2022 Stock Assessment Update for Atlantic Striped Bass

TOR 1

Update fishery-dependent data (landings, discards, catch-at-age, etc.) that were used in the previous peer-reviewed and accepted benchmark stock assessment.

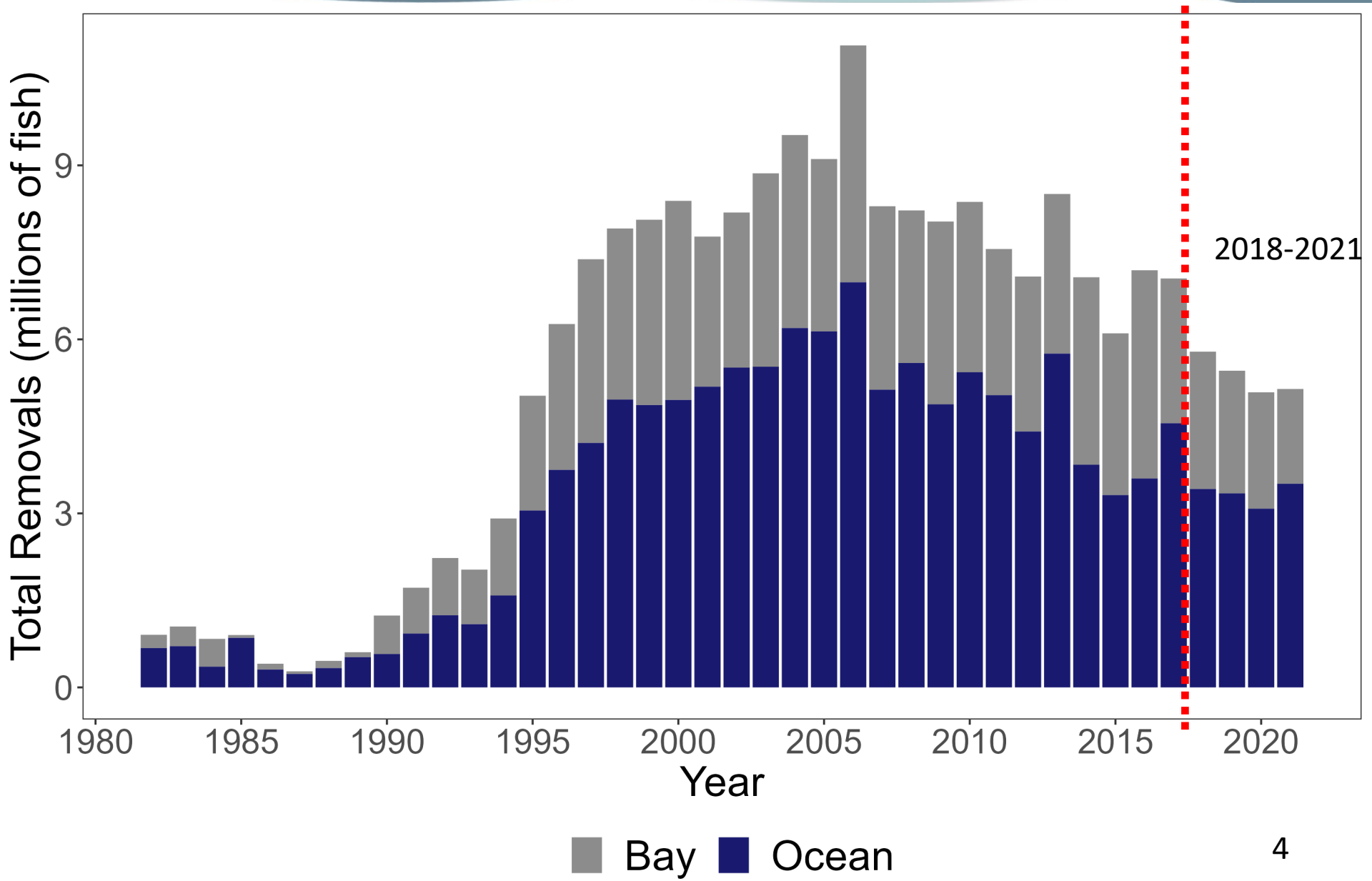
Catch Data

- MRIP estimates of harvest and dead releases for ME, NH, MA, RI, CT, NY, NJ, DE, MD, VA, and NC (ocean only)
- Reported commercial harvest for MA, RI, NY, DE, MD, PRFC, VA and NC (ocean only)
- Commercial dead discards estimated from tag and MRIP data

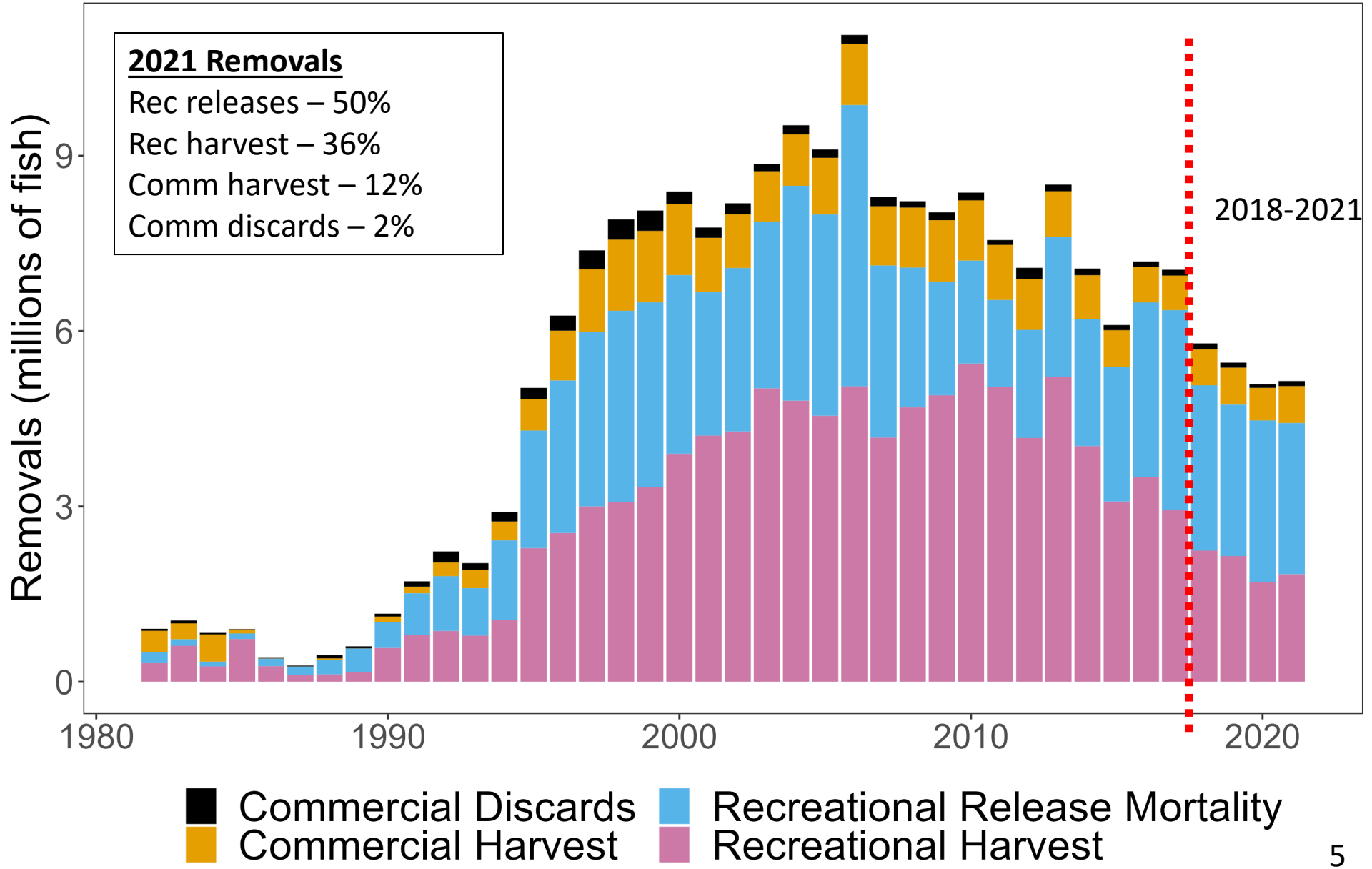
<u>Missing Catch Data</u>

- Catch from major rivers (e.g., Hudson River, Delaware River, etc.)
- Unreported catch (e.g., poaching, underreporting)

Total Removals By "Fleet"



Total Removals By Disposition



Total Catch Composition

TOR 2

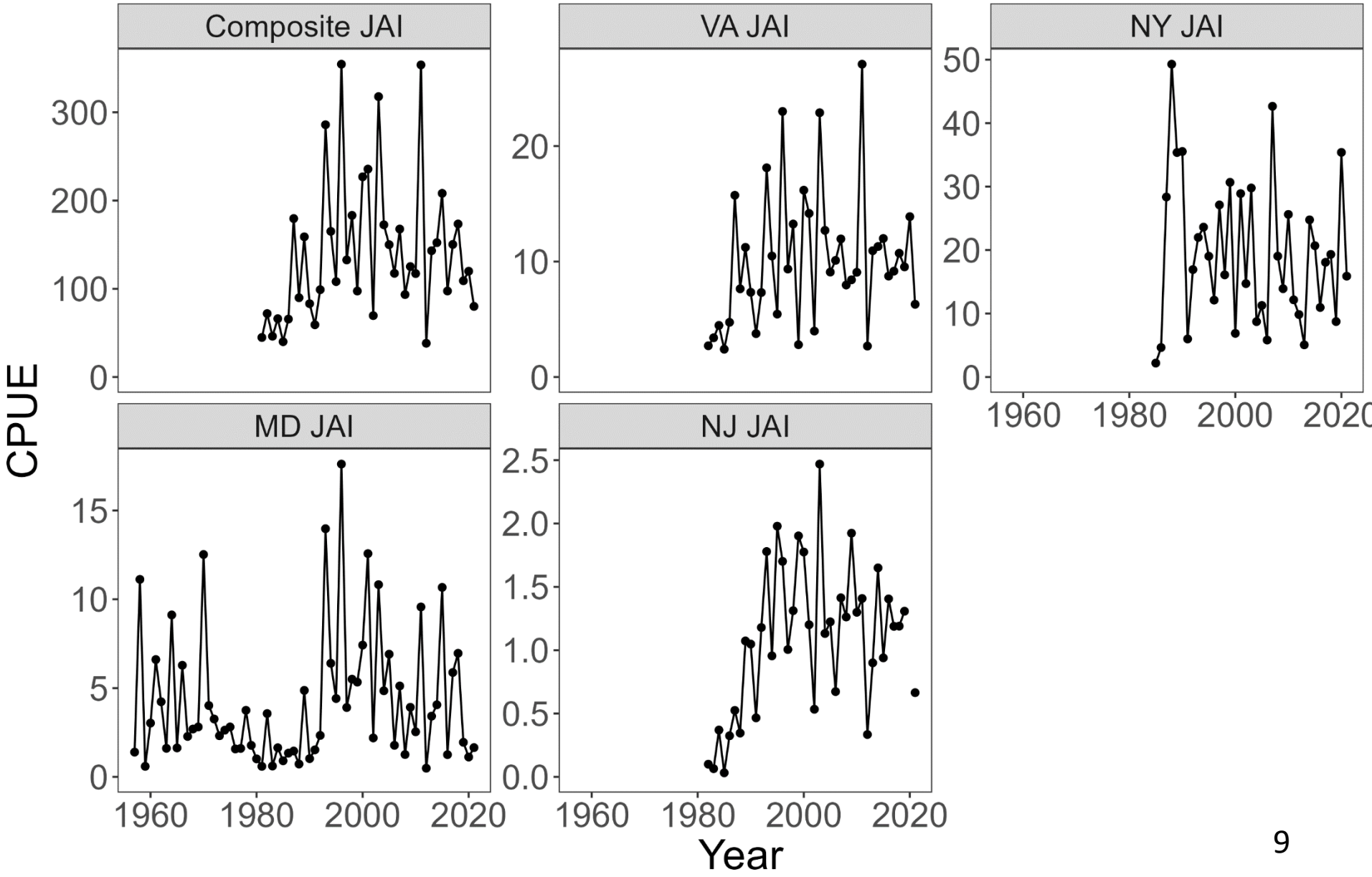
Update fishery-independent data (abundance indices, age-length data, etc.) that were used in the previous peer-reviewed and accepted benchmark stock assessment.

Index Data Availability

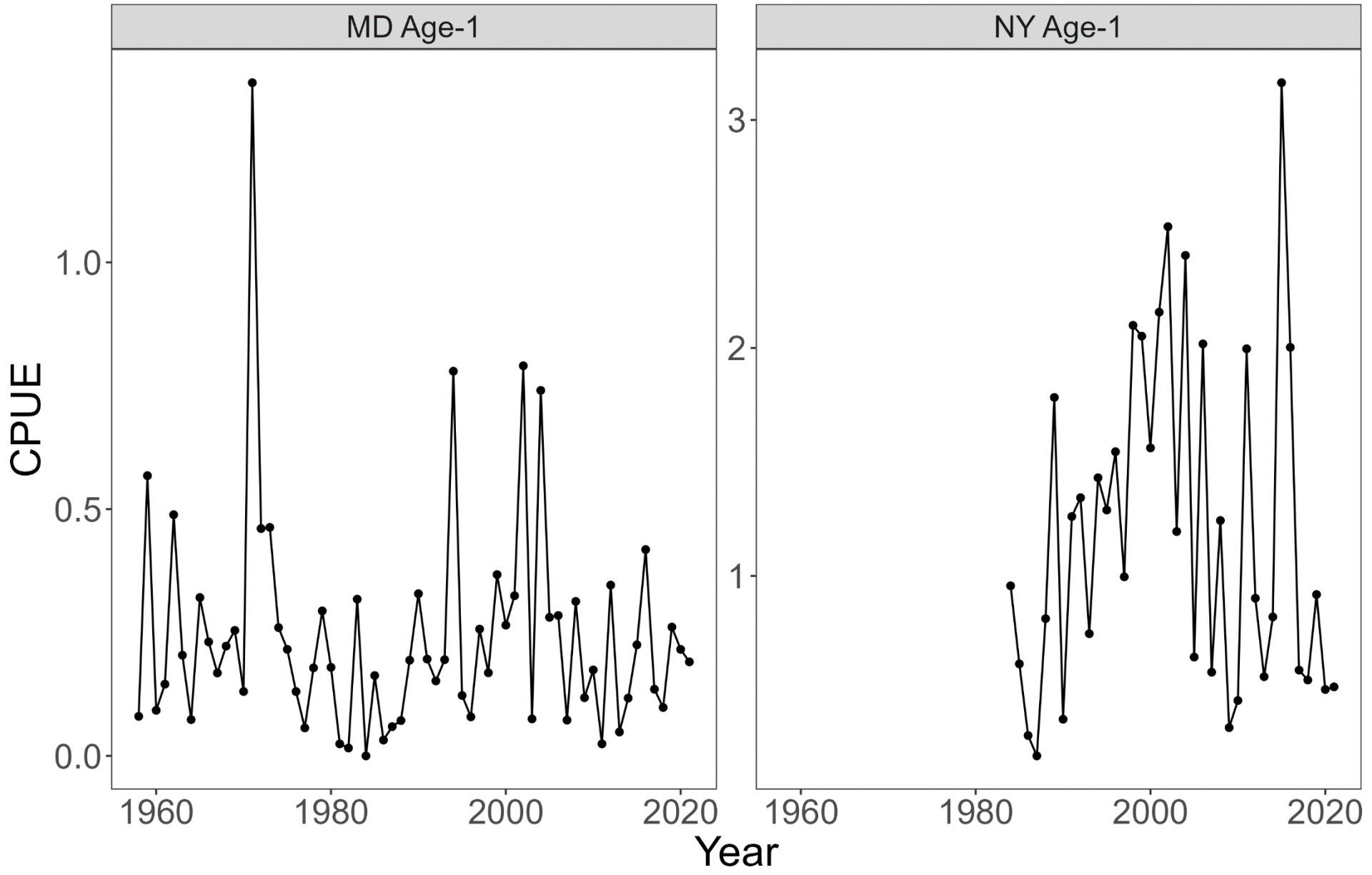
Year	NY JAI	NY Age-1	NJ JAI	MD JAI	MD Age-1	VA JAI
2018						
2019						
2020		Delayed	Did not occur			
2021						

Year	CT LISTS	NJ TRL	DE SSN	DE 30’	MD SSN	ChesMMAP
2018						
2019		Did not occur				Unavailable
2020	Did not occur	Did not occur	Did not occur			Unavailable
2021		Did not occur			Interrupted	Unavailable

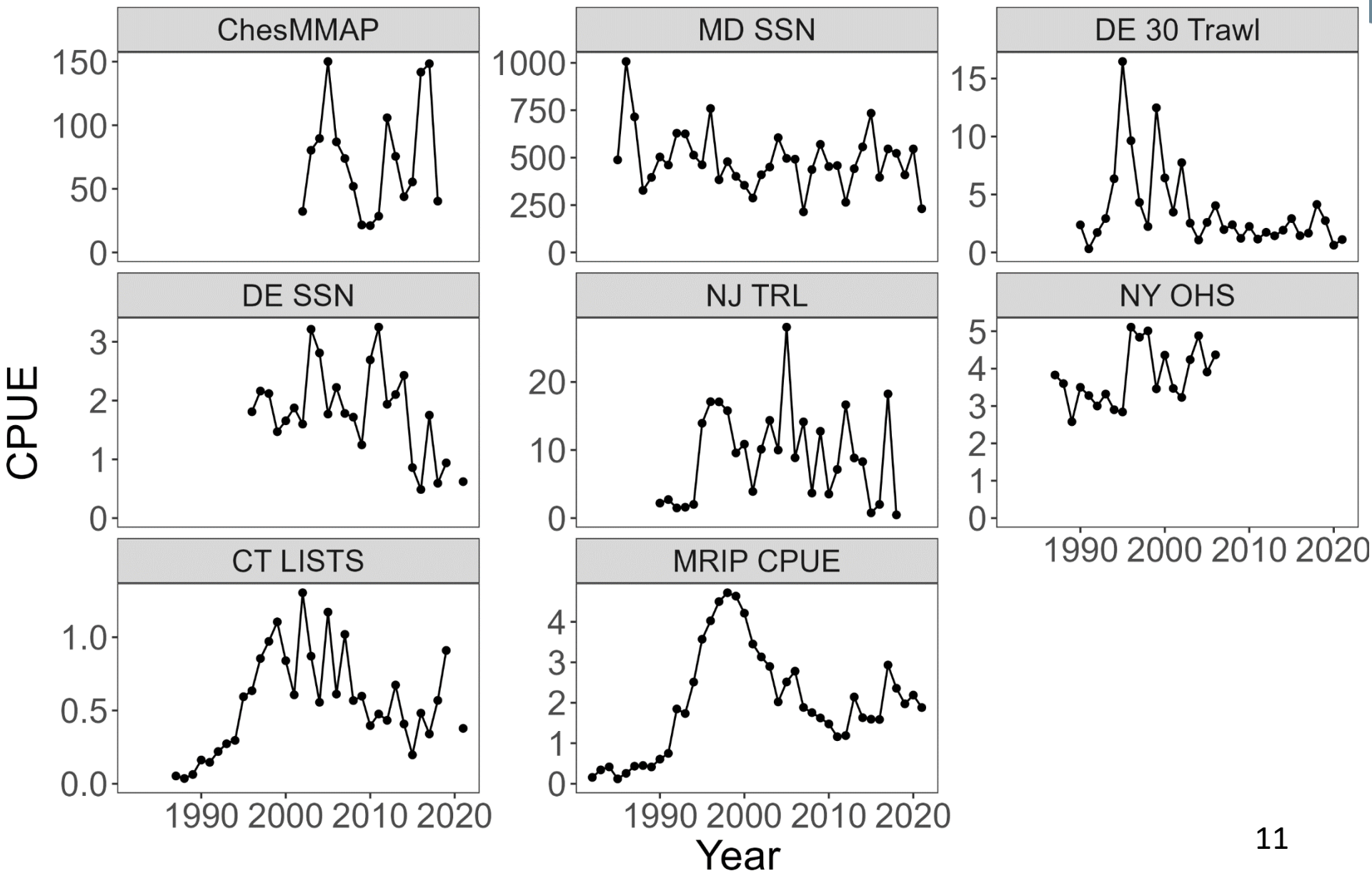
YOY Indices


Composite JAI
VA JAI
NY JAI
MD JAI
NJ JAI
CPUE
Year
0
100
200
300
10
20
30
40
50
5
15
0.0
0.5
1.0
1.5
2.0
2.5
1960
1980
2000
2020

Age-1 Indices



Age Composition Indices



TOR 3

1) Tabulate or list the life history information used in the assessment and/or model parameterization (M, age plus group, start year, maturity, sex ratio, etc.) and note any differences (e.g., new selectivity block, revised M value) from benchmark.

2018 Benchmark Assessment

- Forward projecting statistical catch-at-age model
  - Age-1 abundance (recruitment) in each year
  - Fully-recruited F in each year
  - Catch selectivity in 4 regulatory periods
  - Catchability coefficients for all indices (14)
  - Selectivity for each survey (8) with age composition data
- Data are split into two "Fleets" – Ocean and Bay regions
  - Improved selectivity fits
  - Provided partial F for each fleet
- Age-specific M were used (1.13: age 1 to 0.15: age 7+)

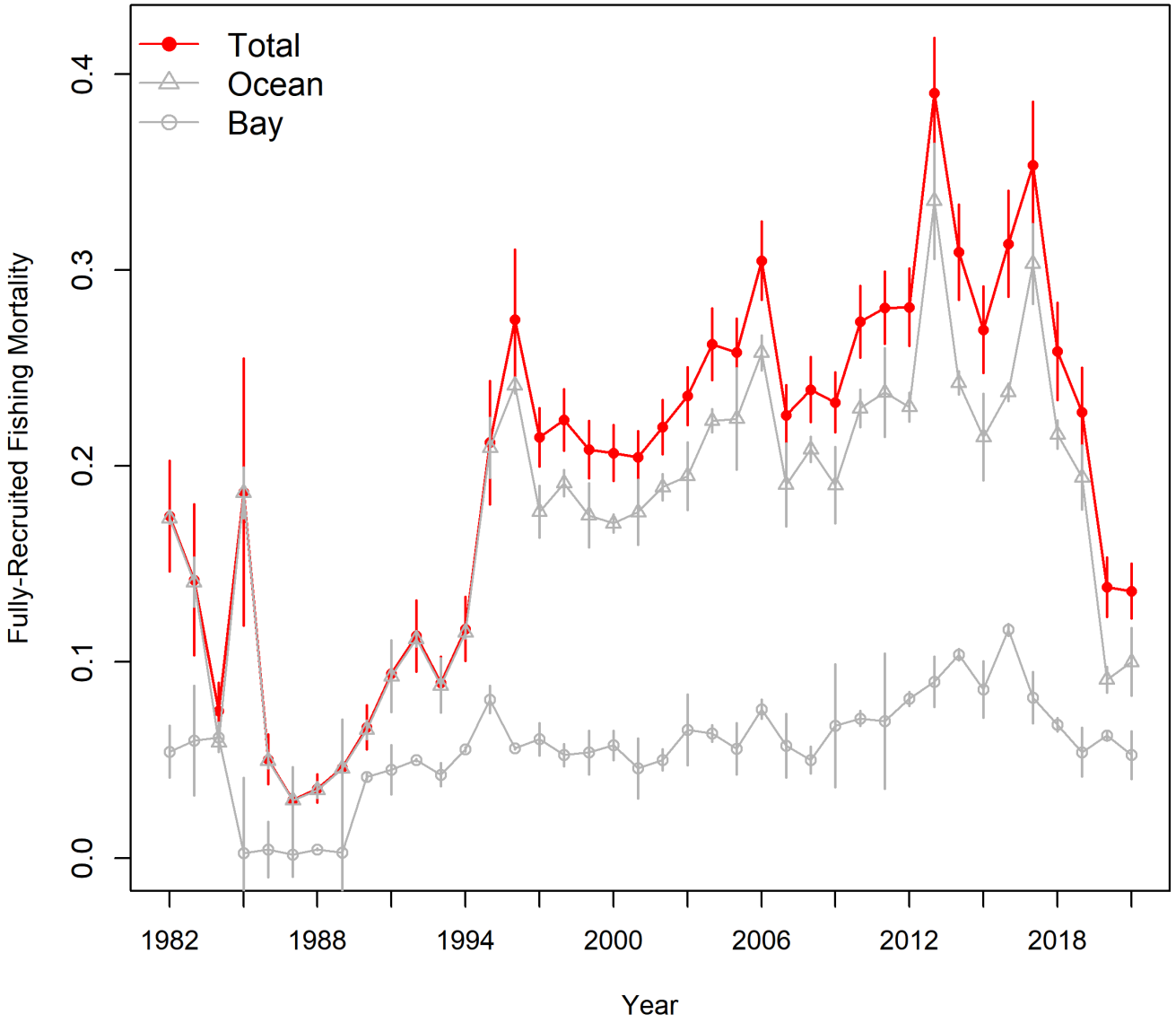
Update

- Same life history parameters (M, maturity-at-age, etc.)
- Updated weights-at-age for use in SSB calculation
- Added new selectivity block (2020-2021) for both regions (used double logistic at first)
- Adjusted CVs of surveys to get close to RMSE=1.0
- Adjusted effective sample size of survey age compositions using the Francis method

TOR 4

1) UPDATE ACCEPTED MODEL AND ESTIMATE UNCERTAINTY
2) RETROSPECTIVE ANALYSIS
3) INCLUDE SENSITIVITY RUNS
4) COMPARE WITH THE BENCHMARK ASSESSMENT RESULTS

Fully-Recruited F (±SE) By "Fleet"



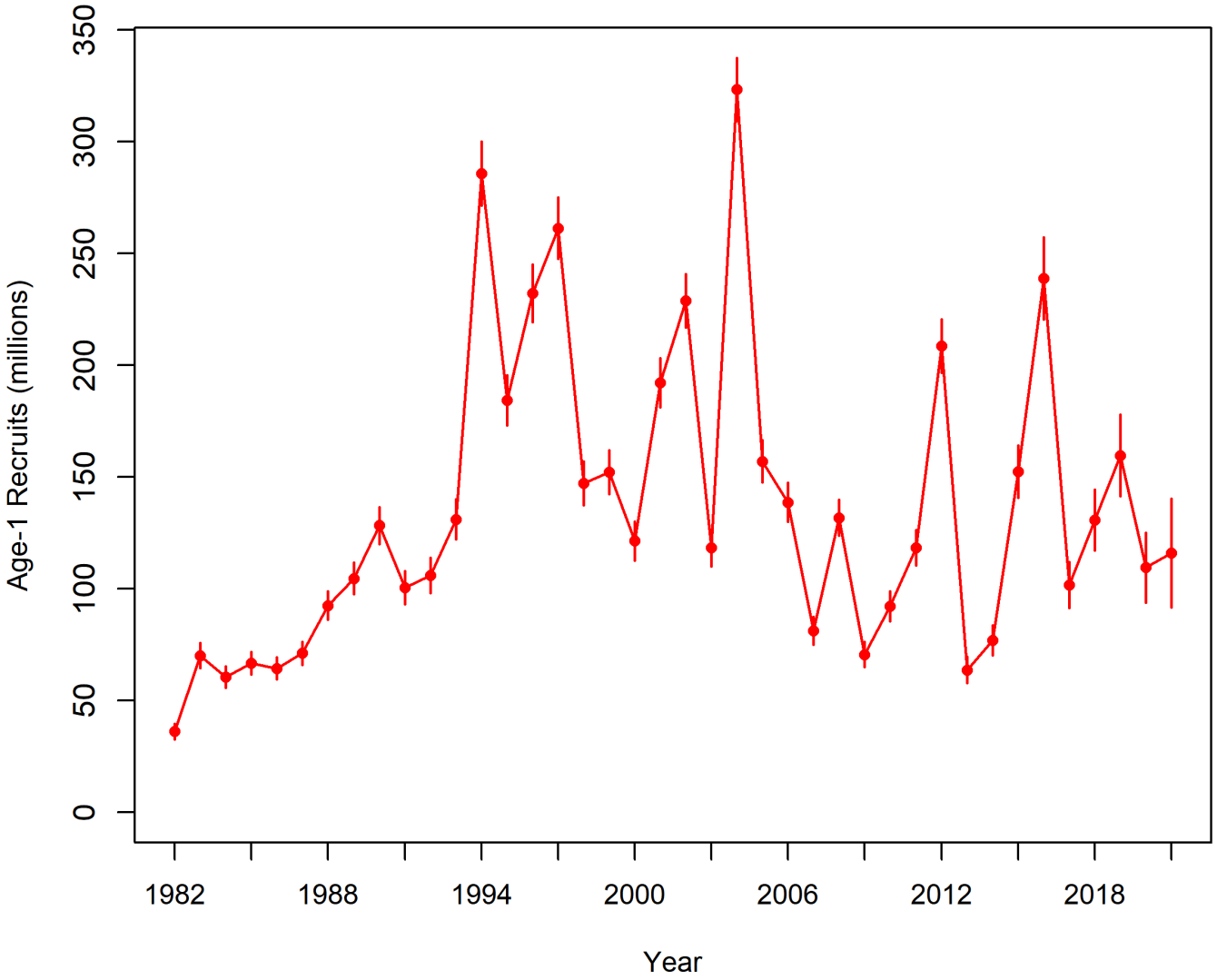
2021

Bay: 0.052

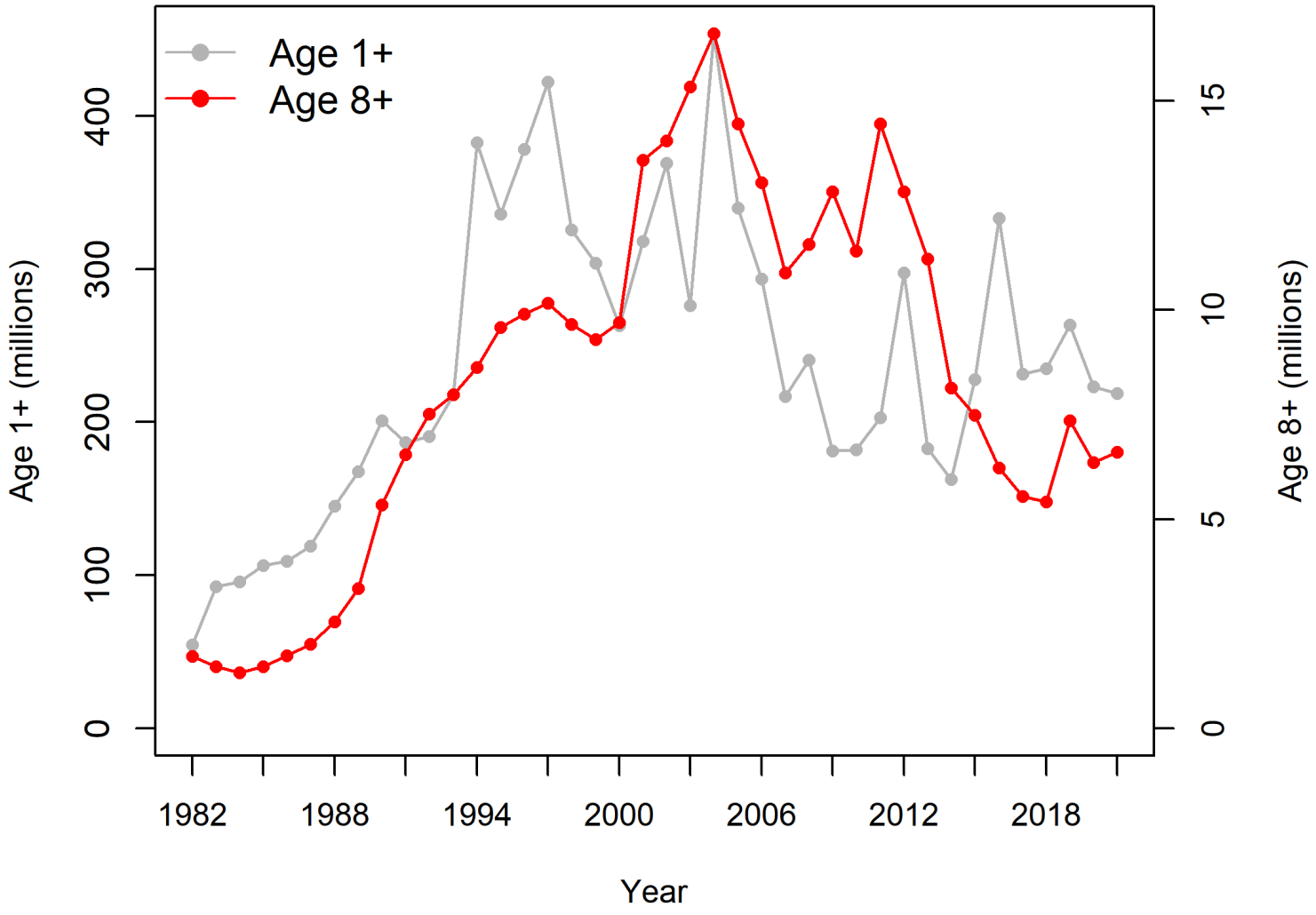
Ocean: 0.100

Total: 0.136

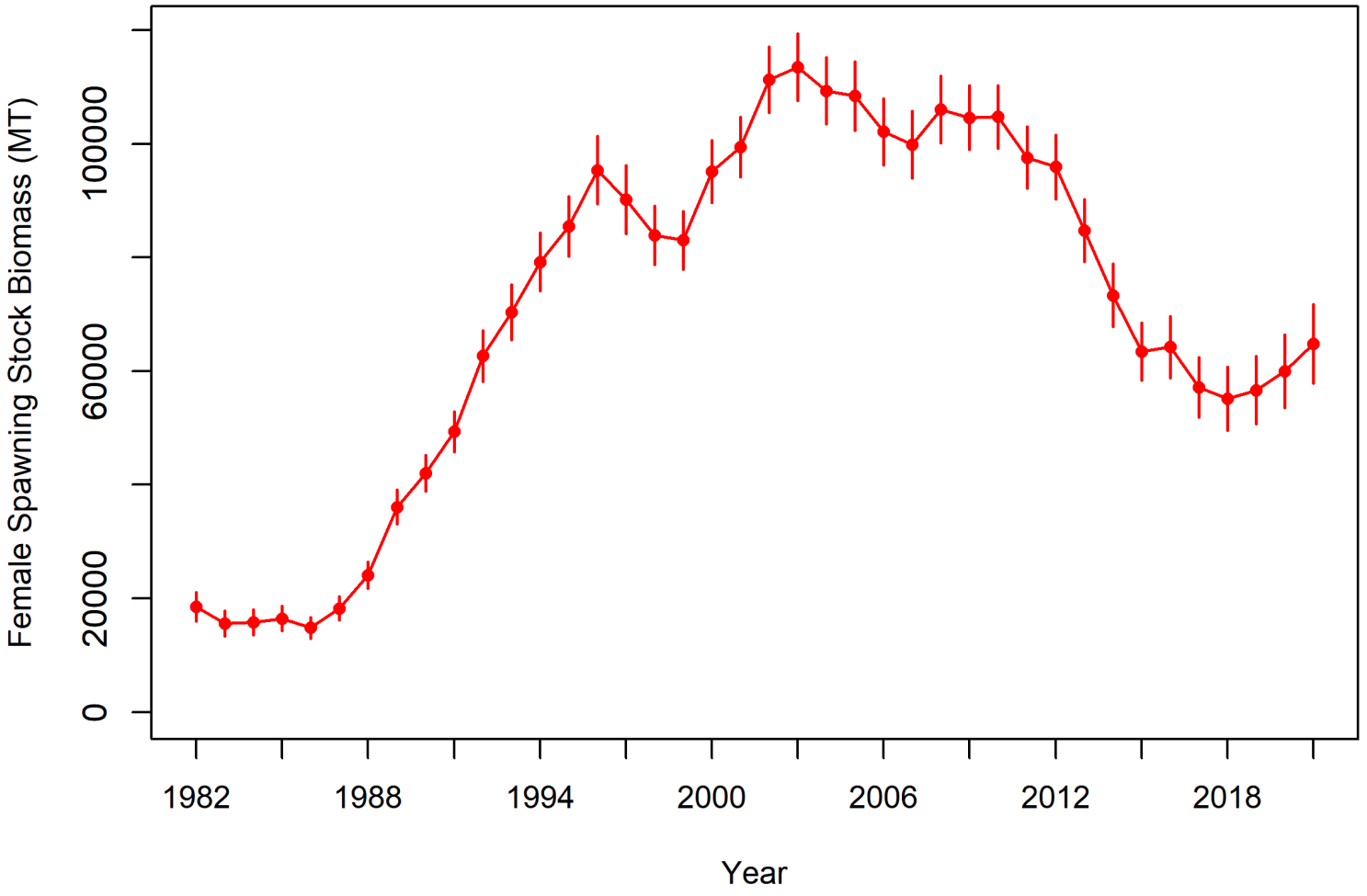
Recruits (Age-1) (±SE)



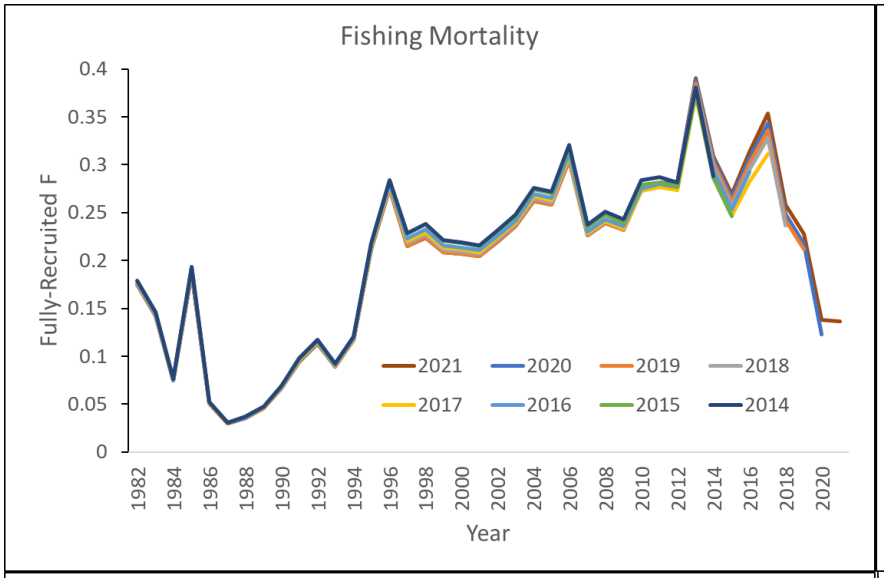
Abundance

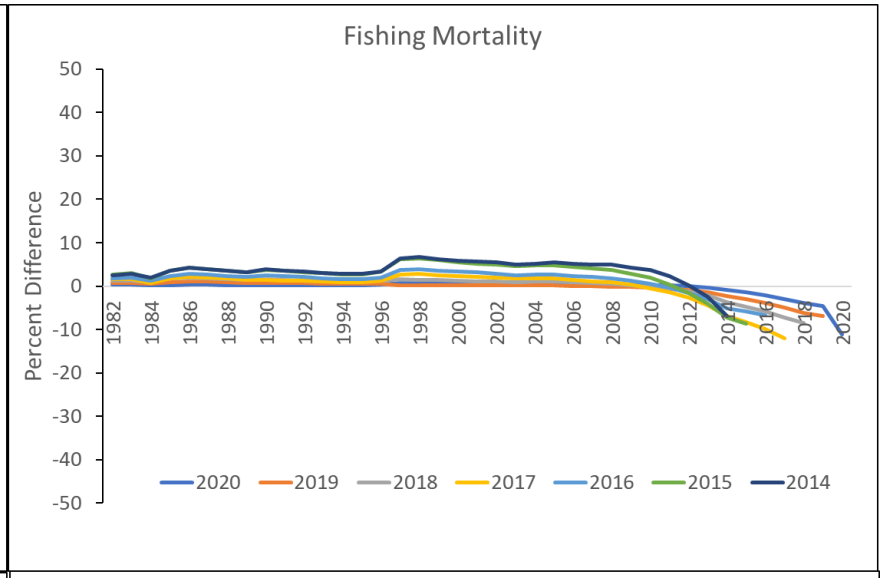

Age 1+
Age 8+
Age 1+ (millions)
Age 8+ (millions)
0
100
200
300
400
0
5
10
15
1982
1988
1994
2000
2006
2012
2018
Year

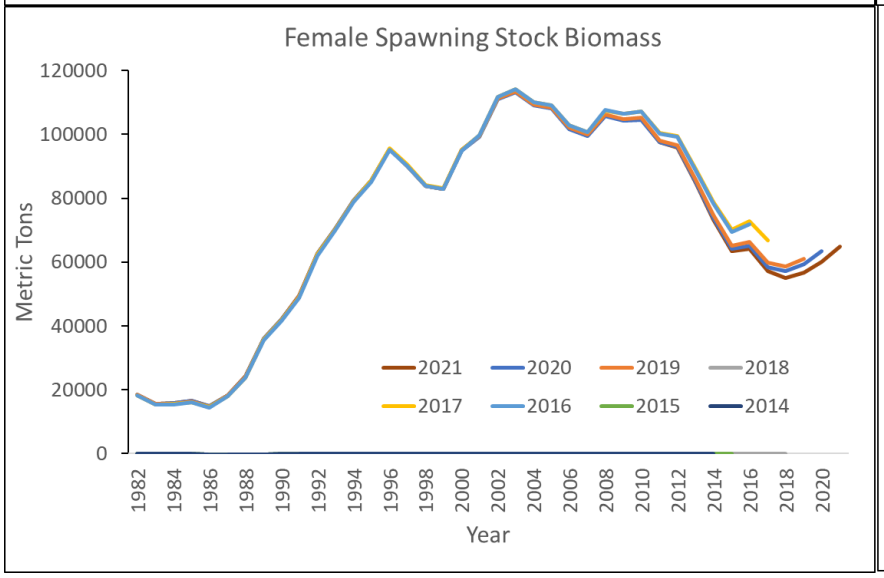
Female Spawning Stock Biomass (±SE)

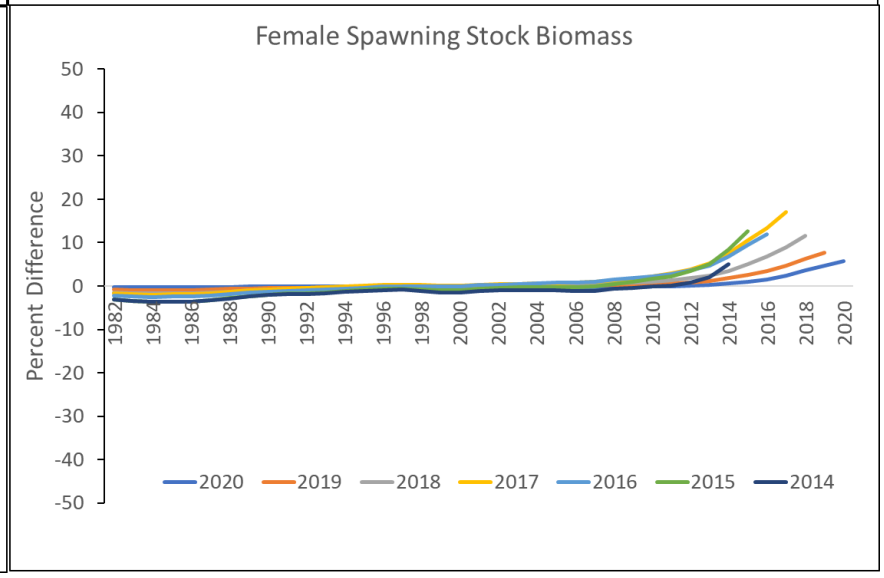


Retrospective Analysis

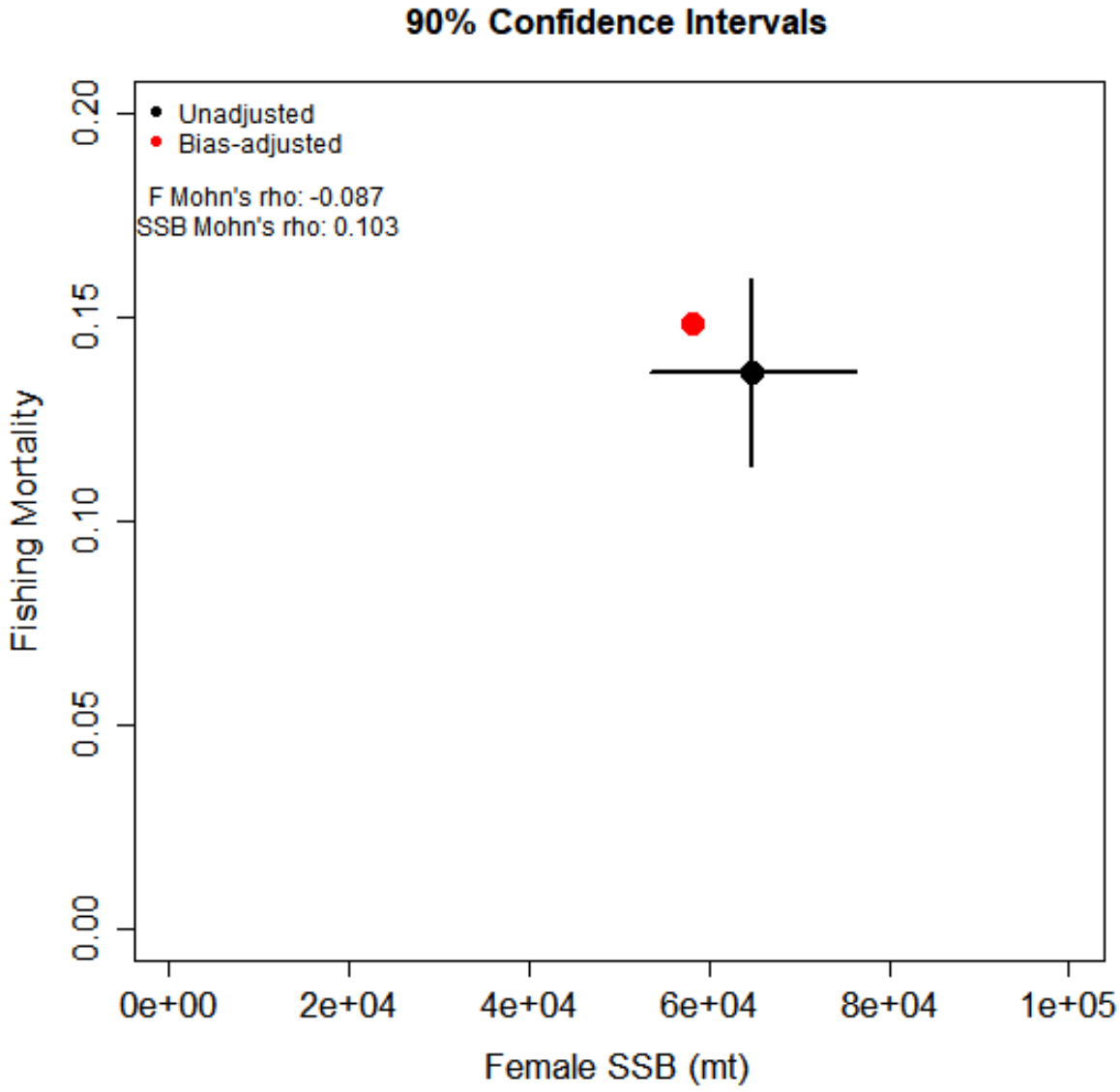






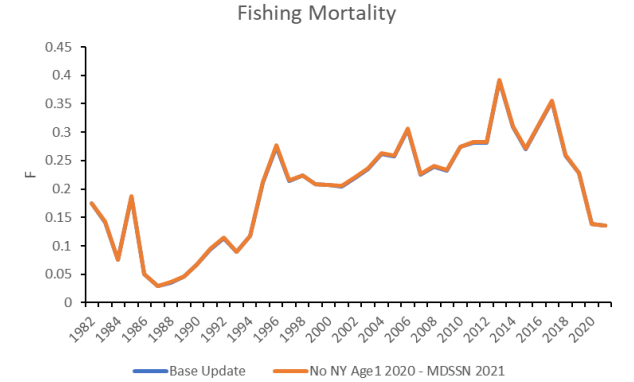


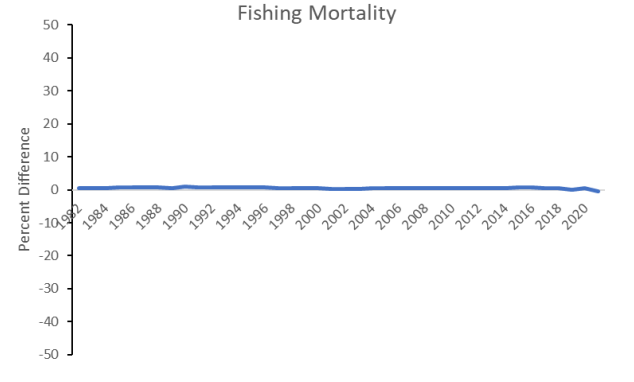
Bias-Correction Not Needed

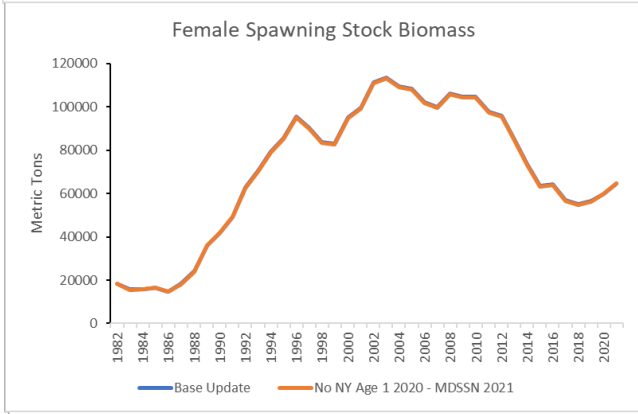


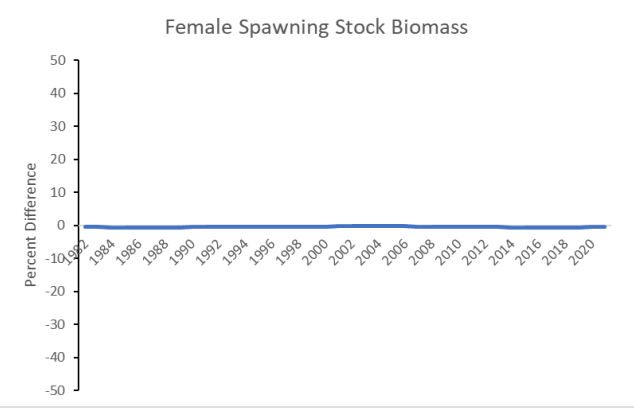
SENSITIVITY RUNS

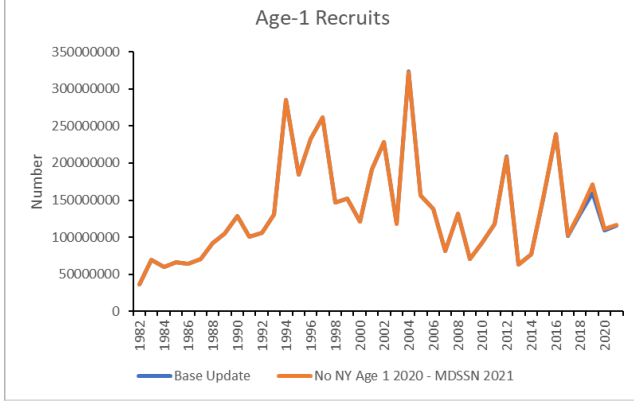
NY Age-1 in 2020 and MD SSN in 2021 Shorter Seasons

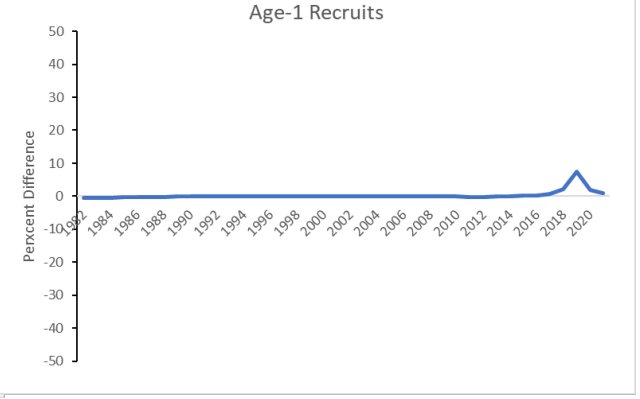




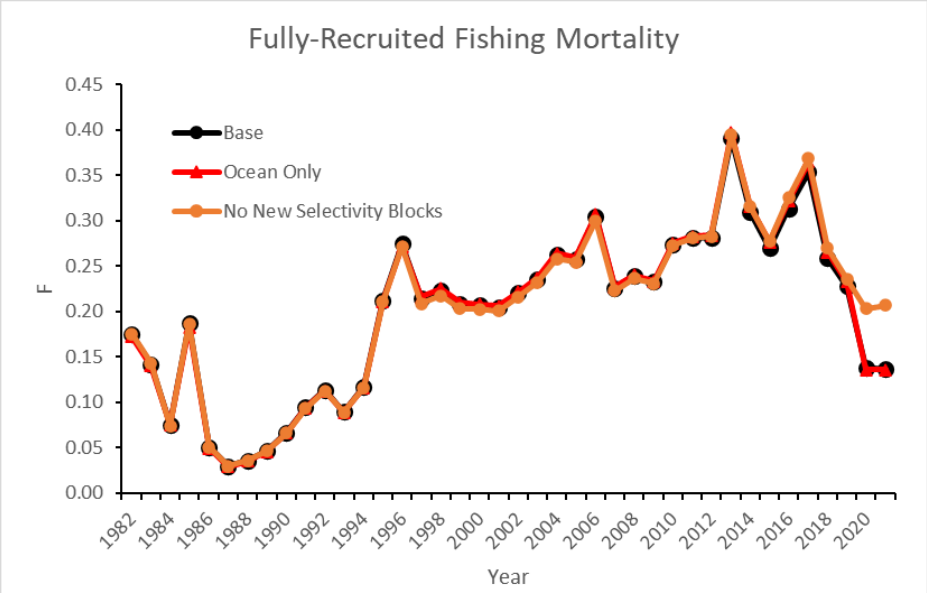


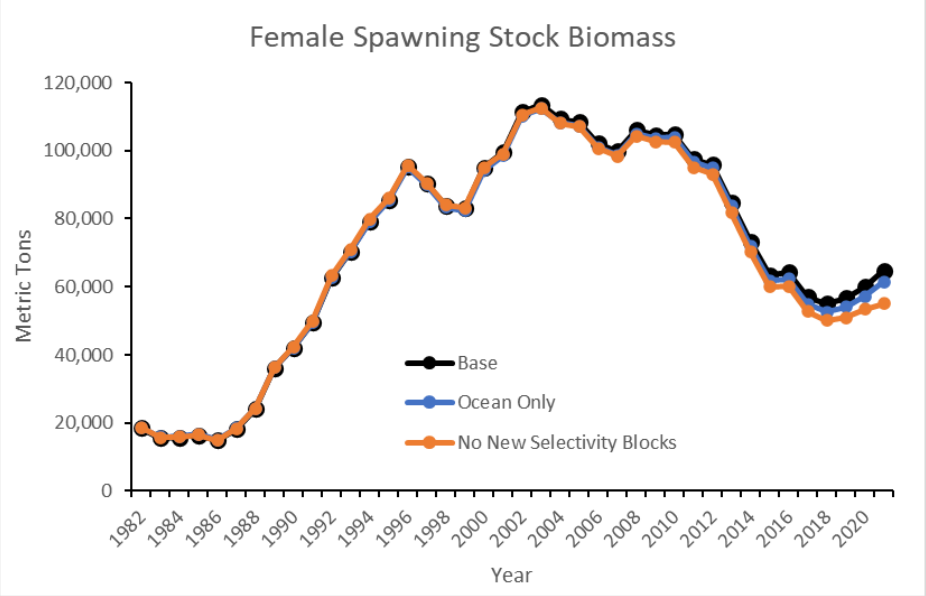




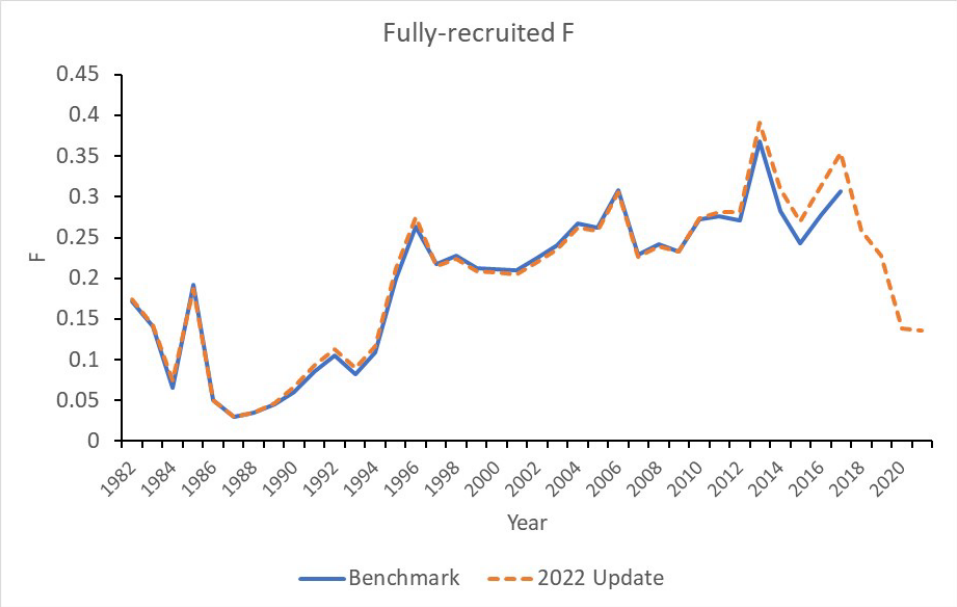


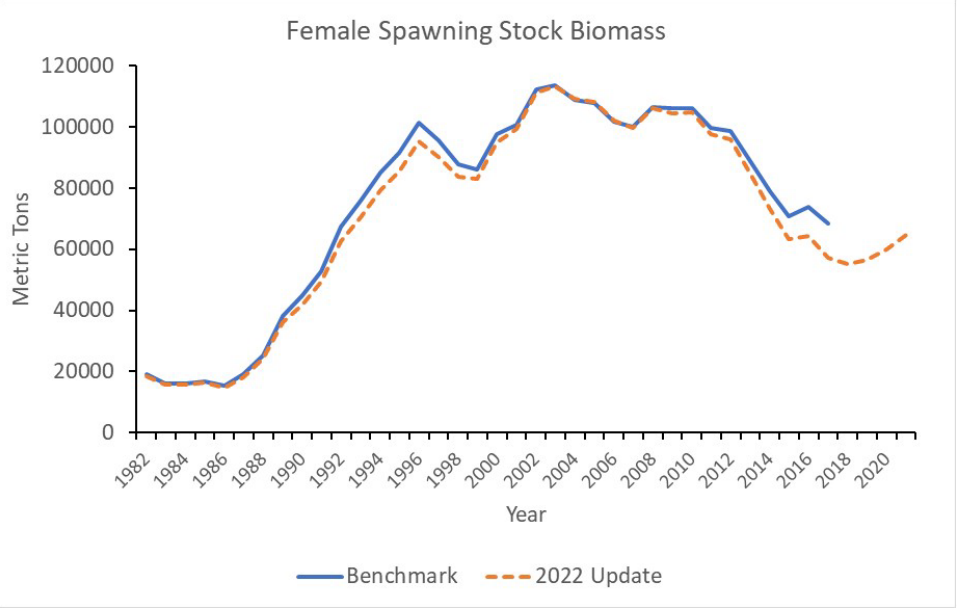
Different Selectivity Blocks For 2020-2021





Comparisons: Benchmark vs. Update





TOR 5

1) UPDATE THE BIOLOGICAL REFERENCE POINTS FOR THE STOCK

2) DETERMINE STOCK STATUS

Reference Points

Female Spawning Stock Biomass Reference Points

$SSB_{threshold}$ = 1995 SSB Value = **85,847** metric tons
SSB_{target} = 125% of Threshold = **106,820** metric tons

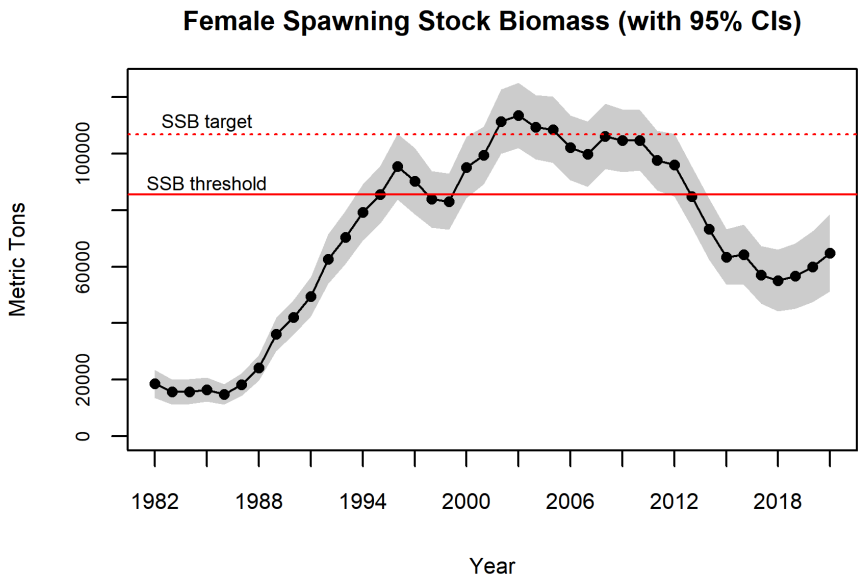
Fishing Mortality Reference Points (*F* associated with $SSB_{threshold}$ and SSB_{target})

Determined via stochastic projection

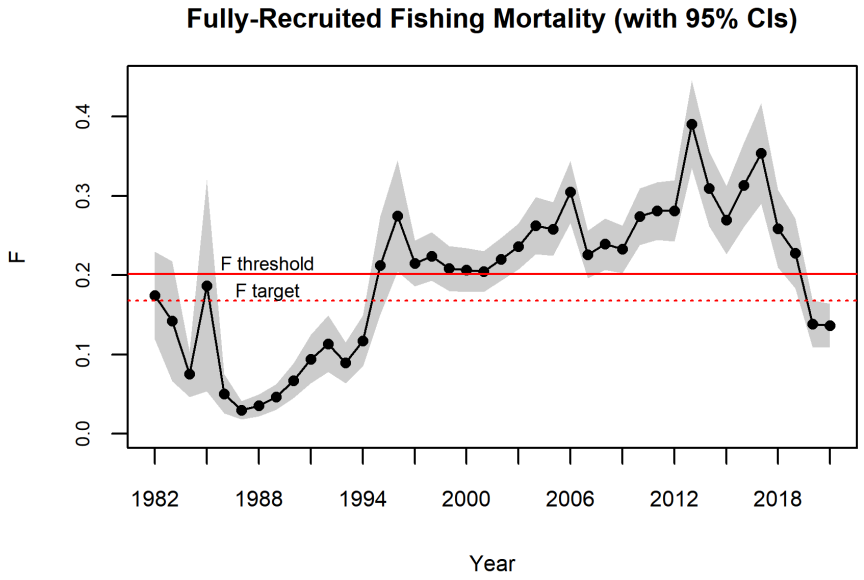
- Estimates of N-at-age and associated error for 2017
- After 2021, average selectivity 2020-2021
- Empirical estimates of recruitment from "low" (2008-2021) recruitment regime
- Projected 100 years 10,000 times
- Adjust fully-recruited *F* until median SSB = $SSB_{threshold}$ or SSB_{target}

$F_{threshold}$ = **0.20**
F_{target} = **0.17**

Stock Status



Stock is overfished

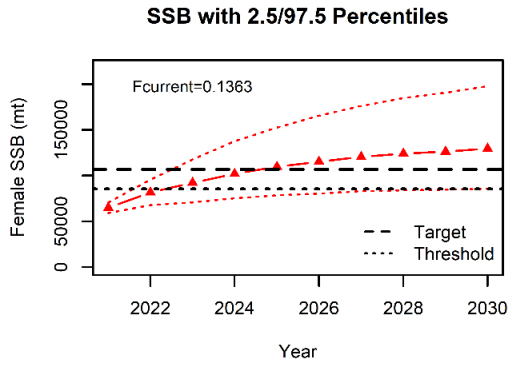


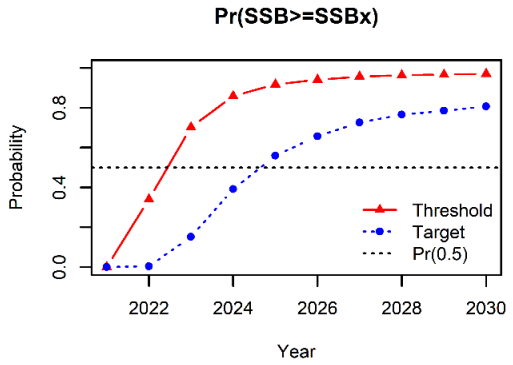
Overfishing is <u>not</u> occurring

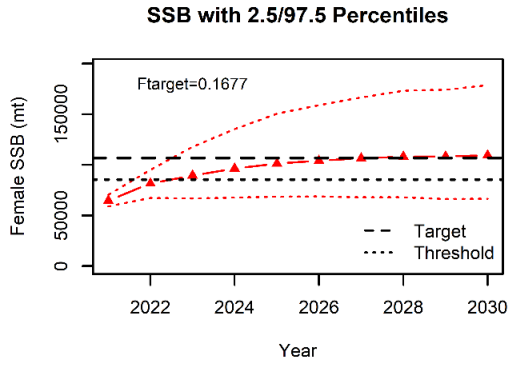
TOR 6

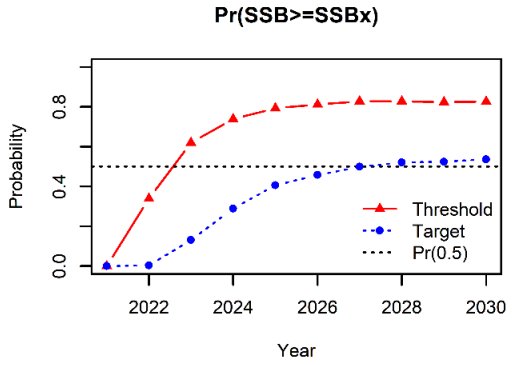
CONDUCT SHORT TERM PROJECTIONS WHEN APPROPRIATE.

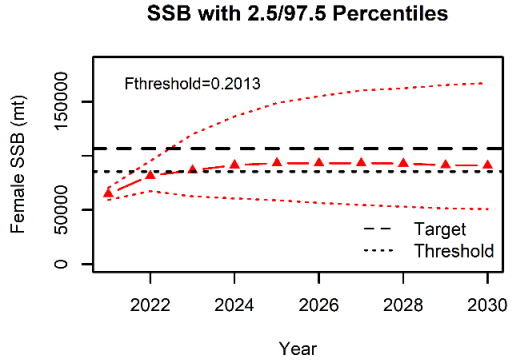
Projected through 2030 using $F_{current}$, F_{target} and $F_{threshold}$ under "low" recruitment

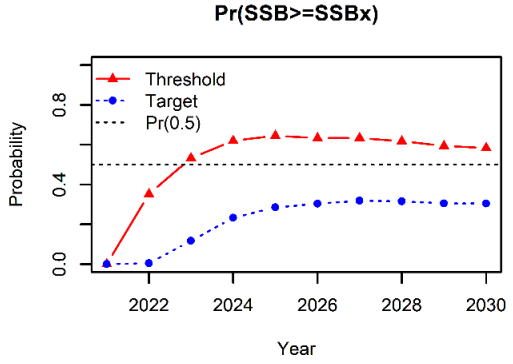












2029

F	Prob. $SSB \geq SSB_{threshold}$	Prob. $SSB \geq SSB_{target}$
$F_{current}$	96.7%	78.6%
F_{target}	82.4%	52.5%
$F_{threshold}$	59.4%	30.5%

Conclusions

- Stock is **overfished**

- Overfishing is not occurring, relative to the new, low-recruitment F reference points

- There is a 78.6% chance that the stock will be at or above the SSB target in 2029 under current F

  →No further reductions are needed at this time

Conclusions

- Sources of uncertainty:
  - 2020 and 2021 data are more uncertain because of COVID-19
  - Retrospective pattern has changed direction
    - Underestimates F and overestimates SSB now
  - Only 2 years of data with the new selectivity blocks

- Monitor removals closely and conduct another update in 2 years to track rebuilding progress

Questions

Review Connection to 2022 Stock Assessment

- **Amendment 7 ‘fast-track’ response provision**
- **Juvenile Abundance Indices (JAIs), Recruitment, and Rebuilding**

Amendment 7: Fast-Track Response

- IF the 2022 assessment update indicates:
  - There is less than a 50% probability of rebuilding the stock by 2029 (low recruitment assumption)

  AND

  - At least a 5% reduction in removals is needed to achieve *F* rebuild

- THEN the Board may adjust measures via Board action (i.e., by voting on measures at a Board meeting)

Amendment 7: Fast-Track Response

- Criteria:
  - There is ~~less than a 50% probability~~ of rebuilding the stock by 2029 (low recruitment assumption)

    Assessment indicates greater than 50% probability

  - At least a ~~5% reduction in removals~~ is needed to achieve *F* rebuild

    Assessment indicates no reduction

- Fast-track response criteria are <u>not</u> met
- Any action by the Board would be via the <u>addendum process</u>

JAIs and Age-1 Recruitment

Age-0 JAIs: NY, NJ, MD, VA

Age-1 Indices: NY, MD

→ Stock Assessment Model Estimate of Age-1 Recruitment

- Four JAIs and two age-1 indices are weighted internally by the model to estimate age-1 recruitment
- Maryland JAI is closely correlated to the model estimate of age-1 recruitment, indicating the Maryland JAI is a good predictor of coastwide age-1 recruitment

JAIs and Age-1 Recruitment

- Assessment terminal year of 2021
- Estimates age-1 recruitment through 2021 → incorporates age-0 JAIs through 2020
- Low Maryland JAIs from 2019-2020 translate into below-average age-1 recruitment in 2020 and 2021
- Low 2021 and 2022 Maryland JAIs will inform the 2022 and 2023 age-1 recruitment in the next assessment

Recruitment and Rebuilding

- 2022 assessment uses low recruitment assumption for rebuilding projections and reference points
  - Model draws future age-1 recruitment from low recruitment period only (2008-2021)
- Recent below-average year classes won't reach maturity until 2027 and beyond; may not significantly affect SSB until after 2029 deadline
- Future stock assessments will provide updated projections as recent below-average year classes enter the fishery and reach maturity

Questions

Atlantic Striped Bass
Draft Addendum I to Amendment 7
For Board Review

Atlantic Striped Bass Management Board

November 7, 2022

Statement of the Problem

- Questions/concerns raised about striped bass commercial quota system
  - 1970s reference period as basis for quotas (concerns about data quality at the time, inconsistent use in Amend. 6, etc.)
  - Other questions (e.g., fixed quotas vs. setting quotas annually)

- Concerns included in scoping for Draft Amendment 7, but commercial quota issue was not selected for further development
- Some support for addressing commercial quota issues separately from Amendment 7

Statement of the Problem

- In August 2021, the Board initiated this addendum to consider allowing for the voluntary transfer of commercial quota in the ocean region
  - Consider management option that could provide some, more immediate relief for states seeking a change to their quota

- Other Commission-managed species allow for the voluntary transfer of quota between states, which can address issues like shifting stocks, quota overages, etc.

Timeline

Date	Action
August 2021	Board initiated Draft Addendum
Aug-Oct 2021	PDT developed Draft Addendum document
October 2021	Board deferred consideration until May 2022 (later postponed until August 2022)
August 2022	Board provided guidance to PDT for further development
November 2022	**Board reviews revised Draft Addendum; consider approving for public comment**
Nov 2022-Jan 2023	Public comment (if approved)
February 2023	Consider selecting final measures

Note: This timeline is subject to change per the direction of the Board.

Revised Draft Addendum

- Initial development of the draft addendum in 2021 was constrained due to focus on Amendment 7
- Board provided guidance at the August 2022 meeting for further development
- PDT developed a revised Draft Addendum I for Board review today

Today

- Review PDT revisions, question for the Board, and range of options in the draft addendum (PDT memo)

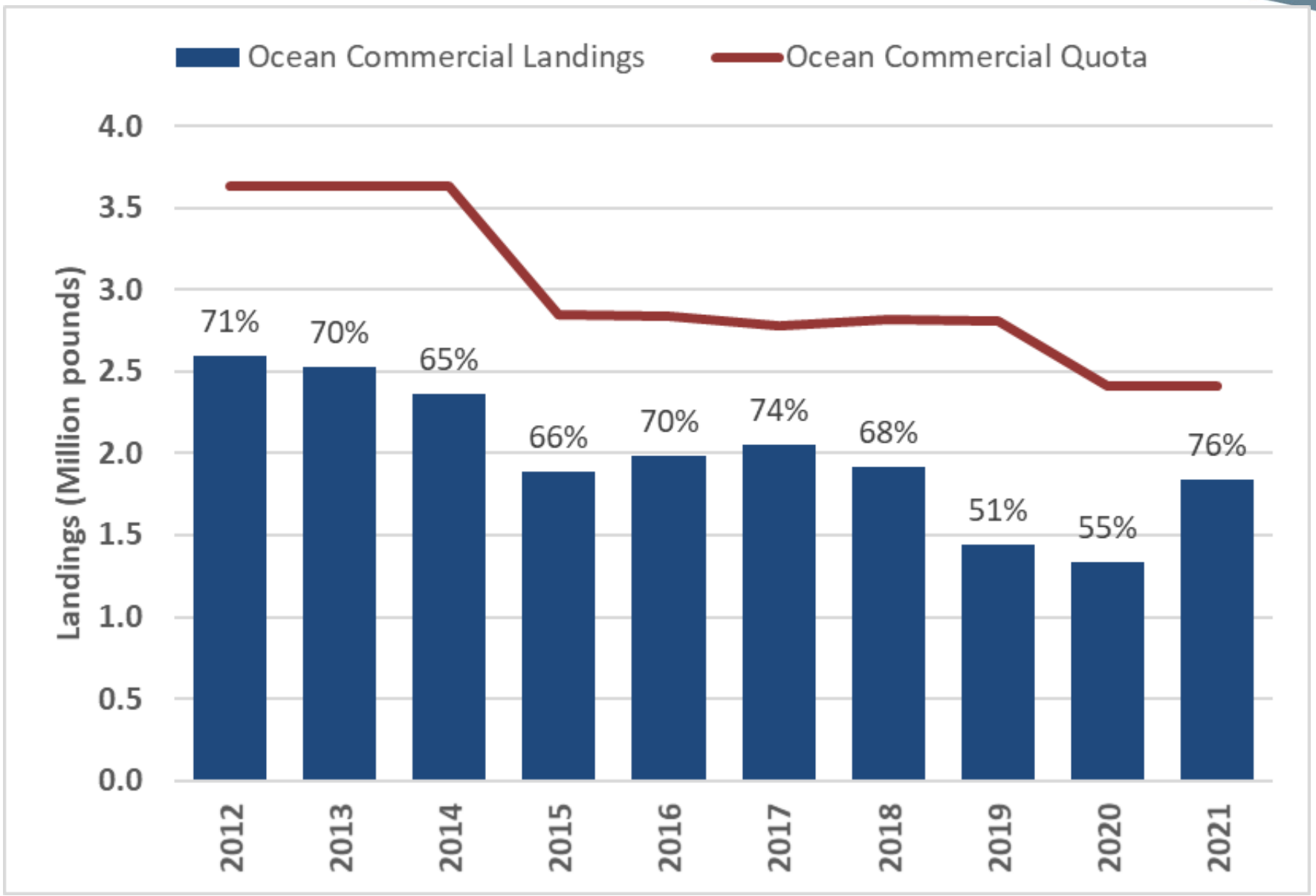
<u>Board action for consideration:</u>

Consider approving Draft Addendum I for public comment.

Background Sections

- Revised background sections with more narrow focus on the commercial quota system and ocean fishery, including:
  - More detailed history of quota changes in the FMP (pre- and post-Amendment 6)
  - Information on ocean quota utilization

Background Sections



Background Section

- Quota utilization section notes concern from the 2021 PDT memo:
  - Allowing quota transfers could increase ocean quota utilization, which could undermine the goals and objectives of Addendum VI reductions
  - Commercial fishery consistently underutilizes quota (due to fish availability and state-specific measures)
  - Add VI reductions assumed the commercial fishery would underutilize its quota as it has in the past→ achieve the reduction in commercial removals
  - This assumption may be violated if transfers are permitted in the ocean region

Proposed Options

- Options consider allowing for the voluntary transfer of commercial quota in the **ocean region** between states that have ocean quota
- If transfers are permitted, quota would be transferred pound-for-pound
- Options do not address Chesapeake Bay quota
- Options do not consider transfers between the Chesapeake Bay and the ocean (or vice versa)

Proposed Options

- Commercial quota that has been reallocated to a state's recreational fishery (i.e., recreational bonus program) is not eligible to be used for commercial quota transfers
  - When developing CE proposals, states can specify reallocation of all or part of their commercial quota to a recreational fishery.
  - Any portion of the state's commercial quota that is not reallocated to the recreational fishery may be used for commercial quota transfers.

[Added by PDT]

Proposed Options

Range of options to consider the voluntary transfer of commercial ocean quota

Status Quo Option A: Transfers not permitted.

Option B: General provision: transfers are permitted.

Option C: Limited transfers based on stock status.

Option D: Board discretion on transfers.

Option E. Limited transfers based on stock status and Board discretion.

Options are mutually exclusive; can select one option.

Proposed Options

Option B. General transfer provision: Voluntary transfers of ocean quota would be permitted.

- Occur up to 45 days after last day of calendar year
- Must receive letter from giving and receiving state
- No limit on the poundage of a transfer
- Transfer is approved after written correspondence from commission; no Board approval required
- Transfers are final upon receipt of letters
- Transfers do not permanently impact state shares
- States are still responsible for quota overages of transferred quota

Proposed Options

Option B. General transfer provision: Voluntary transfers of ocean quota would be permitted.

- Occur up to 45 days after last day of calendar year
- **Question for the Board:** In addition to providing in-season relief for states seeking additional quota, is the Board's intent also for quota transfers to address overages after the season ends?
- If no, the Board could modify the transfer process as such (e.g., remove the provision allowing transfers 45 days after year-end)

Proposed Options

Option C. Limited transfers based on stock status: Voluntary transfers would not be permitted when the stock is overfished.

- Same general process as previous option B, except no transfers when stock is overfished
- PDT added this option, which was raised in Board and PDT discussions, and in public comments
- Address concerns about allowing transfers during stock rebuilding
- However, given the current overfished status of the stock, this option would not provide near-term relief to states seeking additional quota

Proposed Options

Option D. Board discretion on transfers: Board would decide whether voluntary transfers are permitted in the next one or two years.

Option added by the Board at August 2022 meeting

- Board would decide by their final meeting of the year whether to allow transfers in the next one or two years, based on stock status and fisheries performance information

- Transfers are not permitted unless the Board decides to allow them (i.e., if the Board doesn't make a decision for a particular year, transfers not permitted that year)

Proposed Options

Option D. Board discretion on transfers: Board would decide whether voluntary transfers are permitted in the next one or two years.

Board may choose to specify one or more of the following criteria:

- A limit on the transferable amount of quota (e.g., a set poundage or a set percentage of the total commercial quota);
- Further, a seasonal limitation on its transferability (e.g., no more than 50% of the transferable quota amount may be transferred before July 1).
- The eligibility of a state to receive a transfer based on percentage of that state's quota landed (e.g., state may not request quota until it has landed 90% of its annual quota).

If the criteria are implemented, the Board should be as specific as possible when developing criteria

Proposed Options

Option D. Board discretion on transfers: Board would decide whether voluntary transfers are permitted in the next one or two years.

Note: If the Board selects this option and the Addendum is approved during 2023, the Board could decide at the time of the Addendum's approval whether to allow transfers for the 2023 fishing year.

- Then the Board would start the regular process of deciding about transfers before the next year begins (i.e., make decision for 2024 by Fall 2023)

Proposed Options

Option E. Limited transfers based on stock status and Board discretion: Board would decide whether voluntary transfers are permitted, except no transfers permitted when the stock is overfished.

- Same process as Board discretion option D, except no transfers permitted when stock is overfished
- Address concerns about allowing transfers during stock rebuilding
- However, given the current overfished status of the stock, this option would not provide near-term relief to states seeking additional quota

Compliance Schedule

- Measures approved through this Addendum would be effective immediately on the date of approval.

- If commercial quota transfers are permitted, states must account for any additional quota potentially received via transfers when determining the number of commercial tags required for the upcoming season.

Transfers and Different Size Limits

- Concern a pound of striped bass commercial quota is not equal across all states
  - States catch different size striped bass (due to variability in size distribution along the coast, different size limits, gears, and seasons, etc.)
  - Through CE, states have made adjustments to their commercial size limits from the historical standard, resulting in changes to their quota over time

- Standard pound-for-pound transfers would be efficient, but there is uncertainty with moving quota between states that catch different size fish

Transfers and Different Size Limits

- PDT considered “same number of fish” approach
- Intent of transferring the same number of fish to the receiving state as would have been harvested in the donor state for that quota amount
- Requires average weight of commercially harvested fish, which could be difficult to determine
  - Not all states have recent commercial harvest
  - Commercial catch can vary within a state depending on gear/area/time of year
- TC could provide criteria to determine average weight, but there would still be assumptions

Transfers and Different Size Limits

- PDT considered “maintain spawning potential” approach
- Intent of maintaining at least equivalent spawning potential as the quota moves from the donor state size limits to the receiving state size limits
- Based on YPR/SPR analysis (same methodology used for CE)
- Requires inputs including natural mortality, weight at age, and maturity and selectivity curves
- Could more thoroughly address concerns, but would be complex and time-consuming requiring TC review

Transfers and Different Size Limits

- Ultimately, PDT supports moving forward with the standard **pound-for-pound** transfer approach
  - Complexity and uncertainty of alternative approaches
  - Potentially small amount of quota that would be transferred and voluntary nature of transfers
- Draft addendum notes that if transfers are permitted, there is inherent uncertainty associated with transfers between states that harvest different size striped bass
- Uncertainty could potentially be limited if there is a limit on the amount of quota that could be transferred each year

QUESTIONS?

Board action for consideration:

Consider approving Draft Addendum I for public comment.