



# Atlantic States Marine Fisheries Commission

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## MEMORANDUM

April 22, 2019

**To: Atlantic Striped Bass Management Board**  
**From: Atlantic Striped Bass Technical Committee**  
**RE: Percent reduction in harvest to achieve F threshold and F target in 2020, and example recreational options to achieve those reductions**

At its February 2019 meeting, the Atlantic Striped Bass Management Board (Board) reviewed preliminary results of the 2018 Benchmark Stock Assessment for Atlantic striped bass which indicated the stock was overfished and experiencing overfishing. Unfortunately, due to the partial lapse in federal appropriations, the final assessment and peer-review panel reports were not available for this meeting and formal review of those reports was postponed to the ASMFC Spring Meeting. However, as a first step in determining a management response to the assessment findings, the Board made the following motion: “Move to task the TC with providing the Board with a report that shows the reductions in harvest needed to reduce F to F threshold (0.24) and F target (0.197) and also providing one example of recreational bag and size limit combination (if necessary, seasonal restrictions) needed to achieve these conditions a) on the coast and b) in the Chesapeake Bay and report back to the Board in May.”

M19-032

## **Task 1: Projections to determine harvest reductions**

### *Methods and Data*

The terminal year of the assessment was 2017, and, with guidance from the Board, the TC assumed management would be implemented in 2020. Therefore, the TC had to make assumptions about total removals in 2018 and 2019. Preliminary estimates of recreational removals were available for 2018, but estimates of commercial removals were not. The TC used the average ratio of commercial removals (harvest and dead discards) to total removals from 2015 – 2017 to estimate commercial removals for 2018-2020. Recreational removals in 2018 were significantly lower than in 2017 (5.0 million fish in 2018 compared to 6.4 million fish in 2017) (Figure 1). The TC ran projections using the 2018 total removals estimate as a proxy for total removals in 2019, and also ran projections using the average removals from 2016 – 2018 as a proxy for 2019 removals. Recreational dead releases are estimated using a 9% post-release mortality rate for MRIP's estimate of B2 striped bass (i.e., striped bass caught and released alive).

### *Results*

Projection results are shown in Table 1. In order to have a 50% chance of being at or below the F threshold ( $F=0.240$ ) in 2020, removals for 2020 needed to be 7.1 million fish. This is approximately equal to total removals in 2017, and a 26% increase from 2018 levels. This assumed that 2019 removals were equal to 2018 removals. Using the most recent 3-year average resulted in very similar results: removals to achieve the F threshold needed to be 7.0 million fish, a 1% decrease compared to 2017 and a 24% increase relative to 2018.

In order to have a 50% chance of being at or below the F target ( $F=0.197$ ) in 2020, removals for 2020 needed to be 5.9 million fish. This is a 17% reduction from 2017 levels and a 5% increase from 2018 levels. This assumed that 2019 removals were equal to 2018 removals; using the most recent 3-year average again resulted in very similar results: removals to achieve the F target would be equal to 5.8 million fish, an 18% decrease compared to 2017 and a 3% increase relative to 2018.

### *Discussion*

Overall, because of the reduction in removals in 2018 that has already occurred and the strong 2014 and 2015 year classes beginning to enter the exploitable population, there was a 50% chance of being at or below the F threshold in 2020 by keeping removals approximately equal to 2017 levels. To have a 50% chance of achieving the F target, an approximately 17% reduction from 2017 would be necessary (or no reduction relative to 2018).

It should be noted that for all of the scenarios, although striped bass female spawning stock biomass (SSB) increased slightly by 2020, SSB was still projected to be below both the target and the threshold (Figure 2).

The estimates from the projection analysis have uncertainties associated with them. For the projections, the 2018 and 2019 total removals are not known yet. The recreational data for

2018 are still preliminary, and commercial landing and discards are not available. In addition, the TC had to make an assumption about what removals in 2019 would be. The decline in recreational removals from 2017 to 2018 increased uncertainty about what removals would be like in 2019, but the sensitivity analysis suggested the estimate of the reduction necessary to achieve F threshold and F target were relatively similar even if removals in 2019 were higher than in 2018.

## **Task 2: Size and bag limit analysis**

### *Methods and Data*

The TC developed an example management change for the ocean recreational fishery and for the Chesapeake Bay (Bay) recreational fishery that would achieve a 17% reduction in total recreational removals (harvest and dead discards) relative to 2017 to reach F target. The TC assumed commercial removals would also be reduced by 17% through other management actions, so the reduction in total removals would be enough to bring F to the target. Since the ocean is already at a 1-fish bag limit and fishing seasons vary so much along the coast, the TC only looked at a size limit analysis for the ocean. For the Bay, a reduction in bag limit resulted in a greater than 17% reduction, so it is not presented here. A season analysis was conducted for the Bay that resulted in several options for reducing the recreational season and achieving the required 17% reduction. Due to the TC's request to see additional data on the daily catch rate assumptions for that analysis, and for simplicity and ease of comparison with the ocean, only the size limit analysis is presented here.

For this analysis, the TC used MRIP length frequency data from 2016 and 2017. In 2020, the 2014 and 2015 year classes will be the same age as the 2011 year class was in 2016 and 2017, so the TC believed that those years would be most representative of the size structure of the population in 2020.

Maryland and Virginia currently have different size limits within the Bay, so separate analyses were conducted for each state to achieve a 17% reduction within the Bay. In 2016 and 2017, Maryland's minimum size was 20 inches and was decreased to 19 inches in 2018. As 19 inch fish were not fully represented in the 2016-2017 harvest length frequency, the proportion of 19 inch fish in the harvest was estimated as the average proportion in the harvest from 2000-2014, when the minimum size was 18 inches.

### *Results*

Results for the regional size limit analyses are shown in Table 2. In the ocean (which includes ocean waters from Maine – North Carolina and non-Chesapeake Bay inland waters like Delaware Bay and Long Island Sound), the current minimum size limit is 28 inches. In order to reduce total removals by 17%, the size limit would need to be increased to 35 inches. This analysis assumed that current non-compliant harvest (harvest of fish smaller than the current size limit) would still occur. As with any increase in minimum size, dead releases would be expected to increase as anglers would have to release fish that were no longer of legal size.

Under the 35 inch size limit, dead releases are expected to increase by 3% in the ocean. This increase is more than offset by the reduction in harvested fish.

A 17% reduction is estimated if Maryland raised the minimum size limit from 19 inches for the summer/fall season to 21 inches. In Virginia, an 18% reduction is estimated if the 20 inch minimum size limit is increased to 22 inches. Under these scenarios, dead releases are expected to increase by 4.3% for Maryland and 3.5% for Virginia, but again, the increase is offset by the reduction in harvest.

### *Discussion*

The largest source of uncertainty comes from the assumptions made for the size limit analysis. As with all size, season, and bag limit analyses, the future availability of different size classes, and changes in effort and angler behavior resulting from management changes, or other factors cannot be incorporated into the analysis. As a result, the realized reductions from a size limit change could be very different from what was estimated. The TC chose years of catch length data where the size structure is similar to what the TC would expect to see in 2020, but there is uncertainty in that assumption, especially given that there has only been one strong year class in recent years prior to 2014 and 2015. Potential changes in effort and angler behavior – such as high grading, needing to fish longer and discard more fish to harvest a legal-size fish, or choosing not to take a fishing trip because the limits are too onerous – are even harder to account for.

This uncertainty can be seen in the recent history of the striped bass fishery. When ASMFC implemented Addendum IV in 2015, total removals and F declined as predicted in that year. However, for 2016 and 2017, recreational removals increased to pre-Addendum IV levels even though management measures remained the same. Similarly, recreational removals declined 20% from 2017 to 2018, most likely driven by a drop in fishing effort: the number of total trips from Maine – North Carolina was 37% lower and directed striped bass trips were 12% lower in 2018 than in 2017. This was despite virtually the same management measures in both years. Changes in effort and fish availability have a large effect on the realized harvest under this kind of management regime.

The TC discussed season changes as a potential management option to reduce harvest without increasing dead releases. In some jurisdictions with seasons where striped bass is the only available sportfish, closing that season would result in those trips not being taken, and harvest and dead releases would be reduced. However, for other states or jurisdictions, if the striped bass season was shortened, anglers might target another species or switch to catch-and-release only for striped bass. Those trips might still occur, striped bass might still be encountered, and while harvest would be reduced, dead releases would likely increase. The TC supports season changes as a method to reduce total removals, but it may not reduce dead releases in all areas.

Table 1. Estimated removals to achieve the F threshold and F target in 2020.

<b>Removals to get to F threshold (F=0.240) in 2020</b>				
Year	Probability SSB < SSB threshold	Probability F > F threshold	Removals (Numbers of fish; 2019 = 2018)	Removals (Numbers of fish; 2019 = 3 yr avg)
2017	1.00	1.00	7,058,838	7,058,838
2018	1.00	0.11	5,631,901	5,631,901
2019	1.00	0.03	5,631,901	6,631,882
<b>2020</b>	<b>0.99</b>	<b>0.50</b>	<b>7,092,400</b>	<b>6,986,000</b>
% Change Relative to 2017			0%	-1%
% Change Relative to 2018			+26%	+24%

<b>Removals to get to F target (F=0.197) in 2020</b>				
Year	Probability SSB < SSB target	Probability F > F target	Removals (Numbers of fish; 2019 = 2018)	Removals (Numbers of fish; 2019 = 3 yr avg)
2017	1.00	1.00	7,058,838	7,058,838
2018	1.00	0.75	5,631,901	5,631,901
2019	1.00	0.45	5,631,901	6,631,882
<b>2020</b>	<b>1.00</b>	<b>0.50</b>	<b>5,894,000</b>	<b>5,796,000</b>
% Change Relative to 2017			-17%	-18%
% Change Relative to 2018			+5%	+3%

Table 2. Size limit analysis for the ocean region (includes non-Chesapeake Bay inland waters such as Delaware Bay and Long Island Sound) and Chesapeake Bay.

<b>Ocean Size Limit</b>		
	28" Size limit (current)	35" Size limit
Harvest	1,732,344	898,552
Dead releases	2,609,528	2,684,569
Total recreational removals	4,341,872	3,583,122
% Reduction	--	-17.5%

<b>Chesapeake Bay Size Limit</b>				
	Maryland 19" Size limit (current)	Maryland 21" Size limit	Virginia 20" Size limit (current)	Virginia 22" Size limit
Harvest	1,003,700	693,707	110,304	66,361
Dead releases	654,761	682,660	113,081	117,036
Total recreational removals	1,658,461	1,376,368	223,385	183,397
% Reduction	--	-17.0%	--	-17.9%

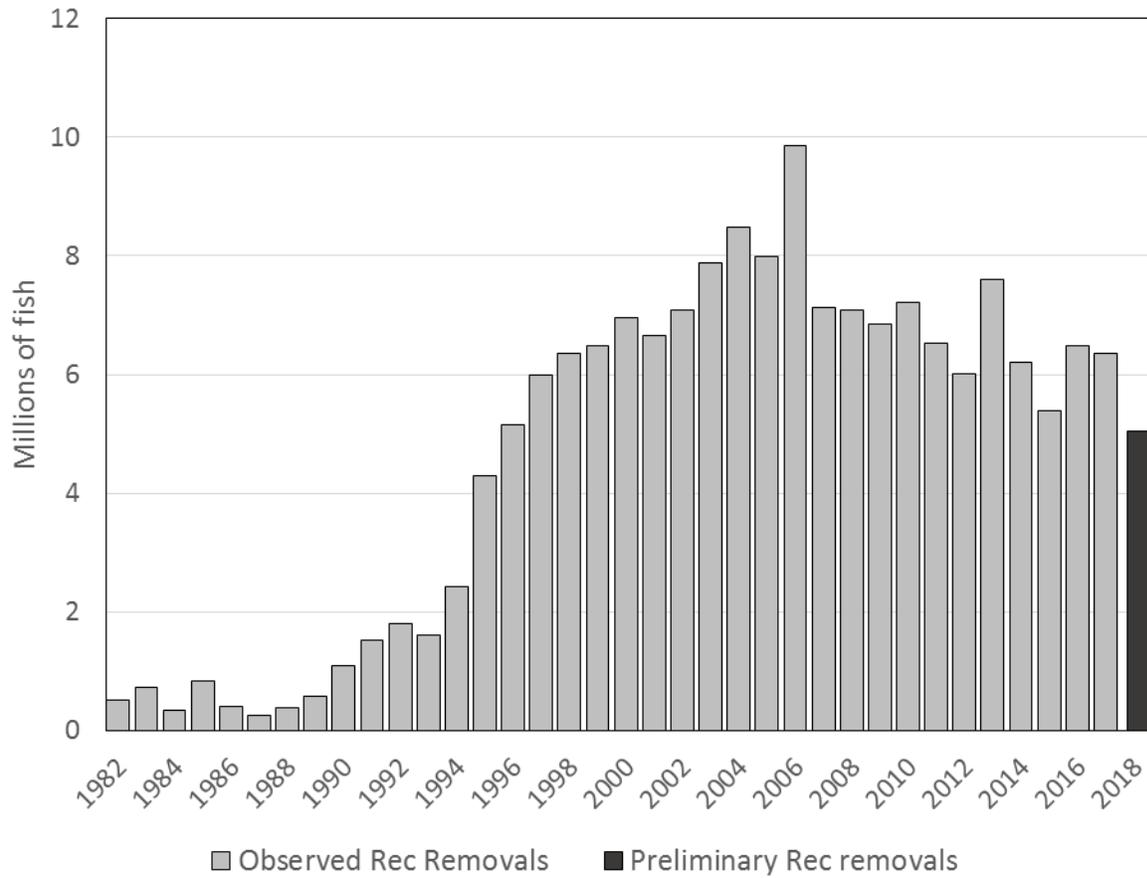


Figure 1. Time series of recreational removals (harvest + dead releases). The 2018 value used in the projection is preliminary.

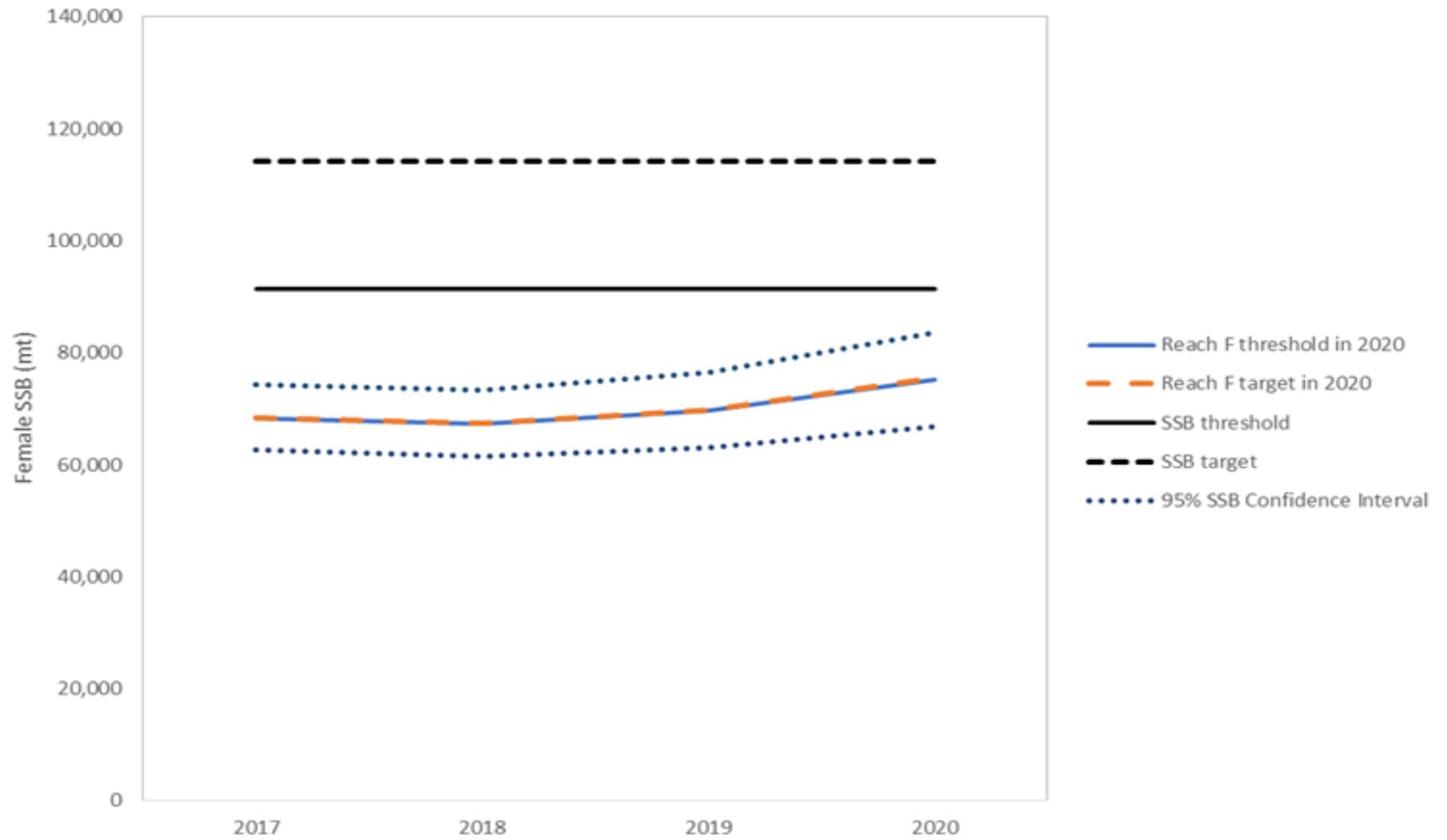


Figure 2. Female spawning stock biomass (SSB) trends under different removal scenarios, plotted with the SSB target and threshold.