



Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: Striped Bass Management Board

FROM: Striped Bass Technical Committee and the Stock Assessment Subcommittee

DATE: October 16, 2024

SUBJECT: Release Mortality Calculations and No-Targeting Closure Tasks

In August 2024, the Board tasked the Striped Bass Technical Committee (TC) with calculations to determine how decreasing recreational release mortality could contribute to any potential reduction needed to achieve rebuilding. Part of this tasking required the TC to identify a method for estimating the reduction in live releases associated with no-targeting closures. The TC met in September and October 2024 to address these tasks.

Release Mortality Calculations

Task 1. If a reduction is needed to achieve rebuilding, determine how low the release mortality rate would need to be to achieve that entire reduction through the release mortality rate alone. If the number of live releases is constant, what would the release mortality rate need to be to achieve the reduction?

Task 2. If a reduction is needed to achieve rebuilding, determine the percent reduction in number of live releases needed to achieve the entire reduction through live releases alone. Using the current 9% release mortality rate, how many fewer live releases would there need to be to achieve the reduction?

Response: For Tasks 1 and 2, the calculations depend on what proportion of total removals is attributed to recreational release mortality. In 2023, recreational release mortality was 42% of total removals so that proportion was used for these calculations. These scenarios assume that a needed reduction would be fully achieved through reducing the release mortality component of fishery removals (i.e., commercial removals and recreational harvest are assumed constant). The hypothetical release mortality rate (Task 1) and the hypothetical reduction in live releases (Task 2) were calculated for a 4% reduction, which is the lowest reduction needed to achieve the fishing mortality (F) rebuilding rate under the various projection scenarios in the 2024 Stock Assessment Update, and for a 15% reduction for reference. The results are summarized in the tables below.

Regarding the proportion of total removals attributed to recreational release mortality, the TC-SAS considered a range from 39% of total removals (the proportion of release mortality in 2022 when the strong 2015 year-class was available) to 50% of total removals (the

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proportion of release mortality in 2021 before the strong 2015 year-class was available). The results were not especially sensitive to that assumption over the range considered.

**Task 1: Reduction in Release Mortality Rate to Achieve Reduction
(assuming release mortality is 42% of total removals)**

	Current Release Mortality Rate Used in Stock Assessments	Task 1 Hypothetical Release Mortality Rate to achieve entire reduction
4% reduction from total removals	9%	8.1%
15% reduction from total removals	9%	5.8%

**Task 2: Reduction in Live Releases to Achieve Reduction
(assuming release mortality is 42% of total removals)**

	Task 2 Hypothetical Reduction in Live Releases to achieve entire reduction
4% reduction from total removals	-9.5%
15% reduction from total removals	-35.8%

If total removals need to be reduced by 4%, and that entire reduction was achieved by reducing dead recreational releases:

- a release mortality rate of 8.1% is needed if the number of striped bass caught-and-released alive remains constant; OR
- live releases would need to be reduced by 9.5% under the current 9% mortality rate.

If total removals need to be reduced by 15%, and that entire reduction was achieved by reducing dead recreational releases:

- a release mortality rate of 5.8% is needed if the number of striped bass caught-and-released alive remains constant; OR
- live releases would need to be reduced by 35.8% under the current 9% mortality rate.

Task 3. If a reduction is needed to achieve rebuilding, determine the percent reduction in number of live releases needed under the current 9% mortality rate, assuming there is an associated reduction in recreational harvest due to no-targeting closures.

Task 4. Identify the tradeoffs of implementing no-targeting closures at different times of the year with different assumed release mortality rates to help inform when/where implementing no-targeting closures would result in the highest reduction. Factors could include water temperature and salinity, with the assumption that the release mortality rate is higher when the water temperature is high and the salinity is low.

Response: The TC-SAS has identified a method to estimate the reduction in total removals associated with no-targeting closures (see below). The TC-SAS could apply that methodology coastwide with additional guidance from the Board on what percent reduction management is aiming to achieve (Task #3) in light of the 2024 Stock Assessment Update results. The TC-SAS can address Task #4 at the same time Task #3 is addressed.

Method for Quantifying the Reduction Associated with No-Targeting Closures

A. Giuliano (MDDNR) provided an overview of the evaluation of the no targeting closures implemented in the Maryland Chesapeake Bay starting in 2020 for April 1-30 (half of Wave 2) and for 16 days during Wave 4. In 2020, the Wave 4 closure was August 16 through August 31, and from 2021 onward, the closure is July 16 through July 31. In addition to these closures, Maryland implemented other recreational management changes at the same time, including a shortened trophy season (May 1 start date) and reduced bag limit for private anglers (2 fish to 1 fish). The charter bag limit stayed at 2 fish for charter boat anglers if the charter boat was enrolled in the charter electronic reporting system.

MDDNR tested various assumptions about how striped bass trips and releases would change during a no-targeting closure to estimate the decrease in live releases. The final method and assumptions used to estimate the change in live releases is as follows. Trips that were only targeting striped bass (e.g. no other species were targeted) were assumed to no longer release any striped bass. If striped bass were targeted with a second species, those trips would still release striped bass but at a lower non-targeted rate. All striped bass releases from non-targeted trips (i.e., incidental catch) would still occur.

MDDNR reviewed MRIP data for striped bass directed trips, harvest, and live releases to compare effort and removals in Wave 2 and Wave 4 for the five years prior to the no targeting closures (2015-2019) to the four years since the no targeting closures were implemented (2020-2023). There was a decrease in directed fishing effort for striped bass in Maryland's Chesapeake Bay after the closures, and harvest, live releases and total removals estimates also declined after the no targeting closures were implemented, particularly for private and shore modes. It is important to note that other factors (e.g., fish availability, year-class strength, and the private angler trip limit changing from 2 fish to 1 fish) are also contributing to these results. To reduce the effects of changing fish availability and year class strength, the results were also presented to the TC-SAS as the proportions of directed trips, harvest, and live releases across the year. These results also showed a decrease in directed fishing effort, harvest, and live releases after the no targeting closures were implemented. Anglers reported targeting other Bay species more heavily during the closures as compared to prior to the closures when striped bass was the most targeted species.

The TC-SAS asked for more information on the Wave 2 data. It appears there were some changes in effort and harvest prior to the no targeting closure between 2015-2019, so MDDNR provided additional insight on other regulation changes (e.g., trophy season size limit changes

and season start dates (3rd Saturday of April)) that likely impacted decreases in directed trips observed prior to the April closure/shortening of the trophy season.

MDDNR provided a summary of predicted vs. realized reductions for recreational harvest, release mortality, and total removals (Table 1). In addition to the realized reductions, there was a shift in the species anglers reported targeting during the closure, which also points to success of the closures from MDDNR's perspective. When considering applying this methodology to the ocean, the other species anglers report targeting might be different, so the ultimate impact of a no-targeting closure in the ocean may be different than in the Chesapeake Bay. A high proportion of anglers in the Chesapeake Bay are only targeting striped bass in the summer, which may result in a larger scale reduction in the Bay as compared to a similar closure in the ocean.

The TC-SAS agreed the closures generally seem successful in reducing total removals, but uncertainties around fish availability, angler behavior, and where people are shifting their effort (to other species) are important influences on the likelihood of success of these programs to consider. Tools like recreational demand models (RDMs)¹ could be helpful in the future to get a better handle on some of these uncertainties.

Overall, the TC-SAS agreed the MDDNR method for estimating the reduction in total removals associated with no-targeting closures is appropriate to apply coastwide if the Board considers no-targeting closures as a future management action.

¹ Carr-Harris, A and S Steinback. 2020. Expected economic and biological impacts of recreational Atlantic striped bass fishing policy. *Frontiers in Marine Science* 6:814. <https://doi.org/10.3389/fmars.2019.00814>

Table 1. Comparison of Addendum VI conservation equivalency estimated vs. realized reductions for Maryland’s no-targeting closures implemented in 2020. Source: Maryland Department of Natural Resources.

	Harvest		Dead Releases		Total Removals	
	Estimated Reduction (2015-2018)	Realized Reduction (2020-2023)	Estimated Reduction (2015-2018)	Realized Reduction (2020-2023)	Estimated Reduction (2015-2018)	Realized Reduction (2020-2023)
Wave 2	-100%	-99.1%* (-100%)	-20.5%	-19.2%* (-12.7%)	-77.4%	-76.1%* (-74.8%)
Wave 4	-40.6%	-55.5%	-15.3%	-56.6%	-30.4%	-56.0%
Annual	-31.6%	-44.0%	-4.8%	-51.2%	-20.6%	-47.1%

* wave 2 comparison included 2020 data which was all imputed due to COVID impacts on APAIS sampling. Parenthetical value underneath is without the 2020 data included (i.e. comparing to just 2021-2023)

Realized reduction calculated comparing the 2015-2019 average harvest/dead releases/total removals to the 2020-2023 average harvest/dead releases/total removals