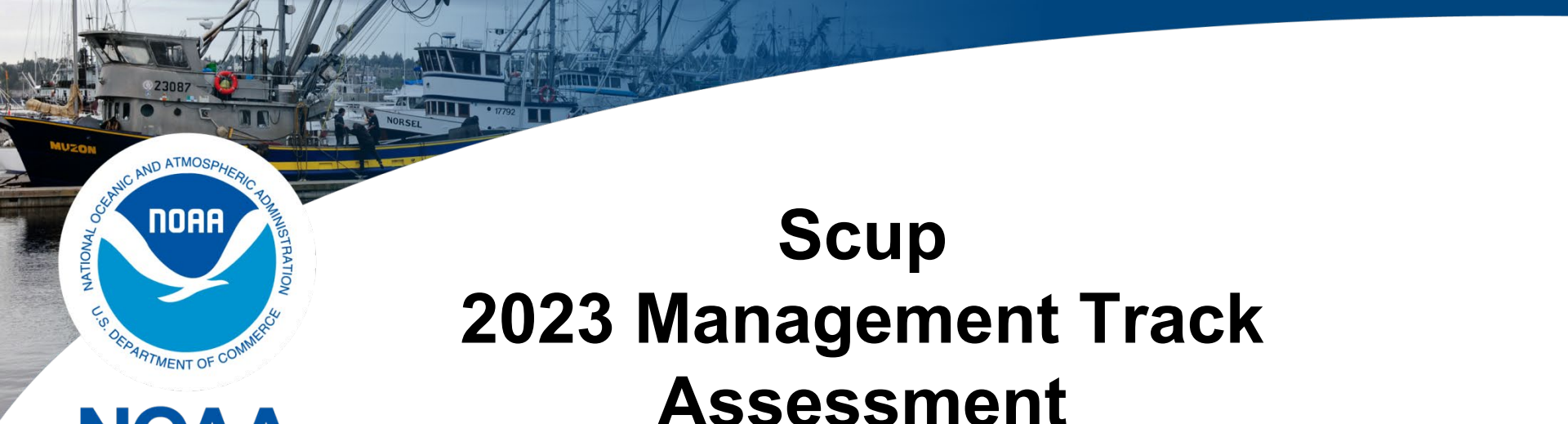


Scup
2023 Management Track Assessment

- NEFSC

- ***Stenotomus chrysops***

- **June 2023**

Scup 2015 SAW 60
Most recent 'Benchmark' Assessment

SAW-60 concluded that the scup stock was not overfished nor did it experience overfishing in 2014. The Review Panel stated that "…all of the ToRs were met and the assessment results can be used as a basis for management. "

The Panel concluded that the assessment represented a robust summary of scup population dynamics, but noted uncertainty regarding the steepness of the estimated rise in biomass since 2000, the possible "cryptic" biomass, and in the accuracy of the Biological Reference Points.

Recent Updates

Model Update in 2017
Analysis: NFT ASAP SCAA, AGEPRO Projection
YPR/SSBR BRP models
Not Overfished and No Overfishing in 2016
SSC accepted projections for
OFLs/ABCs in 2018-2019

Data Updates in 2016 and 2018
All Fishery Catch and Catch-at-age
All Surveys
SSC made no changes to OFLs/ABCs

Recent Updates

Operational Assessment in 2019
Analysis: NFT ASAP SCAA, AGEPRO Projection
YPR/SSBR BRP models
Not Overfished and No Overfishing in 2018
Historically large 2015 year class recruiting
SSB about 2X BMSY target
F about 70% of FMSY threshold

Increasing but still 'minor' internal retrospective
(SSB -11%; F +26%) no adjustment
Consistency between recent assessments

SSC accepted projections for
OFLs/ABCs in 2020-2021

Recent Updates

Management Track Assessment in 2021
Analysis: NFT ASAP SCAA, AGEPRO Projection
YPR/SSBR BRP models
Not Overfished and No Overfishing in 2019
Historically large 2015 year class recruiting
SSB about 2X BMSY target
F about 70% of FMSY threshold

Increasing but still 'minor' internal retrospective
(SSB -14%; F +20%) no adjustment
Consistency between recent assessments

SSC accepted projections for
OFLs/ABCs in 2022-2023

2023 Management Track Assessment
Data and modeling overview

- **Add 2020-2022 fishery and research survey data to the 2015 SAW 60 / 2017 / 2019 / 2021 assessment model**
- **Update mean weight and maturity averages for BRPs and projections**
- **Update BRPs**
- **Evaluate stock status relative to updated BRPs**
- **Conduct projections for 2024-2025 to determine OFLs**
- **Level 2 Management Track review**
  - **CAMS 2020-2022 commercial fishery catch data**
  - **BIG Indices to 'AS'**
  - **Minor model setting changes (input CVs, ESSs)**
- **Backup – Examination of aggregate survey trends or PlanBsmooth using NEFSC fall survey trend to project trend of catch**

TOR 1: Fishery Catch

1. Estimate catch from all sources including landings and discards

Commercial Landings

Comm. Landings: mostly MA to NJ, out to edge of shelf
NEFSC Weighout/Dealer AA through 2019; CAMS 2020-2022
Mainly a mixed trawl fishery (>90% of landings);
Some hand gear and trap landings
Avg. ~18,000 mt (40 million lbs) for 1948-1966
Avg. ~ 6,400 mt (14 million lbs) for 1967-1996

Under quotas, avg. 4,500 mt (10 million lbs) for 1997-2017
2018: 6,064 mt (13 million lb), 56% of CQ (10,858 mt)
2019: 6,252 mt (14 million lb), 57% of CQ (10,879 mt)
2020: 6,177 mt (14 million lb), 61% of CQ (10,083 mt)
2021: 5,944 mt (13 million lb), 64% of CQ (9,299 mt)
2022: 5,507 mt (12 million lb), 60% of CQ (9,245 mt)

Commercial Discards

- SBRM Estimator through 2019; CAMS Estimator 2020-2022;
- 100% mortality rate

  - During 1997-2017: 1,500 mt = about 35% of comm. land.

    2018: 3,293 mt = 54% of comm. land.
    2019: 2,779 mt = 45% of comm. land.
    2020: 2,611 mt = 42% of comm. land.
    2021: 1,895 mt = 32% of comm. land.
    2022: 2,171 mt = 39% of comm. land.

Commercial Discards

	SBRM	CAMS	C-S	%
2018	3293	3505	+212	+6%
2019	2779	2877	+98	+4%
2020	2865	2611	-254	-9%
2021	2440	1895	-545	-22%

Recreational Landings

Largest catches in NY, CT, MA, and RI state waters
P/R Boat lands ~70%, Shore 20%, P/C Boat 10%

Under limits, avg. 4,000 mt (9 million lb) for 1997-2017

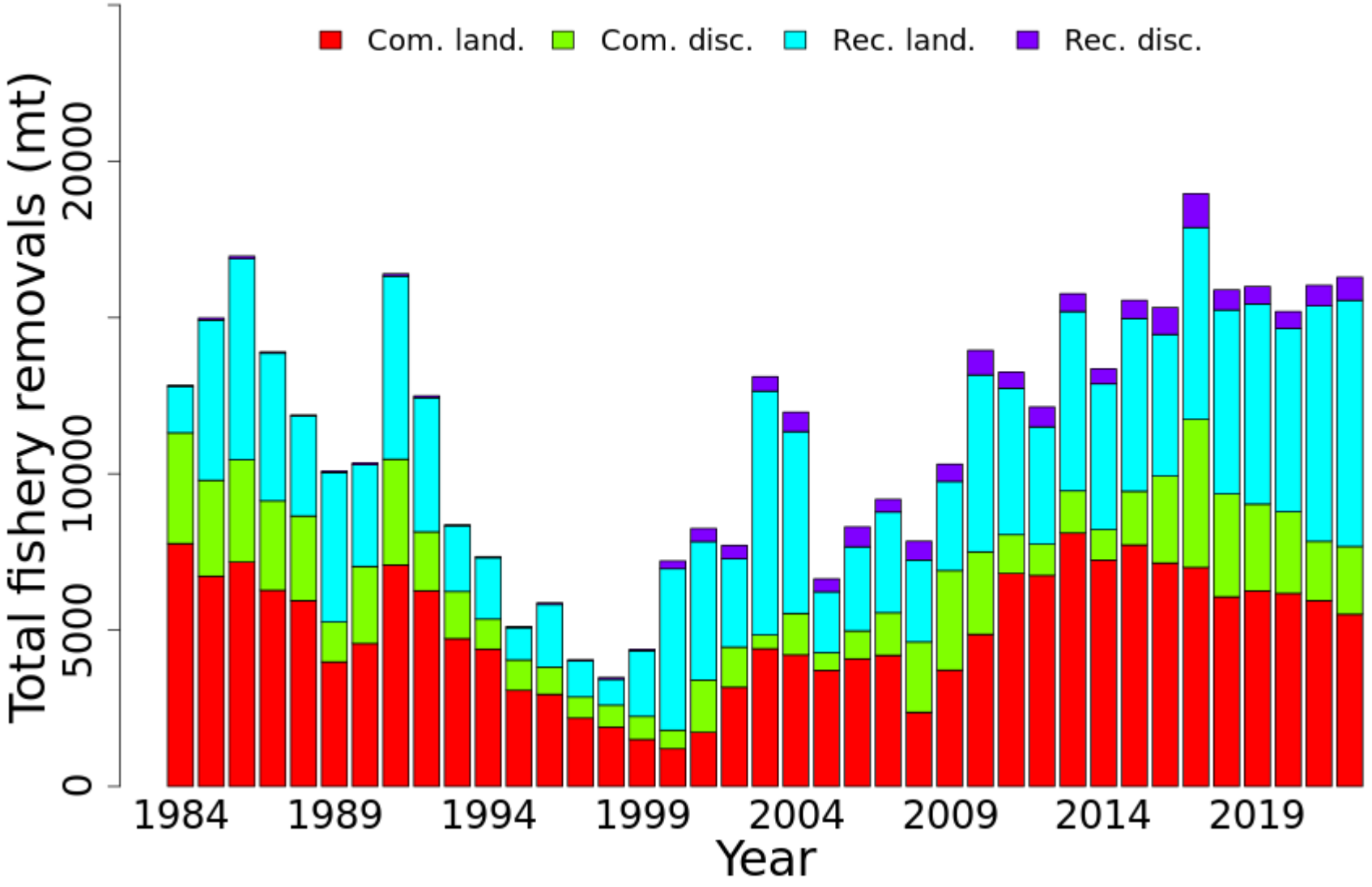
2018: 5,887 mt (13 million lb); 176% of RHL (3,342 mt)
2019: 6,403 mt (14 million lb); 192% of RHL (3,342 mt)
2020: 5,863 mt (13 million lb); 198% of RHL (2,954 mt)
2021: 7,540 mt (17 million lb); 274% of RHL (2,752 mt)
2022: 7,875 mt (17 million lb); 286% of RHL (2,757 mt)

Recreational Discards

Largest catches in NY, CT, MA, and RI state waters
P/R Boat discards ~64%, Shore 31%, P/C Boat 5%
15% mortality rate

Under limits, avg. 500 mt (1 million lb) for 1997-2017

2018: 644 mt (1.4 million lb)
2019: 560 mt (1.2 million lb)
2020: 541 mt (1.2 million lb)
2021: 653 mt (1.4 million lb)
2022: 738 mt (1.6 million lb)

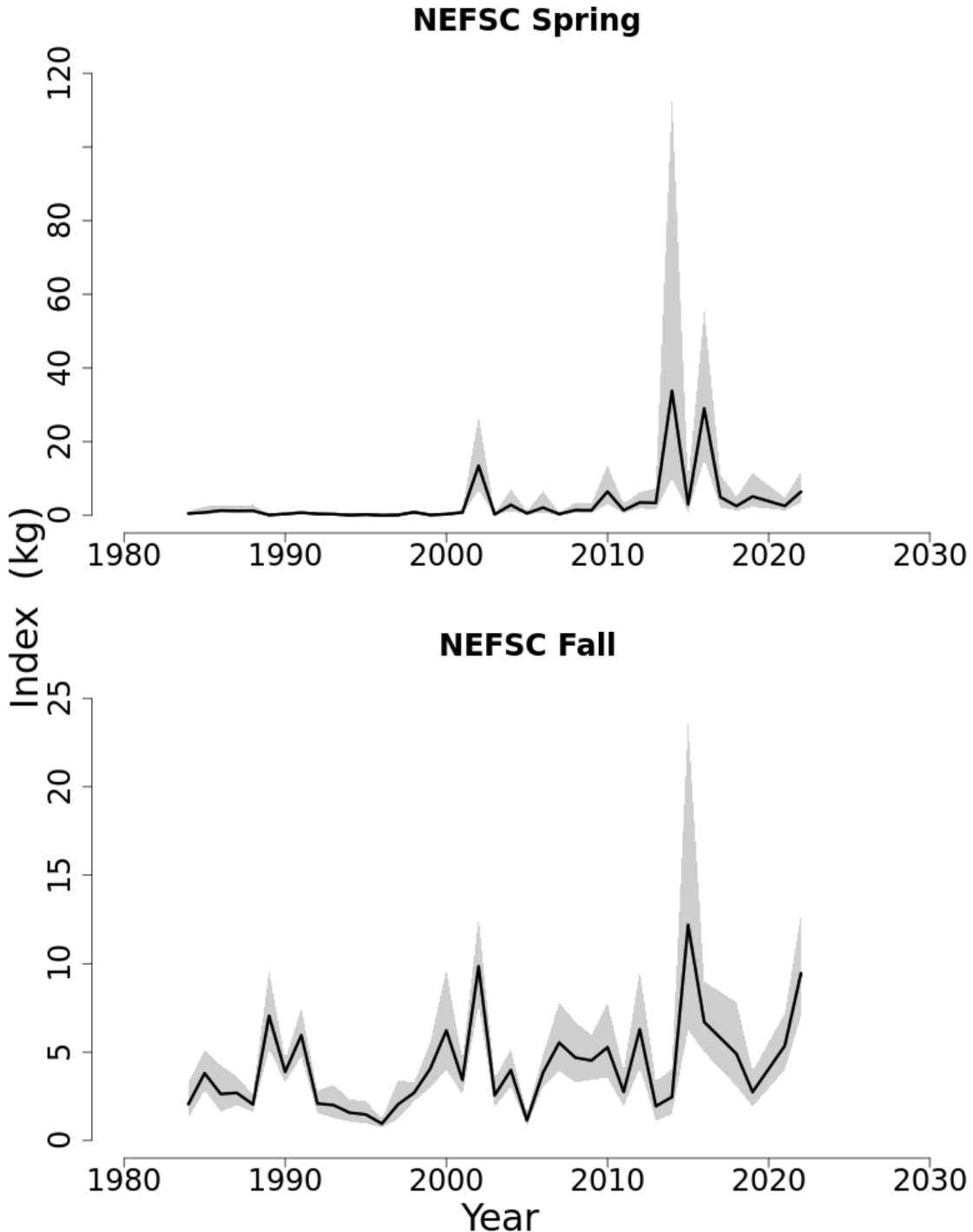

Com. land.
Com. disc.
Rec. land.
Rec. disc.
Total fishery removals (mt)
0
5000
10000
20000
1984
1989
1994
1999
2004
2009
2014
2019
Year

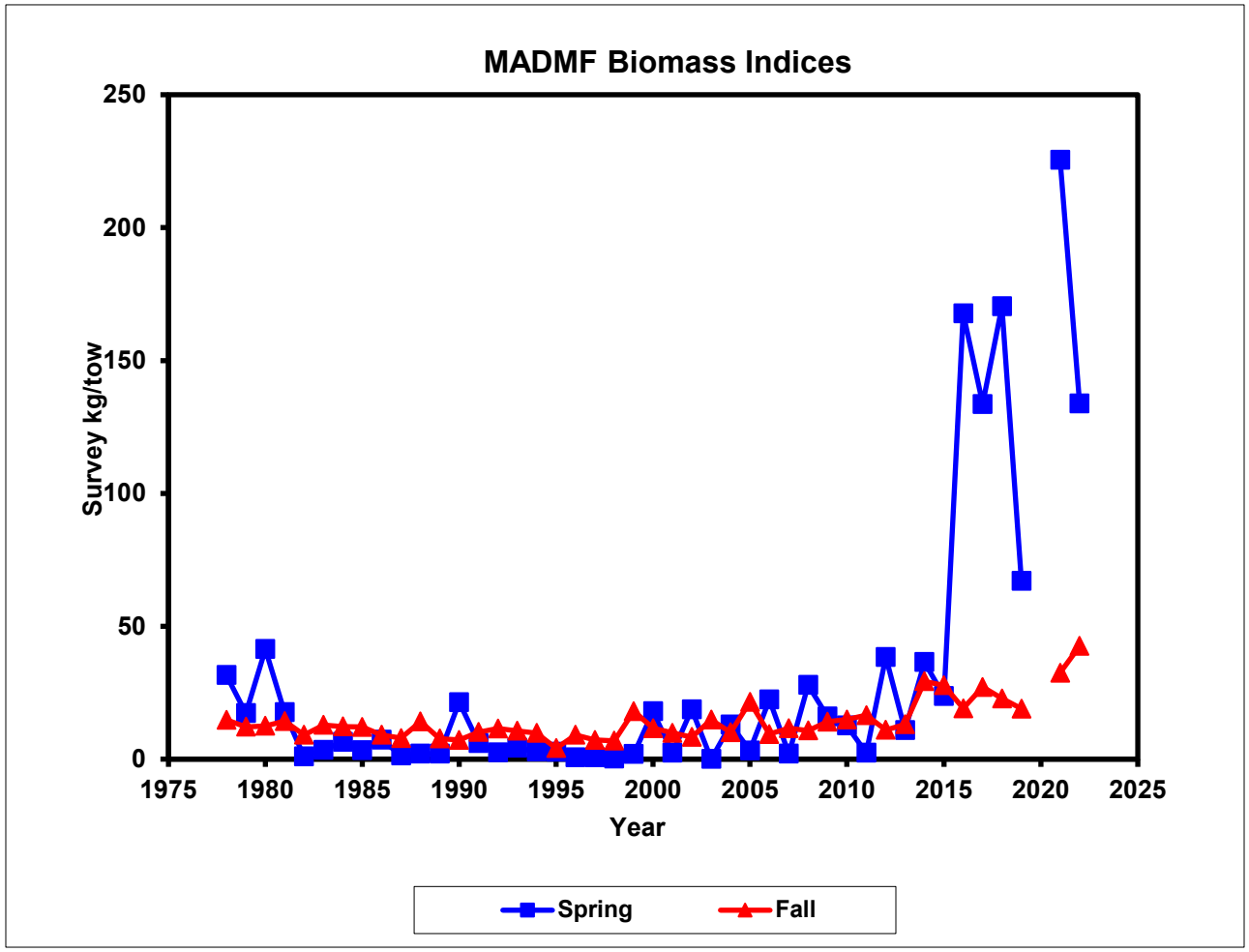
TOR 2: Indices of abundance

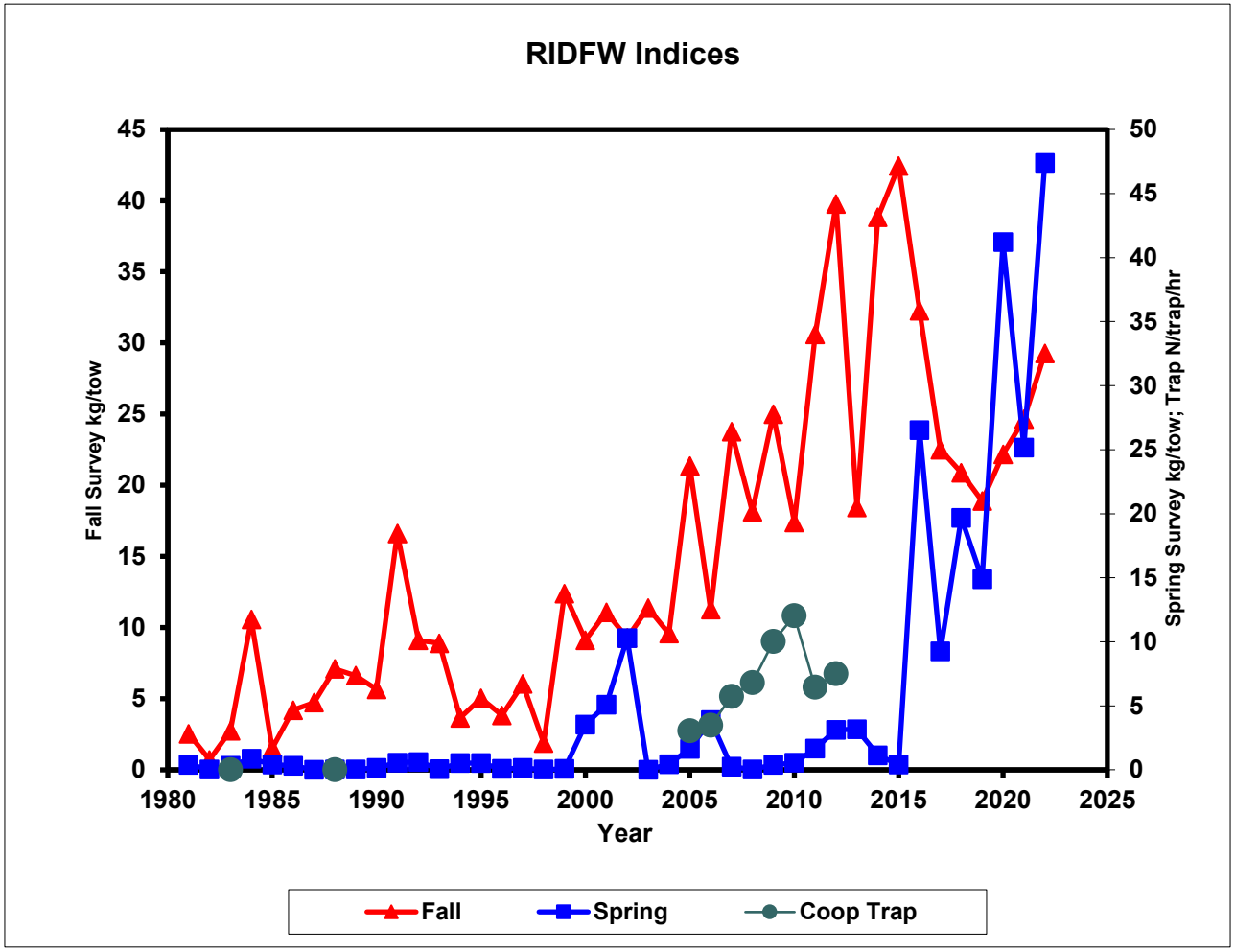
2. Evaluate indices used in the assessment (e.g., indices of relative or absolute abundance, recruitment, state surveys, age-length data, etc.)

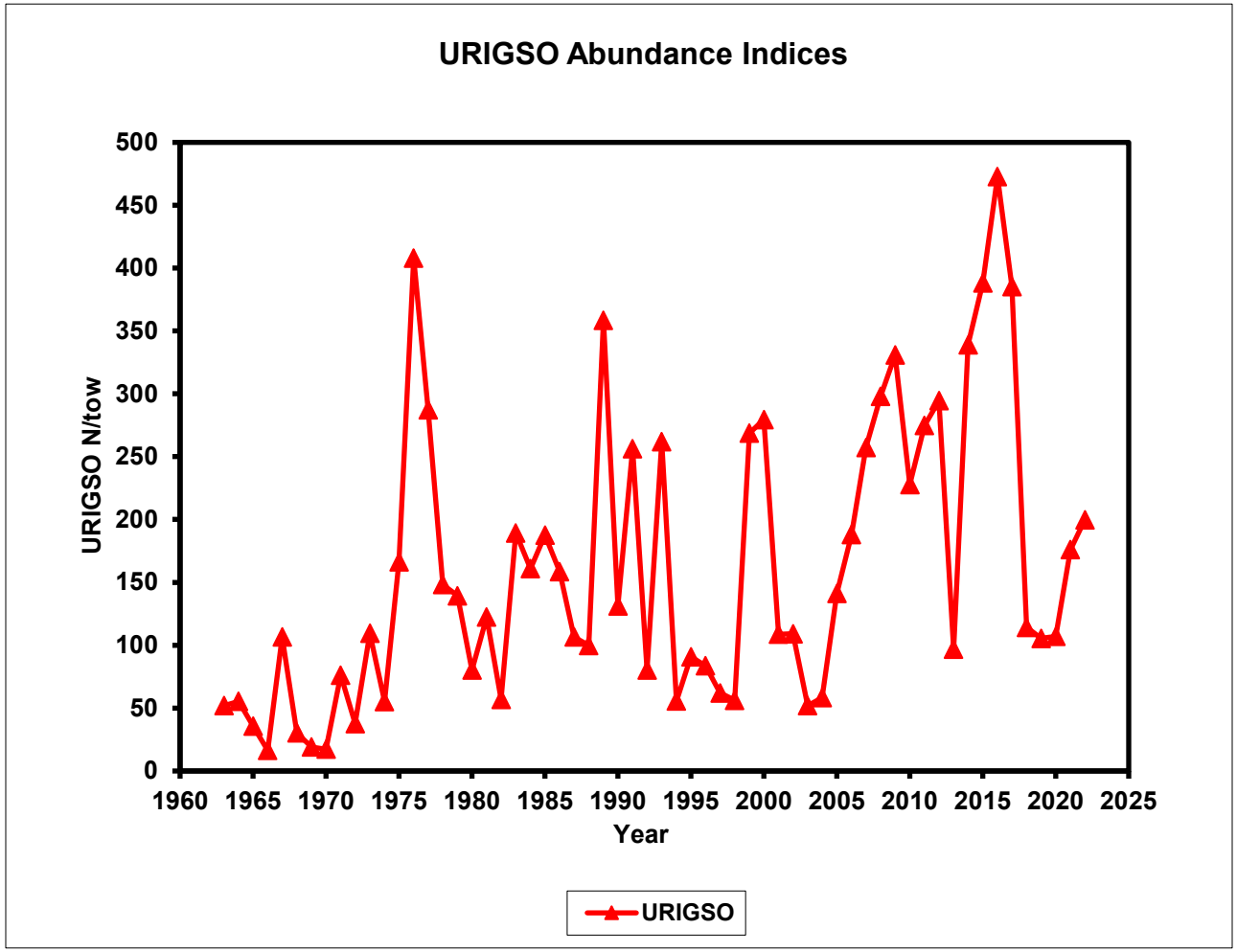
Research Surveys

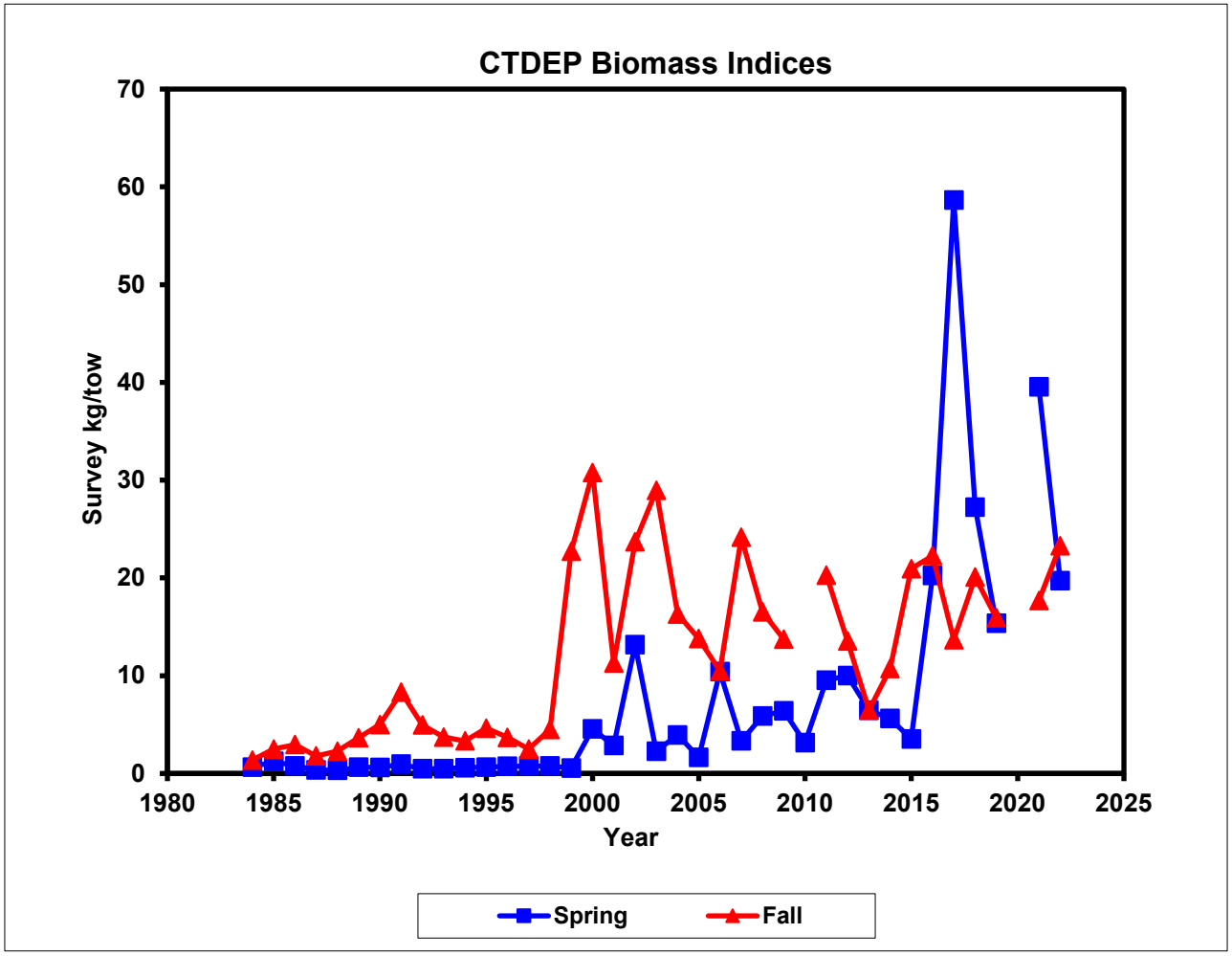
- NEFSC Winter 1992-2007, Fall and Spring 1967-2022 (ALB IV)
- MADMF Spring and Fall 1978-2022
- RIDFW Spring and Fall 1981-2022
- URIGSO Narragansett Bay, RI Sound 1959-2022
- RI Industry Cooperative Trap 2005-2012
- CTDEEP Spring and Fall 1984-2022
- NYDEC Peconic Bay 1987-2022
- NJDFW Coastal Apr-Oct 1988-2022
- VIMS Juv. Trawl YOY 1955-2022
- VIMS ChesMMAP 2002-2022
- VIMS NEAMAP Fall and Spring 2007-2022

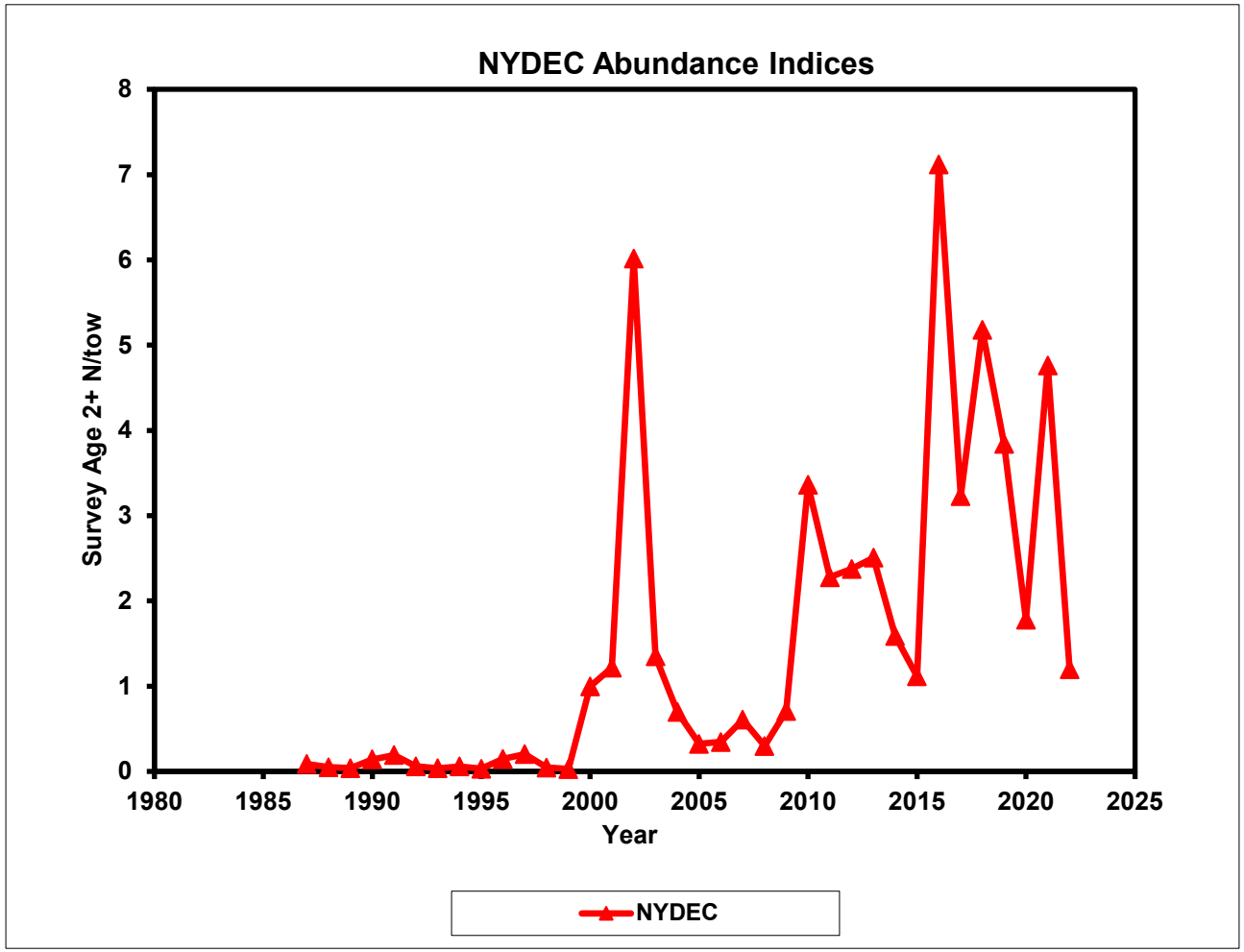

NEFSC Spring
Index (kg)
0
20
40
60
80
120
1980
1990
2000
2010
2020
2030
NEFSC Fall
0
5
10
15
20
25
1980
1990
2000
2010
2020
2030
Year

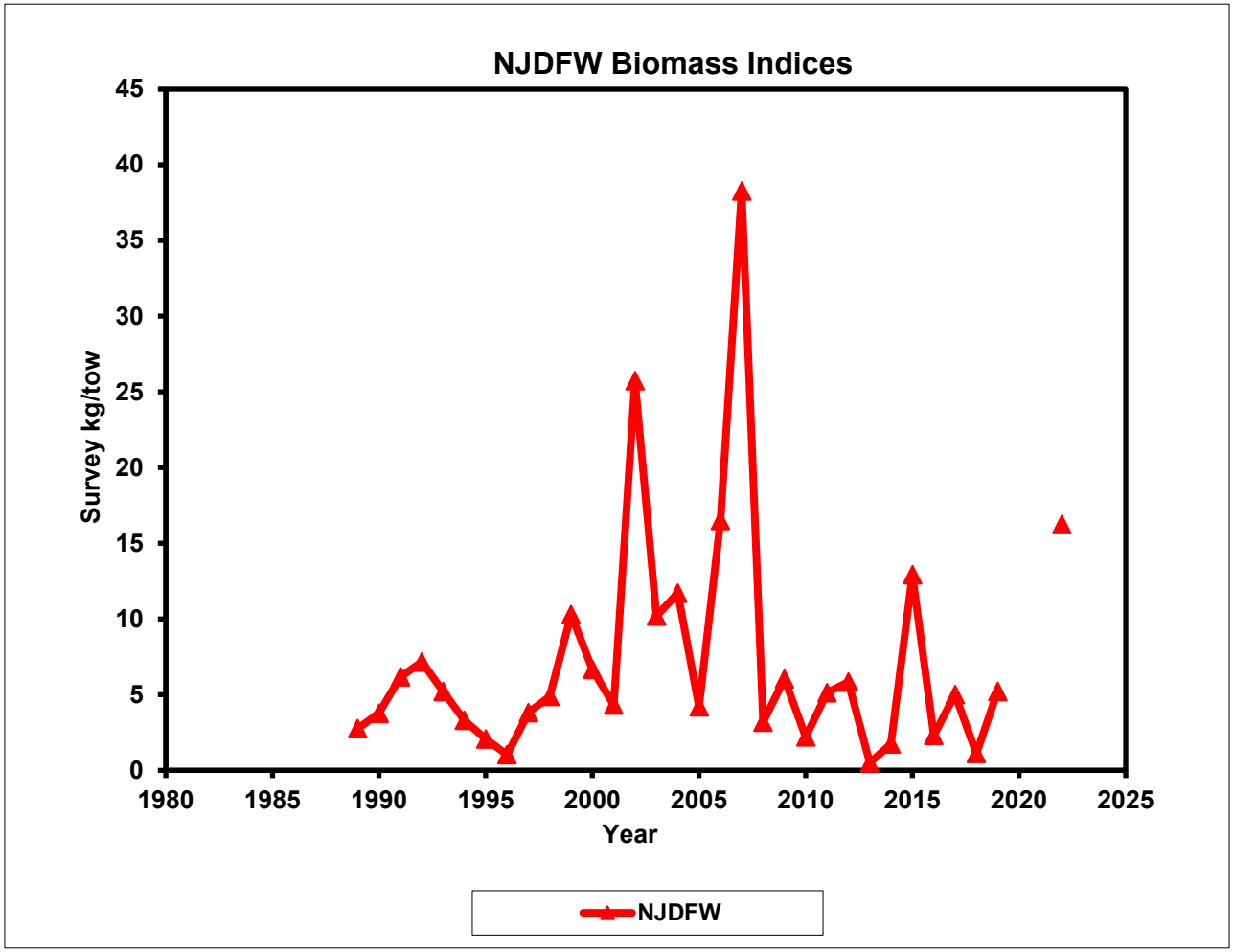

MADMF Biomass Indices
250
200
150
100
50
0
Survey kg/tow
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
Year
Spring
Fall

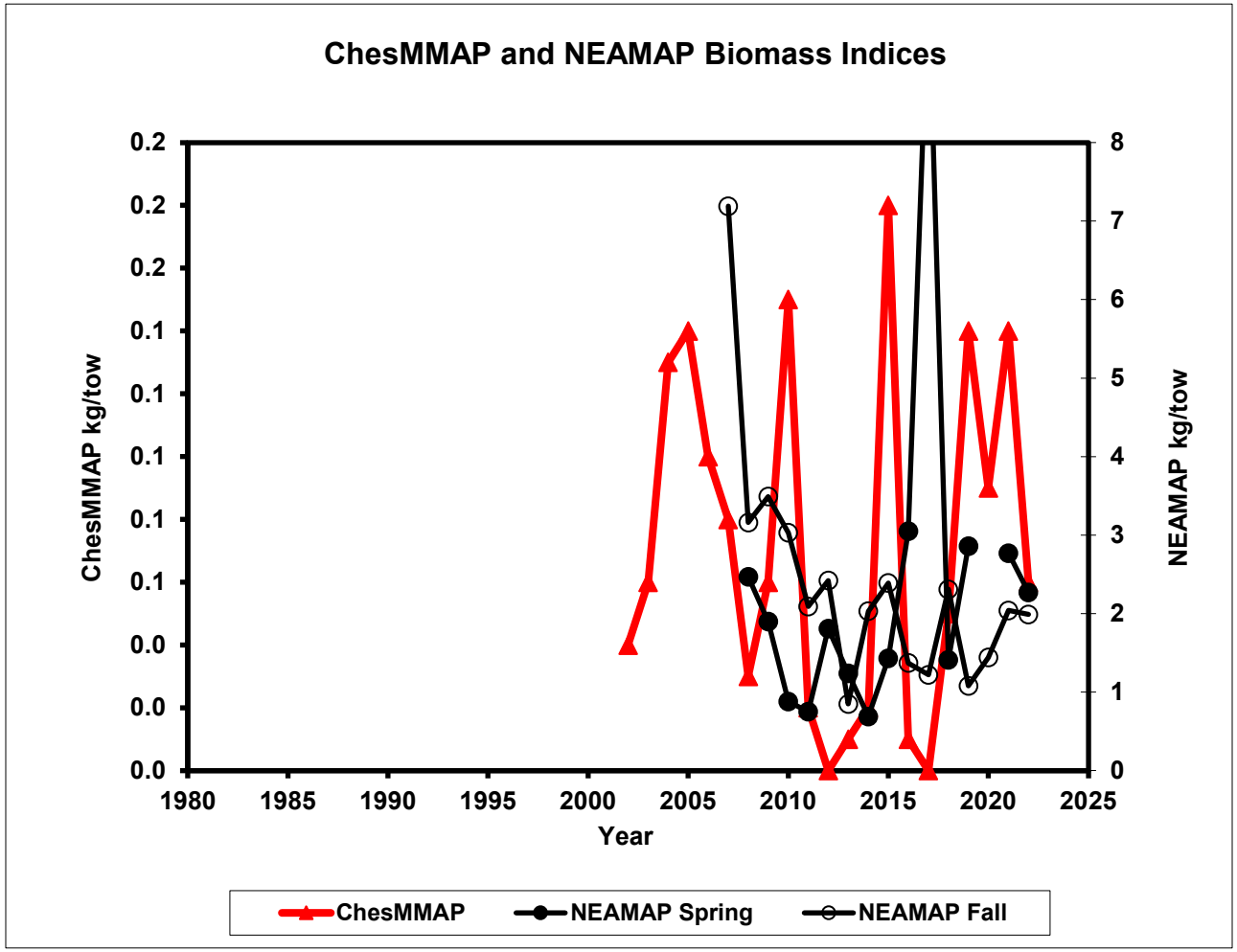

RIDFW Indices
Fall Survey kg/tow
Spring Survey kg/tow; Trap N/trap/hr
Year
0
5
10
15
20
25
30
35
40
45
50
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
Fall
Spring
Coop Trap


URIGSO Abundance Indices
URIGSO N/tow
500
450
400
350
300
250
200
150
100
50
0
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
Year
URIGSO


CTDEP Biomass Indices
Survey kg/tow
70
60
50
40
30
20
10
0
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
Year
Spring
Fall


NYDEC Abundance Indices
Survey Age 2+ N/tow
0
1
2
3
4
5
6
7
8
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
Year
NYDEC


NJDFW Biomass Indices
Survey kg/tow
Year
0
5
10
15
20
25
30
35
40
45
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
NJDFW


ChesMMAP and NEAMAP Biomass Indices
ChesMMAP kg/tow
NEAMAP kg/tow
Year
0.2
0.2
0.2
0.1
0.1
0.1
0.1
0.1
0.0
0.0
0.0
8
7
6
5
4
3
2
1
0
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
ChesMMAP
NEAMAP Spring
NEAMAP Fall

Scup (*Stenotomus chrysops*) Life History

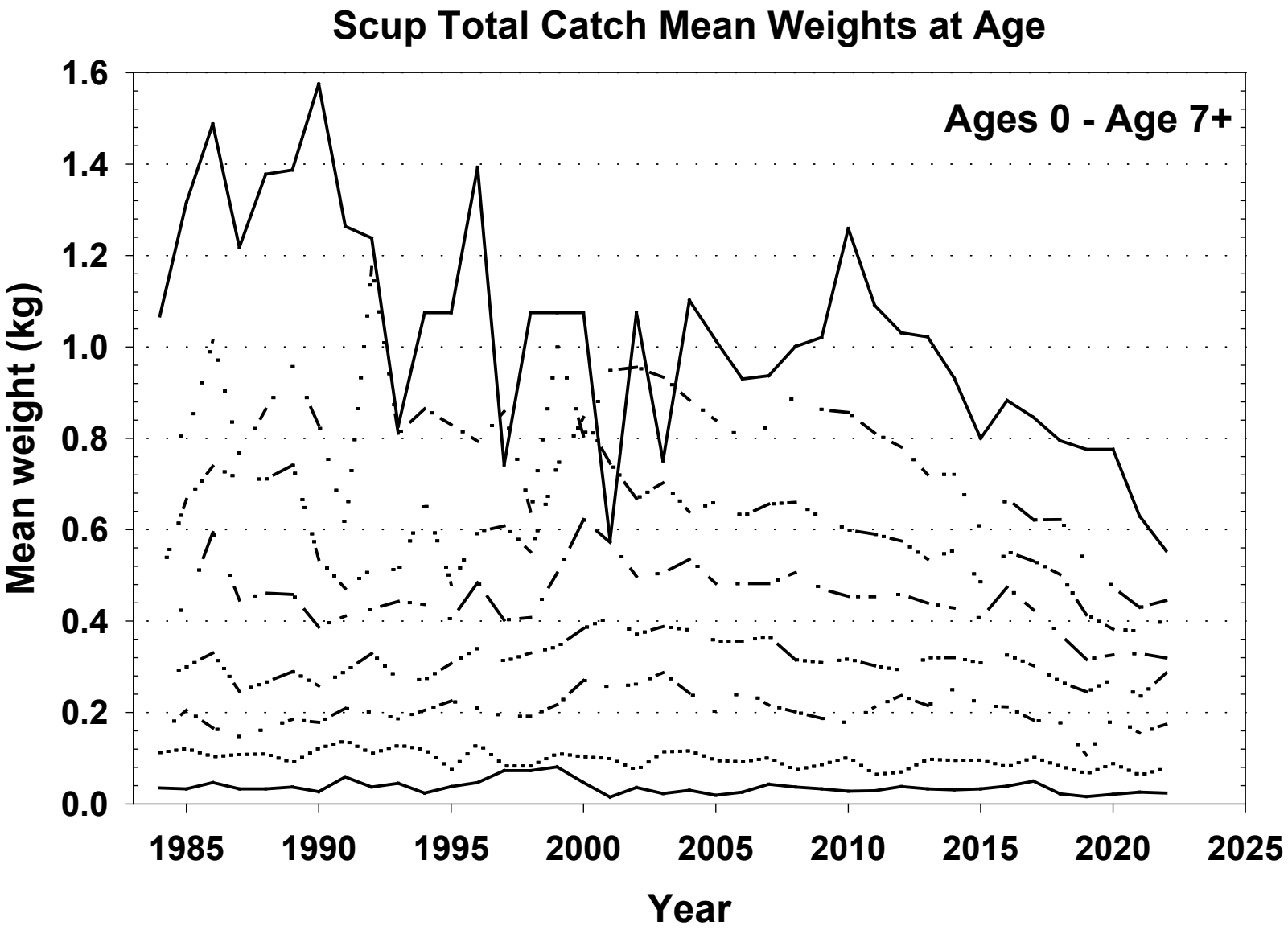
- **Biological data from NEFSC survey and fishery samples**

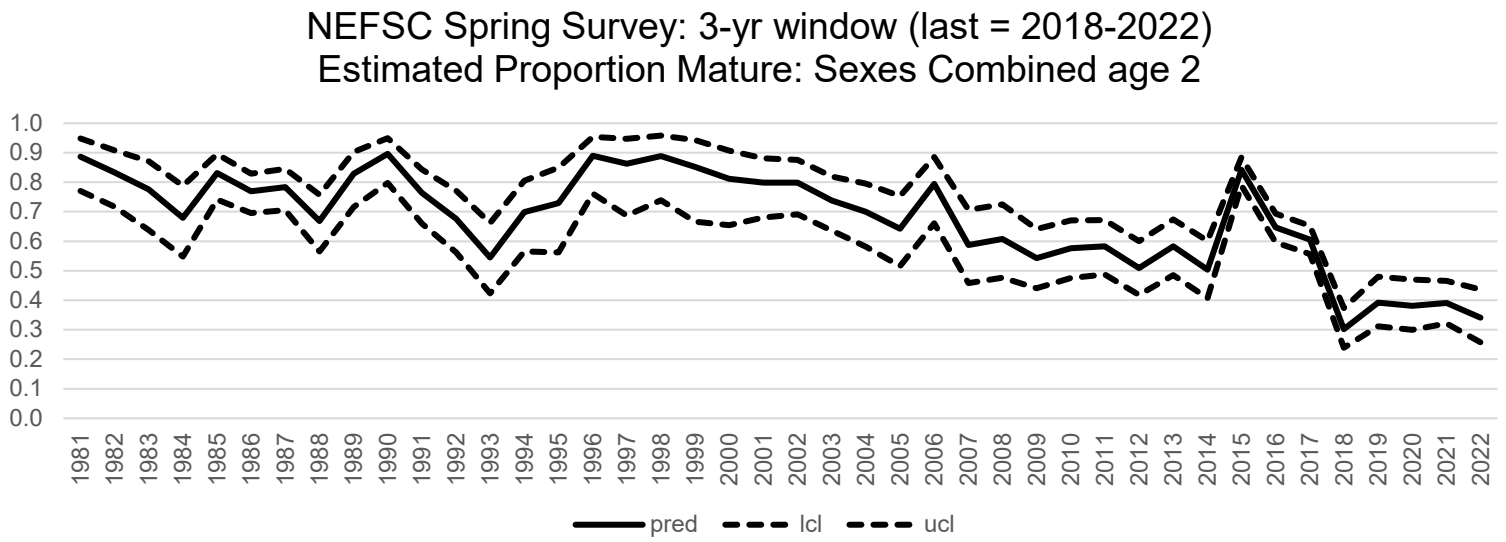
- **Maximum size & age fish in NEFSC SVs and fishery samples (scales):**

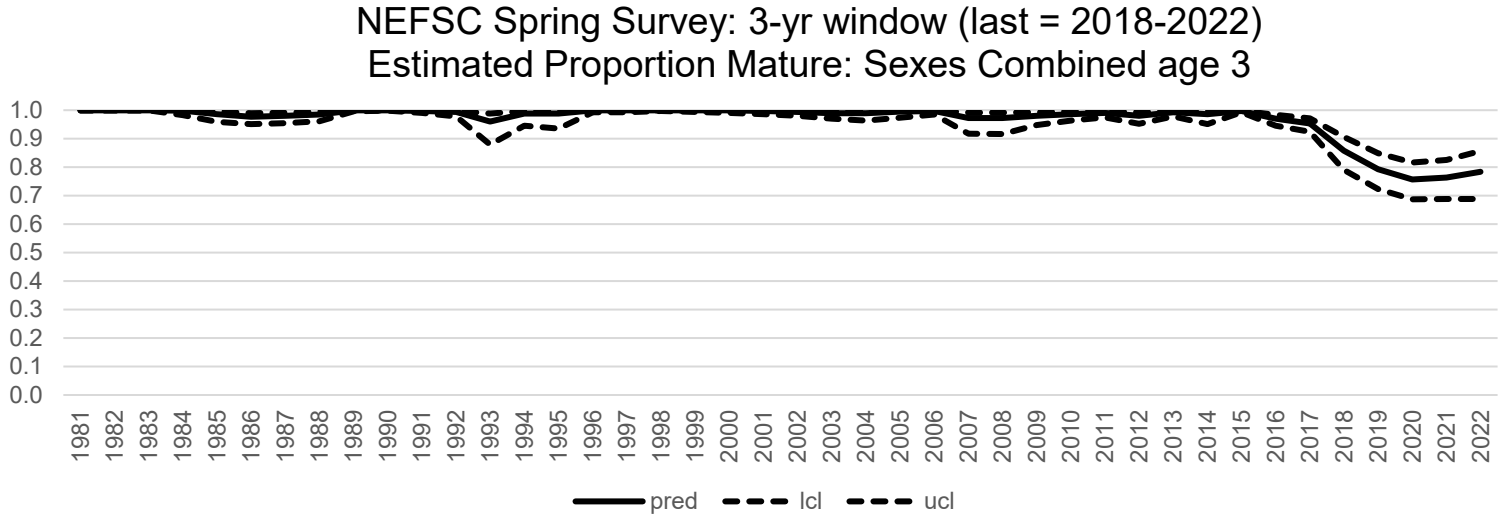
SV: 1973 - 41 cm FL at age 14; 1976, 1978 - 38 cm at age14;
2001 - 41 cm FL at age 9;
2014 - 45 cm at age 12;
2016 - 41 cm FL at age 14, 38 cm FL at age 16
2018 - 39 cm FL at age 16
2022 - 32 cm FL at age 17

Comm : 1970s - 45-46 cm FL at ages 8-10
2014 - 40 cm at age 14
2016 - 36, 38 cm at age 17
2017 - 36, 38 cm at age 17, 35 cm at age 18
2019 - 38 cm FL at age 17

- **Decreasing trend in mean weights at age since about 2000**
- **~80% ---> ~30-40% mature at age 2, 100% ---> 80% at age 3; M = 0.20**
- **Mechanisms unknown**


Scup Total Catch Mean Weights at Age
Ages 0 - Age 7+
Mean weight (kg)
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1985
1990
1995
2000
2005
2010
2015
2020
2025
Year


NEFSC Spring Survey: 3-yr window (last = 2018-2022)
Estimated Proportion Mature: Sexes Combined age 2
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
pred
lcl
ucl


NEFSC Spring Survey: 3-yr window (last = 2018-2022)
Estimated Proportion Mature: Sexes Combined age 3
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
pred
lcl
ucl

TOR 3: Estimate F, R, and SSB

- **3. Estimate annual fishing mortality, recruitment and stock biomass (both total and spawning stock) as possible (depending on the assessment method) for the time series using the approved assessment method and estimate their uncertainty. Include retrospective analyses if possible (both historical and within-model) to allow a comparison with previous assessment results and projections, and to examine model fit.**

  a. Include bridge runs to sequentially document each change from the previously accepted model to the updated model proposed for this peer review.

  b. Prepare a backup assessment approach that would serve as an alternative for providing scientific advice to management if the analytical assessment were to not pass review

2023 Management Track Assessment
ASAP Model thru 2022

- **NEFSC NFT ASAP Statistical Catch at Age Model**

- **M at ages 0-7+ (model ages 1-8+); constant M = 0.20**
- **Weights at age for Catch and SSB; recent decreases**
- **Maturity at age: 3 year moving window ~60-80% age 2, 100% age 3+**
- **Recent decreases to ~30-40% age 2, ~80% age 3**

- **Four fleets - Landings and Discards (Com L, Com D, Rec L, Rec D)**

- **Several surveys with age comps and one stand-alone YOY index**
- **Several aggregate indices of biomass**
- **SV selex modeled with at-age estimation; constant over full time series**

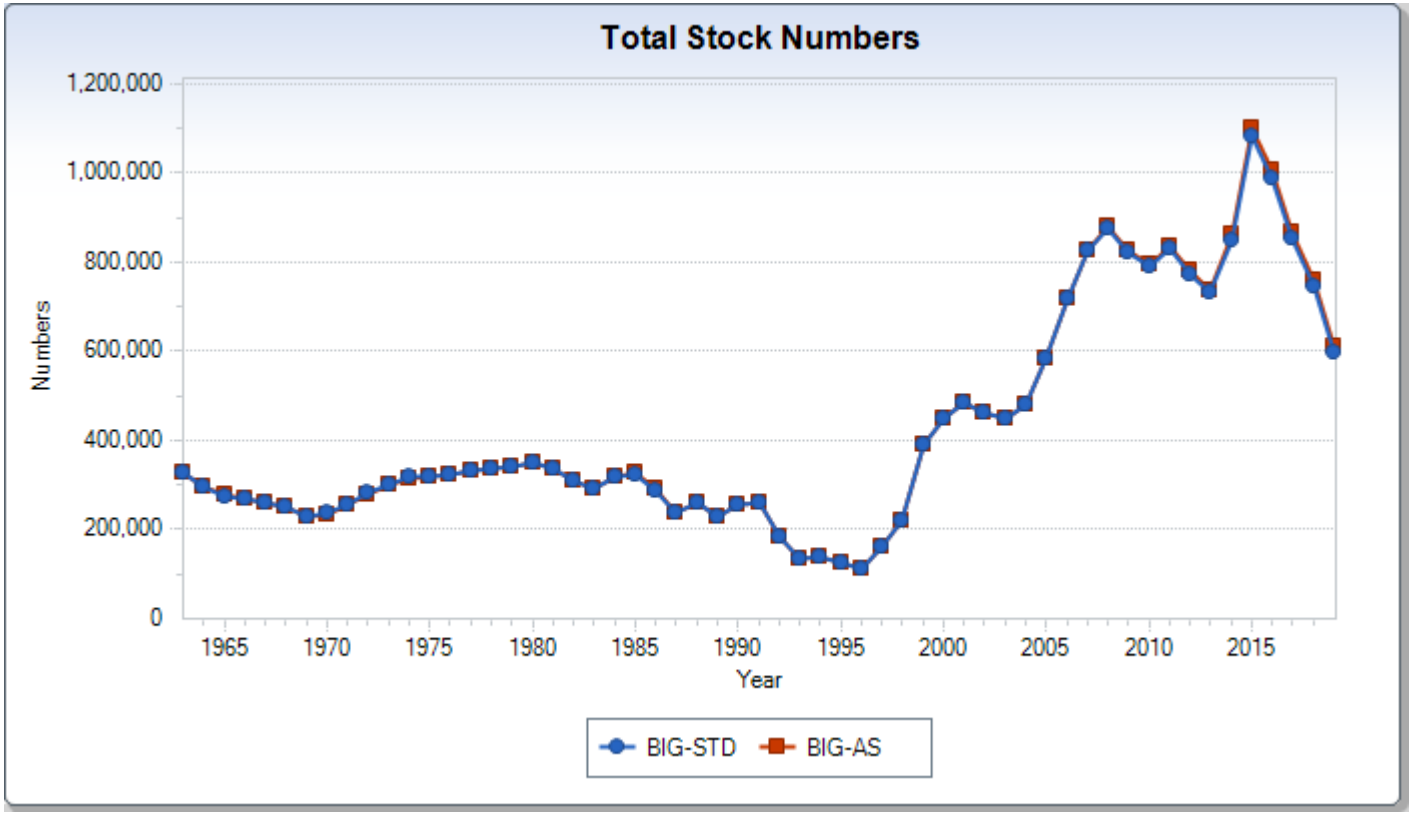
- **Fishery selex modeled with at-age estimation: 4 time blocks 1963, 1997, 2006, 2013; Land selex with S = 1 at true age 3 or 4; discards at true age 1 or 2;**

2023 Management Track Assessment
ASAP Model Development

- **Revision to NEFSC survey Bigelow indices (minor)**
- **Bridge runs using MTA 2021 model through 2019 – move on…**
- **..to MTA 2023 model through 2022**
- **Inflate input CVs of a few survey indices (MA fall, CT spring, NJ; to improve RMSE diagnostic (minor)**
- **Re-center input catch and survey ESSs (minor)**
- **Latter two revisions result in minor improvement to model diagnostics (i.e., clean-up)**
- **Bridge/Sensitivity runs for CVs (NEWSET) and ESS (NEWSET_ESS)**

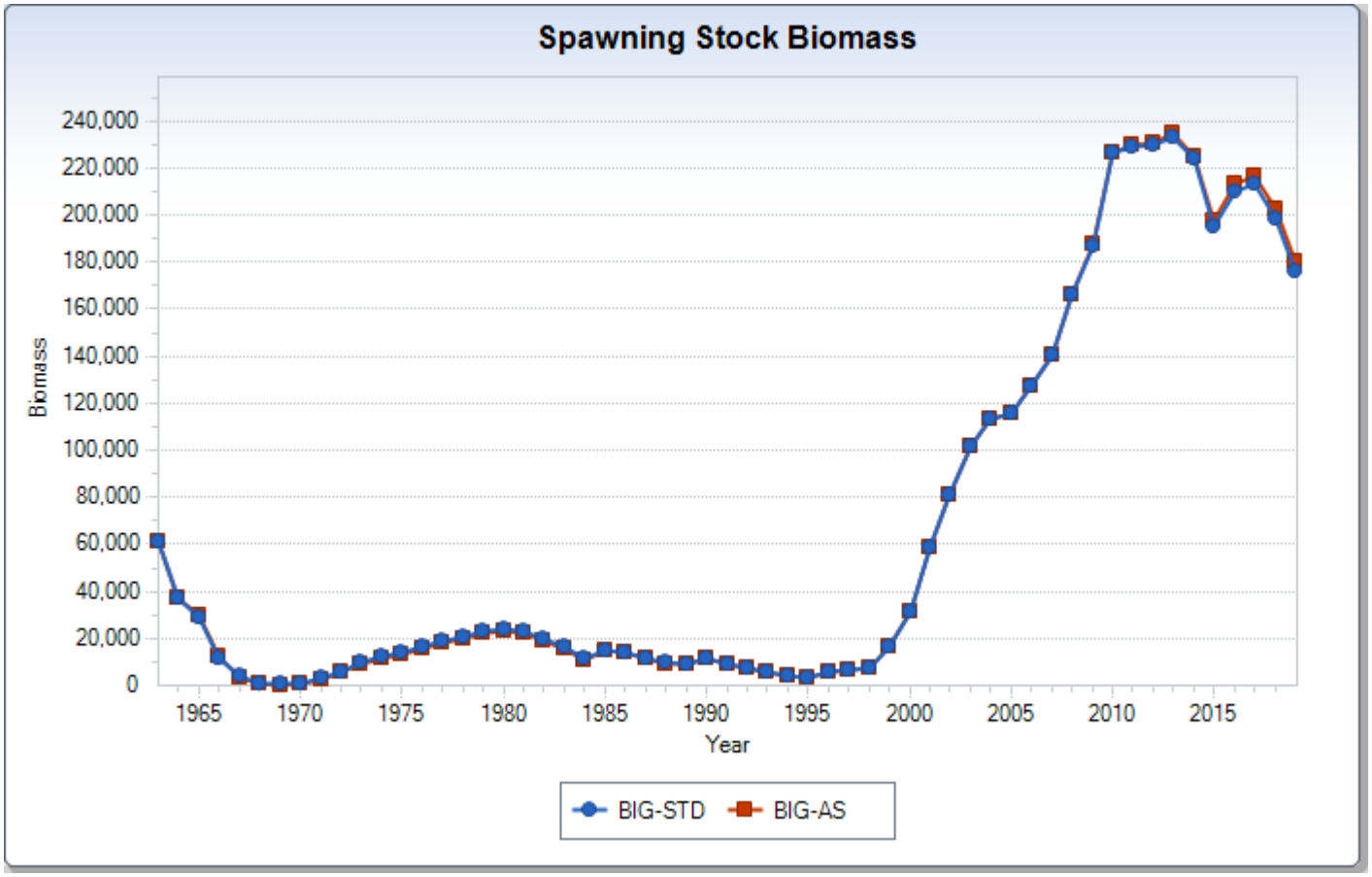
2023 Management Track Assessment

- **Revision to NEFSC survey Bigelow indices (minor)**
- **Effect on MTA 2021 model through 2019**



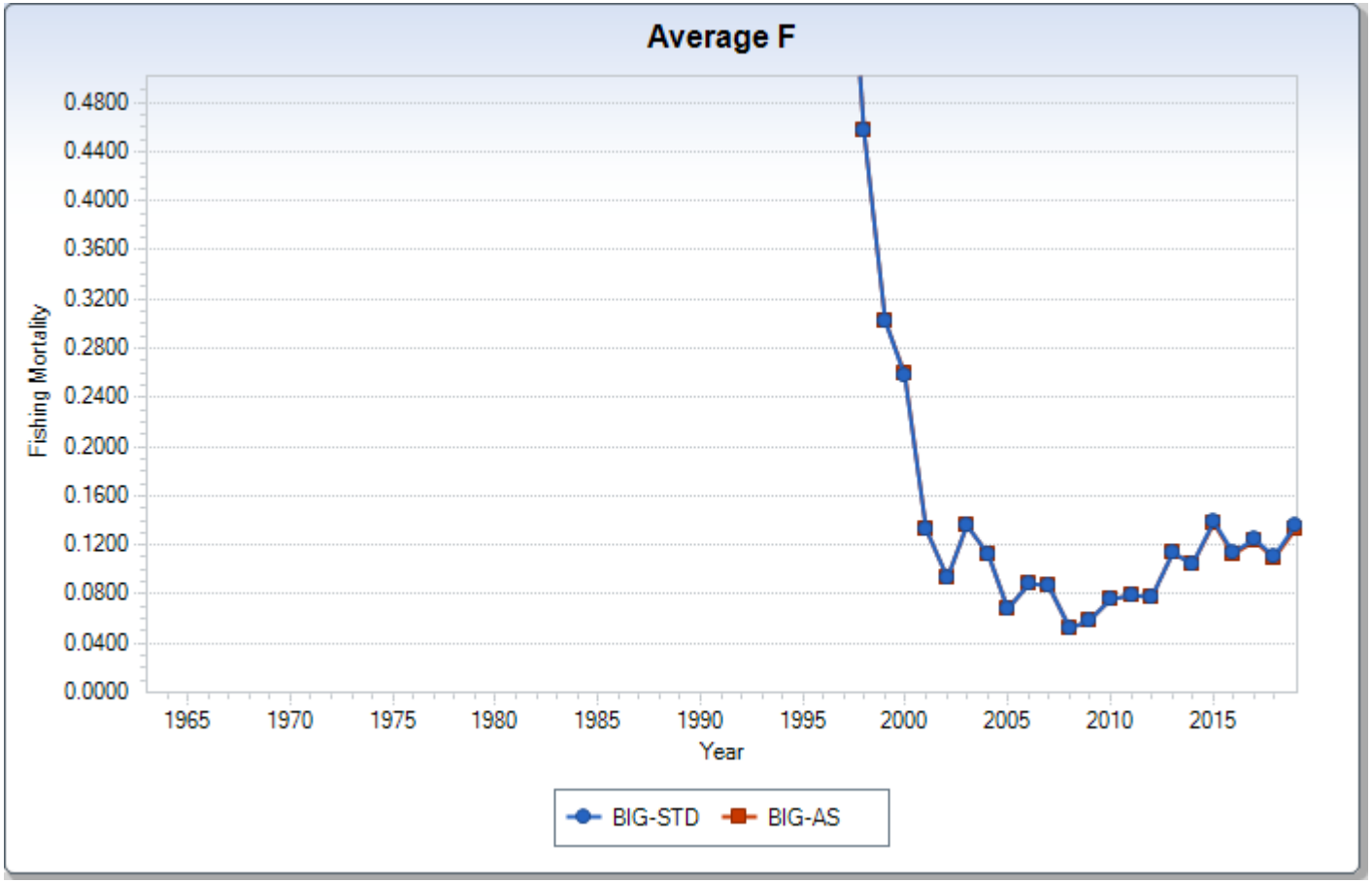
2023 Management Track Assessment

- **Revision to NEFSC survey Bigelow indices (minor)**
- **Effect on MTA 2021 model through 2019**



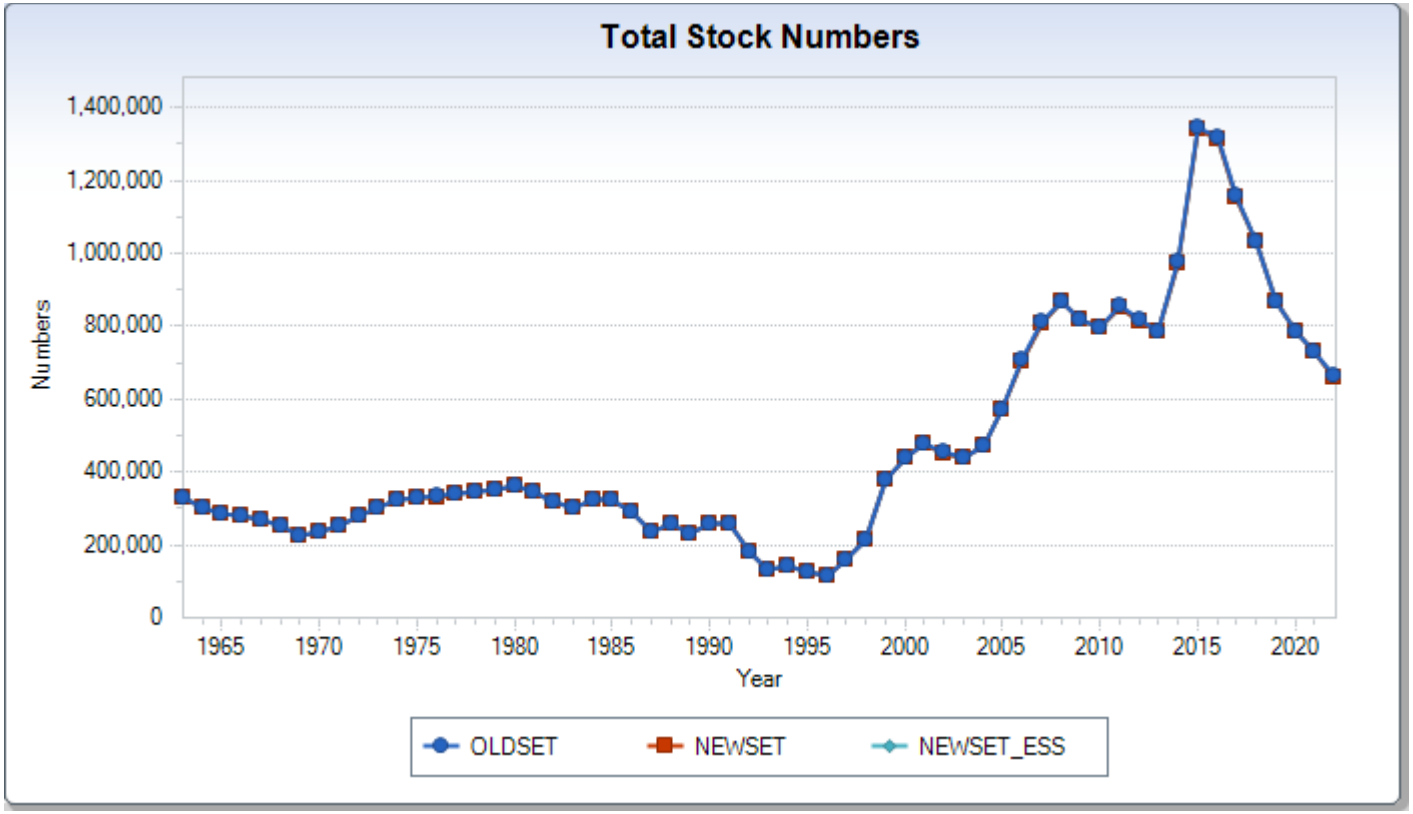
2023 Management Track Assessment

- **Revision to NEFSC survey Bigelow indices (minor)**
- **Effect on MTA 2021 model through 2019**



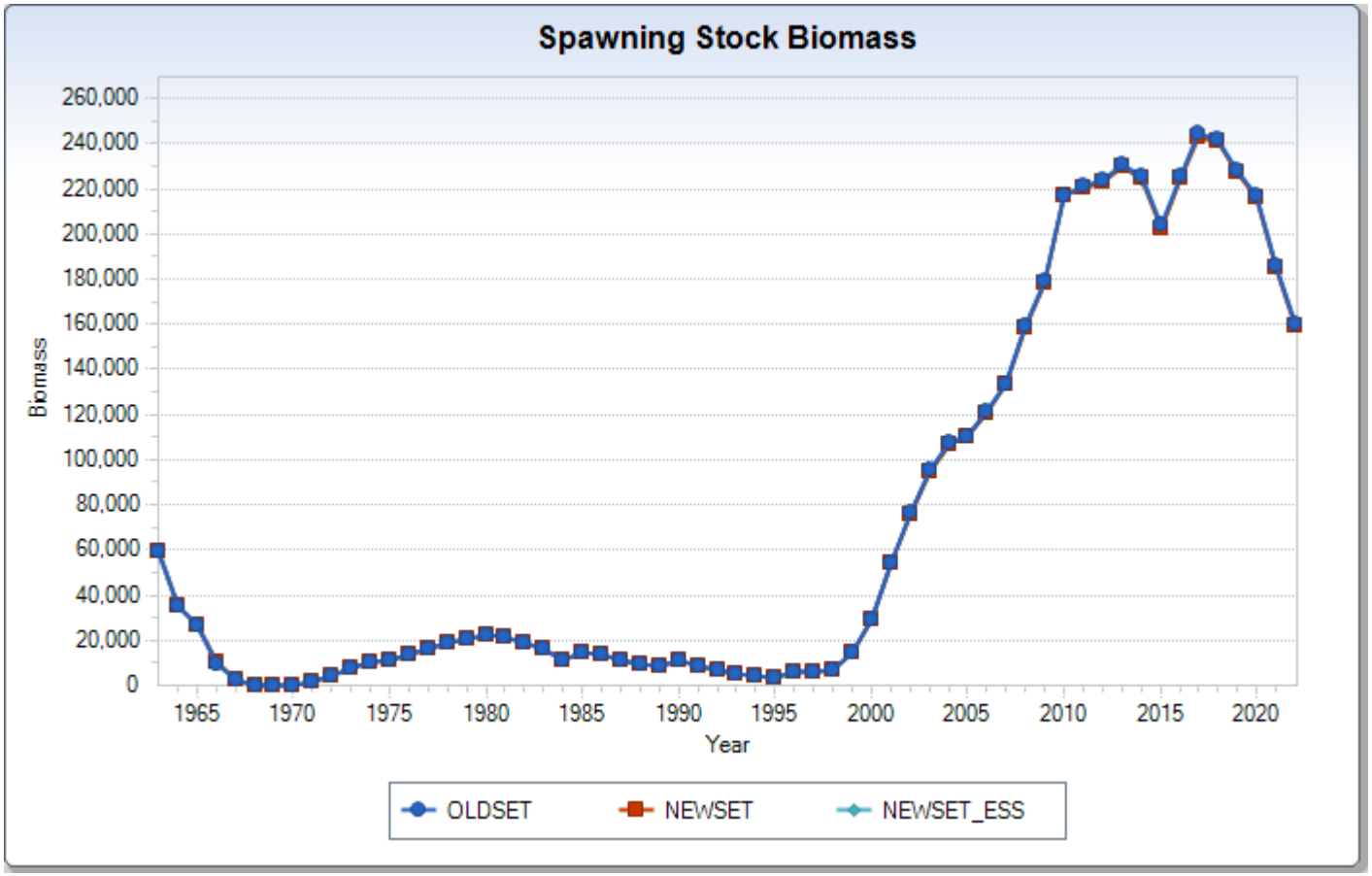
2023 Management Track Assessment

- **Inflate input CVs of a few survey indices (MA fall, CT spring, NJ; minor)**
- **Re-center input catch and survey ESSs (minor)**
- **Effect on MTA 2023 model through 2022**



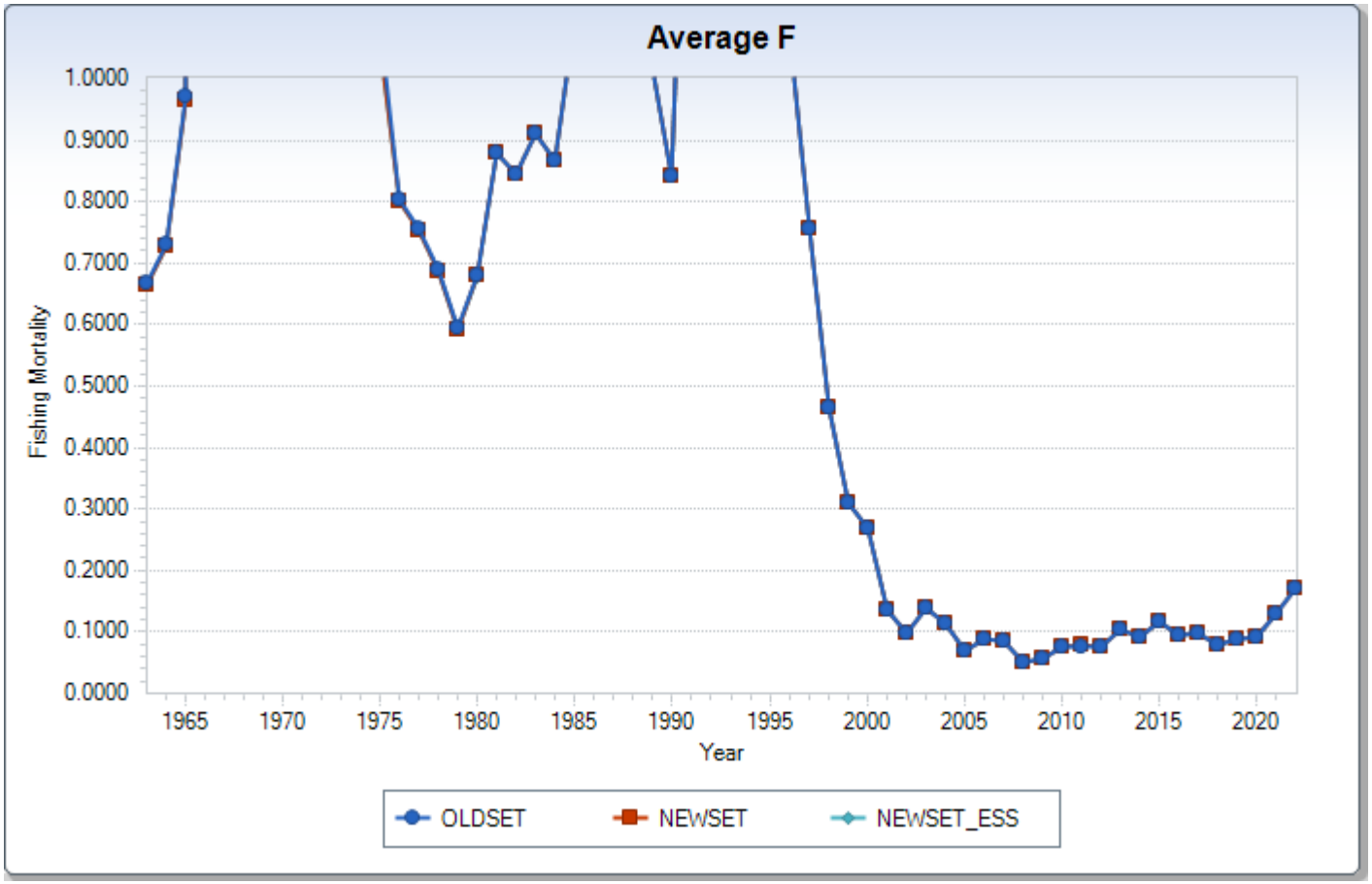
2023 Management Track Assessment

- **Inflate input CVs of a few survey indices (MA fall, CT spring, NJ; minor)**
- **Re-center input catch and survey ESSs (minor)**
- **Effect on MTA 2023 model through 2022**



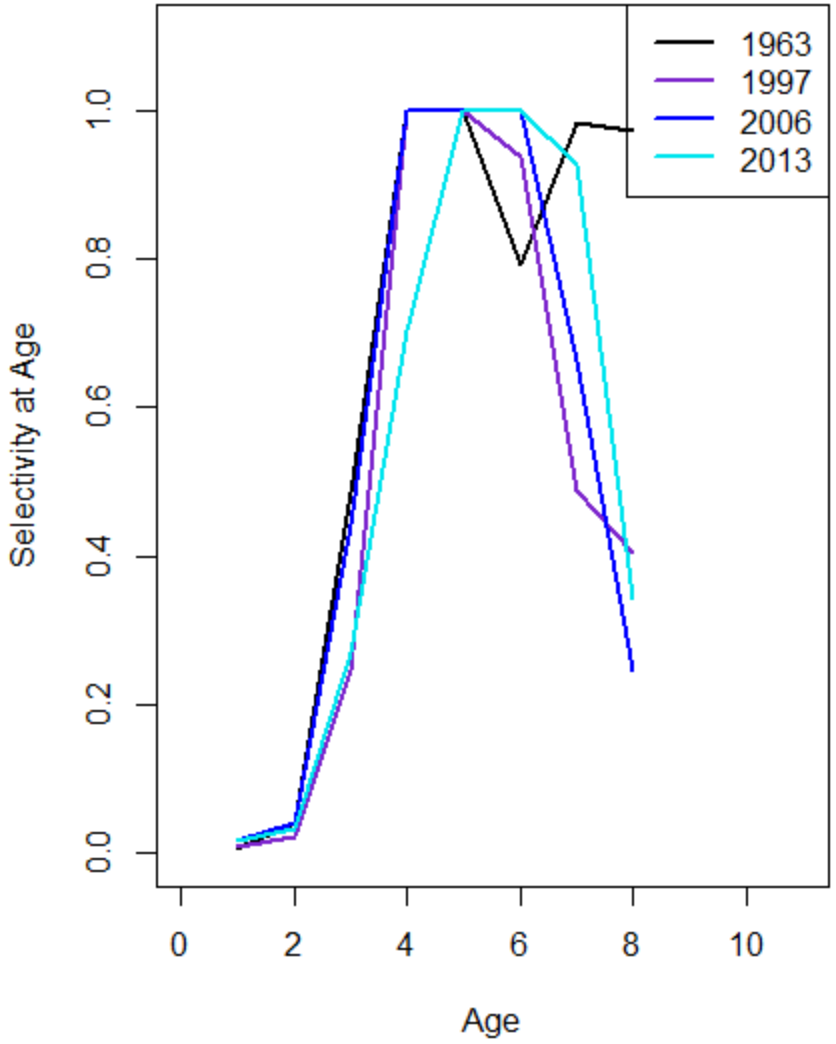
2023 Management Track Assessment

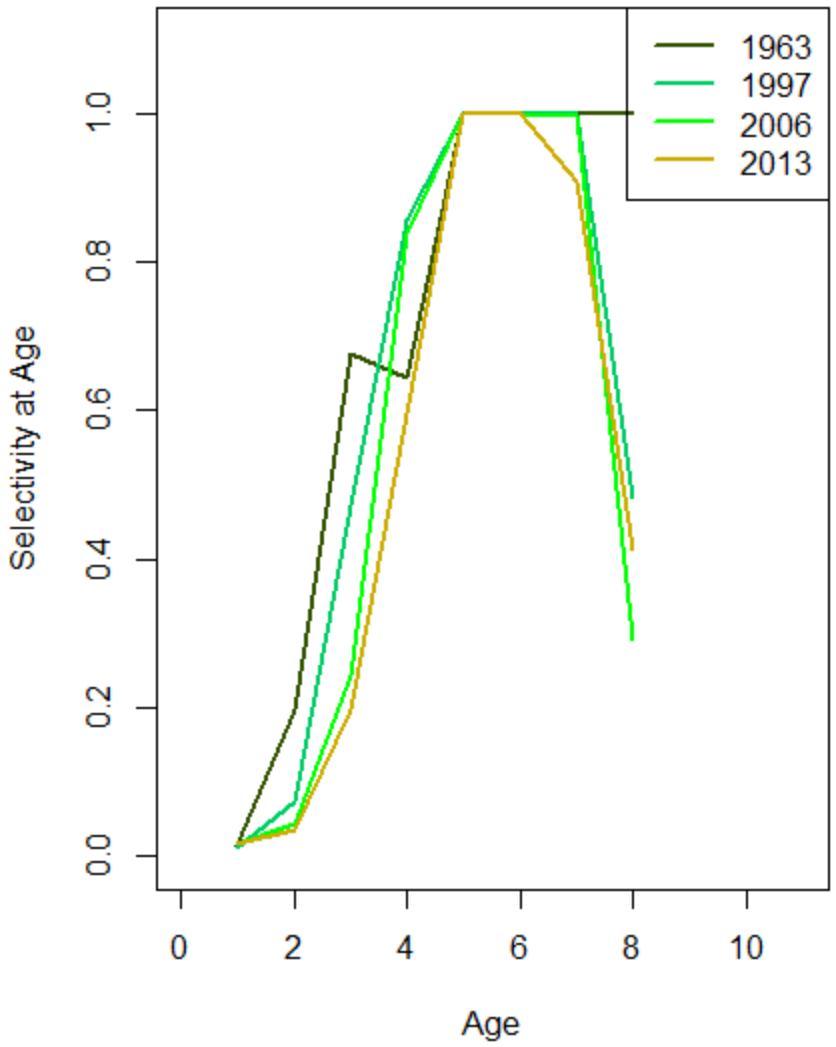
- **Inflate input CVs of a few survey indices (MA fall, CT spring, NJ; minor)**
- **Re-center input catch and survey ESSs (minor)**
- **Effect on MTA 2023 model through 2022**

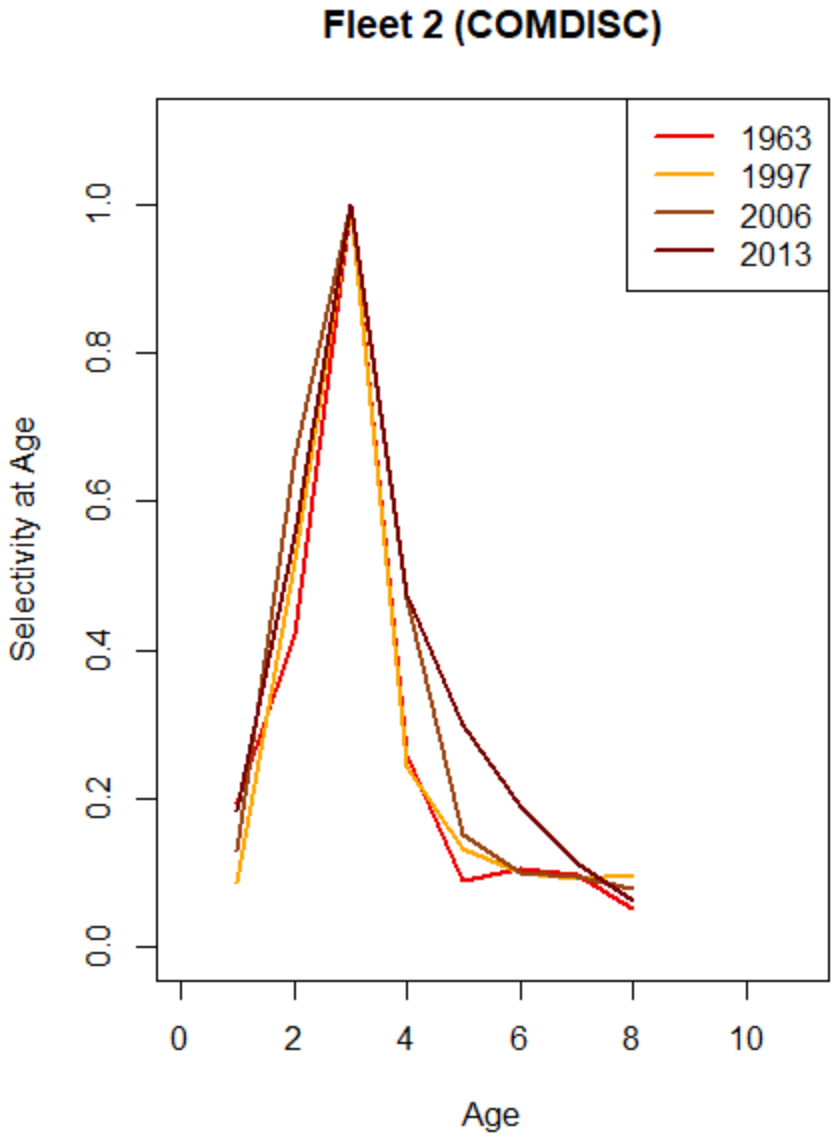


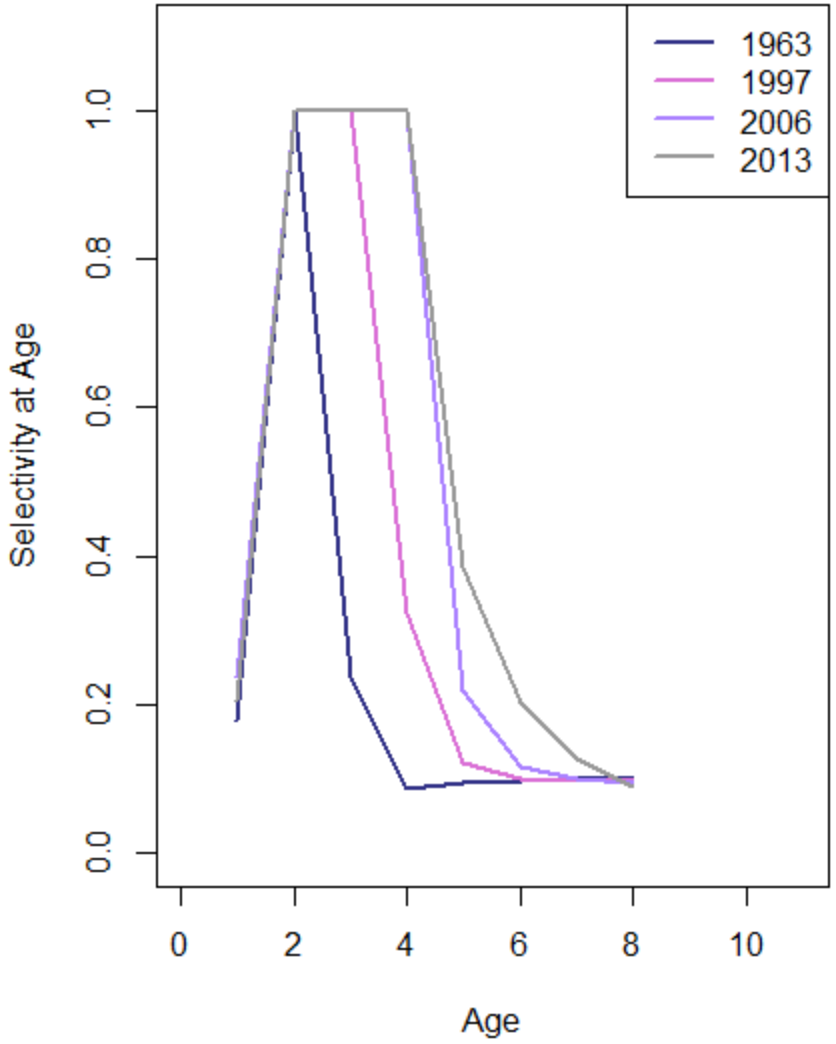
2023 Management Track Assessment
Final ASAP Model

- **Model now has a 'major' retrospective pattern: 'Good' retro; SSB underestimated (-21%), F overestimated (+42%)**
- **Adjusted SSB and F are both outside 90% Terminal Year ~90%CI**
- **Terminal Year (2022) SSB and F adjusted for stock status and stock size for projections**
- **Jitter: 66% at final Objective Function value, 20% ~ 4 points below, 14% ~ 4 points above – however, final maximum gradient value = 0.0011, so fairly robust given that diagnostic**
- **MCMC: no convergence problems or unusual high correlations, relatively precise estimates (terminal year CVs=15-20%)**
- **Internal Estimation of BRPs not sufficient: estimated steepness (h) = 1, used proxies instead (F40% = FMSY)**
- **Final Model: MTA2023_NEWSET_ESS_V1**

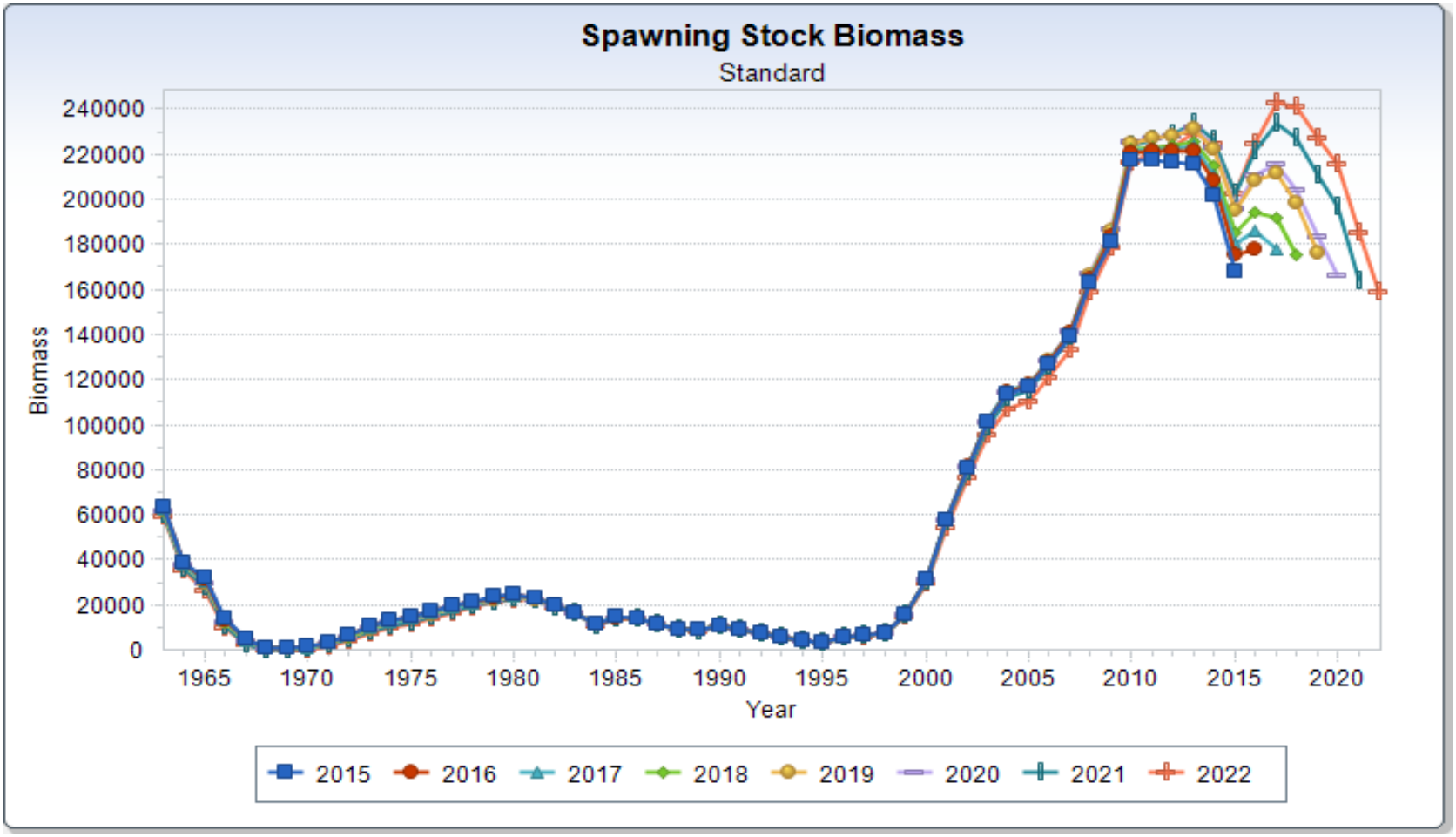

Fleet 1 (COMLAND)
1963
1997
2006
2013
Selectivity at Age
0.0
0.2
0.4
0.6
0.8
1.0
0
2
4
6
8
10
Age


Fleet 3 (RECLAND)
1963
1997
2006
2013
Selectivity at Age
0.0
0.2
0.4
0.6
0.8
1.0
0
2
4
6
8
10
Age

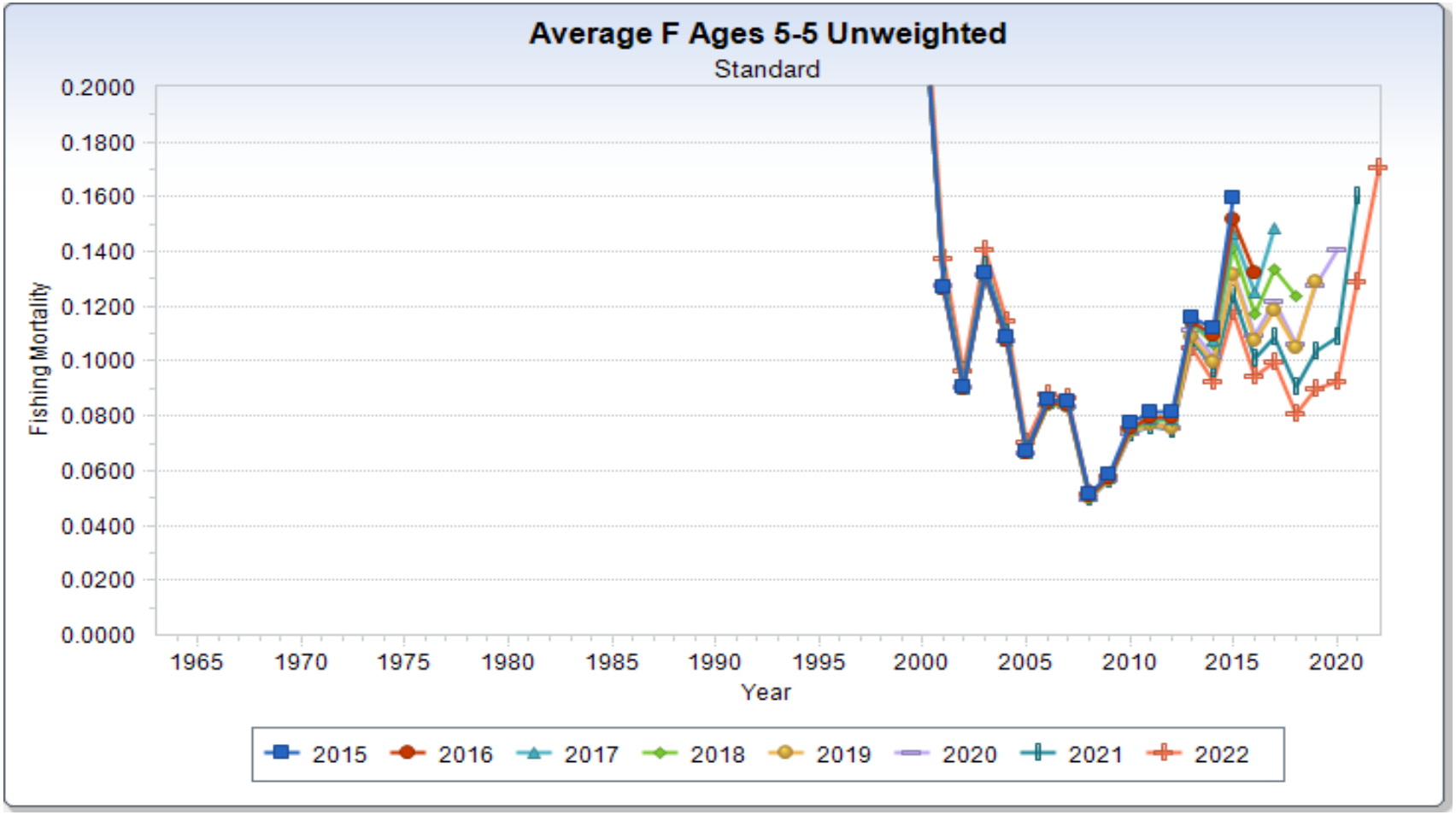

Fleet 2 (COMDISC)
1963
1997
2006
2013
Selectivity at Age
0.0
0.2
0.4
0.6
0.8
1.0
0
2
4
6
8
10
Age


Fleet 4 (RECDISC)
1963
1997
2006
2013
Selectivity at Age
0.0
0.2
0.4
0.6
0.8
1.0
0
2
4
6
8
10
Age

'Internal' Retrospective



7-year 'peel'
Mohn's rho =
-27% to -1%, -21%
(underestimate SSB)



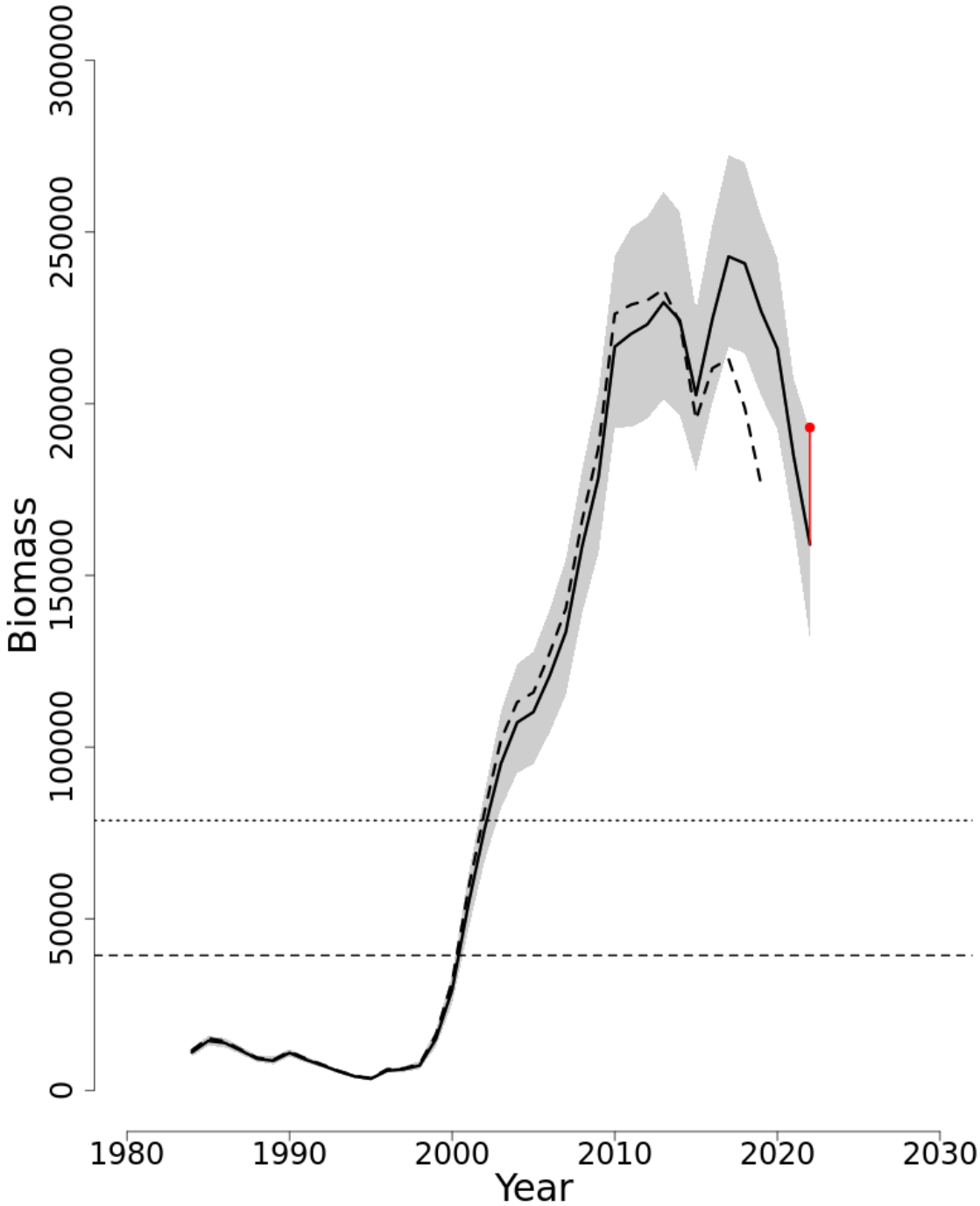
7-year 'peel'
Mohn's rho =
+54% to +6%, +42%
(overestimate F)

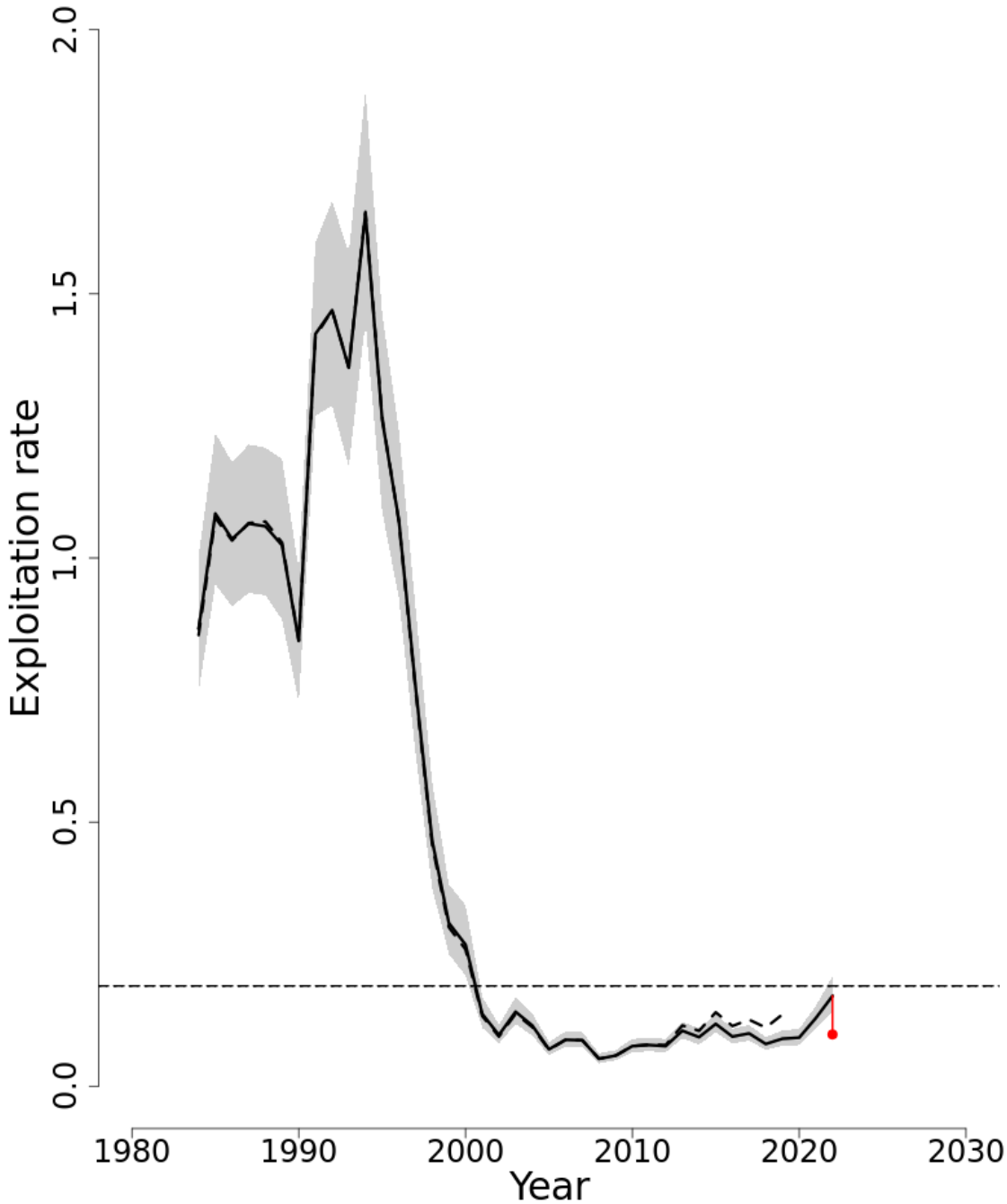
- The model estimate of SSB in 2022 adjusted for internal retrospective error (-21.4%; 193,087) is outside the model estimate 90% confidence interval (131,720 – 192,050)

- The model estimate of F in 2022 adjusted for internal retrospective error (+42.0%; 0.098) is outside the model estimate 90% confidence interval (0.140 – 0.208)

- Therefore, adjustment of these terminal year estimates has been made for stock status determination and projections (SSB adjustment applied to all ages N)

- SSB in 2022 adjusted from 159,050 mt to 193,087 mt
- F in 2022 adjusted from 0.171 to 0.098

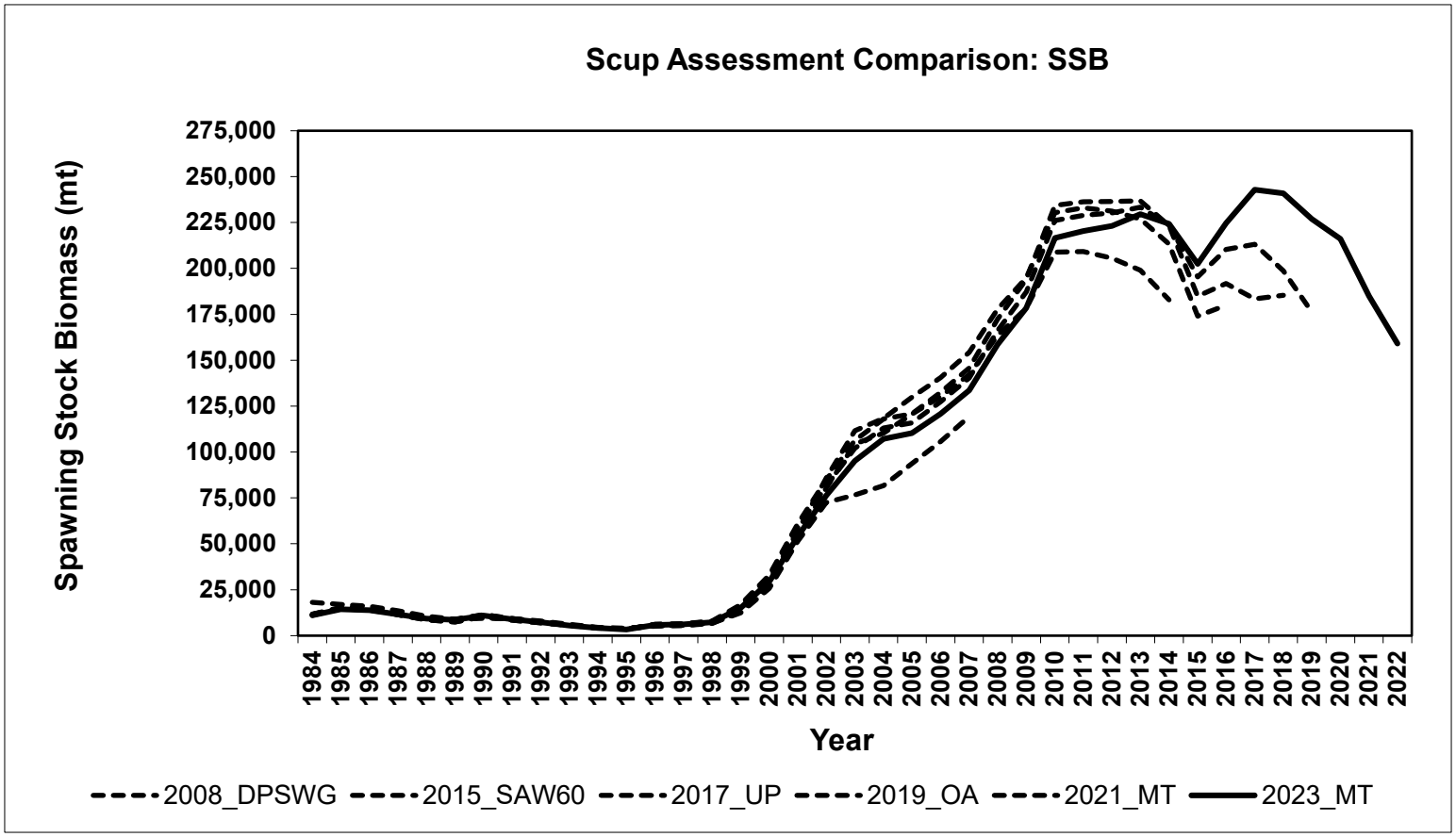

Biomass
0
50000
100000
150000
200000
250000
300000
1980
1990
2000
2010
2020
2030
Year


Exploitation rate
0.0
0.5
1.0
1.5
2.0
1980
1990
2000
2010
2020
2030
Year

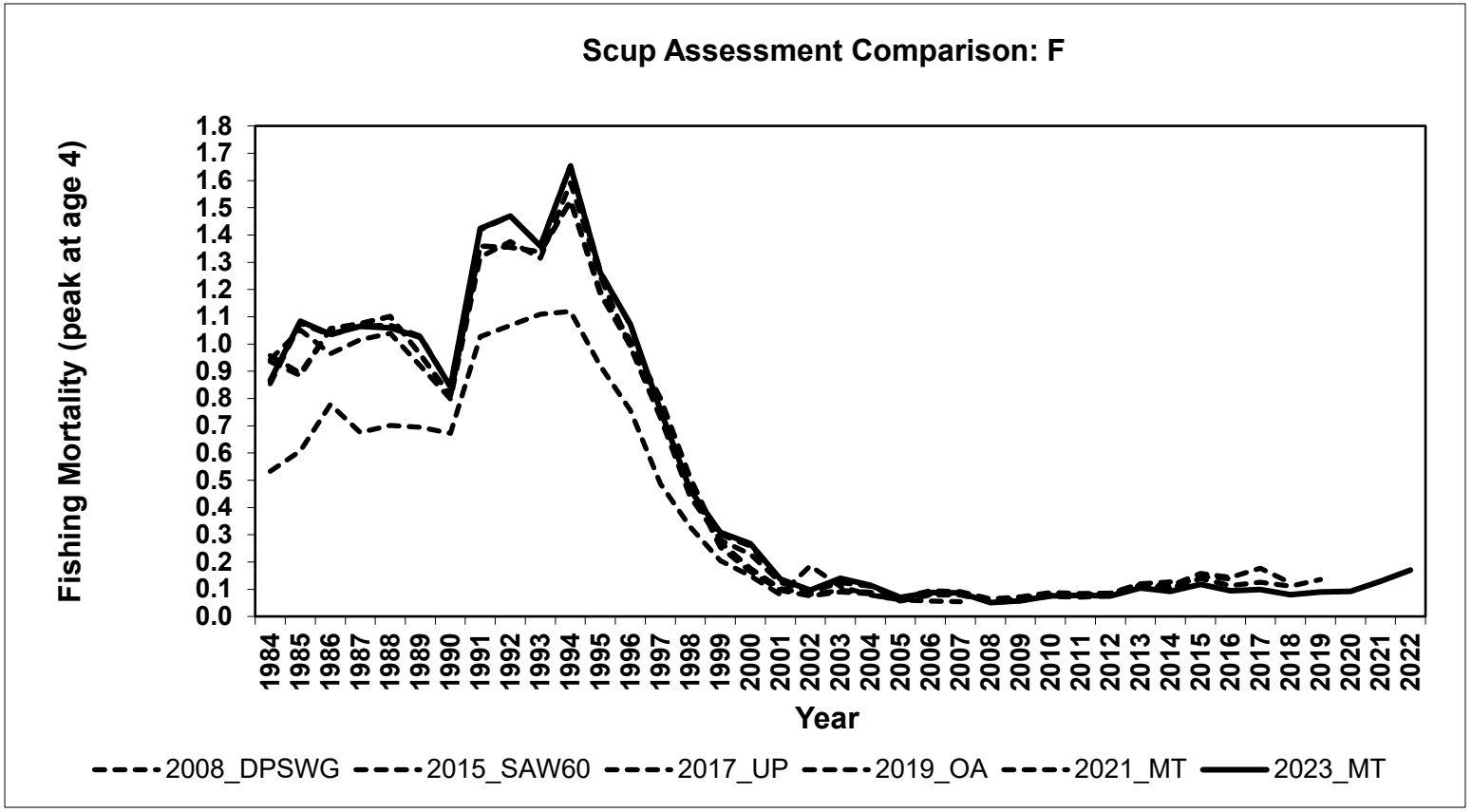
2023 Management Track Assessment
ASAP Model

Comparative results 2015 to 2023 models

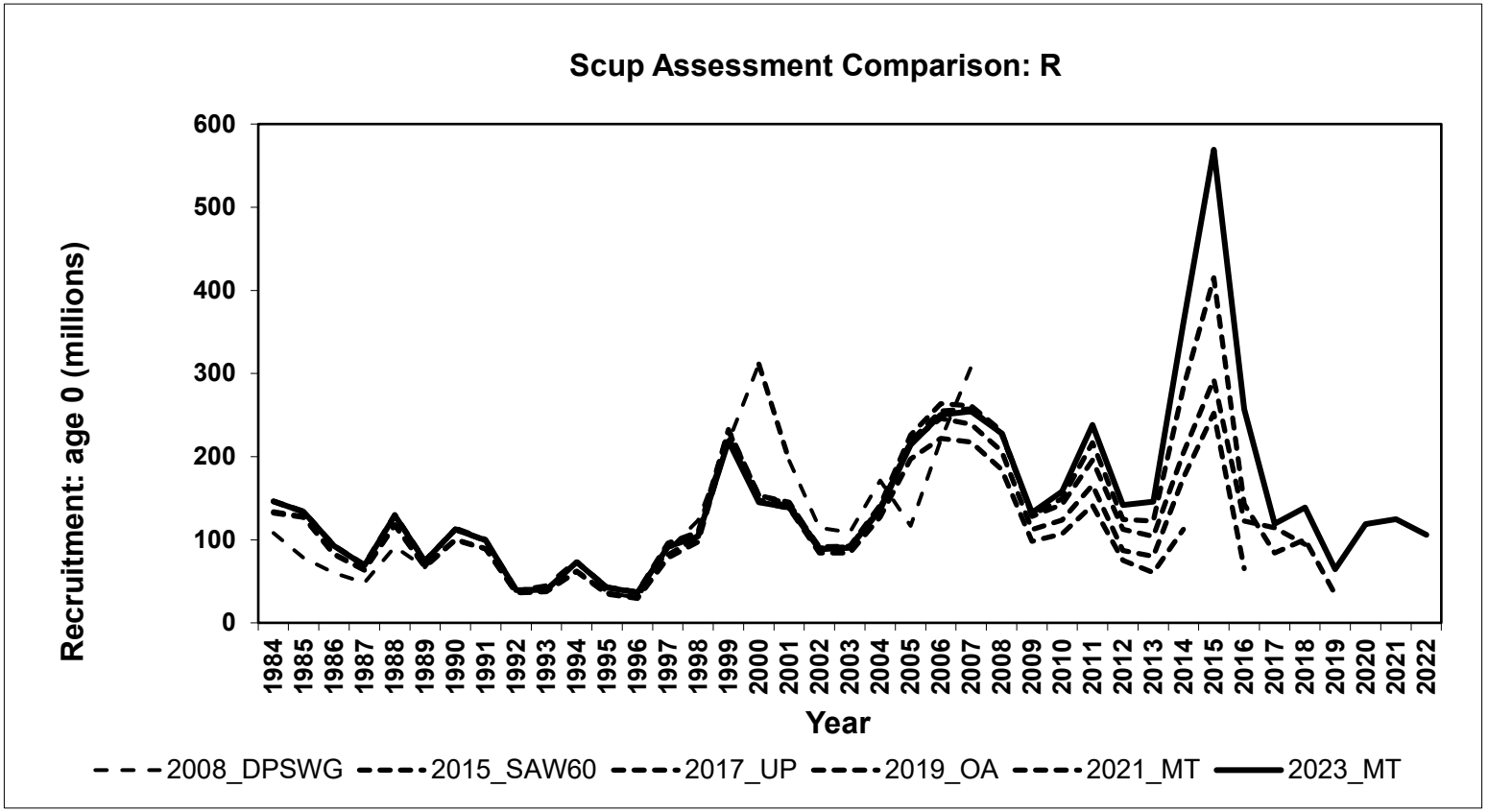
Comparison across assessments
2008, 2015, 2017, 2019, 2021, 2023



Comparison across assessments
2008, 2015, 2017, 2019, 2021, 2023



Comparison across assessments
2008, 2015, 2017, 2019, 2021, 2023

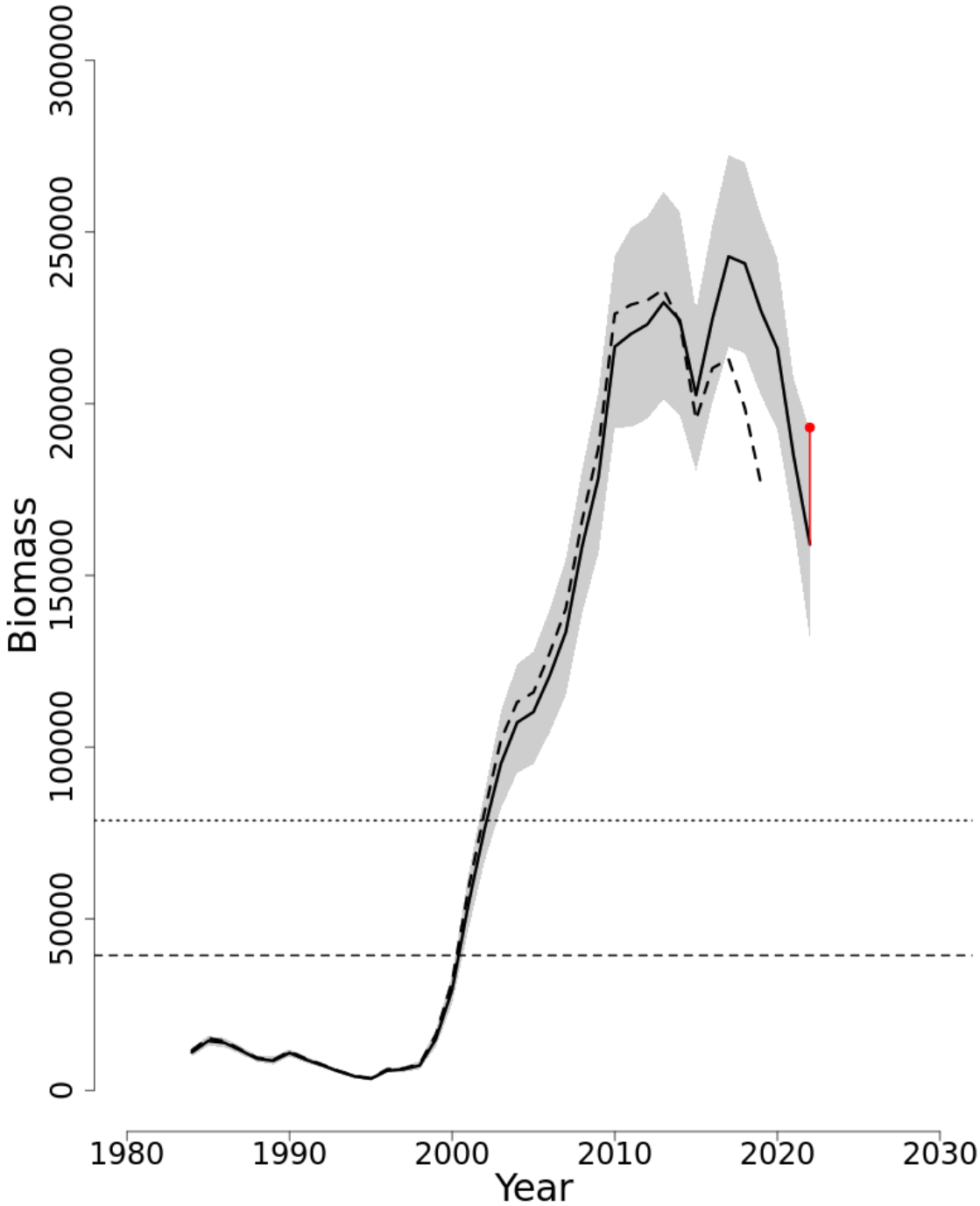


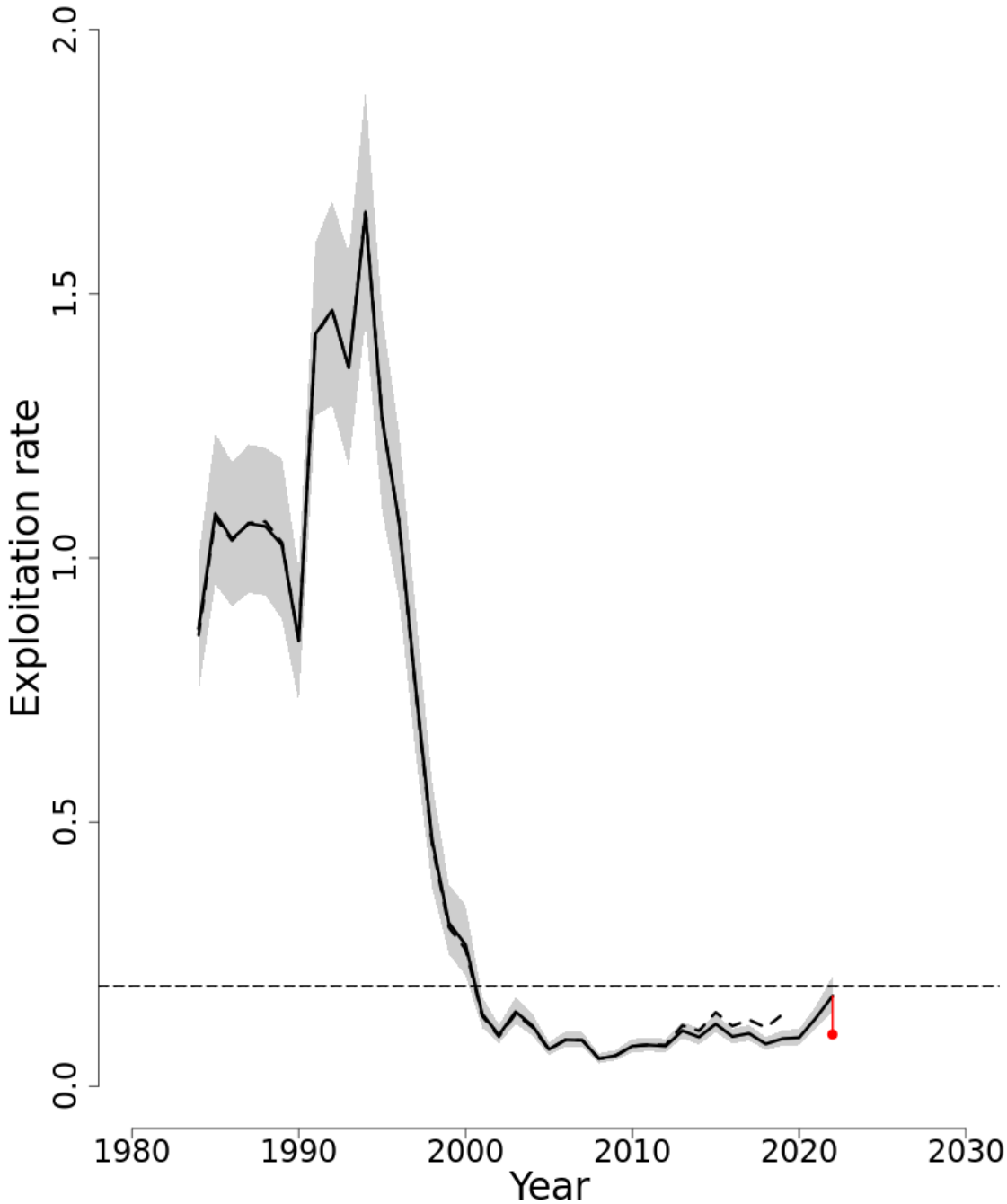
Scup (*Stenotomus chrysops*)
TOR 4: BRPs and Status

4. Re-estimate or update the BRP's as defined by the management track level and recommend stock status. Also, provide qualitative descriptions of stock status based on simple indicators/metrics (e.g., age- and size-structure, temporal trends in population size or recruitment indices, etc.).

- 2021 Management Track Assessment: through 2019
- BMSY = SSB40% = 90,019 mt
- FMSY = F40% = 0.200
- MSY = 12,671 mt
- Not Overfished: SSB2019 = 176,404 mt, 1.96 x BMSY
- Not Overfishing: F2019 = 0.136, 68% of FMSY

- 2023 Management Track Assessment: through 2022
- BMSY = SSB40% = 78,593 mt
- FMSY = F40% = 0.190
- MSY = 11,959 mt
- Not Overfished: ADJ SSB2022 = 193,087 mt, 2.46 x BMSY
- Not Overfishing: ADJ F2022 = 0.098, 52% of FMSY


Biomass
0
50000
100000
150000
200000
250000
300000
1980
1990
2000
2010
2020
2030
Year


Exploitation rate
0.0
0.5
1.0
1.5
2.0
1980
1990
2000
2010
2020
2030
Year

2023 Management Track Assessment
TOR 4: Qualitative status

- **Expanded age structure in current catch and surveys relative to early 1990s**
- **Most survey aggregate biomass indices near time series high through 2017, with a decrease since then**
- **Survey indices suggest recruitment of several large year classes during 2000-2016, below average recruitment since 2017**
- **Simple metrics indicate that mortality from all sources was lower than recruitment inputs to the stock since about 2000, which has resulted in SSB that is still well above the target**
- **The high stock biomass has sustained relatively high catches during 2010-2022**

Scup (*Stenotomus chrysops*)
TOR 5: Projections

5. Conduct short-term stock projections when appropriate.

2023 Management Track Assessment
OFL Projections 2024-2025

- **Projections for 2024-2025 OFLs at FMSY = 0.190**
- **During 2018-2022, an average of 101% of the ABC was caught; assume 2023 ABC caught = 13,458 mt**
- **Recruitment sampled from 1984-2022**
- **Retrospective Adjustment using SSB factor as per SOP**
- **OFL 2024 = 20,295 mt (CV = 18%)**
- **OFL 2025 = 18,363 mt (CV = 18%)**
- ***Subsequent MAFMC SSC, MC, and Staff recommendations will determine OFLs/ABCs under the risk policy and any other options***

2023 Management Track Assessment
TOR 6: Respond to any review panel comments or SSC concerns from the most recent prior research or management track assessment.

2015 SAW 60

- **A standardized fishery dependent CPUE of scup targeted tows, from either NEFOP observer samples or the commercial study fleet, might be considered as an additional index of abundance to complement survey indices in future benchmark assessments: completed for 2015 SAW 60, CPUE indices not included model calibration**

- **Explore additional sources of length/age data from fisheries and surveys in the early parts of the time series to provide additional context for model results: no success, likely alternative is to begin model in 1984 in next RTA**

- **Explore experiments to estimate the catchability of scup in NEFSC and other research trawl surveys (side-by-side, camera, gear mensuration, acoustics, etc.): no progress**

- **Refine and update the Manderson et al. availability analysis when/if a new ocean model is available (need additional support). Explore alternative niche model parameterizations including laboratory experiments on thermal preference and tolerance: no progress**

2023 Management Track Assessment
TOR 6: Respond to any review panel comments or SSC concerns from the most recent prior research or management track assessment.

2015 SAW 60

- **Explore the Study fleet data in general for information that could provide additional context and/or input for the assessment: completed for 2015 SAW 60, CPUE indices not included model calibration**

- **A scientifically designed survey to sample larger and older scup would likely prove useful in improving knowledge of the relative abundance of these large fish: no progress**

2023 Management Track Assessment
TOR 6: Respond to any review panel comments or SSC concerns from the most recent prior research or management track assessment.

2019 OA

- **The recent recruitment of the largest year class in the assessment time series (the 2015 year class) has contributed to recent high commercial fishery discards. The exploration of management actions to reduce discarding in the event of future high recruitment events might include modification of the commercial fishery Gear Restricted Areas and modified commercial mesh sizes: considered annually as part of the specifications process**

- **There is evidence of a decreasing trend in mean weights at age and maturity, perhaps indicative of density dependent effects. Potential effects on reference points and projected fishery yield should continue to be closely monitored: ongoing monitoring in assessment**

2023 Management Track Assessment
TOR 6: Respond to any review panel comments or SSC concerns from the most recent prior research or management track assessment.

2021 MT

- **The panel discussed the unusual direction of the retrospective pattern in the assessments (under estimating biomass and overestimating fishing mortality). There was concern that a retrospective adjustment would increase terminal year estimates of biomass and decreased estimate of fishing mortality when biomass is likely declining due to the decline in the large 2015 year class. The panel discussed potential causes for the retrospective pattern including the potential for overestimation of catch by Marine Recreational Information Program (MRIP): in this 2023 assessment, a retrospective adjustment has been made for stock status and projections, in line with recent 'standard' procedures**

- **The panel discussed ideas on how the model inputs could be altered to reduce the retrospective pattern, noting that recommending a Level 2 review would allow for this flexibility. It was noted that shifting model influence weights between catch and survey did not result in much response. Splitting the selectivity series with the final series starting in 2013 did not change the retrospective pattern very much, but did reduce the error sufficiently that an adjustment was not needed: terminal selection block for 2013+ implemented in the 2021 model and retained in 2023 model**

2023 Management Track Assessment
TOR 6: Respond to any review panel comments or SSC concerns from the most recent prior research or management track assessment.

MAFMC SSC 2019-2022

- **Characterize the pattern of selectivity for older ages of Scup in both surveys and Fisheries: ongoing estimation in assessment**

- **Explore the applicability of the pattern of fishery selectivity in the model to the most recent catch data to determine whether a new selectivity block in the model is warranted: updated in 2021 model – new 2013+ selectivity block added to model and retained in 2023 model**

- **Mean weights-at-age have declined and age-at-maturity has increased slightly (the proportion mature at age 2 has decreased) in recent years. Continued monitoring of both is warranted: ongoing monitoring in assessment**

- **It was conjectured that the increase in stock biomass since 2000 resulted from increased recruitments due to the imposition of gear restriction areas (GRAs), to minimize interactions between Scup and squid fisheries, and from increases in commercial mesh sizes. Long-term climate variation is a potential alternative explanation for increased recruitments from 2000 to 2015. Research to explore the validity of both hypotheses is warranted: no new research progress**

2023 Management Track Assessment
TOR 6: Respond to any review panel comments or SSC concerns from the most recent prior research or management track assessment.

MAFMC SSC 2019-2022

- **Improve estimates of discards and discard mortality for commercial and recreational fisheries: no specific progress, but no concerns expected if current levels of sampling are maintained; note 2022 commercial sampling at lowest (worst) intensity since 1994**

- **Evaluate the degree of bias in the catch, particularly the commercial catch: no stock-specific progress, but GARFO CAMS estimates now included for 2020-2022 data**

- **Conduct experiments to estimate catchability of Scup in NEFSC surveys: no progress**

- **Explore the utility of incorporating ecological relationships, predation, and oceanic events that influence Scup population size on the continental shelf and its availability to resource surveys used in the stock assessment model: no new research progress**

- **Explore additional source of age-length data from historical surveys to inform the early part of the time series, providing additional context for model results: no success, likely alternative is to begin model in 1984 in next RTA**

2023 Management Track Assessment
TOR 6: Respond to any review panel comments or SSC concerns from the most recent prior research or management track assessment.

MAFMC SSC 2019-2022

- **An MSE could evaluate the effectiveness of Scup management procedures: no progress**

- **The Scup Statistical Catch at Age assessment model uses multiple selectivity blocks. The final selectivity block (2006-2018) is the longest in the model. The applicability of the most recent selectivity block to the current fishery condition is uncertain. If the fishery selectivity implied in this block changes, estimates of stock number, spawning stock biomass, and fishing mortality become less reliable: updated in 2021 model – new 2013+ selectivity block added to model and retained in 2023 model**

- **Recruitment indices for Scup have been declining in recent years. The 2021 management track assessment should consider the implications on stock biomass projections should this trend continue: evaluated in the 2021 MTA assessment model and associated projections**

2023 Management Track Assessment
TOR 6: Respond to any review panel comments or SSC concerns from the most recent prior research or management track assessment.

MAFMC SSC 2019-2022

- **Most of the fishery-independent indices used in the model provide estimates of the abundance of Scup < age 3. One consequence is that much of the information on the dynamics of Scup of older ages arises largely from the fishery catch-at-age and from assumptions of the model, and are not conditioned on fishery-independent observations. As a result, the dynamics of these older fish remain uncertain. Knowledge of the dynamics of these older age classes will become more important as the age structure continues to expand: no new research progress, but assessment indicated the abundance of older fish in increasing in fishery and survey catches, and there is evidence of possible density dependent effects on growth and maturity**

- **The projection on which the ABC was determined assumes that the quotas would be landed in 2019, 2020, and 2021; however, landings in recent years have been below the quotas and perhaps a more realistic assumption should be used in future projections: given the uncertainty of fishery dynamics and catch estimated for 2020, the 2021 MTA projections assumed the ABCs would be caught in 2020-2021; prelim 2020 catch is 94% of 2020 ABC. In current assessment, recent 5 year pattern (101% of ABC caught) indicates that assuming 2023 ABC will be caught is a valid assumption for projections**

- **Uncertainty exists with respect to the estimate of natural mortality used in the assessment: no new research progress**

2023 Management Track Assessment
TOR 6: Respond to any review panel comments or SSC concerns from the most recent prior research or management track assessment.

MAFMC SSC 2019-2022

- **Uncertainty exists as to whether the MSY proxies (SSB40%, F40%) selected and their precisions are appropriate for this stock: no new research progress**

- **Survey indices are particularly sensitive to Scup availability, which results in high inter-annual variability. Efforts were made to address this question in the Stock Assessment Workshop and Stock Assessment Review Committee (SAW/SARC) in 2015 that should be continued in the 2021 management track assessment: no new research progress**

- **SSC is concerned over the reduction in port sampling which has the potential to exacerbate concerns about the dynamics of older fish: commercial landings sampling intensity in 2022 was the lowest (i.e., worst) since 1994**

2023 Management Track Assessment
TOR 3b:
Backup – Aggregate Survey Trends (plot) and/or PlanBsmooth trend (cod/monkfish model)

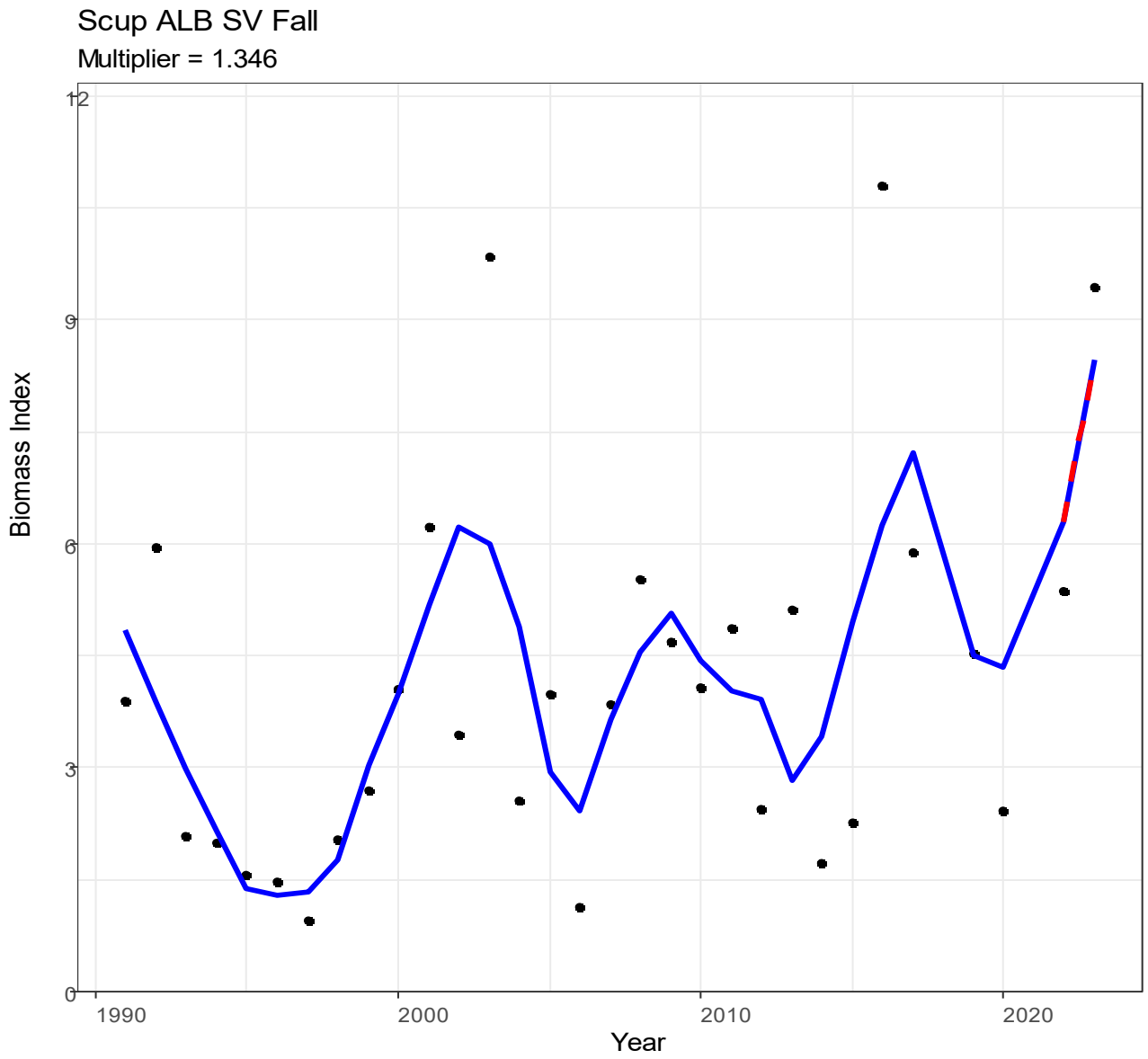
- **PlanBsmooth:**

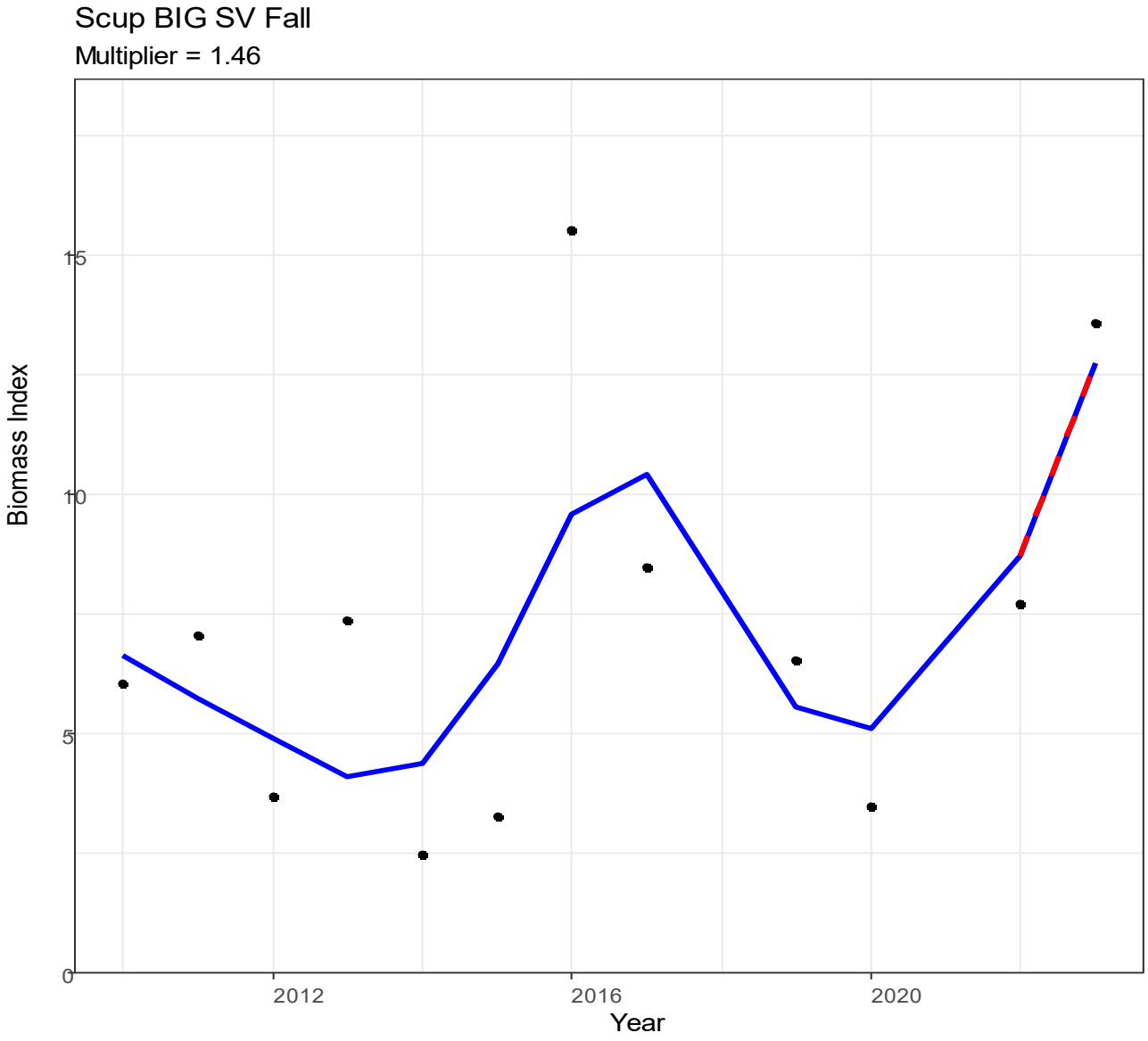
- **NEFSC Fall survey only (spring not used in ASAP calibration)**
- **Use entire 1984-2022 series in ALB units (incorporates calibration)**
- **Use only 2009-2022 series in BIG units (no calibration)**
- **Note: no surveys in 2017 or 2020 – program interpolates**

- **ALBSV 'Multiplier' = 1.346; BIGSV 'Multiplier' = 1.460**
- **So, use ~1.4 as 'Multiplier' for future OFL**

- **Example: future 2024-2025 OFL/ABC might be 140% of current 2023 OFL/ABC**

- **Relationship of OFL to ABC will depend on SSC application of risk-policy and assumption for OFL CV under Backup Plan**


Scup ALB SV Fall
Multiplier = 1.346
Biomass Index
12
9
6
3
0
1990
2000
2010
2020
Year


Scup BIG SV Fall
Multiplier = 1.46
Biomass Index
15
10
5
0
2012
2016
2020
Year

Extra Slides

2023 Management Track Assessment
OFL Projections
Effect of Retrospective Adjustment

- Projection for 2024 OFL at FMSY = 0.190
- During 2018-2022, an average of 101% of the ABC was caught; assume 2023 ABC caught = 13,458 mt
- Recruitment sampled from 1984-2022

		OFL	SSB
NOADJ	2024	16,481	150,736
	2025	15,057	132,305
ADJN	2024	20,664	175,527
	2025	19,104	158,277
ADJSSB	2024	20,295	185,475
	2025	18,363	162,716