



Atlantic States Marine Fisheries Commission

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Atlantic Striped Bass Technical Committee and Plan Development Team Meeting Summary

Webinar
June 28, 2023

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Meeting Overview

The Atlantic Striped Bass Technical Committee (TC) and Draft Addendum II Plan Development Team (PDT) met via webinar on June 28, 2023 to continue discussions on estimating the impact of the 2023 Emergency Action and development of 2024 management options for Draft Addendum II. The June 28 meeting is a follow-up to the June 5 TC-PDT meeting. The June 5 meeting summary is available here: http://www.asmfc.org/uploads/file/648b4274SBTC-PDT_MeetingSummary_06.05.23.pdf.

Estimating 2023 Removals Accounting for Emergency Action

TC Task for Emergency Action

The TC discussed methods to estimate 2023 removals accounting for the emergency 31" maximum size limit implementation. An estimate of 2023 removals is needed to project what level of 2024 removals would achieve the fishing mortality target for Draft Addendum II development.

Brief Review of Method #1: Past Strong Year-Class Estimation

The TC discussed Method #1 during the June 5 meeting. Method #1 estimates 2023 removals using 2018-2019 data to simulate fish availability and recreational catch when a strong year class (2011-year class as proxy) moves from age-7 to age-8 in the fishery, just as the 2015s are

moving from age 7 to 8 from 2022-2023. Overall, the preliminary estimate is a 29% reduction in 2023 total removals relative to 2022 due to the emergency 31" recreational maximum size limit. The TC noted this method and assumptions are reasonable to estimate 2023 removals. The benefit is this is an empirical approach based on past observed data. One noted assumption is this method assumes any change in effort from 2018 to 2019 would also occur from 2022 to 2023. See [June 5](#) meeting summary for more detail.

Method #2: Size-Bag Simulation Model

In response to the TC request for a second estimation of 2023 removals using a projection-based method, G. Nelson presented a size-bag model that simulates the impact of recreational size and bag limits on a two-sex population over a monthly time step. The simulation model is currently developed with data and equation parameters for striped bass. The population is modeled as length platoons that initially have abundance and age assigned to each interval. Besides natural mortality, fish may be harvested and released under different size and bag limits (for the latter, some fish die due to handling). The model creates a total catch per trip from MRIP to correlate with total abundance from the stock assessment. As time progresses, fish grow at a specified monthly rate. Age-1 recruits are generated by using either a recruit-female SSB equation or by sampling from a vector of user-specified recruitment values.

The simulation was run to determine the relative change in removals between regulations (1 fish at 28-35 slot versus 1 fish at 28-31 slot). There are no underlying regulations for Chesapeake Bay in the simulation because the population is not split into area components in this simulation model. The simulation model underestimated harvest and overestimated releases in 2022, but the total projected removals (6.5 million fish) were relatively close to the observed 6.8 million fish. The model estimated the relative change between 2022 and 2023 with the new 31" maximum size limit to be a 30.7% reduction relative to 2022, similar to the Method #1's 29% reduction estimate.

The TC agreed that an average of Method #1 and Method #2 (average ~30% reduction from 2022) should be used to estimate 2023 removals. The TC noted that considering both methods contributes to a stronger estimate, and both methods are reasonable for this estimation. There is some assumed error in either method which is difficult to fully characterize. The TC noted the size-bag simulation model could be further refined and considered for future use, including for projections following the 2024 stock assessment update.

Implementation Assumptions for 2023

The TC discussed implementation assumptions for the emergency action. Both estimation methods assumed implementation occurred in Wave 3 for the ocean. Method #1 assumed Wave 4 implementation for the Chesapeake Bay to avoid the Wave 3 trophy season, which was not subject to the new maximum size limit. Some expressed concern that a few ocean fisheries did not implement the emergency action until the very end of Wave 3 or beginning of Wave 4, particularly New York (June 20 implementation) and New Jersey (July 2 implementation) which contribute significantly to ocean harvest.

The TC agreed that using the Wave 3 implementation date was still reasonable, considering most other states implemented in May. However, a sensitivity run will be conducted assuming a Wave 4 ocean implementation date for comparison. Even if the 2023 removals estimate is higher with a Wave 4 ocean assumption, the resulting percent reduction needed for 2024 may be minimally affected since the model also takes into account population dynamics. One TC member pointed out that an overestimation of the ocean reduction in Wave 3 may be partially offset by the underestimation of the Bay reduction in Wave 3 (since the Bay Wave 3 is not counted).

*Following the June 28 call, sensitivity runs were conducted using Method #1 to explore different assumptions for estimating 2023 removals, and the resulting impact on the percent reduction needed for 2024. Results are provided in the **Appendix**. With these sensitivity runs, the percent reduction needed to achieve F-target in 2024 was only minimally affected (~1-2%).*

New Selectivity for 2023-2024

One challenge noted on the previous TC call was determining what selectivity to use for projections accounting for the emergency action. G. Nelson estimated new selectivity for 2023-2024 using the following method:

- 1) Combine state ALK keys that have been expanded to the total number across each component (Rec Harvest, Rec Dead Releases, Comm Harvest). Dead Commercial Discards are included by using the ALK of the Comm Harvest.
- 2) Within an age, calculate the fraction that each length interval of each component comprises of the summed total of all components.
- 3) Within an age, multiply step 2 fractions for each length interval of each component by the age-specific F .
- 4) Apply the new slot to recreational harvest component, make lengths outside slot zero, but transfer $F \cdot 0.09$ to the Rec Dead Releases.
- 5) Sum the age-specific F s across components, standardize new F vector to one ($F/\max(F)$).

The new selectivity accounting for the 31" recreational maximum size limit results in a lower selectivity for ages 7-9 fish as compared 2022 stock assessment estimated selectivity (Figure 1).

The TC agreed this is a logical approach and this new selectivity can be applied to Draft Addendum II calculations to capture the effect of the 2023 emergency action. However, this selectivity should not be applied for projections beyond 2024 since selectivity will likely change again with new regulations. The TC agreed that rebuilding projections through 2029 should not be conducted until the 2024 assessment when observed 2023 data are available.

Following the June 28 call, the new 2023 selectivity along with the average 2023 removals from Methods #1 and #2 were applied to the Draft Addendum II calculations. The new selectivity was also applied to re-calculate F-target for 2024 since F-target depends on selectivity. To achieve the updated 2024 F-target of 0.176 (compared to 0.168 from the 2022 assessment), a 14.5% reduction in removals is needed relative to

2022 removals (compared to the initial 16.0% reduction estimate with the original selectivity).

The TC also discussed broader questions about the estimated selectivity for striped bass and why selectivity is relatively high at higher ages, even under a slot limit. One contributing factor is the difficulty of modeling a predominantly catch-and-release fishery. This has been an ongoing question regarding the selectivity estimate, and can be further discussed during future assessments. Additionally, a TC member raised the issue of low MRIP length frequency sample size in Delaware, and the need to discuss this issue further.

Draft Addendum II Guidance for 2024 Management Options

General Methods

For recreational option analysis, the TC recommended using length frequencies (LF) from 2020, when the strong 2011 year-class was age-9, to provide comparable fish availability to 2024 when the 2015 year-class will be age-9. **The TC clarified this recommendation to use 2020 LF's applies to the ocean only since the 2015 year-class will continue to be accessible in the ocean, but no longer in the Bay. For the Chesapeake Bay, the TC recommends the PDT compare 2020 LF's to 2021 LF's and consider which year is more representative of what 2024 fish availability may look like in the Bay considering other year classes (e.g., 2018 year class).**

The TC further discussed the rationale for not using 2022 LF's for this analysis, particularly for the ocean. The growth of a strong year class influences size distribution, so exploring options for 2024 using 2022 LF's would not be appropriate without a way to project 2022 LF's forward to represent growth of the 2015 year-class. The 2020 LF's offers a better proxy for what fish availability might look like in 2024, including accounting for other year classes behind the 2015s also becoming available to the ocean fishery. The TC acknowledged that while there were COVID impacts on 2020 data, length frequency data is subject to uncertainty in all years (i.e., what fish happen to be measured in a given year?). 2020 still offers a better fish availability proxy to characterize what catch might look like in 2024 for this analysis.

The TC agreed that the LF reduction analysis should be self-contained (i.e., if 2020 LF's are used to explore size limit options, the reduction provided by each option should be calculated using 2020 as the reference year). Determining the necessary percent reduction is based on a 2024 to 2022 comparison, but determining whether different size limit options meet that percent reduction is based on 2020 LF's which represent what size fish would be caught in the 2024 fishery. This is the same protocol used for Addendum VI calculations. Reduction calculations also use the same assumptions as the Addendum VI calculations (e.g., assume fish no longer harvested under size limit options are added as new releases).

For PDT analysis, LF's were generated from MRIP including conversion from FL to TL, and compiled using both 0.25" length bins and 1" length bins by mode. The quarter inch length bins can be used for inclusive slot limit options; for example, a 28-31" slot assumes legal harvest up to and including the 31.0" length bin of 31.0-31.24". The extra quarter inch accounts for

measurement rounding, conversion mm-inches, etc. The one-inch length bin can be used for 'less than' slots; for example, a 28-<31" slot including the 30" length bin to account for harvest up to 30.99".

Ocean Recreational Options

To calculate the ocean non-compliance rate, pooled 2021-2022 data for harvest above the slot was used because 2020 data had very high non-compliance, and it's unclear how much of that is due to using the pre-Add VI slot data in the data imputation. All harvest below the slot is assumed to continue, as it is a mix of non-compliance and compliance with different, regional size limits established through CE, and difficult to separate.

The 2020 ocean length frequencies included unusually high estimates in the 19" and 21" size bins. **The TC was not concerned about these estimates, as they could be younger year-classes entering the ocean fisheries over time.**

The PDT is considering ocean slot limit options starting with the emergency action 28-31" slot and expanding from there (28-32", etc.). The PDT may also consider different options by mode. In addition, the PDT is considering combined size limit/harvest closure options. For the harvest closure options, the percent harvest closure reduction is calculated using 2022 harvest data by wave to determine the number of fish per day that would no longer be harvested during a harvest closure of x# days in a particular wave. Those fish are then assumed to be new releases. 2022 harvest data by wave is being used for the harvest closure component because COVID likely impacted when people were fishing during 2020, and likely skewed the proportion of harvest by wave in 2020.

A combined size limit/closure option will have two percent reduction components: 1) size limit percent reduction calculated using 2020 LF's, and 2) harvest closure percent reduction calculated using 2022 data. Those percent reductions can be combined using the following equation, which has been used for other species including bluefish, black sea bass, and cobia to calculate cumulative reductions. If one regulation gives us an X% reduction by itself, and a different kind of regulation gives us a Y% reduction by itself, then the reduction from both measures combined is:

$X + [(1 - X) * Y]$. It can also be written as: COMBINED REDUCTION = X+Y – X*Y.

The TC agreed these ocean methods are reasonable, including using 2022 data to estimate harvest closure reductions by wave.

Chesapeake Bay Recreational Options

Chesapeake Bay recreational fisheries currently operate under varying size limits, seasons, and bag limits by jurisdiction. Current measures are summarized at the end of this document.

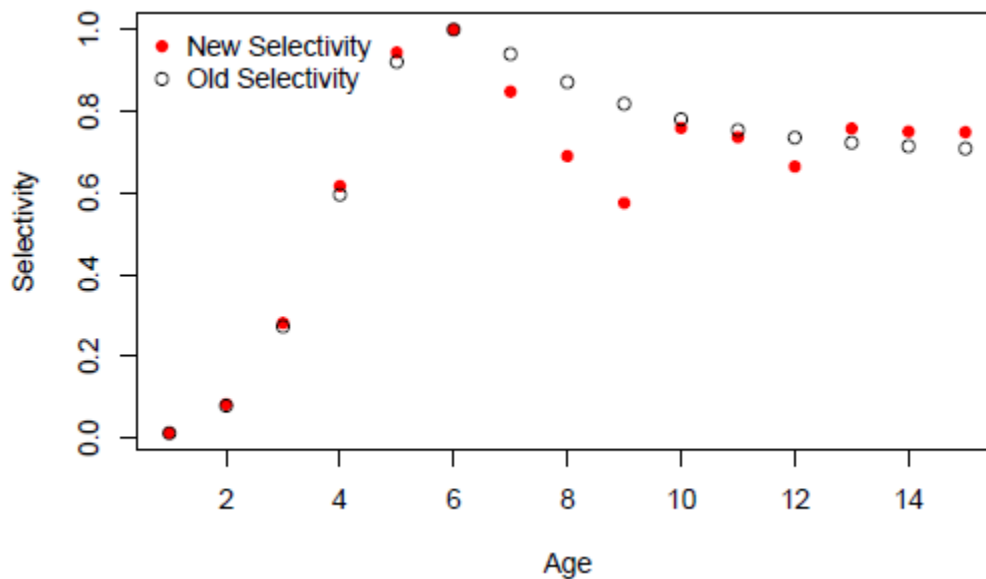
The initial option calculations to achieve a Chesapeake Bay recreational reduction consider implementing a consistent maximum size limit across all Bay jurisdictions while maintaining the jurisdiction-specific status quo minimum sizes, bag limits, and seasons. These maximum size

limit options may also be combined with a new Wave 6 closure to explore slot size vs. closure tradeoffs. Additional options are being developed that will attempt to standardize more than one measure across jurisdictions (e.g., standard minimum and standard maximum size with a standard bag limit across all Bay jurisdictions); however, these calculations are more complex since each state has a different starting minimum size, different starting bag limits, and PRFC intercepts are intertwined in MD-VA MRIP data.

2020 length frequencies for Chesapeake Bay include some Maryland landings in Wave 2 (March-April). Given APAIS was not operational in March-April 2020, these landings are likely imputed data from 2019 when the trophy season started in Wave 2 April vs. the current Wave 3 May start date. **If 2020 length frequencies are used, the TC agreed these Wave 2 landings could be removed.**

To calculate non-compliance for the Bay, the PDT is developing an estimate based on undersize fish from Maryland and oversize from Virginia (since Virginia has a slot limit). Virginia's minimum size is 20", but the 2020 length bin of 19.75" from VA had a very large estimate (~14,000 fish of VA's ~50,000 fish total harvest). PDT decided to exclude those 19.75" fish from the non-compliance estimate since they suspect most of these were likely legal fish that are being binned down due to the way the bins are set up and the error/variance associated with the FL-TL conversion. **The TC agreed this issue is likely due to FL-TL conversion and other error, and agrees with PDT discretion here.**

Figure 1. New 2023 selectivity in red for the combined Ocean+Bay accounting for the emergency action 31" recreational maximum size limit.



Striped Bass Reduction Sensitivity Runs

July 5, 2023

Sensitivity runs were conducted to develop estimates of predicted removals in 2023 under different assumptions, and projections were run to estimate the total removal level in 2024 that would result in a 50% chance of F being at or below the F target with those 2023 removals.

TC-Preferred Base Model

- 30% = Average of the 29% predicted by the original empirical method and the 31% predicted by G. Nelson's size-bag limit model

Original Empirical Method

- 2018 and 2019 used as proxies for 2022 and 2023
- Add. VI regulations applied to 2018 and 2019, then Emergency Action regulations applied to those removal estimates
- EA regulations assumed to start in Wave 3 for the ocean region and Wave 4 for the Bay
- Calculate the percent reduction from 2018 removals under Add. VI to 2019 removals under EA
- Apply the percent reductions for the ocean and Bay for the affected waves to the Wave 3-6 2022 ocean recreational removals and Wave 4-6 Bay 2022 recreational removals to calculate predicted reduction in removals for 2023 for those regions/waves
- 2023 predicted recreational removals added to 2022 values for commercial harvest, commercial discards, and recreational removals from pre-EA waves to calculate total predicted removals in 2023 and the reduction from 2022 levels

Sensitivity Runs

- Start the EA measures in Wave 4 in the ocean instead of Wave 3
- Assume Bay removals in 2023 are the same as Bay removals in 2022 (since the effect of the EA regulations was minimal; the main driver of the decrease was the decline in removals from 2018 to 2019 under constant regulations)
- Calculate the expected reduction relative to 2019 instead of 2018 (compare EA removals in 2019 to Add. VI removals in 2019)

Projections

The re-estimated selectivity for 2023 was used for 2023 and 2024, and the F target was recalculated with the new selectivity.

Results

The estimated reduction due to the EA ranged from a maximum of 28.7% for the base case down to a minimum of 15.7% for the reduction relative to 2019.

The target levels of removals in 2024 to achieve F target ranged from 5.55 million fish for the base case to 5.47 million fish for the reduction relative to 2019. This translates into a reduction of 14.5% to 15.9% relative to 2022 levels.

Table 1: Observed removals by sector for 2022

Year	Scenario	Commercial Harvest	Commercial Discards	Recreational Harvest	Recreational Release Mortality	Total
2022	Observed	599,615	81,200	3,454,022	2,667,846	6,802,683

Table 2: Estimated removals for 2023 and target removals for 2024 under different assumptions.

Year	Scenario	Total Removals	% Difference from 2022	2024 Target Harvest	% Difference from 2022
2022	Observed	6,802,683	--	--	--
2023	Base Model (30% Avg)	4,761,878	-30.0%	5,816,800	-14.5%
2023	Original Method	4,847,649	-28.7%	5,808,321	-14.6%
2023	EA in Wave 4 in Ocean	5,174,172	-23.9%	5,775,645	-15.1%
2023	Bay 2023=Bay 2022	5,536,344	-18.6%	5,739,363	-15.6%
2023	Relative to 2019	5,733,177	-15.7%	5,719,627	-15.9%