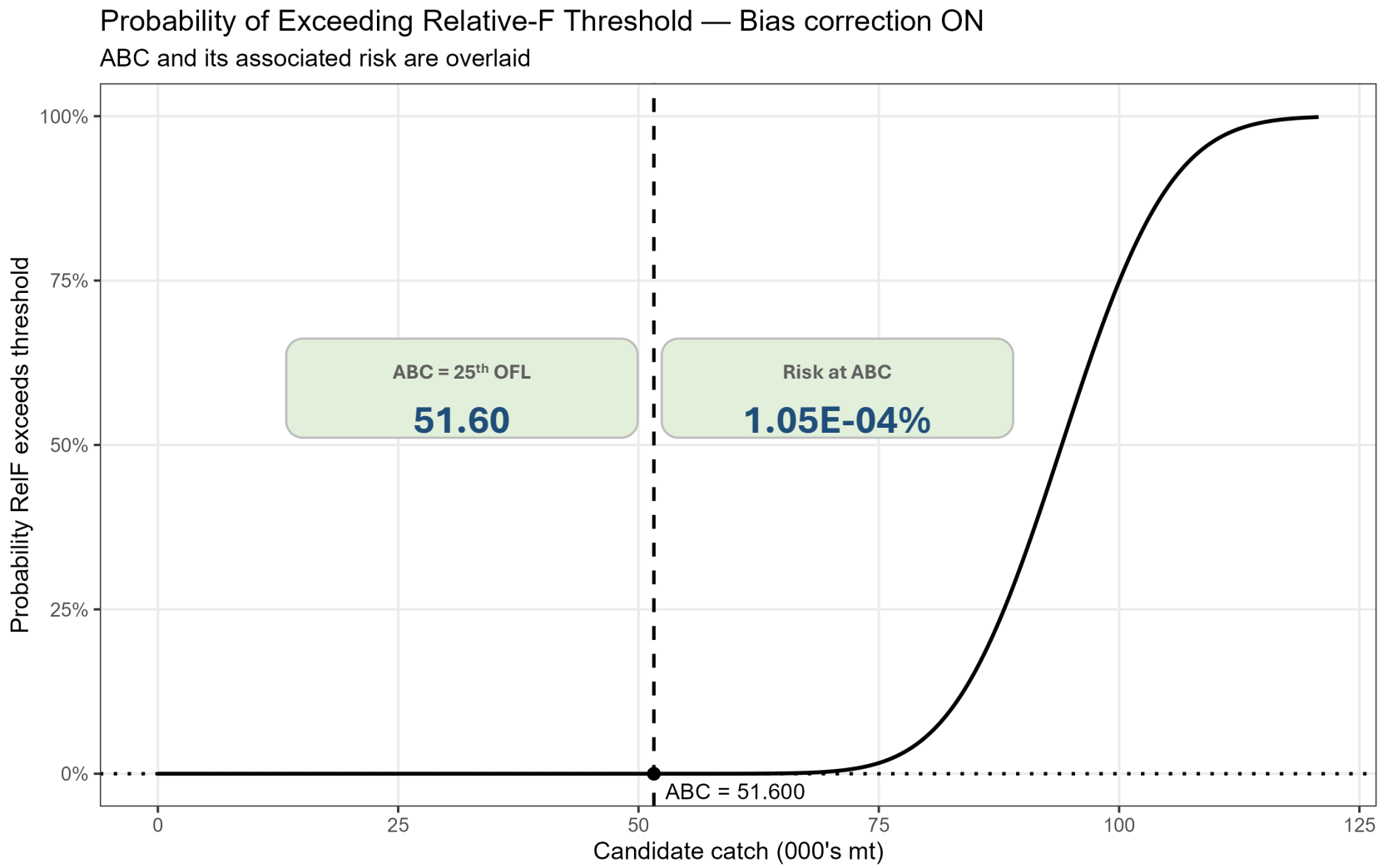




P25 / Silver ABC	Median / OFL	Offshore +4%	Final whiting ABC
51.60	96.26	+2.06	53.66

15. Catch–risk curve

Risk is evaluated against the southern silver hake RelF proxy; offshore hake is added after the silver-hake ABC is selected



16. Proposed catch specifications

Separate the biological southern silver hake ABC from the combined southern whiting management ABC

Catch	2021–2023	2024–2026	2027–2031 proposed	Change*
OFL — southern silver hake (000s mt)	60.15	31.18	96.26	+209%
ABC — southern silver hake P25 (000s mt)	31.13	19.39	51.60	+166%
ABC — southern whiting, incl. 4% offshore hake (000s mt)	32.38	20.17	53.66	+166%

*OFL and silver-hake ABC changes reproduce the supplied specification table; the combined southern-whiting ABC applies the same 4% offshore-hake adjustment to the silver-hake ABC.

2027–2031 ABC calculation

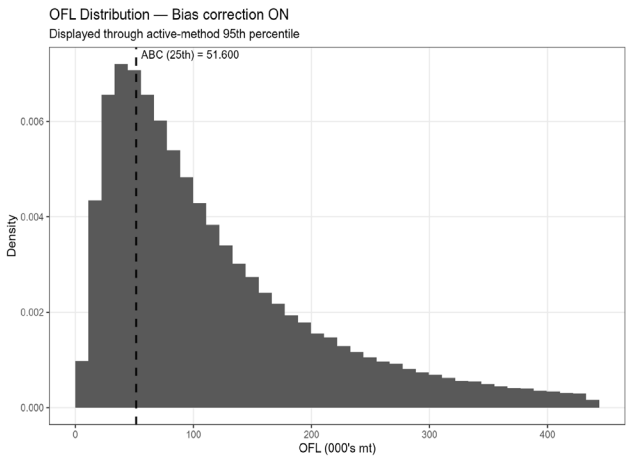
51.600 × 1.04 = 53.665 thousand mt

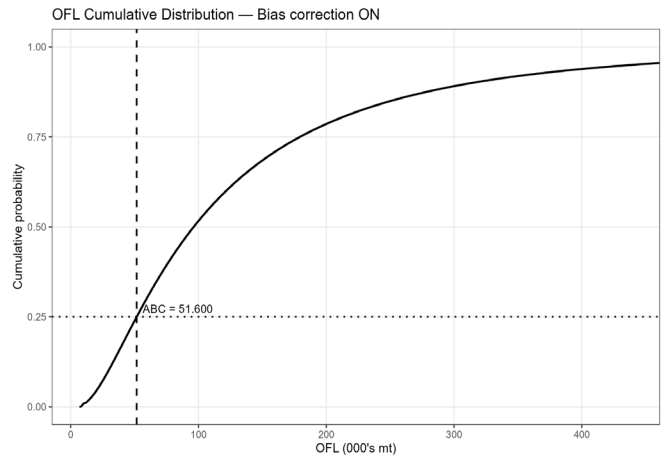
- Offshore-hake allowance = 2.06k mt.
- Combined ABC is ~166% above the similarly adjusted 2024–2026 value.

17. Interpretation and decision points

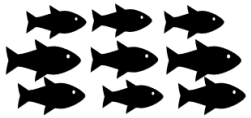
What the updated Southern Silver Hake results mean for specifications

- Stock signal: the 2023–2025 survey MA3 is 2.75 kg/tow, about 67% above the historical biomass target.
- Exploitation signal: recent relative exploitation is well below the 1973–1982 mean proxy of 34.19.
- Scientific ABC: the 25th percentile gives a southern silver hake ABC of 51.60k mt.
- Offshore hake: applying the established 4% augmentation produces a combined Southern Whiting ABC of 53.66k mt.
- Risk: silver-hake ABC and the combined whiting ABC well below 0.1% risk

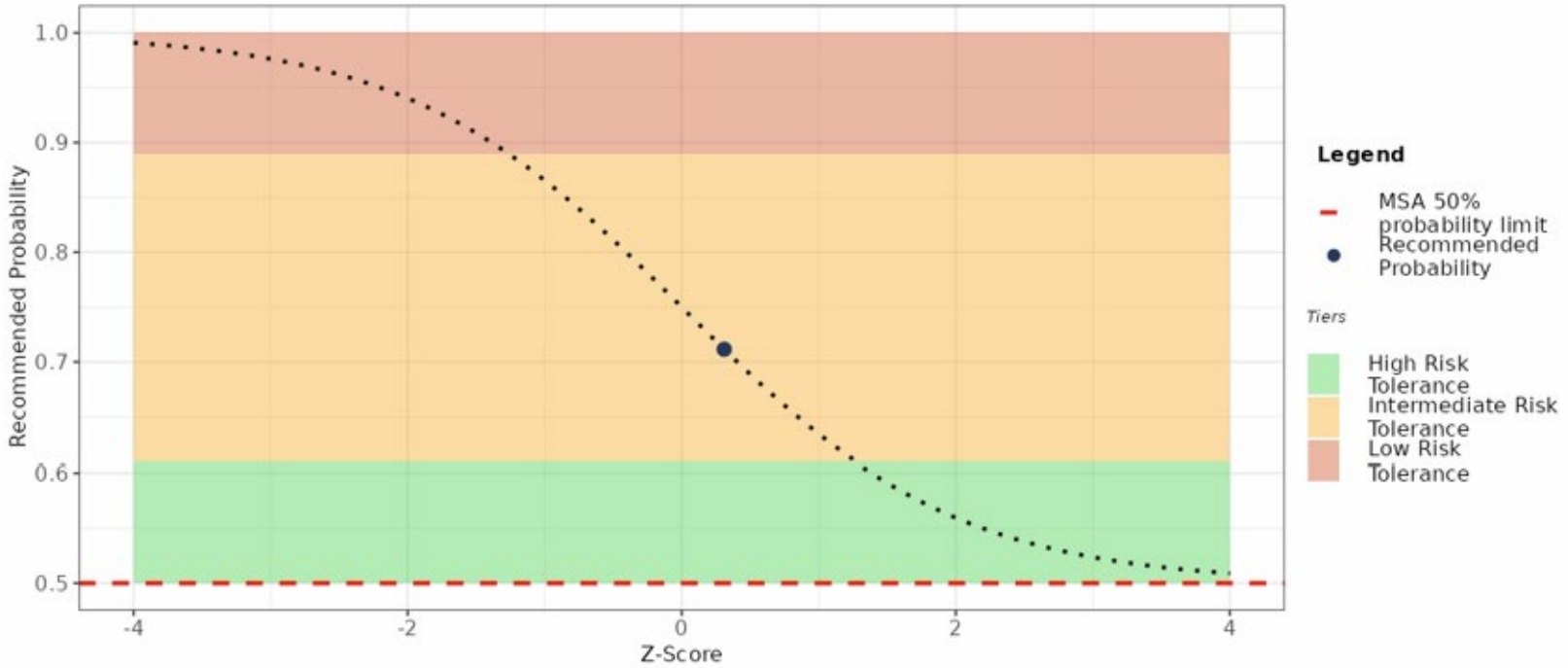




SOUTHERN WHITING RISK POLICY FACTORS, SCORING, AND WEIGHTING

Factor	Weight	Score	Scoring Details
 SSB / Stock Status	0.30	0	5 of 10 (50%) below 25th percentile; 0 of 10 (0%) above 75th percentile
 Recruitment	0.26	0	1 of 10 (10%) below 25th percentile; 1 of 10 (10%) above 75th percentile.
 Climate Vulnerability	0.19	-1	CVA 1.0; changes in distribution Silver hake: Sensitivity = L ; Exposure = H ; Vulnerability = L; Directional effect = Ng Offshore hake: Sensitivity = L ; Exposure = L ; Vulnerability = L; Directional effect = Neu
 Commercial Fishery Characterization	0.25	2	Utilization = 0 (23.8% ACL; 22.5% TAL); Port activity trend = 1; Revenue trend = 1; Fishery interactions = 0; AP input = 0
 Recreational Fishery Characterization	No sub-ACL	-	
			Total Z Score: +0.31

SOUTHERN WHITING RISK POLICY FACTOR SCORING



The recommended probability based on the logisitic curve and the Z-score:

71.2%

Z-SCORE = +0.31→ INTERMEDIATE RISK TOLERANCE

RED HAKE ASSESSMENT METHODS

Model	Empirical; exploitation (catch/efficiency-adjusted swept area biomass) applied to 3-year average current survey biomass
Stock Status	Northern red hake: Not overfished; overfishing status not determined Southern red hake: Overfished; overfishing status not determined
Rebuilding	None Southern red hake: 10-yr rebuilding ending in 2031
Uncertainties	MSY-proxy period may be outdated and unrepresentative of current productivity Overfishing definition inconsistent with current assessment method Customary variations in survey data Missing years of survey data

Red Hake ABC methodology

Empirical catch advice because compatible OFL/MSY reference points are not currently available

1 Survey index

Spring year t + lagged Fall year t−1

2 Efficiency adjustment

Apply chain-sweep q and convert kg/tow to swept-area biomass

3 Recent biomass

Calculate trailing 3-year mean swept-area biomass

4 Baseline exploitation

Mean catch / swept-area biomass over SSC-selected reference period

5 ABC

ABC = terminal 3-year MA biomass × baseline exploitation rate

Why this approach?

- The empirical red hake assessment estimates exploitation as total catch divided by efficiency-adjusted swept-area biomass.
- Stock status is unknown under the new empirical framework because existing overfishing/MSY proxies were developed from the discarded AIM model.
- With no compatible OFL estimate or projections, the SSC used historical exploitation periods directly to derive ABC.

SSC basis retained from 2023

- Northern: mean exploitation during 1981–1994 — a period interpreted as showing a management response in biomass followed by stability.
- Southern: mean exploitation during 2001–2019 — lower exploitation, contemporary conditions, and low stock productivity.
- SSC/PDT also identified the need to further investigate the reference periods and potential F40% SPR-based reference points.

Catch includes commercial landings + estimated discards + recreational catch; swept-area biomass combines spring and lagged-fall survey information.

Methodological revision: applying survey calibration coefficients

Replace a constant average calibration factor with the actual length-based calibration for Albatross-era observations

Previous implementation

- Albatross indices were converted using a constant coefficient derived as an average of the length-based calibration factors.
- This preserved a common scale but did not retain year-specific changes in observed length composition.

2027–2031 specification exercise

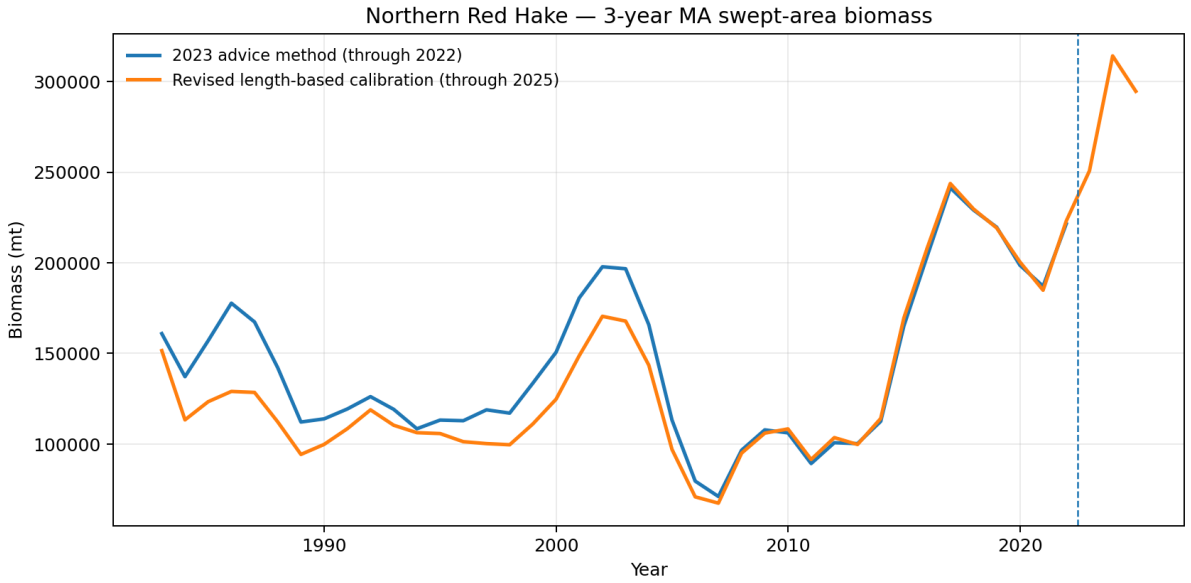
- Recalculate the Bigelow-equivalent indices for Albatross years using the actual length-based calibration approach.
- Then apply chain-sweep q to the recalibrated survey indices and recompute swept-area biomass, relative exploitation, and 3-year moving averages.

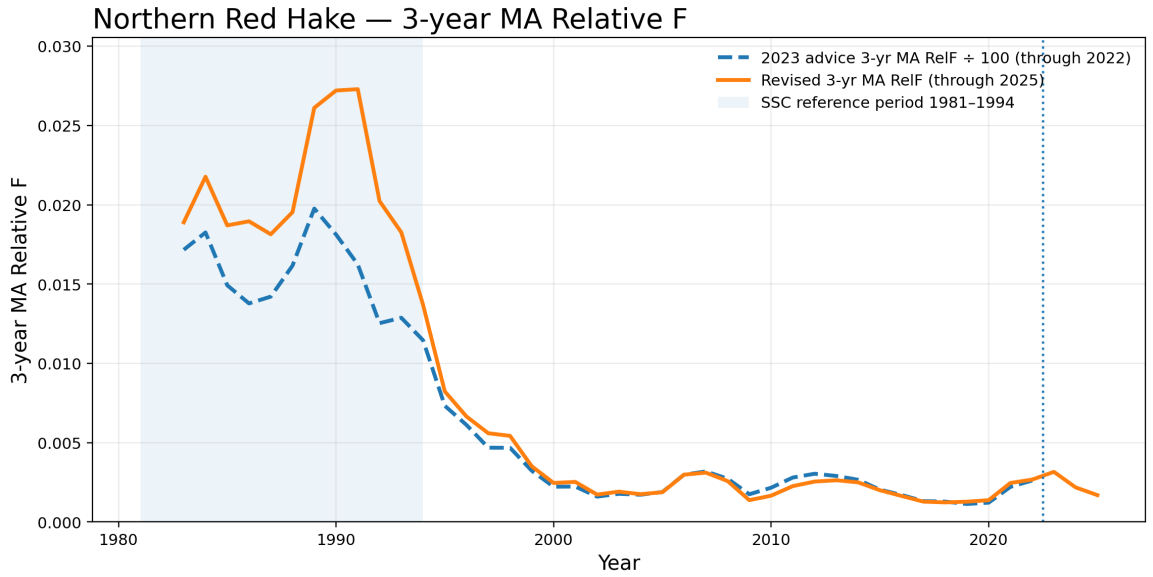


Interpretation: the revision changes the historical biomass scale and therefore the historical exploitation ratio. For internal consistency, the SSC reference-period exploitation rate is recalculated from the revised series before it is applied to the terminal biomass.

Northern Red Hake — effect of calibration revision

2023 advice series ends in 2022; revised series extends through 2025

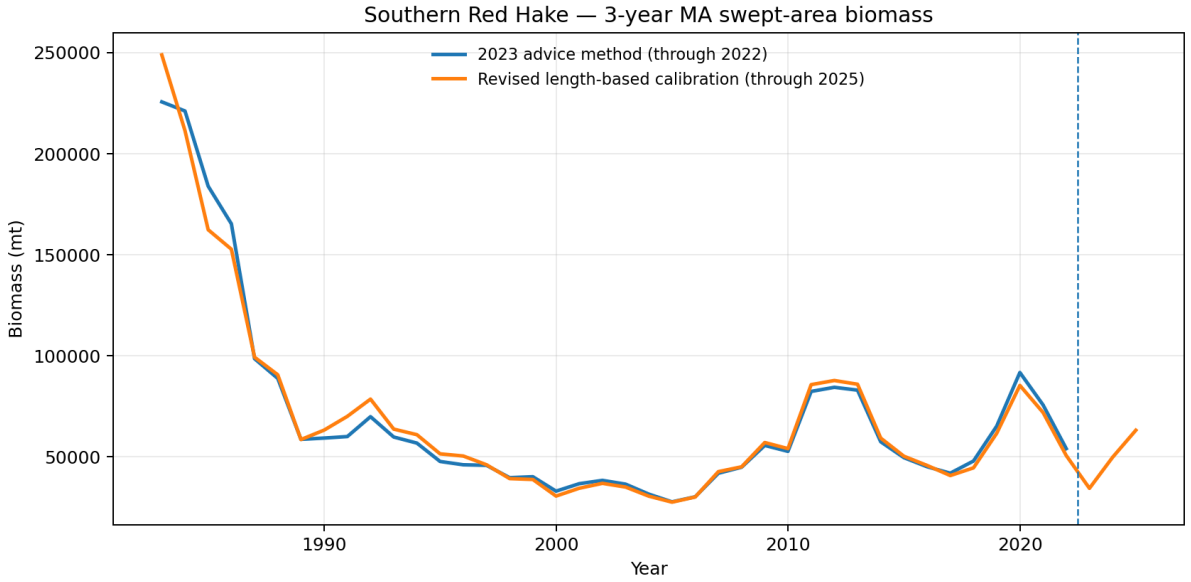


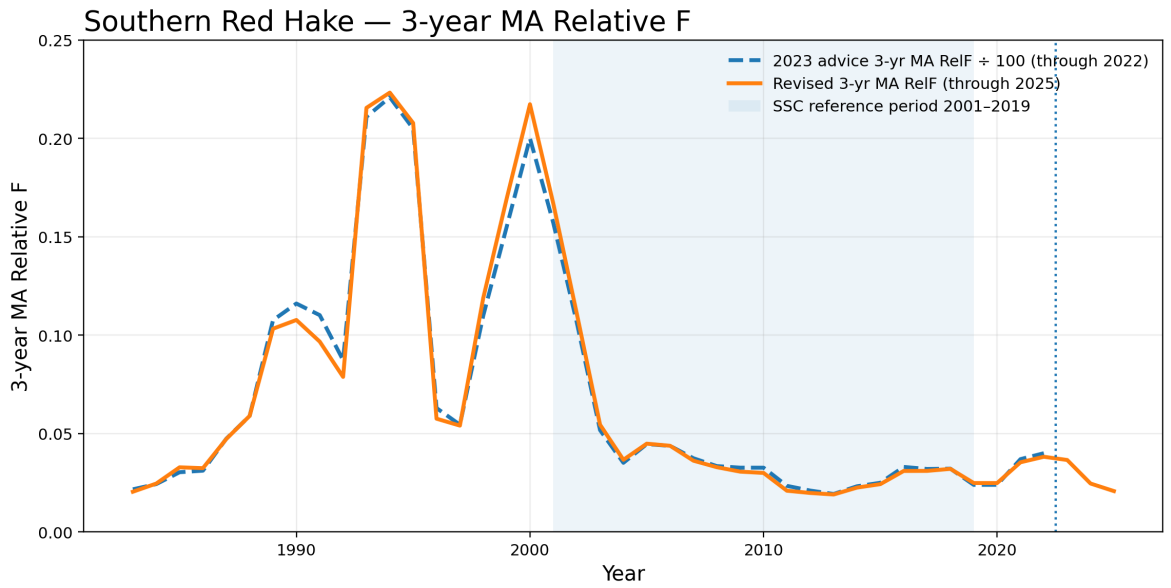


2023 terminal MA3	Revised 2022 MA3	2025 terminal MA3	2023 baseline RelF	Revised 1981–94 RelF
221,920 mt	223,041 mt	294,602 mt	0.01411	0.01965
	~+0.5%			~+39%

Southern Red Hake — effect of calibration revision

2023 advice series ends in 2022; revised series extends through 2025





2023 terminal MA3	Revised 2022 MA3	2025 terminal MA3	2023 baseline RelF	Revised 2001–19 RelF
53,968 mt	50,536 mt	63,062 mt	0.0338	0.03362
	~−6%			~−1%

NORTHERN RED HAKE

Northern red hake — Spring and Fall surveys

Spring 2023 treated as missing because coverage was incomplete

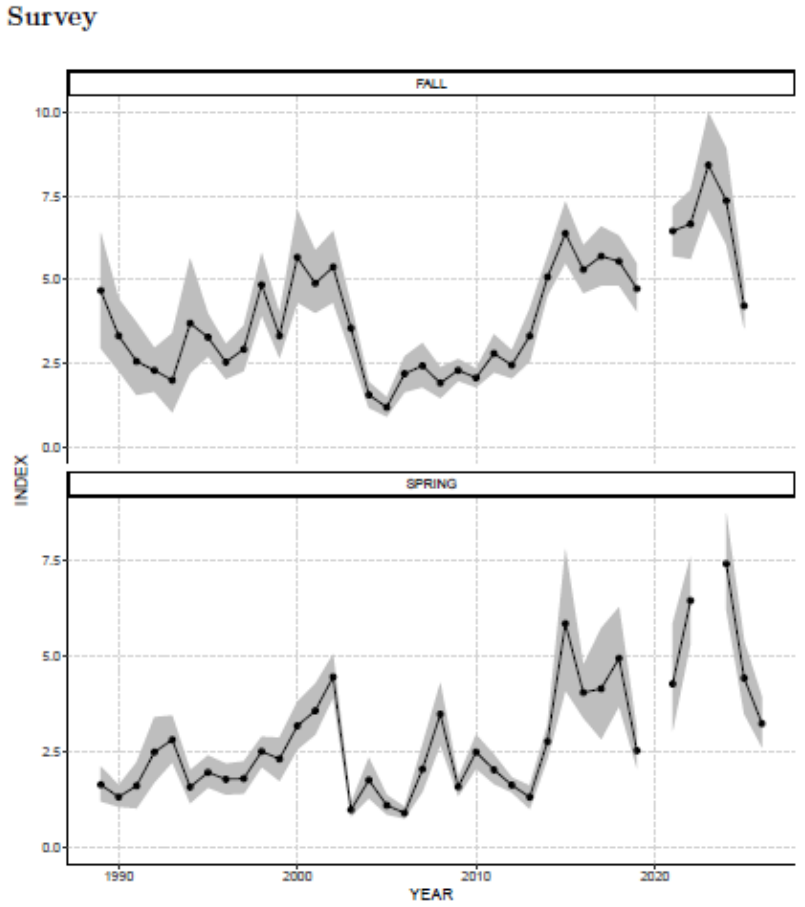


Figure 3: Bottom Trawl Survey Index of Red Hake from 1989 through 2026. Units in Biomass (kg/tow). Gray-shaded area represents the 90% confidence interval. The survey was not conducted in Spring or Fall 2020 and incomplete in Spring 2023.

Fall: 7.36 kg/tow (2024) → 4.22 (2025), a marked decline in the latest observation. Fall 2025 not used in the Spec. Calc (Lagged one yr (t-1))

Spring: 7.41 (2024) → 4.43 (2025) → 3.25 (2026). Spring 2026 Not used in Specs Calc. (Terminal yr = 2025)

Both seasonal series show declining trends.

Northern red hake — recent length composition

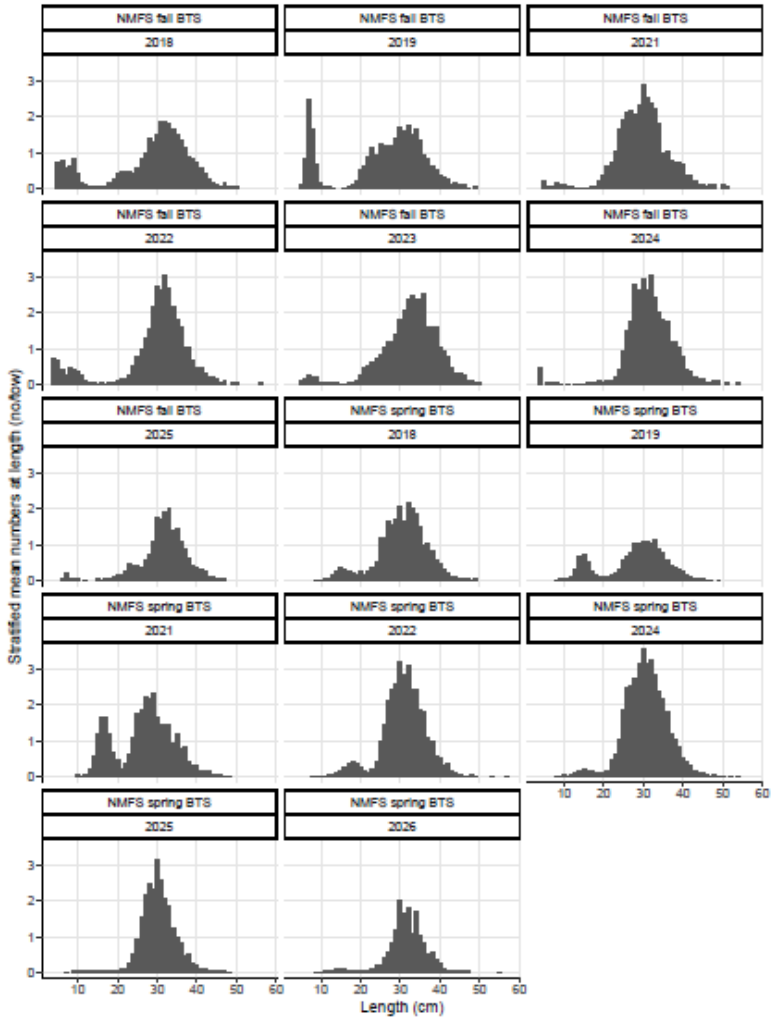


Figure 5: Stratified Mean Indices at Length for the Bottom Trawl Survey of Red Hake from 2018 through 2026. The survey was not conducted in Spring or Fall 2020 and incomplete in Spring 2023.

Recent Fall observations remain centered broadly around ~30 cm, with lower abundance in 2025.

Spring 2024-2026 likewise shows a mode around the upper-20s/low-30s cm with also lower abundance recent two years.

*Spring 2023 is intentionally excluded from recent-panel interpretation.

Northern red hake — catch through 2025

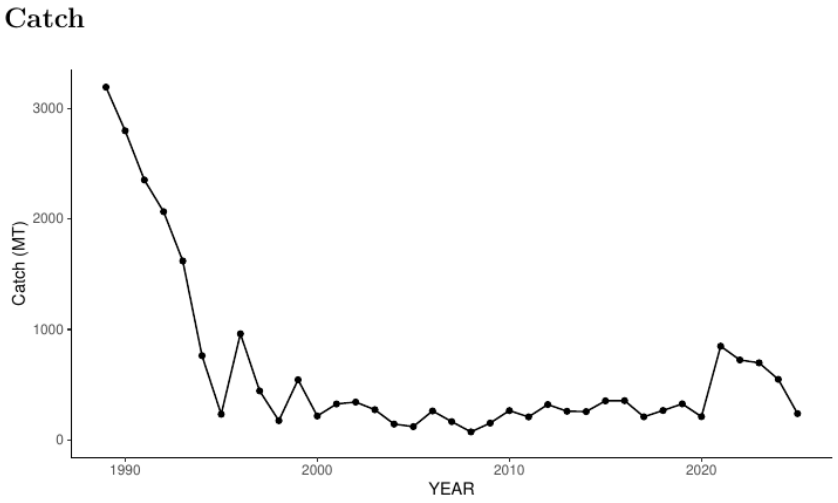


Figure 1: Total catch in metric tons (MT) of Red Hake from calendar year 1989 through 2025.

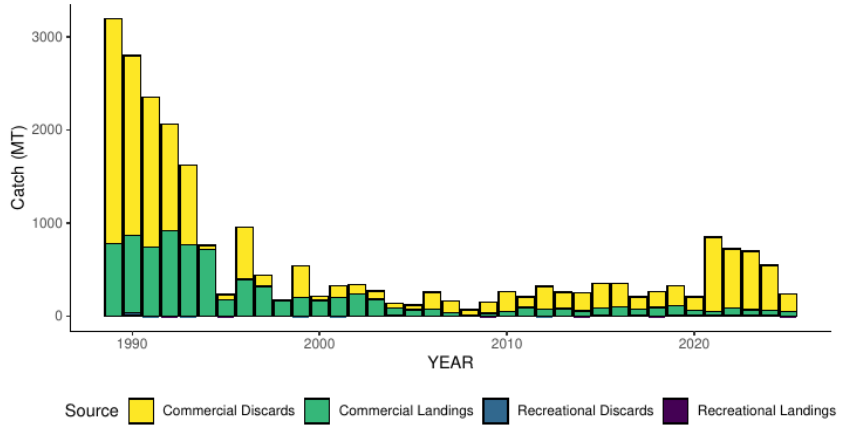


Figure 2: Landings (MT) and discards (MT) of Red Hake from calendar year 1989 through 2025. The landings and discards timeseries incorporated in this data update spans 1989-2025.

Total catch: 698 MT (2023) → 549 MT (2024) → 239 MT (2025). ~ -66%

Commercial discards dominate recent removals: 625, 482, and 187 MT.

Commercial landings declined to 51 MT in 2025.

2025 total catch is well below the 2021-2023 discard-driven increase.

Summary Northern red hake — data-update summary

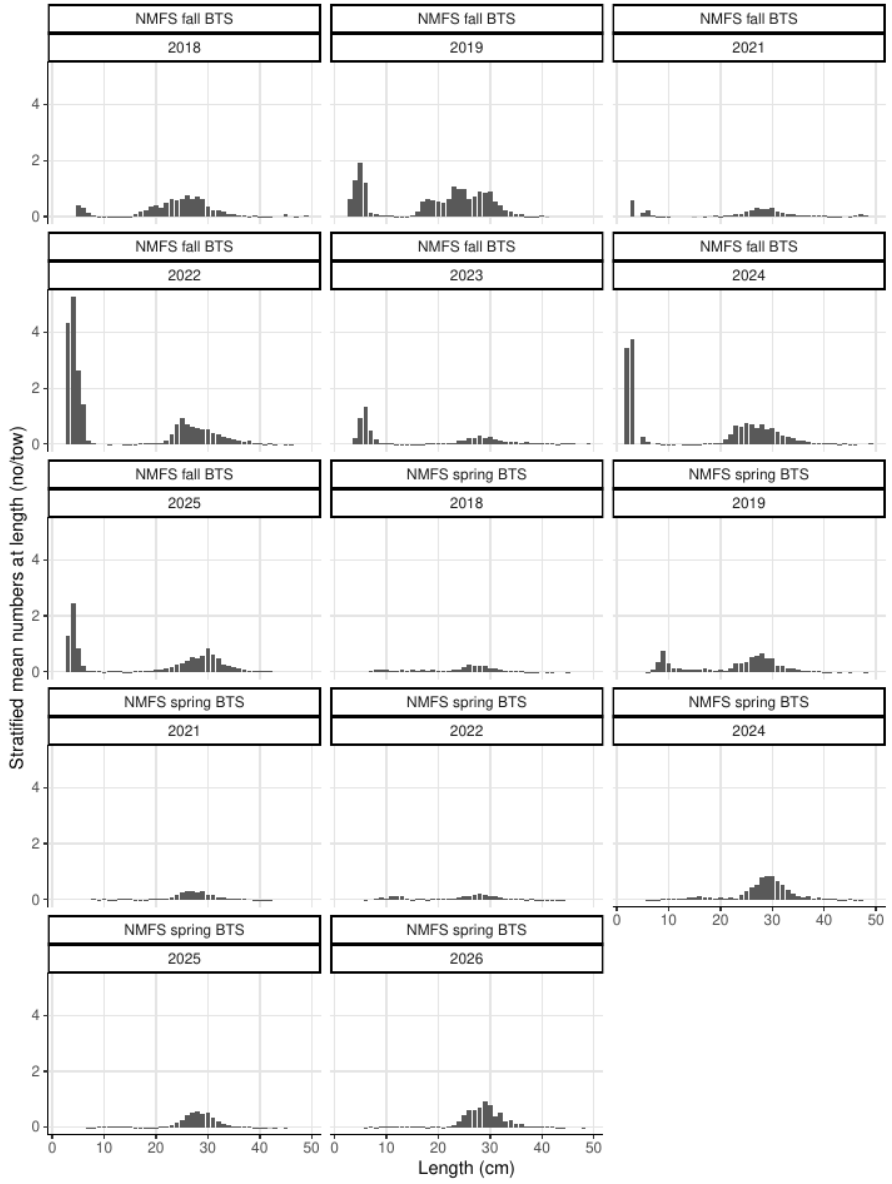
Survey: both seasonal survey series declined at the most recent endpoint.

Coverage: Spring 2023 treated missing/incomplete coverage;

Catch: removals declined substantially through 2025, driven mainly by commercial discards.

Overall: recent fishery removals are lower, but latest survey observations also point downward.

Southern red hake — recent length composition

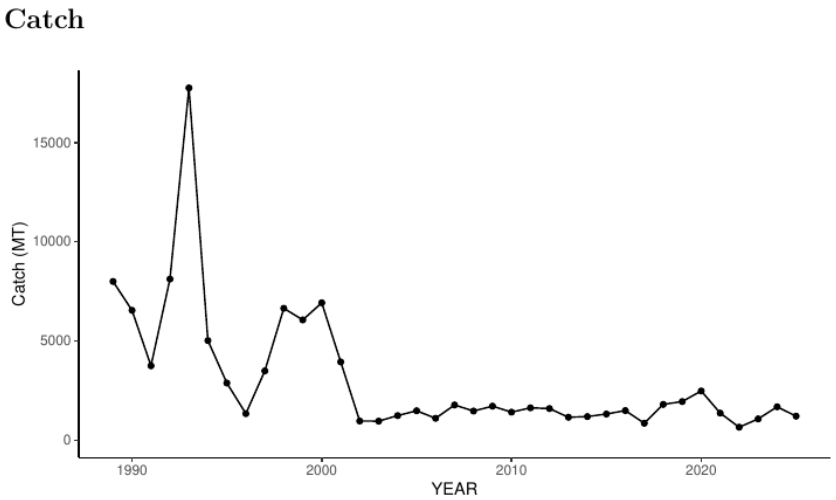


Fall observations show substantial year-to-year variability in small-fish abundance.

2024-2025 retain a broader mode around the mid-20s to low-30s cm alongside small-fish signals.

Spring 2024-2026 are concentrated primarily around the upper-20s cm.

Southern red hake — catch through 2025



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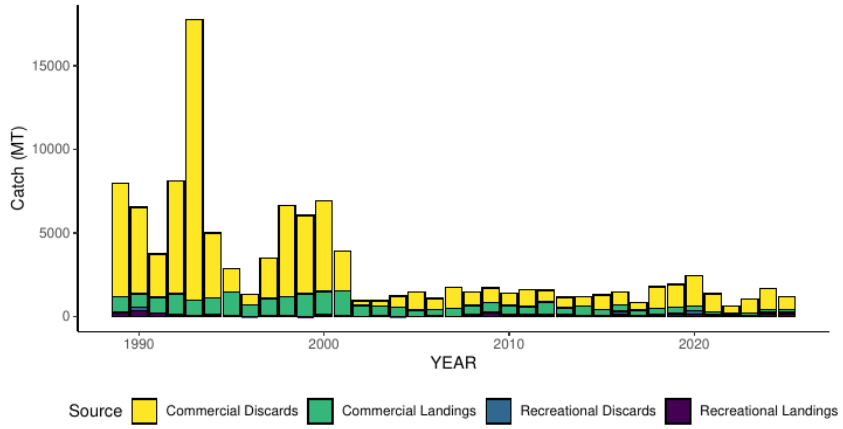


Figure 2: Landings (MT) and discards (MT) of Red Hake from calendar year 1989 through 2025. The landings and discards timeseries incorporated in this data update spans 1989-2025.

Total catch: 1,072 MT (2023) → 1,681 MT (2024) → 1,210 MT (2025). SOUTH RED

Commercial discards remain the largest component: 864, 1,227, and 795 MT.

Commercial landings remain low; recreational landings increased in 2024-2025.

Recent catch is far below historical peaks but remains discard-dominated.

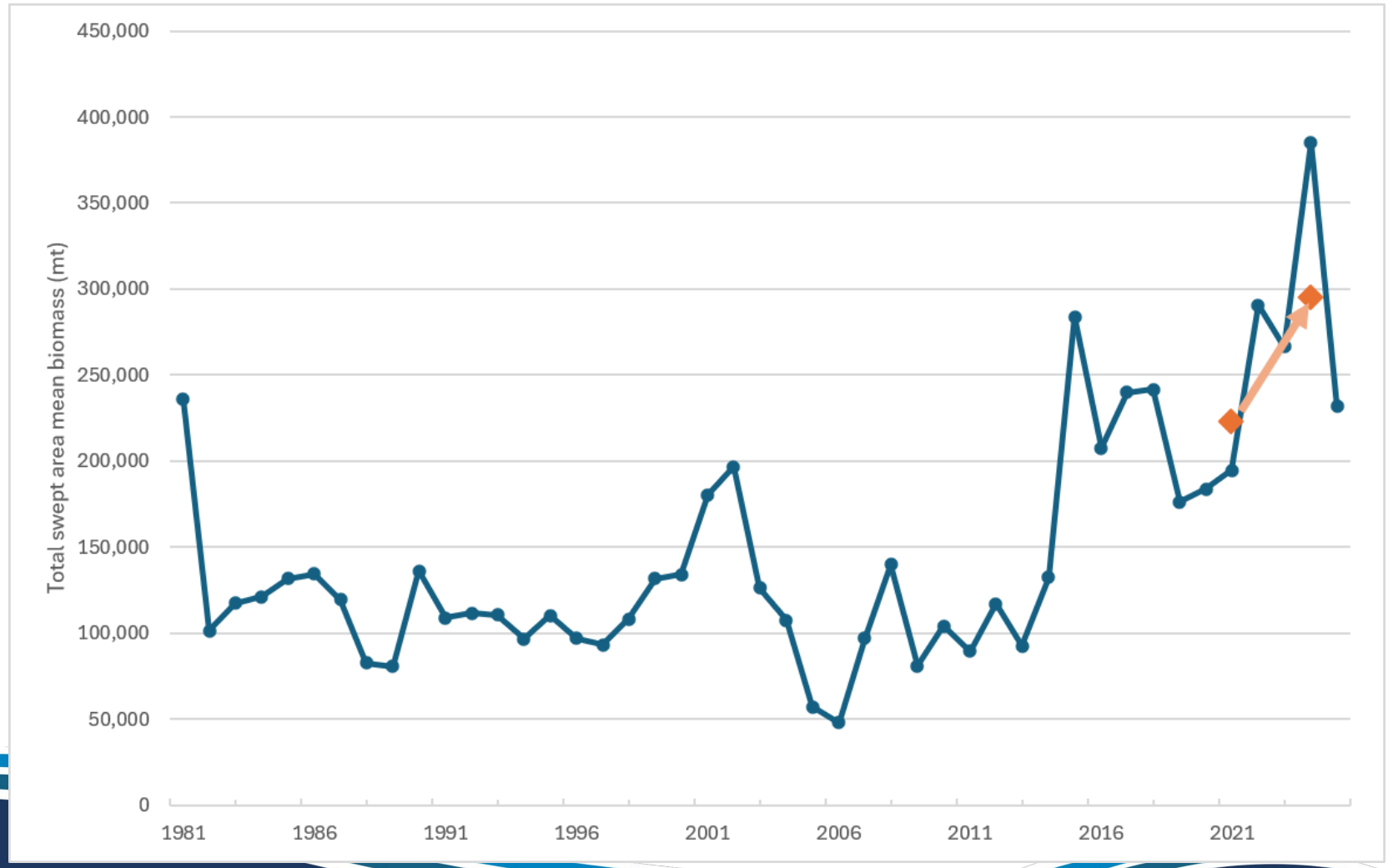
Southern red hake — data-update summary

Survey: Fall remained near ~1 kg/tow in 2024-2025; Spring declined in 2025 and appears to have rebounded in 2026 (TBD).

Catch: 2024 increased relative to 2023, followed by a partial decline in 2025.

Overall: variable but not uniformly declining survey signals, with removals still dominated by commercial discards.

BIOMASS TREND AND CHANGE IN NORTHERN RED HAKE 3-YEAR AVERAGE BIOMASS



2027–2031 Red Hake ABCs

Apply SSC-selected baseline exploitation rates to the revised terminal 3-year mean swept-area biomass

Northern Red Hake

294,602 mt × 0.01965 = 5,790 mt

Proposed ABC ≈ 5,790 mt

Southern Red Hake

63,062 mt × 0.03362 = 2,120 mt

Proposed ABC ≈ 2,120 mt

Stock	2023 advice ABC	bridge/revision From 2023	2027–2031 proposed	Primary driver
Northern red hake	3,132	3,144	5,790	Higher terminal biomass + higher revised baseline RelF
Southern red hake	1,826	1,699	2,120	Recovery in terminal 3-yr biomass; baseline RelF nearly unchanged

- Northern: revised 1981–1994 mean exploitation = 0.019655; terminal 2023–2025 biomass MA3 = 294,602 mt.
- Southern: revised 2001–2019 mean exploitation = 0.033615; terminal 2023–2025 biomass MA3 = 63,062 mt.
- These are empirical ABCs, not OFLs; no compatible red hake OFL/reference-point framework is currently available.

4.2 Utilization

Percent utilization of ACL and TAL (quota). All values in metric tonnes.

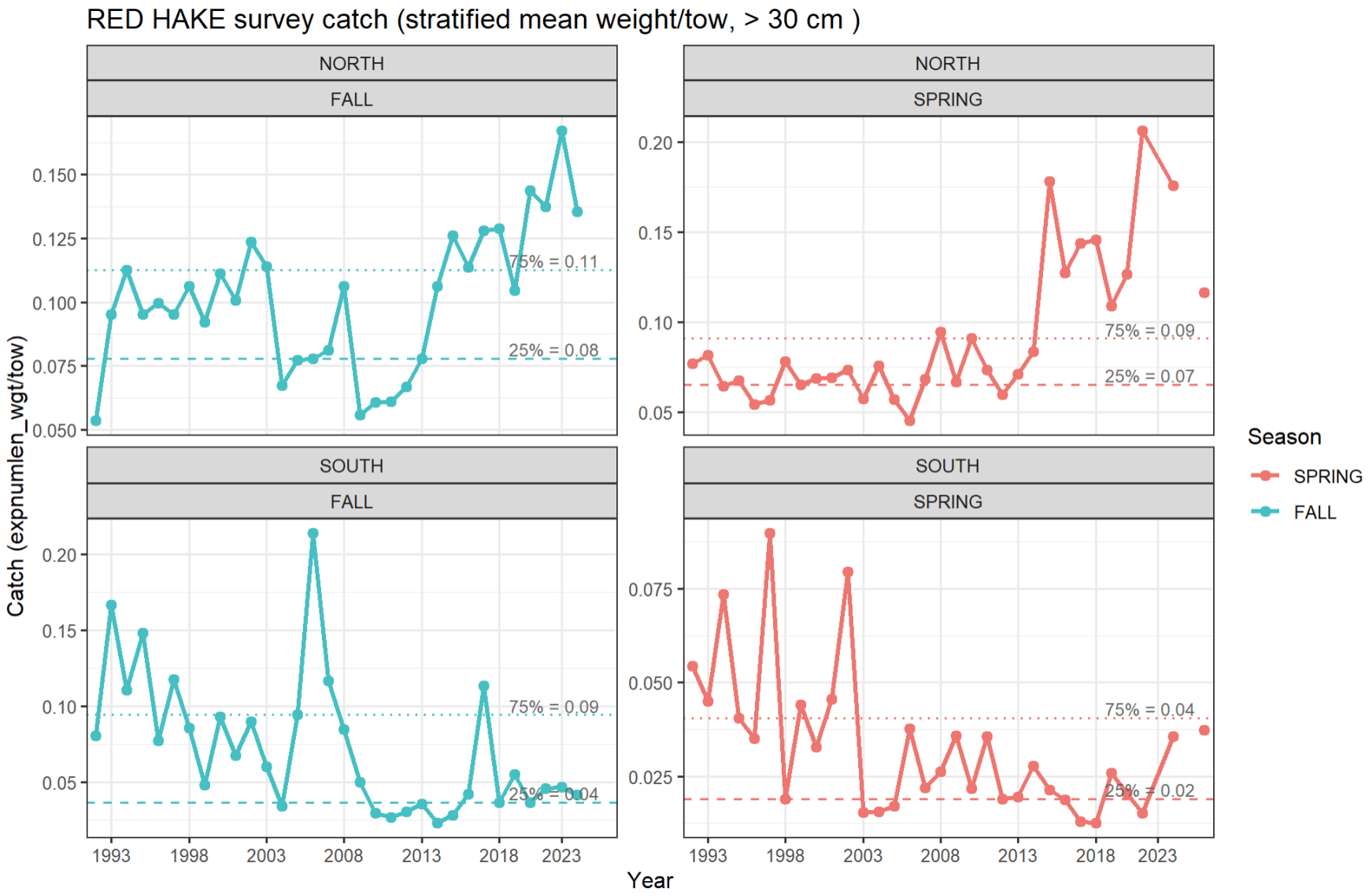
Risk policy: Quota utilization below 80% in all years

Southern red hake overfishing occurred in fishing year 2024

Fishing year	stock	ACL	Catch	Percent of ACL	TAL	Landings	Percent of TAL
2023	Northern red hake	2,973	750.8	25.3%	1,274	74.1	5.8%
2024	Northern red hake	2,973	451.2	15.2%	1,274	49.3	3.9%
2025	Northern red hake	2,973	209.5	7.0%	1,274	51.9	4.1%
2023	Northern silver hake	38,825	2,801.9	7.2%	31,347	2,264.1	7.2%
2024	Northern silver hake	38,825	2,107.5	5.4%	31,347	1,634.4	5.2%
2025	Northern silver hake	38,825	1,688.1	4.3%	31,347	1,484.6	4.7%
2023	Southern red hake	1,301	1,218.4	93.7%	234	156.9	67.1%
2024	Southern red hake	1,301	1,612.2	123.9%	234	181.7	77.6%
2025	Southern red hake	1,301	635.2	48.8%	234	153.4	65.6%
2023	Southern whiting	19,142	3,073.0	16.1%	13,881	2,484.6	17.9%
2024	Southern whiting	19,142	5,300.9	27.7%	13,881	3,325.7	24.0%
2025	Southern whiting	19,142	5,308.6	27.7%	13,881	3,565.3	25.7%

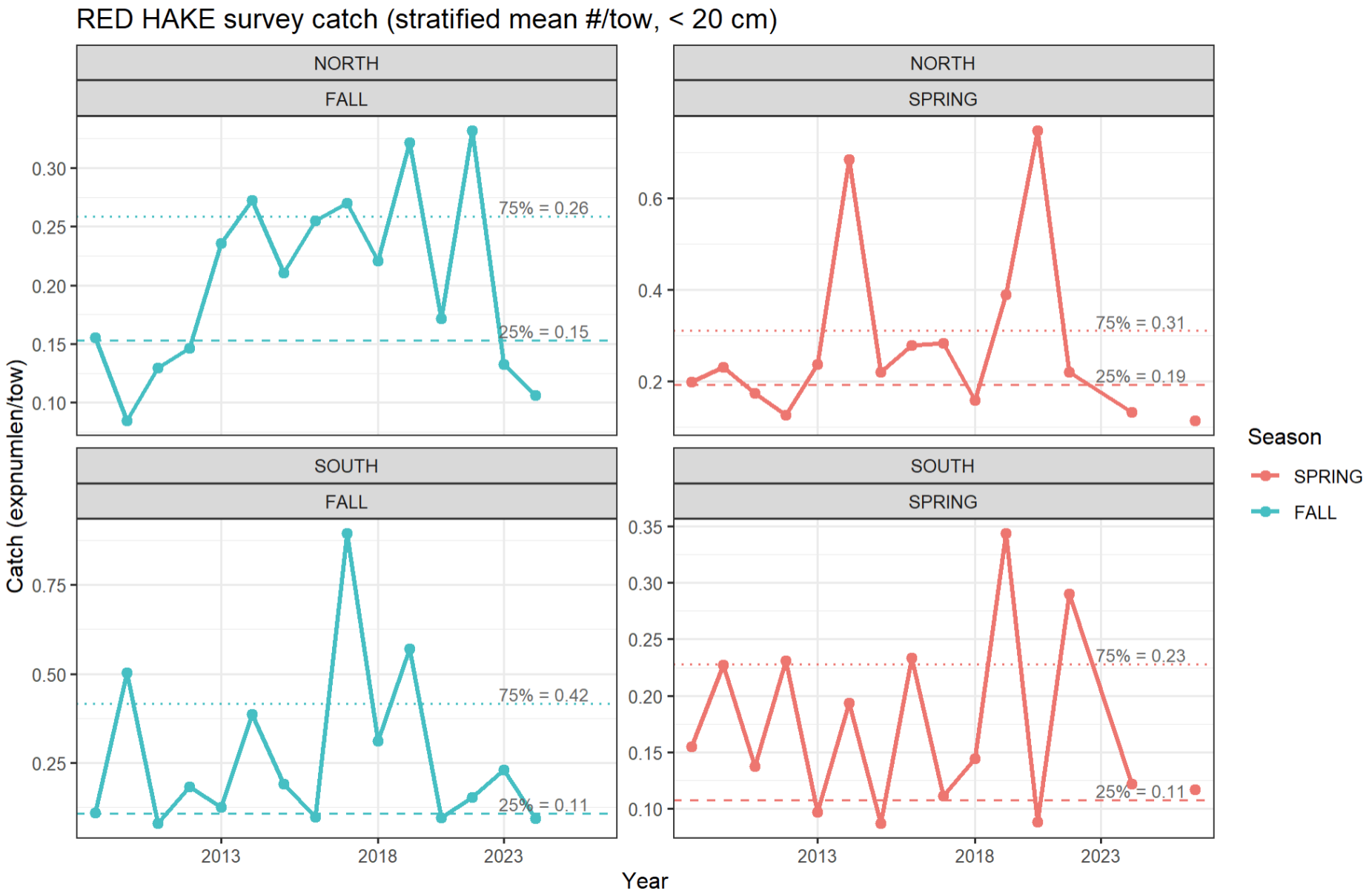
4.7 Red hake spawning biomass

- Recent red hake spawning biomass levels compared to time series quartiles (excluding last five years), adjusted for RV Bigelow years and converted to biomass based on accepted survey length/weight parameters.
- Recent five-year trend: – **Northern red hake** spawning biomass above the 75th percentile for 9 of 10 observations in fall and spring and below the 25th percentile for 0 of 10 observations.
- **Southern red hake** spawning biomass above the 75th percentile for 0 of 10 observations in fall and spring and below the 25th percentile for 3 of 10 observations.



4.5 Red hake recruitment

- Recent red hake recruitment levels compared to time series quartiles (excluding last five years).
- Recent five-year trend: – **Northern red hake** recruitment above the 75th percentile for 4 of 10 observations in both fall and spring; below the 25th percentile 3 of 10 observations
- **Southern red hake** recruitment above 75th percentile for3 of 10 observations in both fall and spring; below the 25th percentile 3 of 10 observations



Alternative risk policy plot with quartiles.

The PDT uses the quartiles for the last five years for risk-factor scoring. The quartile values are calculated from the plotted time series, excluding the last five years.

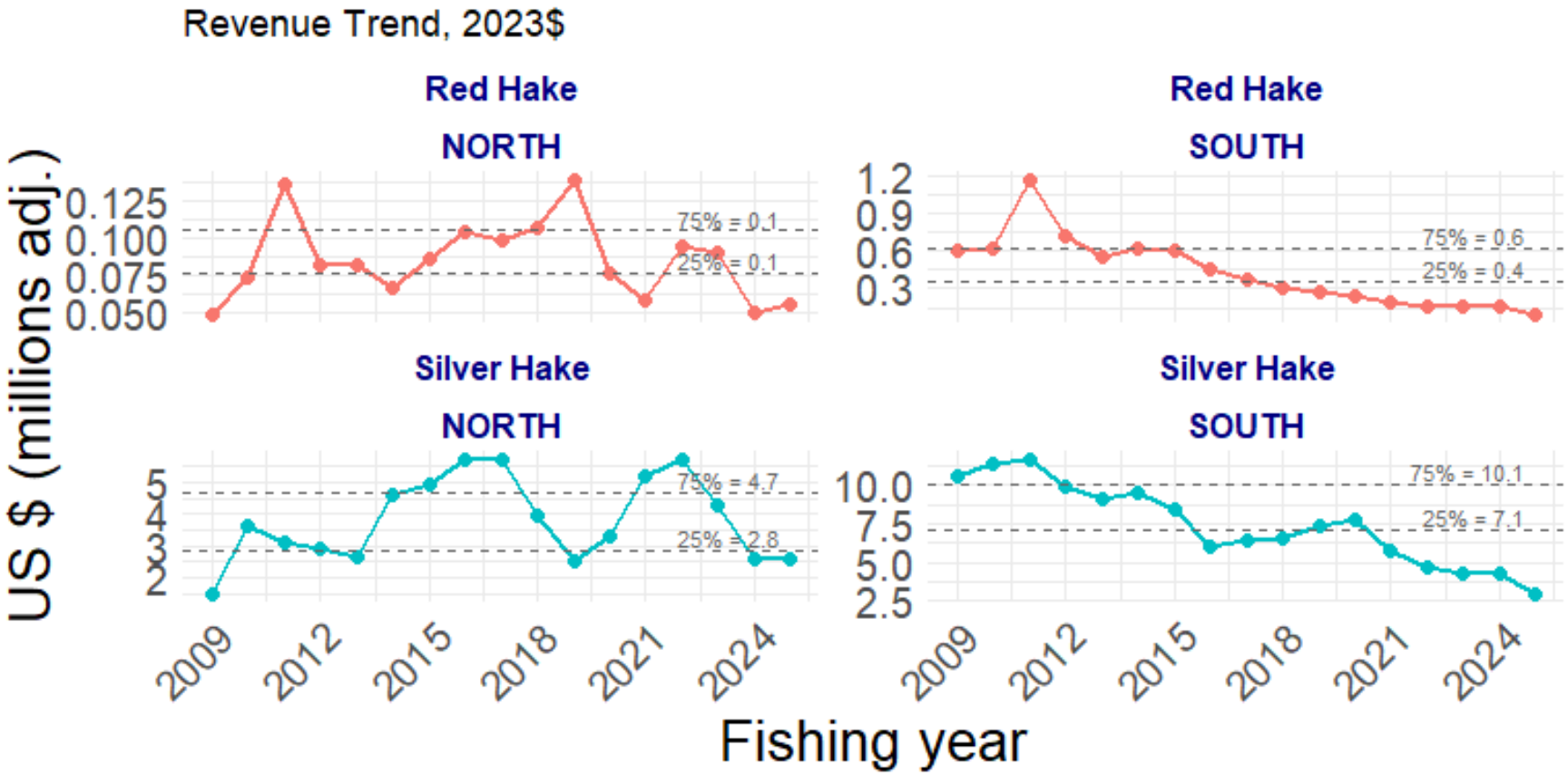
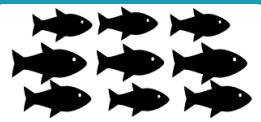
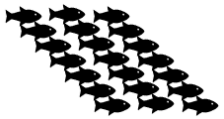
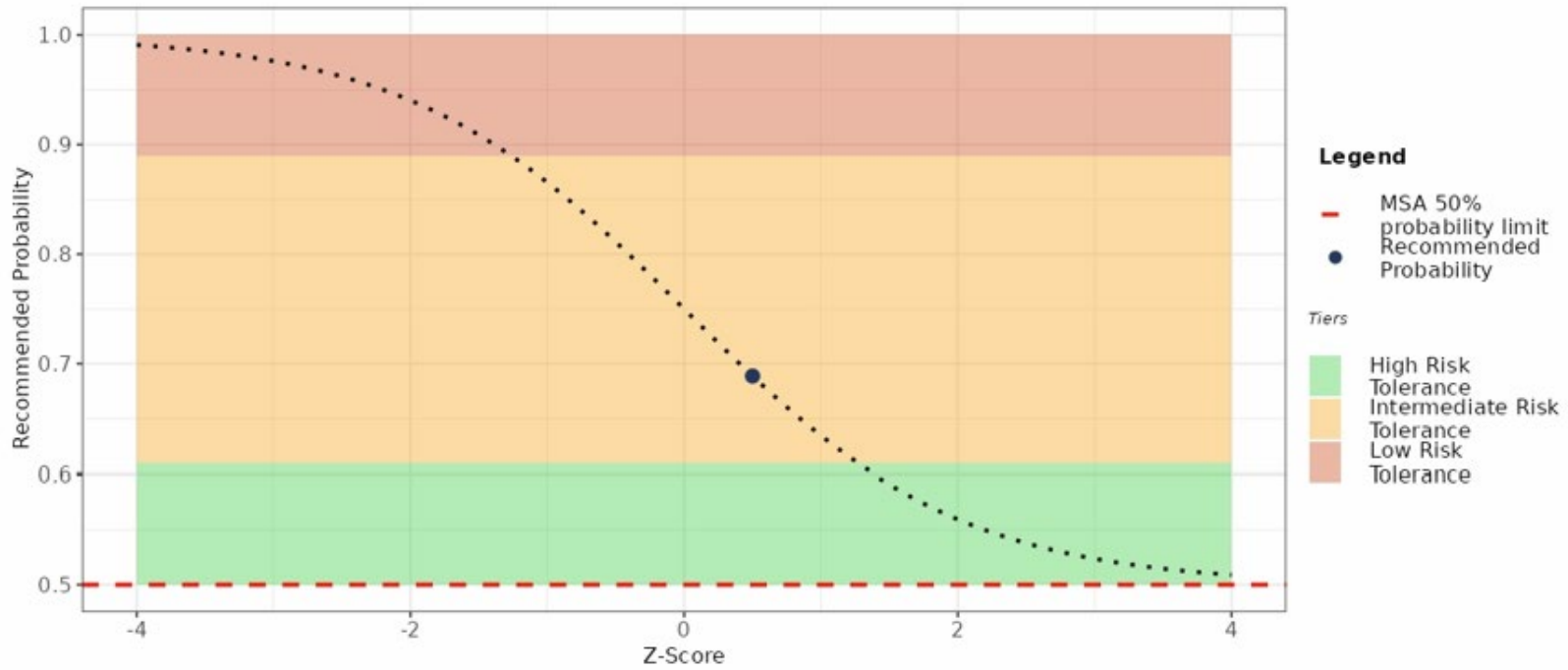


Figure 3: Revenue trends by species (Silver hake LEFT, Red hake RIGHT)

NORTHERN RED HAKE RISK POLICY FACTORS, SCORING, AND WEIGHTING

Factor	Weight	Score	Scoring Details
 SSB / Stock Status	0.30	0	0 of 10 (0%) below 25th percentile; 9 of 10 (90%) above the 75th percentile
 Recruitment	0.26	0	3 of 10 (30%) below 25th percentile; 4 of 10 (10%) above 75th percentile.
 Climate Vulnerability	0.19	0	Increases in productivity; deep basins Sensitivity = L ; Exposure = H ; Vulnerability = L; Directional effect = P
 Commercial Fishery Characterization	0.25	2	Utilization = 0 (15.8% ACL; 4.6% TAL); Port activity trend = 1; Revenue trend = 1; Fishery interactions = 0; AP input = 0
 Recreational Fishery Characterization	No sub-ACL	-	
			Total Z Score: +0.50

NORTHERN RED HAKE RISK POLICY FACTOR SCORING



The recommended probability based on the logisitic curve and the Z-score:

68.9%

Z-SCORE = +0.50→ INTERMEDIATE RISK TOLERANCE

SOUTHERN RED HAKE

Southern red hake — Spring and Fall surveys

Spring 2023 treated as missing because coverage was incomplete

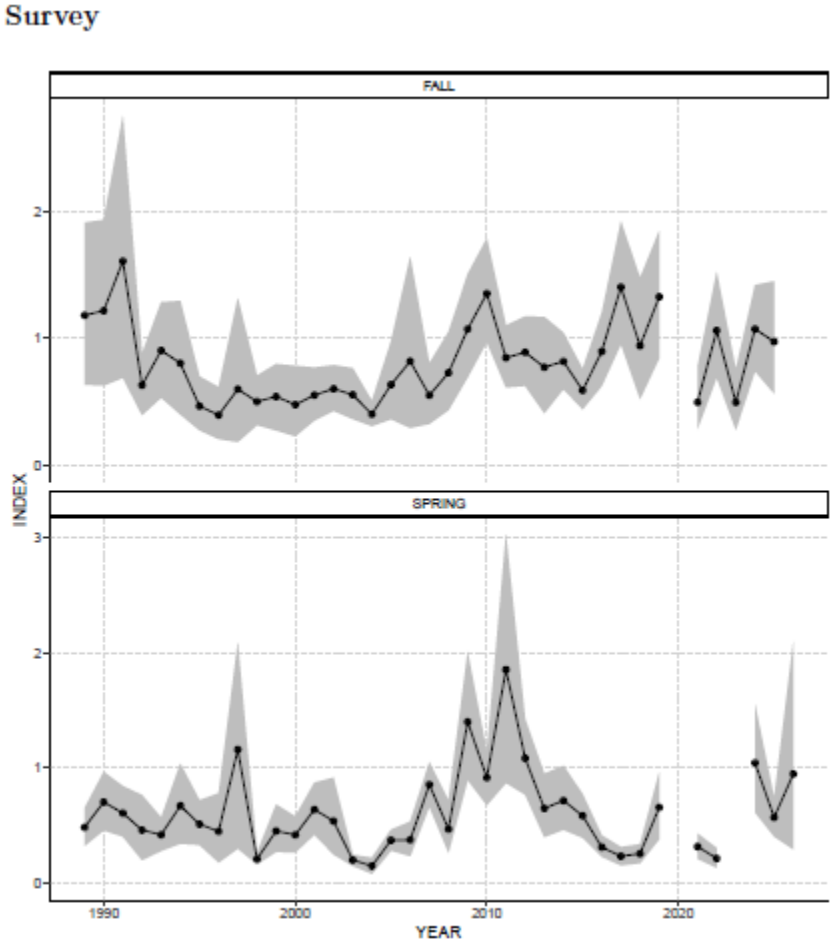


Figure 3: Bottom Trawl Survey Index of Red Hake from 1989 through 2026. Units in Biomass (kg/tow). Gray-shaded area represents the 90% confidence interval. The survey was not conducted in Spring or Fall 2020 and incomplete in Spring 2023.

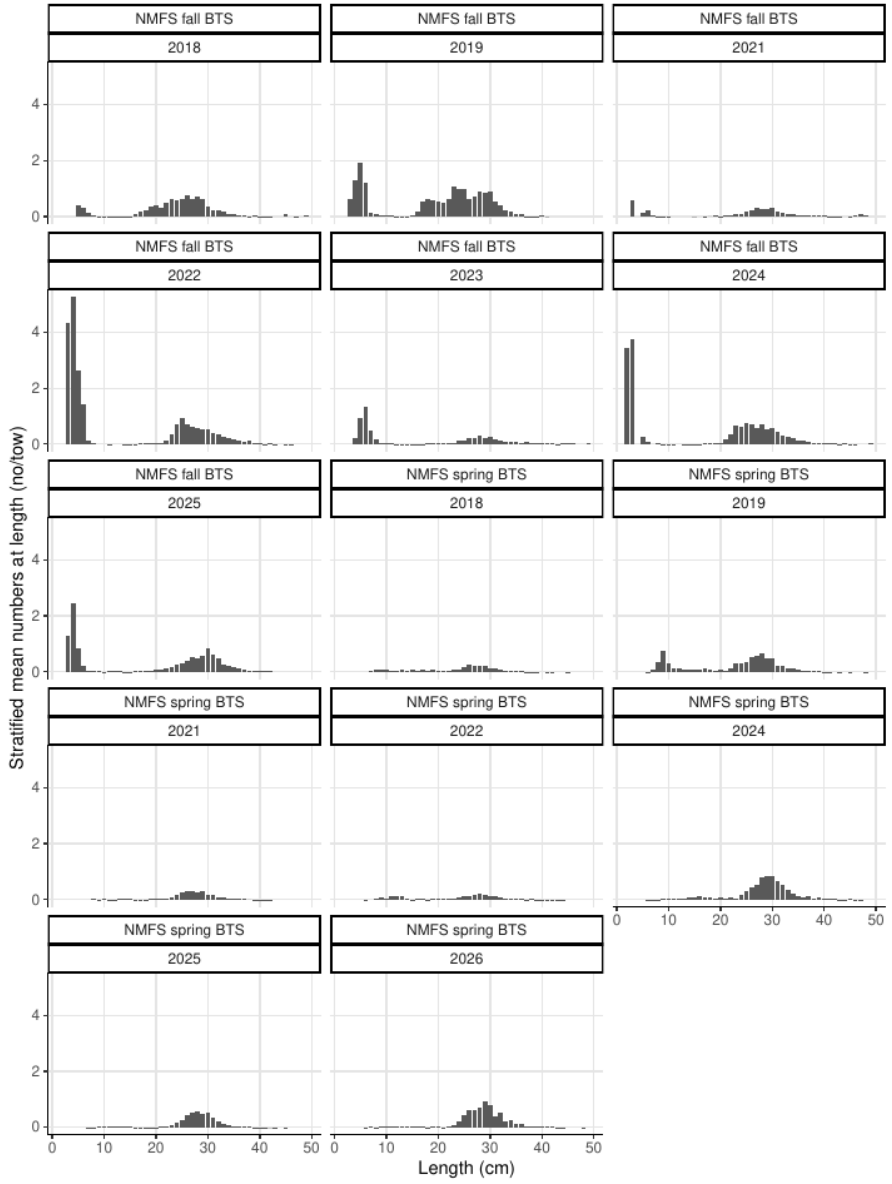
Fall: 0.49 (2023) → 1.07 (2024) → 0.97 kg/tow (2025).

Spring: 1.05 (2024) → 0.57 (2025) → 0.95 (2026).

Spring 2023 is excluded because survey coverage was incomplete.

Recent seasonal signals are variable, without the same sustained decline evident in northern red hake.

Southern red hake — recent length composition



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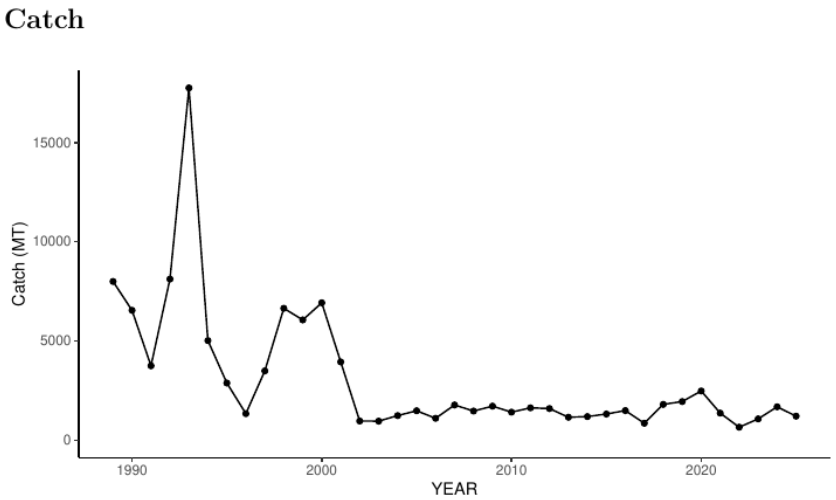

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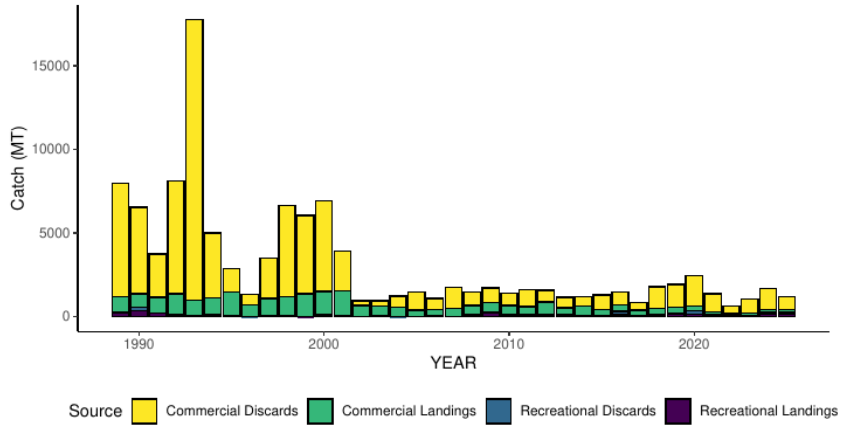

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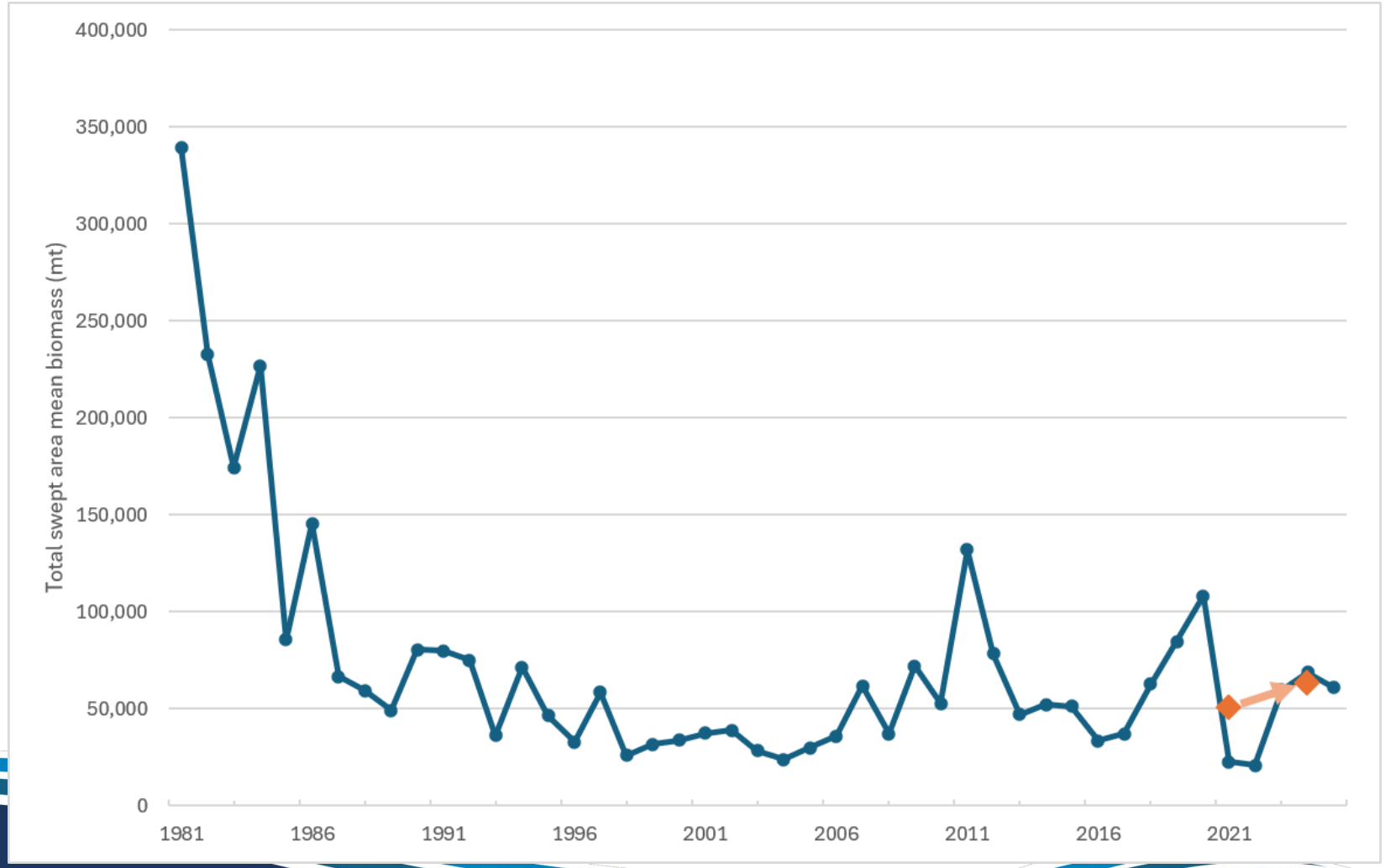

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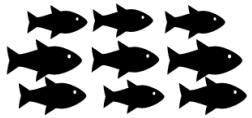
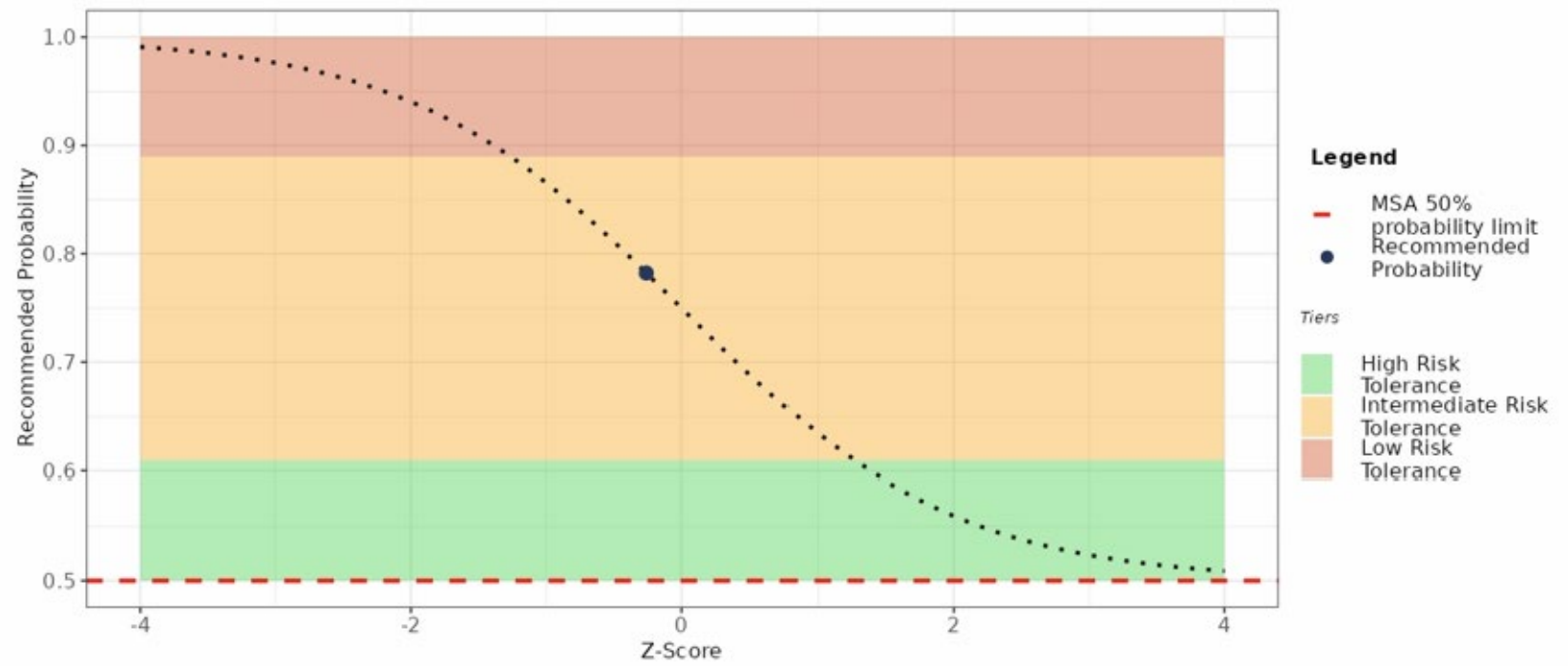
SOUTHERN RED HAKE RISK POLICY FACTORS, SCORING, AND WEIGHTING

Factor	Weight	Score	Scoring Details
 SSB / Stock Status	0.30	0	3 of 10 (30%) below 25th percentile; 0 of 10 (0%) above the 75th percentile
 Recruitment	0.26	0	3 of 10 (10%) below 25th percentile; 3 of 10 (10%) above 75th percentile.
 Climate Vulnerability	0.19	-4	Declines in productivity; 2023 SSC review Sensitivity = L ; Exposure = H ; Vulnerability = H; Directional effect = Ng
 Commercial Fishery Characterization	0.25	2	Utilization = 0 (88.8% ACL; 22.5% TAL); Port activity trend = 1; Revenue trend = 1; Fishery interactions = 0; AP input = 0
 Recreational Fishery Characterization	No sub-ACL	-	
			Total Z Score: -0.26

SOUTHERN RED HAKE RISK POLICY FACTOR SCORING



The recommended probability based on the logisitic curve and the Z-score:

78.2%

Z-SCORE = -0.26→ INTERMEDIATE RISK TOLERANCE

Management Recommendations and comments:

- Silver hake biological reference points are static based on a 1972-1980 period as a proxy for MSY conditions and is long overdue for re-evaluation by a formal assessment process.

- Red hake stocks have no overfishing level specification because the AIM assessment model on which it was based had been rejected. The SSC chose a more recent static period to represent an acceptable level of exploitation, but the official overfishing definition has not been modified (based on a 1980-2010 proxy for MSY)

-- In 2023 following an assessment update, the SSC said that fishing was an unlikely cause in reductions in southern red hake biomass

-- Uncertainty in the index-based assessment

-- Existing proxy reference points that define overfishing are inconsistent with more recent assessment information.

- Exemption area fishing programs should be reviewed and adjusted as needed to respond to new environmental and stock conditions of SMS and stocks that are commonly caught by SMS trips.