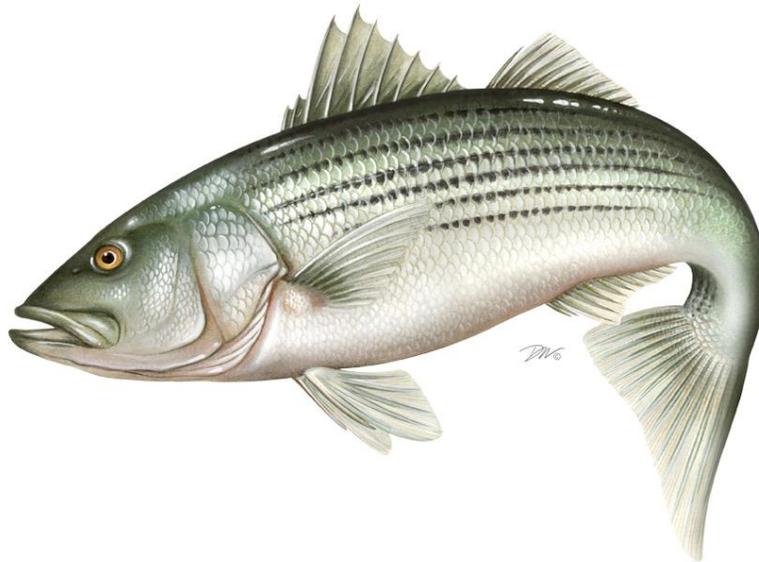


Draft Document for Board Review. Not for Public comment.

Atlantic States Marine Fisheries Commission

**DRAFT ADDENDUM VI TO AMENDMENT 6 TO THE
INTERSTATE FISHERY MANAGEMENT PLAN FOR
ATLANTIC STRIPED BASS**



This draft document was developed for Management Board review and discussion. This document is not intended to solicit public comment as part of the Commission/State formal public input process. Comments on this draft document may be given at the appropriate time on the agenda during the scheduled meeting. If approved, a public comment period will be established to solicit input on the issues contained in the document.



Sustainable and Cooperative Management of Atlantic Coastal Fisheries

August 2019

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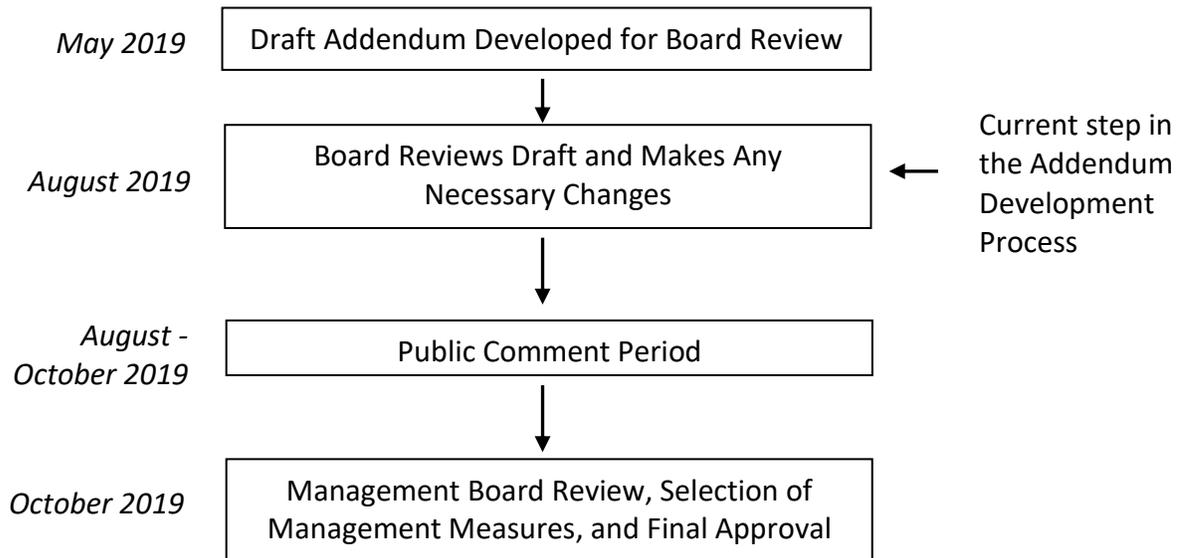
Public Comment Process and Proposed Timeline

In May 2019, the Atlantic Striped Bass Management Board (Board) initiated the development of an addendum to Amendment 6 to the Interstate Fishery Management Plan for Atlantic Striped Bass to consider changes to coastwide commercial and recreational regulations to address overfishing. This Draft Addendum presents background on the Atlantic States Marine Fisheries Commission’s (Commission) management of striped bass; the addendum process and timeline; and a statement of the problem. This document also provides management options for public consideration and comment.

The public is encouraged to submit comments regarding this document at any time during the public comment period. The final date comments will be accepted is [Month Day], 2019 at 5:00 p.m. Comments may be submitted at state public hearings or by mail, email, or fax. If you have any questions or would like to submit comment, please use the contact information below. Organizations planning to release an action alert in response to this Draft Addendum should contact Max Appelman at 703.842.0740.

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1.0 Introduction

Atlantic striped bass (*Morone saxatilis*) are managed through the Commission in state waters (0-3 miles) and through NOAA Fisheries in federal waters (3-200 miles). The management unit includes the coastal migratory stock between Maine and North Carolina. Atlantic striped bass are currently managed under Amendment 6 (2003a) to the Interstate Fishery Management Plan (FMP) and Addenda I–IV.

At its May 2019 meeting, the Board initiated the development of Draft Addendum VI to Amendment 6 to the Atlantic Striped Bass FMP to consider coastwide changes to commercial and recreational regulations to bring fishing mortality to the target level. The Board’s action responds to results of the 2018 benchmark stock assessment for Atlantic striped bass which indicates the stock is overfished and experiencing overfishing.

2.0 Overview

2.1 Statement of the Problem

The 2018 benchmark stock assessment indicates the stock is overfished and experiencing overfishing relative to the updated reference points defined in the assessment. Female spawning stock biomass (SSB) was estimated at 68,476 metric tons (151 million pounds), which is below the SSB threshold of 91,436 metric tons (202 million pounds). Total fishing mortality (F) was estimated at 0.31, which is above the F threshold of 0.24. The benchmark assessment and its single-stock statistical catch-at-age model was endorsed by the Peer Review Panel and accepted by the Atlantic Striped Bass Management Board (Board) for management use.

By accepting the assessment for management use, the reference point management triggers in Amendment 6 have been tripped. In response, the Board initiated the development of Draft Addendum VI to address overfishing status and consider measures to reduce F back to F target. Accordingly, Draft Addendum VI proposes alternative measures for the commercial and recreational fisheries aimed to reduce total removals by 18% compared to 2017 levels in order to achieve F target in 2020. Other management issues including (but not limited to) reference points and rebuilding the biomass, will be addressed in a subsequent management document.

Roughly 90% of annual Atlantic striped bass recreational catch is released alive, of which 9% are estimated to die as a result of being caught (referred to as “release mortality” or “dead releases”). Catch and release fishing has been perceived to have a minimal impact on the population, however a large component of annual striped bass mortality is attributed to release mortality – accounting for roughly 48% of total removals in 2017 (49% in 2018). The current recreational striped bass management program uses bag limits and size limits to limit the number of fish that are harvested. However, these measures are not designed to reduce fishing effort and subsequent release mortality. While the proposed measures herein result in lower overall removals, the majority of them also increase dead releases. In order to address dead releases, effort controls that are better designed to reduce the number of fishing trips that encounter striped bass should be considered (e.g., closed seasons).

2.2 Background

2.2.1 Status of the Stock

The 2018 benchmark stock assessment for Atlantic striped bass is the latest and best information available on the status of the coastwide striped bass stock for use in fisheries management. The assessment was completed and peer-reviewed at the 66th Northeast Regional Stock Assessment Workshop/Stock Assessment Review Committee (SAW/SARC) meeting in November 2018. The accepted model for use in striped bass stock assessment is a forward projecting statistical catch-at-age (SCA) model which uses catch-at-age data and fishery-dependent and -independent survey indices to produce annual estimates of female SSB, F, and recruitment.

The results of the 2018 benchmark indicate that the Atlantic striped bass stock is overfished and overfishing is occurring. Female SSB in 2017 was estimated at 68,576 metric tons (151 million pounds), which is below the SSB threshold of 91,436 metric tons (202 million pounds) (Figure 1). Female SSB peaked in 2003 and has been declining since then; SSB has been below the threshold level since 2013. Total F in 2017 was estimated at 0.31, which is above the F threshold of 0.24 (Figure 2). Total F has been at or above the threshold in 13 of the last 15 years of the assessment (2003-2017). Recruitment in 2017 was estimated at 108.8 million age-1 fish, which is below the time series average of 140.9 million fish (Figure 1). Striped bass experienced a period of lower recruitment from 2005-2011 which contributed to the decline in female SSB that the stock has experienced since 2010. Recruitment was high in 2012, 2015, and 2016 (corresponding to strong 2011, 2014, and 2015 year classes), but estimates of age-1 striped bass were below average in 2013, 2014, and 2017.

The reference points currently used for management are based on female SSB levels during the 1995 reference year. The 1995 reference year is used as the female SSB threshold because many stock characteristics (e.g., an expanded age structure) were reached by this year and the stock was declared rebuilt. The female SSB target is 125% of SSB threshold. To estimate the associated F reference points, population projections are made using a constant F and changing the value until the female SSB threshold and target are achieved. For the 2018 benchmark, the reference point definitions remained the same, but the values have been updated. The 2018 benchmark was the first assessment for striped bass to use the improved Marine Recreational Information Program (MRIP) survey methods to estimate recreational fishery catches. The new MRIP removals estimates are on average 2.3 times higher than recreational removals used in previous stock assessments, resulting in higher estimates of female SSB and, therefore, higher estimates for the SSB reference points.

2.2.2 History of the Fishery Management Plan

The first Interstate FMP for Atlantic Striped Bass was approved in 1981 in response to declining juvenile recruitment and landings occurring along the coast from Maine through North Carolina. The FMP and subsequent amendments and addenda focused on addressing the depleted spawning stock and recruitment failure. Despite these management efforts, the Atlantic striped bass stock continued to decline prompting many states (beginning with

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Maryland in 1985) to impose a complete harvest moratorium for several years. State fisheries reopened in 1990 under Amendment 4 which aimed to rebuild the resource rather than maximize yield. The stock was ultimately declared rebuilt in 1995 and as a result, Amendment 5 to the Atlantic Striped Bass FMP was adopted which relaxed both recreational and commercial regulations along the coast.

The Atlantic striped bass stock is currently managed under Amendment 6 and its subsequent addenda, the most recent being Addendum IV which implemented new commercial and recreational regulations beginning with the 2015 season (ASMFC 2014). The addendum was initiated in response to the findings of the 2013 benchmark stock assessment which triggered management action; female SSB was below the target for two consecutive years and F was above the target in at least one of those years (ASMFC 2003a). Although the stock was not overfished, a steady decline in female SSB had occurred since the mid-2000s. The addendum established new F reference points (target and threshold) and a suite of regulatory measures aimed to bring F back down to the new F target. All states/jurisdictions (hereafter states) were required to implement regulations to achieve a 25% reduction from 2013 removals in the ocean fishery, and Chesapeake Bay fisheries implemented regulations to achieve a 20.5% reduction from 2012 removals. To achieve this, the ocean commercial quota was reduced by 25% and the Chesapeake Bay commercial quota was set at 2012 harvest, less 20.5%. For the recreational fishery, states implemented a 1 fish bag limit with a minimum size of 28 inches in the ocean fishery, and Chesapeake Bay jurisdictions submitted implementation plans to achieve the required reductions. Several states also had conservation equivalency proposals approved which allowed them to adopt different management programs while still achieving the required reductions.

The U.S. Exclusive Economic Zone (EEZ; 3-200 miles) has been closed to the harvest, possession and targeting of striped bass since 1990, with the exception of a defined route to and from Block Island in Rhode Island which allows for the transit of vessels in possession of striped bass legally harvested in adjacent state waters. A recommendation was made in Amendment 6 to re-open federal waters to commercial and recreational fisheries. However, NOAA Fisheries concluded opening the EEZ to striped bass fishing was not warranted at that time. Following the completion of the 2018 benchmark stock assessment, NOAA Fisheries, in consultation with the Commission, is directed to review the federal moratorium on Atlantic striped bass, and to consider lifting the ban on striped bass fishing in the Federal Block Island Transit Zone (Consolidated Appropriations Act, 2018).

2.2.3 Status of the Fishery

Atlantic striped bass is arguably the most iconic finfish on the Atlantic coast and has supported valuable fisheries for centuries. The current fishery is predominantly recreational with the sector accounting for roughly 90% of total harvest by weight since 2004 (commercial and recreational harvest, combined; Table 1). In 2017, total striped bass removals (harvest and dead discards/release mortality from both sectors) were estimated at 7.06 million fish, 90% of which was attributed to the recreational sector (Table 2; Figure 3). In 2018, total removals were estimated at 5.8 million fish, with 88% attributed to the recreational sector.

Commercial Fishery Status

The commercial fishery is managed via a state-specific quota system based on average landings during the 1970s, resulting in relatively stable landings since 2004. From 2004 to 2014, coastwide commercial landings averaged 6.8 million pounds (1 million fish) annually (Table 1; Table 2). From 2015-2018, commercial landings have decreased to an average of 4.8 million pounds (611,000 fish) due to implementation of Addendum IV and a reduction in the commercial quota. In 2017, commercial landings were estimated at 4.8 million pounds (592,670 fish). In 2018, commercial landings were estimated at 4.7 million pounds (622,451 fish). Commercial dead discards (the portion of commercially caught striped bass that are released and assumed to die) account for approximately 13% of total commercial removals in numbers of fish since 2004. In 2017, commercial removals (landings plus dead discards) accounted for 10% of total removals (commercial plus recreational) in numbers of fish, and 12% of total removals in 2018.

The majority of commercial striped bass landings come from Chesapeake Bay; roughly 60% by weight annually since 1990, and 80% in numbers of fish. The differences between landings in weight and in numbers of fish is primarily attributed to availability of smaller fish and lower size limits in Chesapeake Bay relative to the ocean fishery.

Unlike the commercial fishery in Chesapeake Bay, the ocean fishery regularly underutilizes the quota. The ocean quota underage is mainly attributed to designated game fish status in several states including Maine, New Hampshire, Connecticut, and New Jersey which collectively share about 10% of the commercial quota in the ocean region. Furthermore, the underage has increased in recent years since migratory striped bass have not been available to the ocean fishery in North Carolina resulting in zero harvest since 2012 (North Carolina holds 13% of the ocean quota).

Recreational Fishery Status

The Atlantic striped bass recreational fishery is managed via bag limits and minimum size limits in order to constrain fishing mortality. Approximately 90% of recreational catch is released alive (Figure 4) – either due to angler preference (i.e., catch and release fishing) or regulation (e.g., undersized, or the angler already caught the bag limit). The assessment assumes, based on previous studies, that 9% of the fish that are released alive die as a result of being caught.

Total recreational removals (harvested fish plus released fish that died as a result of being caught) increased from a low of 2.7 million pounds (434,665 fish) in 1984 to a high of 75.8 million pounds (7.6 million fish) in 2013. Total removals decreased to an average of 53.5 million pounds (5.8 million fish) since the implementation of Addendum IV in 2015. In 2017, recreational removals were estimated at 53.7 million pounds (6.4 million fish). Of those removals, 37.9 million pounds (2.9 million fish) were harvested. In 2017, 38.0 million striped bass (equivalent to 176 million pounds) were released alive resulting in an estimated 3.4 million dead releases (15.8 million pounds), which accounted for 48% of total striped bass removals in numbers of fish. In 2018, 49% of total removals were attributed to dead releases (2.8 million

fish or 12.3 million pounds). Recreational dead releases make up a large portion of total removals because most of the catch is released.

A large proportion of recreational harvest comes from Chesapeake Bay. From 2004-2014, 33% of recreational harvest in numbers of fish came from Chesapeake Bay. From 2015-2018, that percentage increased to 45%, likely as a result of the strong 2011, 2014, and 2015 year classes moving through the fishery.

2.2.4 Performance of Addendum IV and the Effects of Changes in Effort and the Availability of Strong Year Classes

In 2016, following the first full year under Addendum IV measures, the Striped Bass Plan Review Team compared observed removals in 2015 to the reference period (2013 for the ocean fishery and 2012 for Chesapeake Bay) to evaluate whether the reductions needed to bring F back down to the target had been achieved. The results indicated the overall reduction was nearly the same as the predicted reduction on a coastwide level. The observed commercial reduction was very close to the predicted reductions, but the observed recreational reduction in the ocean and Chesapeake Bay fisheries diverged significantly from the predicted values. Recreational fisheries in the ocean saw a greater reduction than what was predicted, while recreational fisheries in Chesapeake Bay experienced an increase in harvest relative to the reference period. Upon further review, the Technical Committee (TC) identified changes in effort and changes in the size, age structure, and the distribution of the 2011 year class in the ocean relative to the Chesapeake Bay as the most significant variables contributing to the large differences in the observed harvest compared to that predicted by the TC during the development of Addendum IV (ASMFC 2016). At that time, the 2011 year class was the largest recruitment event since the early 2000s. Those fish continued to grow and migrate to the ocean, becoming increasingly available to ocean fisheries and leading to significant increases in removals in 2016 and 2017 under the same management program¹. It should also be noted that decreased effort in the ocean fishery in 2018 resulted in roughly an 18% reduction in total removals relative to 2017 (and a 5% reduction from 2015 levels) under the same management measures. The decrease in effort was observed across all recreational fisheries, not just effort directed at striped bass. These annual fluctuations in catch (and in fishing mortality) under constant regulations highlight the effect of changes in effort and strong year classes on future catch, and the degree of uncertainty associated with bag and size limit analyses.

It is difficult to account for changes in effort and the impacts of emerging year classes in bag limit and size limit analyses, and harvest reduction calculations. The 2011, 2014, and 2015 year classes (corresponding to the 2012, 2015, and 2016 recruitment estimates) have all been above average with the 2015 year class being the largest recruitment event since 2004. It is expected that the availability of the 2014 and 2015 year classes in 2020 will be similar to what was

¹ A stock assessment update in 2016 also indicated that Addendum IV successfully reduced F below the target in 2015. As a result, the Board initiated Draft Addendum V to consider relaxing coastwide measures to bring F back up to the target level. However, the Board withdrew Draft Addendum V from consideration after preliminary MRIP estimates revealed that 2016 removals increased without changing regulations.

observed for the 2011-year class in 2016 and 2017. These strong year classes become available to the Chesapeake Bay fishery first and become more readily available to the ocean fishery as they grow and begin to migrate to the ocean. While strong year classes are a positive sign for the population, the abundance of undersized striped bass often leads to anglers catching and releasing a larger number of fish, thus driving up the number of recreational releases. When considering management changes, it is important to consider the impact such changes could have on strong year classes and to account for the emergence of strong year classes to the extent possible in supporting analyses.

2.2.5 Socioeconomic Impacts

Overall, there are many potential socioeconomic impacts that could result from striped bass harvest reductions. In general, the reduction in striped bass removals is likely to translate into a short-term negative impact on the regional economy and jobs associated with the fishing industry for this species. However, the positive long-term economic impacts stemming from stock recovery and subsequent catch increases in successive years will likely outweigh the short-term impacts.

The impacts associated with the reduction in removals will be different for the commercial and recreational sectors, primarily because the two sectors do not contribute equally to the local economy. A recent 2019 report from Southwick Associates² indicates 97% of total economic contribution associated with striped bass fishing came from the recreational sector in 2016. According to the report, total revenues in the commercial sector (from Maine to North Carolina) were \$19.8 million that year, while total expenditures in the recreational sector amounted to \$6.3 billion. The contribution of the commercial sector to the region's gross domestic product (GDP) when attempting to account for all industries involved in harvesting, processing, distributing, and retailing striped bass to consumers, was \$103.2 million and supported 2,664 regional jobs. In comparison, the contribution of the recreational sector to the region's GDP was \$7.7 billion and supported 104,867 jobs. Importantly, the report acknowledges that it is not intended to be used to set fishery regulations, but rather to demonstrate the economic significance of striped bass to local economies. It should also be noted that these numbers are an average for the entire region and actual economic impacts are expected to vary by state.

The dollar values above refer to economic impacts, not to the economic value (or net economic benefit for society) associated with the recreational and commercial fisheries. While data required to quantify these measures are not currently available, the effects of changes to the striped bass management program approved through this addendum can be qualified as follows: for the recreational sector, increased minimum size limits or other restrictions can lead to decreased availability of legal sized striped bass which can lead to increased effort and an increase in dead releases. Conversely, increased fishing restrictions could result in a reduction in number of recreational trips which could translate into a reduction in angler welfare. For the

² While this is a useful source of updated information, it is not peer-reviewed and, therefore, the methods behind the report's figures should be considered accordingly.

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commercial sector, a reduction in quota will likely reduce profits and may increase the consumer price of striped bass. However, as in the case of the economic impacts, these effects are expected to be outweighed by the positive effects on anglers', harvesters', and consumers' welfare associated with stock recovery in successive years.

2.2.6 Management Program Equivalency

The use of management program equivalency (hereafter referred to as "conservation equivalency") is an integral component of the Commission's Interstate Fisheries Management Program, particularly for Atlantic striped bass. Conservation equivalency allows states flexibility to develop alternative regulations that address specific state or regional differences while still achieving the goals and objectives of the FMP. Under Amendment 6 to the Striped Bass FMP, a state may submit a proposal for a change to its regulatory program for any mandatory compliance measure. It is the responsibility of the state to demonstrate the proposed management program is equivalent to the measures selected through this addendum. All conservation equivalency proposals are subject to TC review and Board approval.

Several states currently use conservation equivalency. For example, the use of closed seasons have been used as an effective tool to implement smaller size limits or increased bag limits while still achieving the same quantified level of conservation. Note the PDT did not develop closed season options for the ocean or Chesapeake Bay regions because the impacts are expected to vary by state and fishery. While closed seasons could be very effective in regions and seasons when striped bass is the only viable fishing choice, closed seasons may have little or no impact in fisheries that operate as catch and release, or in areas where other species are available for harvest. For example, Atlantic mackerel and bluefish are commonly caught with striped bass, so trips that target those species may still catch striped bass and contribute to striped bass release mortality even if striped bass are not targeted or retained.

States should consult the Commission's Conservation Equivalency Technical Guidance Document before considering the development and submission of conservation equivalency proposals. If this document is approved for public comment, the TC will develop criteria for conservation equivalency with this addendum.

3.0 Proposed Management Options

The striped bass ocean fishery is defined as all fisheries operating in coastal and estuarine areas of the U.S. Atlantic coast from Maine through North Carolina, excluding the Chesapeake Bay and Albemarle Sound-Roanoke River (A-R) management areas. The Chesapeake Bay fishery is defined as all fisheries operating within Chesapeake Bay. This document does not propose changes to the A-R management program.

The proposed recreational management options herein were developed using MRIP catch and harvest estimates. To account for year class strength, the Plan Development Team (PDT) used catch-at-length data from 2016 and 2017 to characterize the catch in 2020. The PDT also assumed the same level of non-compliance observed in 2016 and 2017 will occur in 2020, including undersized fish harvested legally through conservation equivalency. Accordingly,

states do not need to resubmit conservation equivalency proposals to maintain lower minimum size limits or slot limits previously approved through conservation equivalency unless they wish to change said measures. States may voluntarily implement management programs that are more conservative than those required herein. As noted, several states currently implement conservation equivalency programs in order to have management measures that meet the needs of their state's fishery (see *Appendix 1* for a summary of striped bass regulations by state and fishing sector in 2017).

Projecting Harvest Reductions to Achieve the Fishing Mortality Target

The PDT used the same forward projecting methodology that was used in the 2018 benchmark assessment to estimate the removals needed to achieve F target (0.20) in 2020 with a 50% probability, and to identify the percent reduction from 2017 levels. Projections were made using final 2018 landings and dead discard estimates, and average removals from 2016-2018 were used as a proxy for 2019 to account for interannual variability. Results indicate an 18% reduction from 2017 levels is needed to achieve F target in 2020, although additional reductions may be needed to achieve the female SSB target within the timeframe required by the Amendment 6 management triggers (i.e., the stock rebuilding schedule cannot exceed 10 years) (Figure 5).

3.1 Proposed Management Scenarios

The following section outlines three management scenarios (including status quo) that are designed to reduce total removals by 18% relative to 2017 levels in order to reduce F to the target in 2020. These scenarios, which are mutually exclusive, include (1) status quo; (2) an 18% reduction in total removals where the desired percent reductions are applied equally (proportionally) to both the commercial and recreational sectors; and (3) an 18% reduction in total removals where the commercial sector takes a smaller percent reduction than the recreational sector.

Note for all commercial fishery quota options: *quotas are allocated on a fishing year basis. In the event a jurisdiction exceeds its allocation, any overage of its annual quota will be deducted from the state's allowable quota in the following year. None of the scenarios propose changes to existing commercial size limits or the quota transfer provision.*

Note for all recreational fishery options: *the options herein are designed to reduce harvest and total removals; they are not designed to address effort, and in effect, release mortality. The proposed measures are projected to increase releases because effort is assumed to be constant (i.e., the same level of fishing trips encountering striped bass in 2016 and 2017 will occur in 2020). Accordingly, to offset the expected increase in releases, larger reductions in harvest are needed in order to achieve the desired overall reduction in total removals. To reduce both harvest and release mortality, additional effort controls should be considered to reduce the number of fishing trips that encounter striped bass. Additionally, the long term conservation benefits of implementing slot limits (i.e., protecting larger, older fish) may not be realized if effort is concentrated on fish within the slot limit, thus reducing the number of fish that survive to grow out of the slot. While the PDT expects fish larger than the slot limit will be protected,*

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concentrating effort within the slot limit may reduce the number of fish that are able to grow out of the slot thus potentially reducing the population of larger, older fish over time.

When providing input on this document, please first identify your preferred management scenario (Option 1, 2, or 3) and then select your preferred management measures within that scenario. All three scenarios present management options for each fishery and management area combination (recreational measures for the ocean and Chesapeake Bay fisheries and commercial quotas for the ocean and Chesapeake Bay fisheries). All recreational options assume the same fishing seasons as in 2017, unless otherwise noted. All commercial quota options assume the same commercial size limits as in 2017.

Adopted options (other than status quo) would supersede Addendum IV, Sections 3.1 and 3.2, and replace corresponding sections in Amendment 6.

Option 1: Status Quo

The language of Addendum IV, Sections 3.1 and 3.2 would remain in place. In essence, if Option 1 is selected, Atlantic striped bass fisheries will continue to operate under the provisions of Addendum IV. It should be noted this option does not meet the projected reductions needed from 2017 levels to achieve F target in 2020.

Ocean Recreational Fishery

All coastal fisheries (excluding Chesapeake Bay and the Albemarle Sound-Roanoke River) will be constrained by a one fish bag limit and 28-inch minimum size limit. Any jurisdiction submitting a proposal for conservation equivalency must demonstrate through quantitative analysis that its proposal achieves at least a 25% reduction in harvest (including estimated dead discards) from its ocean recreational fishery. All conservation equivalency proposals are subject to Technical Committee review and Board approval.

Note: the Chesapeake Bay spring trophy fishery is part of the coastal fishery for management purposes.

Chesapeake Bay Management Area Recreational Fishery (Maryland, Potomac River Fisheries Commission and Virginia)

The Chesapeake Bay jurisdictions will submit a management program that achieves at least a 20.5% reduction from 2012 harvest (including estimated dead discards) in the Chesapeake Bay recreational fishery for Technical Committee review and Board approval.

The Chesapeake Bay fisheries reductions were based on 2012 harvest because the Bay-wide quota had already been reduced by 14% in 2013, in keeping with the Bay commitment to raise or lower quotas, with definitive changes in the exploitable stock biomass as approved by the FMP. The commercial Chesapeake Bay fisheries' quota reduction meant harvesters were provided 14% less tags or pounds of harvestable quota in 2013, as compared to 2012 and the 2013 recreational summer and fall quotas were reduced by 14% compared to 2012.

Ocean Commercial Fishery

The table below indicates each states commercial quota in pounds. These quotas reflect a 25% reduction from the previous Amendment 6 quotas.

| State | Status Quo Addendum IV Quota (Pounds) | 2017 Harvest For Reference |
|----------------------|--|-------------------------------|
| Maine* | 188 | - |
| New Hampshire* | 4,313 | - |
| Massachusetts | 869,813 | 823,409 |
| Rhode Island^ | 182,719 | 175,312 |
| Connecticut** | 17,813 | - |
| New York | 795,795 | 701,216 |
| New Jersey**^ | 241,313 | - |
| Delaware | 145,085 | 141,800 |
| Maryland^ | 98,670 | 80,457 |
| Virginia | 138,640 | 133,874 |
| North Carolina | 360,360 | - |
| Coastal Total | 2,854,706 | 2,056,068 |

* Commercial harvest/sale prohibited, with no re-allocation of quota to the recreational fishery.

** Commercial harvest/sale prohibited, with re-allocation of quota to the recreational fishery.

^ Addendum IV quota reduced through conservation equivalency for RI (181,572 lbs), NJ (215,912 lbs), and MD (90,727 lbs)

Chesapeake Bay Management Area Commercial Fishery (Maryland, Potomac River Fisheries Commission and Virginia)

The Chesapeake Bay jurisdictions will submit a management program that achieves at least a 20.5% reduction from 2012 harvest in the Chesapeake Bay commercial fishery for Technical Committee review and Board approval. A 20.5% reduction from 2012 harvest results in a Chesapeake Bay commercial quota of 3,120,247 pounds.

Option 2: Equal Percent Reductions

An 18% reduction in total removals relative to 2017 levels to reduce F to the target in 2020 where the desired percent reduction is applied equally (proportionally) to both the commercial and recreational sectors; both sectors would take an 18% reduction from 2017 levels.

Recreational Fishery Management:

The tables below provide a suite of options for both the ocean and Chesapeake Bay recreational fisheries. Size limits are in total length. Bag limits are per person per day. The Board will choose one option from each table, and all states would be required to implement the selected sub-option for striped bass fisheries in their respective state waters. Under all sub-options, states have the flexibility to develop alternative regulations through conservation equivalency.

Sub-Option 2-A: Ocean Recreational Fishery (All jurisdictions would implement).

Under all sub-options, Delaware does not need to resubmit for conservation equivalency to maintain a 2-fish bag limit at 20"-25" slot (July 1 – Aug 31) in the Delaware Bay, River and tributaries. However, Delaware would be required to adopt the selected sub-option for all other seasons and regions. Additionally, New York would be required to submit a proposal that achieves an 18% reduction in removals relative to 2017 levels for the Hudson River management area, and Pennsylvania would be required to submit a proposal that achieves an 18% reduction in its state waters (catch from Pennsylvania and the Hudson River is not covered by MRIP).

| Sub-Option | Bag Limit | Size Limit | Season and Trophy Fish/Season | % reduction from 2017 removals |
|-------------------------|------------------|-------------------|---|---------------------------------------|
| 2-A1 | 1 | 35" min | Same seasons and trophy season as 2017 (see Appendix 1) | 18% |
| 2-A2 | 1 | 28"-34" slot | | 19% |
| 2-A3[^] | 1 | 32"-40" slot | | 21% |

[^]Under sub-option 2-A3, ocean trophy fish fisheries would be capped with a 40" maximum size limit.

Sub-Option 2-B: Chesapeake Bay Recreational Fishery (MD, PRFC, DC and VA would implement).

| Sub-Option | Bag Limit | Size Limit | Season and Trophy Fish/Season | % reduction from 2017 removals |
|-------------------------|------------------|-------------------|--|---------------------------------------|
| 2-B1 | 1 | 18" min | Same seasons and trophy season as 2017 (see Appendix 1) | 20% |
| 2-B2 | 2 | 22" min | | 18% |
| 2-B3[^] | 2 | 18"-23" slot | Same seasons as 2017 but <u>without</u> trophy fish season | 19% |
| 2-B4[^] | 2 | 20"-24" slot | | 19% |

[^]Under sub-options 2-B3 and 2-B4, states would be required to submit for conservation equivalency to reinstate a trophy fish season.

Commercial Fishery Management

This option is an 18% reduction from the Addendum IV quotas (in pounds) after accounting for approved conservation equivalency programs.

The following table presents quotas for both the ocean and Chesapeake Bay commercial fisheries. Note this option can achieve an 18% reduction from 2017 levels if active commercial fisheries perform the same as they did in 2017. However, there is potential for commercial removals to increase relative to 2017 if active fisheries fully utilize their quotas in 2020.

| State | Addendum IV Quota | 2017 Harvest | 18% Reduction |
|--|--------------------------|---------------------|----------------------|
| Chesapeake Bay Commercial Quota[^] | | | |
| Maryland | 1,471,888 | 1,439,760 | 1,206,948 |
| PRFC | 583,362 | 472,719 | 478,357 |
| Virginia | 1,064,997 | 827,848 | 873,298 |
| Chesapeake Bay Total | 3,120,247 | 2,740,327 | 2,558,603 |
| Ocean Commercial Quota | | | |
| Maine [*] | 188 | - | 154 |
| New Hampshire [*] | 4,313 | - | 3,537 |
| Massachusetts | 869,813 | 823,409 | 713,247 |
| Rhode Island ^{^^} | 182,719 | 175,312 | 148,889 |
| Connecticut ^{**} | 17,813 | - | 14,607 |
| New York | 795,795 | 701,216 | 652,552 |
| New Jersey ^{**^^} | 241,313 | - | 177,048 |
| Delaware | 145,085 | 141,800 | 118,970 |
| Maryland ^{^^} | 98,670 | 80,457 | 74,396 |
| Virginia | 138,640 | 133,874 | 113,685 |
| North Carolina | 360,360 | - | 295,495 |
| Coastal Total | 2,854,706 | 2,056,068 | 2,312,579 |

*Commercial harvest/sale prohibited, with no re-allocation of quota to the recreational fishery.

**Commercial harvest/sale prohibited, with re-allocation of quota to the recreational fishery.

[^]Jurisdiction-specific quotas for Chesapeake Bay are based on the 2017 allocation of the Bay-wide quota.

^{^^}Addendum IV quota reduced through conservation equivalency for RI (181,572 lbs), NJ (215,912 lbs), and MD (90,727 lbs). An 18% reduction is calculated relative to these reduced quota.

Option 3: The Commercial Sector Takes a Smaller Percent Reduction

An 18% reduction in total removals relative to 2017 levels to reduce F to the target in 2020 where the commercial sector takes a smaller percent reduction than the recreational sector. In this option, the commercial sector will take a 1.8% reduction in quota [the product of the percent total reductions needed (18%) and the proportion of 2017 removals from the commercial sector (10%)]. The commercial percent reduction in numbers of fish is subtracted from the total reductions needed to achieve F target in 2020 to calculate the reduction the recreational sector must take. This reduction is subtracted from the 2017 recreational removals estimate to calculate the new target percent reduction for recreational removals (20%).

The rationale for this suite of options is the commercial fishery is managed via a static quota system which keeps effort and removals relatively constant from year to year, while the recreational management program does not have a harvest limit. This has allowed recreational effort and, therefore, removals to increase with resource availability and other social and economic factors.

Recreational Fishery Management:

The tables below provide a suite of options for both the ocean and Chesapeake Bay recreational fisheries. Size limits are in total length. Bag limits are per person per day. The Board will choose one option from each table, and all states would be required to implement the selected sub-option for striped bass fisheries in their respective state waters. Under all sub-options, states have the flexibility to develop alternative regulations through conservation equivalency.

Sub-Option 3-A: Ocean Recreational Fishery (All jurisdictions would implement).

Under all sub-options, Delaware does not need to resubmit for conservation equivalency to maintain a 2-fish bag limit at 20"-25" slot (July 1 – Aug 31) in the Delaware Bay, River and tributaries. However, Delaware would be required to adopt the selected sub-option for all other seasons and regions. Additionally, New York would be required to submit a proposal that achieves an 18% reduction in removals relative to 2017 levels for the Hudson River management area, and Pennsylvania would be required to submit a proposal that achieves an 18% reduction in its state waters (catch from Pennsylvania and the Hudson River is not covered by MRIP).

| Sub-Option | Bag Limit | Size Limit | Season and Trophy fish/season | % reduction from 2017 removals |
|-------------------------|------------------|-------------------|---|---------------------------------------|
| 3-A1 | 1 | 36" min | Same seasons and trophy season as 2017 (see Appendix 1) | 20% |
| 3-A2 | 1 | 28"-33" slot | | 22% |
| 3-A3[^] | 1 | 32"-40" slot | | 21% |

[^]Under sub-option 3-A3, ocean trophy fish fisheries would be capped with a 40" maximum size limit.

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Sub-Option 3-B: Chesapeake Bay Recreational Fishery (MD, PRFC, DC and VA would implement).

| Sub-Option | Bag Limit | Size Limit | Season and Trophy Fish/Season | % reduction from 2017 removals |
|-------------------------|------------------|--------------------------------------|--|---------------------------------------|
| 3-B1[^] | 1 | MD: 19" min PRFC, DC, VA: 20" min | Same seasons and trophy season as 2017 (see <i>Appendix 1</i>) | 29% |
| 3-B2 | 1 | 18" min | | 20% |
| 3-B3 | 2 | 23" min | Same seasons as 2017 <u>except</u> the trophy season starts no earlier than May 1 | 20% |
| 3-B4 | 2 | 18"-22" slot | | 21% |
| 3-B5 | 2 | 20"-23" slot | | 20% |
| 3-B6 | 2 | 22"-40" slot | Same seasons as 2017; same trophy season and minimum sizes <u>except</u> with a 40" max size limit | 21% |

[^]Sub-option 3-B1 drops the bag limit to 1-fish but maintains 2018 size limits. The PDT notes that a higher percent reduction is projected relative to 2017 size limits (i.e., when all fisheries were at a 20" minimum).

(COMMERCIAL FISHERY MANAGEMENT OPTION FOR OPTION 3 ON NEXT PAGE)

Commercial Fishery Management

This option is a 1.8% reduction from the Addendum IV quotas (in pounds) after accounting for approved conservation equivalency programs.

The following table presents quotas for both the ocean and Chesapeake Bay commercial fisheries. Note this option can achieve a 1.8% reduction from 2017 levels if active commercial fisheries perform the same as they did in 2017. However, there is potential for commercial removals to increase relative to 2017 if active fisheries fully utilize their quotas in 2020.

| State | Addendum IV Quota | 2017 Harvest | 1.8% Reduction |
|--|--------------------------|---------------------|-----------------------|
| Chesapeake Bay Commercial Quota[^] | | | |
| Maryland | 1,471,888 | 1,439,760 | 1,445,394 |
| PRFC | 583,362 | 472,719 | 572,861 |
| Virginia | 1,064,997 | 827,848 | 1,045,827 |
| Chesapeake Bay Total | 3,120,247 | 2,740,327 | 3,064,083 |
| Ocean Commercial Quota | | | |
| Maine [*] | 188 | - | 185 |
| New Hampshire [*] | 4,313 | - | 4,235 |
| Massachusetts | 869,813 | 823,409 | 854,156 |
| Rhode Island ^{^^} | 182,719 | 175,312 | 178,304 |
| Connecticut ^{**} | 17,813 | - | 17,492 |
| New York | 795,795 | 701,216 | 781,471 |
| New Jersey ^{**^^} | 241,313 | - | 212,026 |
| Delaware | 145,085 | 141,800 | 142,473 |
| Maryland ^{^^} | 98,670 | 80,457 | 89,094 |
| Virginia | 138,640 | 133,874 | 136,144 |
| North Carolina | 360,360 | - | 353,874 |
| Coastal Total | 2,854,706 | 2,056,068 | 2,769,454 |

^{*}Commercial harvest/sale prohibited, with no re-allocation of quota to the recreational fishery.

^{**}Commercial harvest/sale prohibited, with re-allocation of quota to the recreational fishery.

[^]Jurisdiction-specific quotas for Chesapeake Bay are based on the 2017 allocation of the Bay-wide quota.

^{^^}Addendum IV quota reduced through conservation equivalency for RI (181,572 lbs), NJ (215,912 lbs), and MD (90,727 lbs). A 1.8% reduction is calculated relative to these reduced quota.

3.2 Circle Hook Provision

This section proposes options regarding the use of circle hooks to reduce striped bass discard mortality in recreational fisheries.

Discard mortality accounts for a considerable amount of removals in the Atlantic striped bass fishery along the east coast. The latest assessment assumes 9% of fish that are released alive die as a result of being caught (Diodati and Richards 1996), although there is some evidence it may be higher, particularly in the summer months. Management measures that increase the minimum size limit or reduce bag limits can lead to an increase in the number of striped bass released.

The use of circle hooks by anglers targeting striped bass with bait, live or chunk, has been identified as a method to reduce the discard mortality of striped bass in recreational fisheries. The ASMFC defines circle hooks as “a non-offset hook where the point is pointed perpendicularly back towards the shank” (ASMFC 2003b). The term non-offset circle hook means the point and barb are in the same plane as the shank (e.g. when the hook is laying on a flat surface, the entire hook and barb also lay flat). When a circle hook begins to exit the mouth of a fish, the shape causes the shaft to rotate towards the point of resistance and the barb is more likely to embed in the jaw or corner of the fish’s mouth. Circle hooks can reduce rates of “gut-hooking” and lower the likelihood of puncturing internal organs if the hook is swallowed.

Caruso (2000) found discard mortality was reduced by 12.5% by using circle hooks compared to j-hooks in Massachusetts waters and the incidence of potentially lethal wounding was low with circle hooks. Lower discard mortality was also estimated on the Hudson River with circle hook usage when compared to j-hooks (Millard et al. 2005). Within Chesapeake Bay, Lukacovic and Uphoff (2007) collected data on striped bass hooking mortality using natural cut bait on j-hooks and circle hooks. The study found that j-hooks were 3.7 times more likely to result in deep-hooking than circle hooks, and deeply-hooked fish were 17 times more likely to die when released.

While circle hooks have been demonstrated to reduce hooking mortality rates, factors other than hook type can also affect the release mortality rate. These other factors include water temperature (Nelson 1994; Wilde et al. 2000; Millard et al. 2005), air temperature (Lukacovic and Uphoff 2007), salinity (RMC 1990), hook size (ASMFC 2003b), fish length (Lukacovic and Uphoff 2007), and hooking location (Nelson 1994; Millard et al. 2005; Lukacovic and Uphoff 2007). Additionally, it is unknown how many anglers currently use circle hooks, resulting in uncertainty on how many additional fish could be saved if mandatory circle hook measures are put in place. Enforceability and compliance are also concerns depending on how regulations are implemented, specifically depending on which anglers these regulations would apply to (e.g., to only those targeting striped bass, or all bait fishing in a state).

If Option B or Option C is selected, the Board must specify an implementation schedule. The schedule should consider state legislative and regulatory/public outreach development processes, including consultation with its stakeholders and user groups.

Option A. Status Quo

The language from Amendment 6, Section 5.3.1 would remain in place:

The states/jurisdictions are recommended to encourage the use of circle hooks to reduce the mortality associated with hooking and releasing striped bass. A number of studies have been conducted that have demonstrated that release mortality is decreased significantly with the use of circle hooks. In order to promote the use of circle hooks, states are encouraged to develop public relations/education campaigns on their benefits.

Option B. States/jurisdictions would be required to implement regulations requiring the use of circle hooks, as defined above, with the intent of reducing striped bass discard mortality in their recreational fisheries. States have the flexibility to develop regulations that address specific needs of their fisheries. In order to promote the use of circle hooks, states are encouraged to develop public education and outreach campaigns on their benefits.

Option C. States/jurisdictions would be required to promote the use of circle hooks by developing public education and outreach campaigns on their benefits. States/jurisdictions must provide updates on public education and outreach efforts in annual state compliance reports.

4.0 Compliance Schedule

If approved, states must implement Addendum VI according to the following schedule to be in compliance with the Atlantic Striped Bass Interstate FMP:

XXXXXX: States submit proposals to meet requirements of Addendum VI.

XXXXXX: Management Board reviews and takes action on state proposals.

[Month Day, Year]: States implement regulations.

5.0 Literature Cited

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6.0 Tables and Figures

Table 1. Total removals (harvest and discards/release mortality) of Atlantic striped bass by sector in pounds, 2004-2018. Note: Harvest is from ACCSP/MRIP, dead discards and release mortality is from ASMFC. Estimates exclude inshore catch and harvest from North Carolina.

| Year | Commercial | | Recreational | | Total Removals |
|------|------------|---------------|--------------|-------------------|----------------|
| | Harvest | Dead Discards | Harvest | Release Mortality | |
| 2004 | 7,335,116 | 1,262,136 | 54,091,836 | 14,307,082 | 76,144,795 |
| 2005 | 7,121,319 | 1,078,391 | 53,031,074 | 14,412,620 | 79,581,675 |
| 2006 | 6,785,006 | 1,333,235 | 57,421,174 | 16,303,942 | 74,333,557 |
| 2007 | 7,047,195 | 1,181,533 | 50,674,431 | 12,680,939 | 63,054,061 |
| 2008 | 7,190,685 | 953,364 | 42,823,614 | 12,436,713 | 76,637,612 |
| 2009 | 7,216,792 | 1,076,465 | 56,665,318 | 11,236,287 | 73,903,661 |
| 2010 | 6,996,713 | 920,564 | 54,411,389 | 10,833,398 | 80,236,228 |
| 2011 | 6,789,792 | 809,577 | 61,431,360 | 7,569,260 | 74,729,834 |
| 2012 | 6,516,868 | 1,411,621 | 59,592,092 | 8,046,178 | 69,269,469 |
| 2013 | 5,819,678 | 901,326 | 53,256,619 | 10,731,891 | 82,432,216 |
| 2014 | 5,937,949 | 1,167,696 | 65,057,289 | 8,177,402 | 63,484,692 |
| 2015 | 4,830,124 | 1,031,887 | 47,948,610 | 11,621,265 | 57,294,717 |
| 2016 | 4,831,442 | 1,085,060 | 39,898,799 | 11,655,870 | 61,229,668 |
| 2017 | 4,803,867 | 1,110,833 | 43,671,532 | 15,818,534 | 59,392,844 |
| 2018 | 4,714,661 | 870,348 | 37,896,549 | 12,343,941 | 40,997,978 |

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Table 2. Total removals (harvest and discards/release mortality) of Atlantic striped bass by sector in numbers of fish, 2004-2018. Note: Harvest is from ACCSP/MRIP, dead discards and release mortality is from ASMFC. Estimates exclude inshore catch and harvest from North Carolina.

| Year | Commercial | | Recreational | | Total Removals |
|------|------------|---------------|--------------|-------------------|----------------|
| | Harvest | Dead Discards | Harvest | Release Mortality | |
| 2004 | 879,768 | 160,196 | 4,553,027 | 3,665,234 | 9,258,224 |
| 2005 | 970,403 | 145,094 | 4,480,802 | 3,441,928 | 9,038,227 |
| 2006 | 1,047,648 | 158,260 | 4,883,960 | 4,812,332 | 10,902,201 |
| 2007 | 1,015,226 | 166,397 | 3,944,679 | 2,944,253 | 8,070,556 |
| 2008 | 1,027,837 | 108,962 | 4,381,186 | 2,391,200 | 7,909,184 |
| 2009 | 1,049,959 | 128,191 | 4,700,222 | 1,942,061 | 7,820,433 |
| 2010 | 1,031,430 | 133,064 | 5,388,440 | 1,760,759 | 8,313,693 |
| 2011 | 944,777 | 87,924 | 5,006,358 | 1,482,029 | 7,521,088 |
| 2012 | 870,606 | 191,577 | 4,046,299 | 1,847,880 | 6,956,361 |
| 2013 | 784,379 | 112,097 | 5,157,760 | 2,393,425 | 8,447,661 |
| 2014 | 750,263 | 121,253 | 4,033,747 | 2,172,342 | 7,077,604 |
| 2015 | 623,313 | 101,343 | 3,085,725 | 2,307,133 | 6,117,515 |
| 2016 | 607,084 | 105,119 | 3,500,434 | 2,981,430 | 7,194,066 |
| 2017 | 592,670 | 108,475 | 2,934,293 | 3,419,651 | 7,055,089 |
| 2018 | 622,451 | 90,092 | 2,244,766 | 2,826,667 | 5,783,976 |

Figure 1. Female spawning stock biomass (SSB) and recruitment (age-1 fish), 1982-2017. Source: 2018 benchmark stock assessment for Atlantic striped bass.

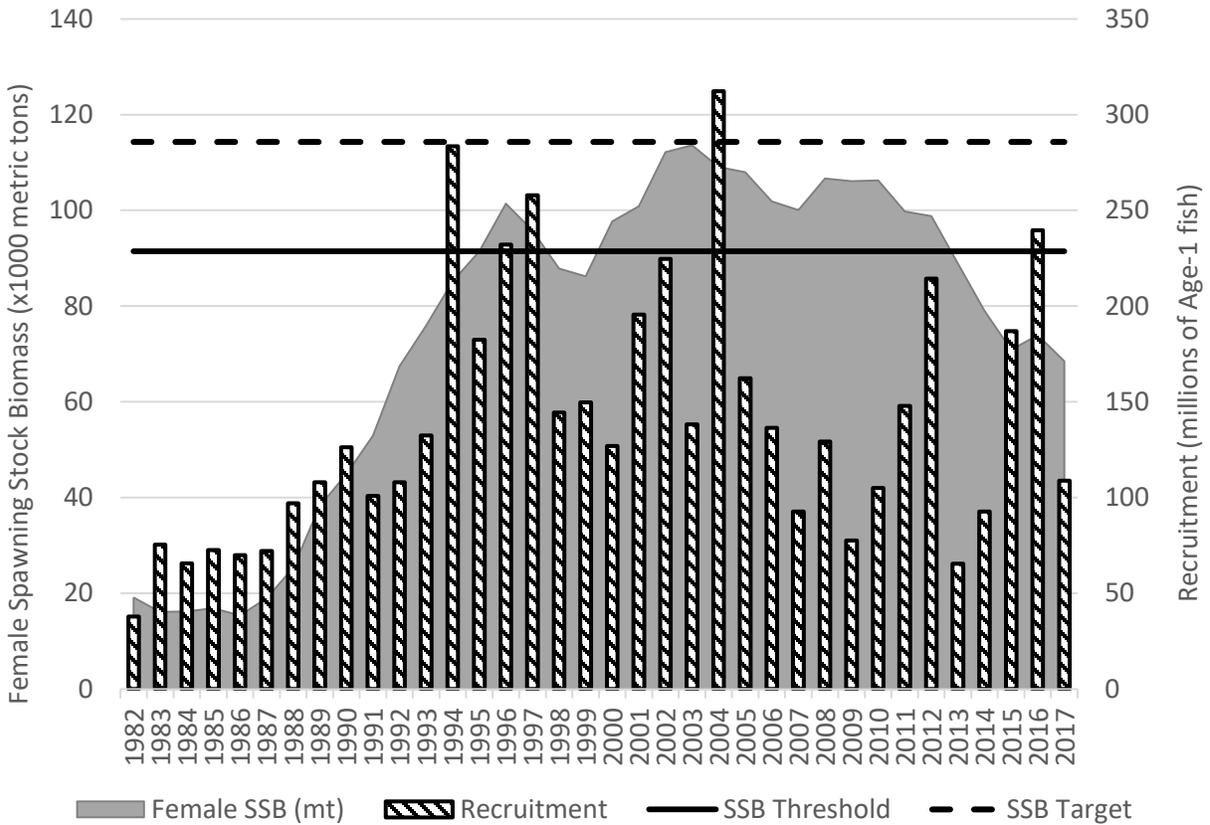


Figure 2. Total fishing mortality (F), 1982-2017. Source: 2018 benchmark stock assessment for Atlantic striped bass.

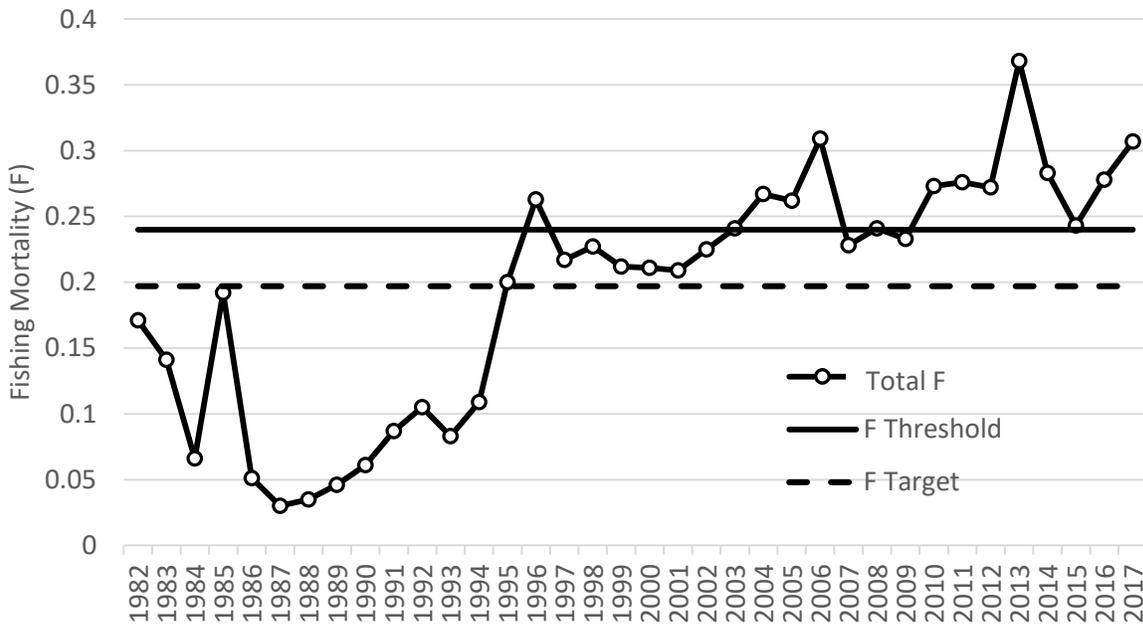


Figure 3. Total striped bass removals by sector in numbers of fish, 1982-2018. Note: Harvest is from ACCSP/MRIP, dead discards and release mortality is from ASMFC. Estimates exclude inshore catch and harvest from North Carolina.

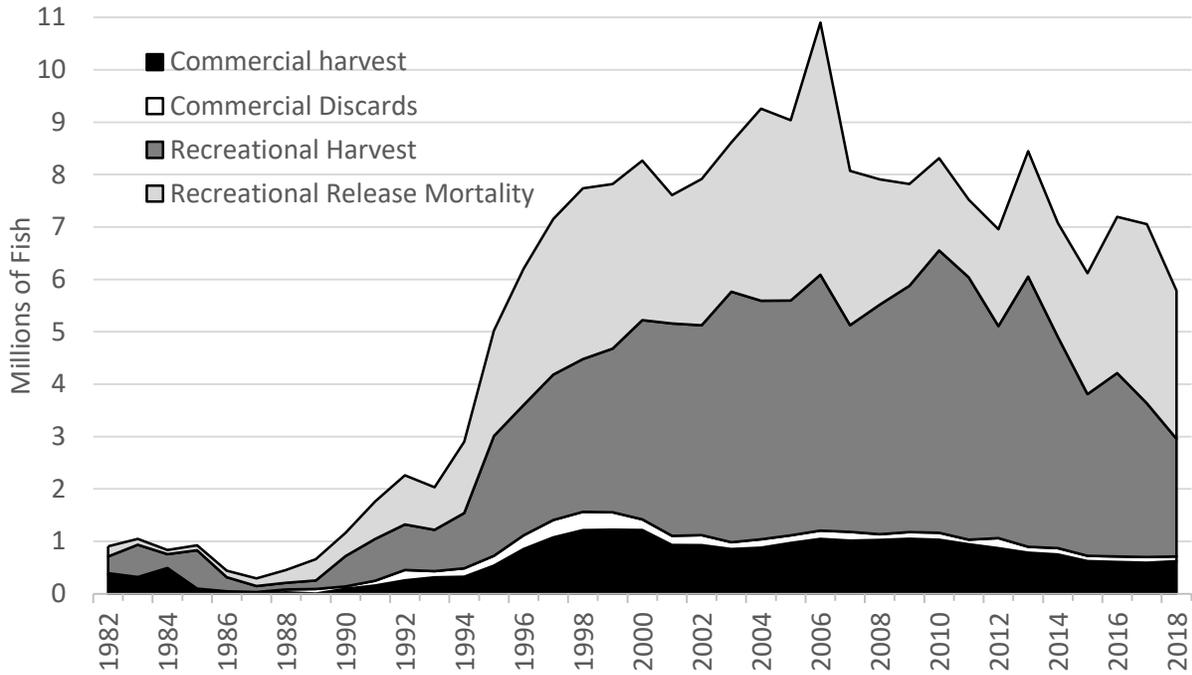


Figure 4. The proportion of recreational fish caught and released alive, 1982-2018. Source: MRIP. Excludes inshore catch from North Carolina.

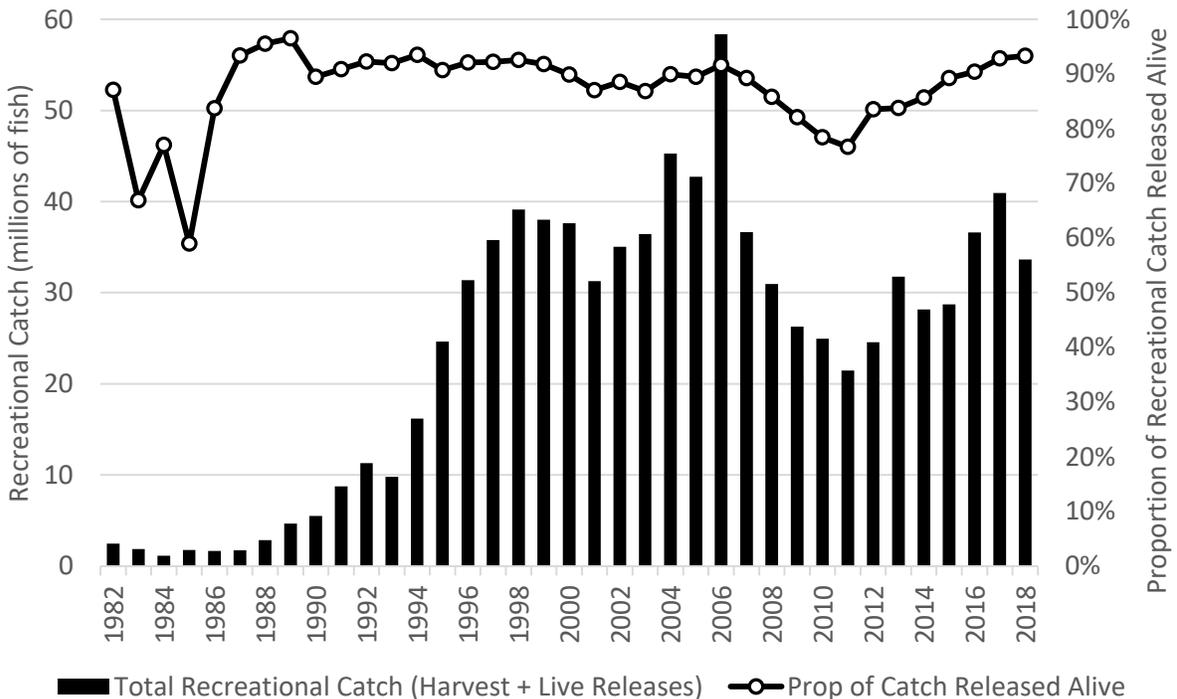
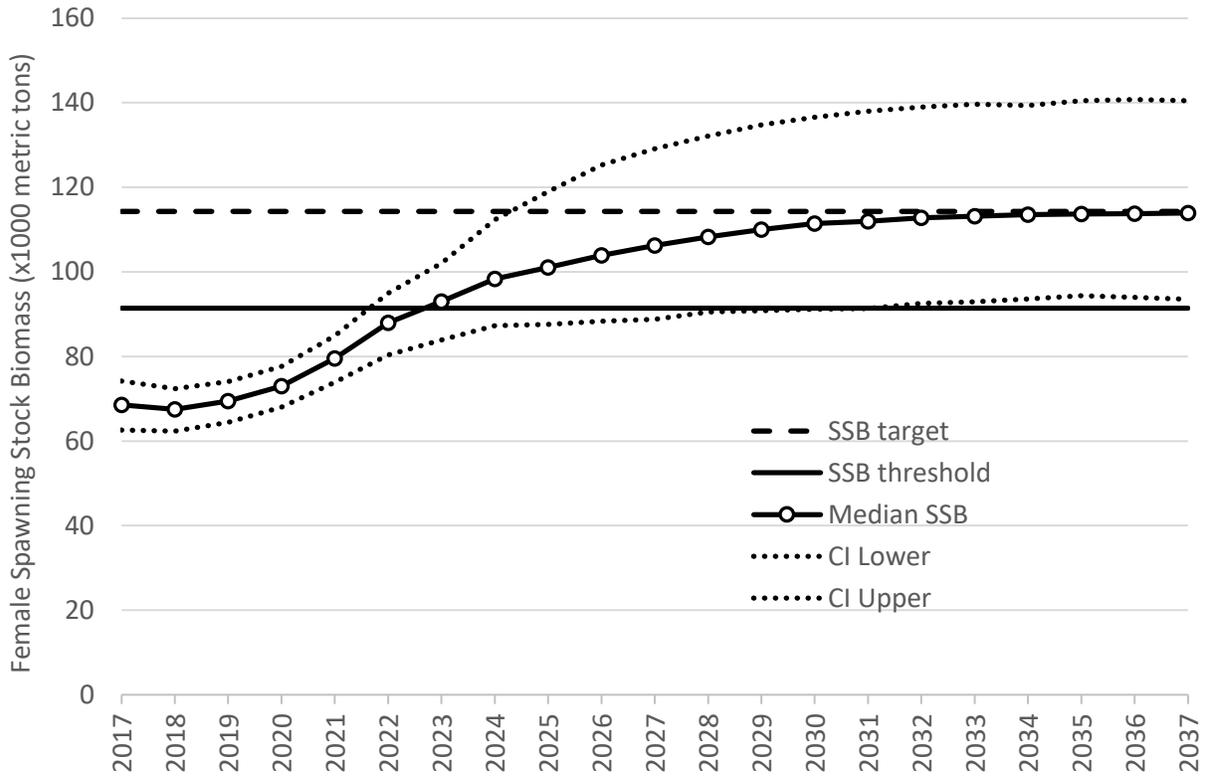


Figure 5. Projecting female spawning stock biomass (SSB) forward until SSB target is achieved while fishing at the fishing mortality target ($F = 0.20$) beginning in 2020.



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Appendix 1. Summary of Atlantic striped bass regulations in 2017. Source: 2018 State Compliance Reports. Minimum size limits and slot size limits are in total length (TL). *commercial quota reallocated to recreational bonus fish program

Commercial regulations in 2017.

| STATE | SIZE LIMITS | SEASONAL QUOTA | OPEN SEASON |
|-------|--|---|---|
| ME | Commercial fishing prohibited | | |
| NH | Commercial fishing prohibited | | |
| MA | 34" minimum size | 869,813 lbs. Hook & line only | 6.23 until quota reached, Monday and Thursdays only; 15 fish/day with commercial boat permit; 2 fish/day with rod and reel permit (striped bass endorsement required for both permits) |
| RI | Floating fish trap (FFT): 26" minimum size General category (GC; mostly rod & reel): 34" min. | Total: 181,540 lbs., split 39:61 between the FFT and GC. Gill netting prohibited. | FFT: 4.1 – 12.31, or until quota reached; unlimited possession limit until 70% of quota projected to be harvested, then 500 lbs/day GC: 5.28-8.31, 9.10-12.31, or until quota reached. Closed Fridays and Saturdays during both seasons. |
| CT* | Commercial fishing prohibited; bonus program: 22 – <28" slot size limit, 5.1 – 12.31 (voucher required) | | |
| NY | 28"-38" minimum size (Hudson River closed to commercial harvest) | 795,795 lb. Pound nets, gill nets (6-8" stretched mesh), hook & line. | 6.1 – 12.15, or until quota reached. Limited entry permit only. |
| NJ* | Commercial fishing prohibited; bonus program: 1 fish at 24 – <28" slot size limit, 9.1 – 12.31 (permit required) | | |
| PA | Commercial fishing prohibited | | |
| DE | Gillnet: 28" minimum size, except 20" min in Del. Bay and River during spring season. Hook and Line: 28" min | Gillnet: 137,831 lbs. Hook and line: 14,509 lbs. | Gillnet: 2.15-5.31 (2.15-3.30 for Nanticoke River) & 11.15-12.31; drift nets only 2.15-2.28 & 5.1-5.31; no fixed nets in Del. River. No trip limit. Hook and Line: 4.1–12.31, 200 lbs/day trip limit |

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Appendix 1, commercial regulations in 2017 (continued).

| STATE | SIZE LIMITS | SEASONAL QUOTA | OPEN SEASON |
|--------------|--|--|--|
| MD | Ocean: 24" minimum CB and Rivers: 18–36" | Ocean: 90,727 lbs. CB and Rivers: 1,471,888 lbs. (part of Bay-wide quota). | Ocean: 1.1-5.31, 10.1-12.31, Mon- Fri Bay Pound Net: 6.1-12.30, Mon-Sat Bay Haul Seine: 6.1-12.29, Mon-Fri Bay Hook & Line: 6.1-12.28, Mon-Thu Bay Drift Gill Net: 1.2-2.28, 12.1-12.29, Mon-Thu |
| PRFC | 18-36" slot size limit 2.15-3.25 and 18" minimum size all other seasons | 583,362 lbs. (part of Bay-wide quota). Allocated by gear and season. | Hook & line: 1.1-3.25, 6.1-12.31 Pound Net & Other: 2.15-3.25, 6.1-12.15 Gill Net: 1.1-3.25, 11.13-12.31 Misc. Gear: 2.15-3.25, 6.1-12.15 |
| DC | Commercial fishing prohibited | | |
| VA | Bay and Rivers: 18" min size, and 18-28" slot size limit 3.26–6.15 Ocean: 28" min | Bay and Rivers: 1,064,997 lbs. (part of Bay-wide quota). Ocean: 136,141 lbs. ITQ-system for both areas. | Bay and Rivers: 1.16-12.31 Ocean: 1.16-12.31 |
| NC | Ocean: 28" | 360,360 lbs. (split between gear types). Number of fish allocated to each permit holder. Allocation varies by permit. | Seine fishery was open for 120 days, 150 fish/permit Gill net fisher was open for 45 days, 50 fish/permit Trawl fishery was open for 70 days, 100 fish/permit |

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Appendix 1, recreational regulations in 2017. C&R = catch and release

| STATE | SIZE LIMITS | BAG LIMIT | GEAR RESTRICTIONS | OPEN SEASONS |
|-------|---|------------|--|--|
| ME | 28" minimum size | 1 fish/day | Hook & line only; circle hooks only when using live bait | All year, except spawning areas are closed 12.1 – 4.30 and catch and release only 5.1 – 6.30 |
| NH | 28" minimum size | 1 fish/day | Gaffing and culling prohibited | All year |
| MA | 28" minimum size | 1 fish/day | Hook & line only; no high-grading | All year |
| RI | 28" minimum size | 1 fish/day | None | All year |
| CT | 28" minimum size | 1 fish/day | Spearing and gaffing prohibited | All year |
| NY | Ocean and Delaware River: 28" minimum size Hudson River: 18"-28" slot limit, or >40" | 1 fish/day | Angling only. Spearing permitted in ocean waters. Catch and release only during closed season. | Ocean: 4.15 – 12.15 Hudson River: 4.1 – 11.30 Delaware River: All year |
| NJ | 1 fish at 28" to < 43", and 1 fish ≥ 43" | | Circle hooks required while fishing with natural bait during springtime spawning ground closure. | Ocean: All year All other waters: 3.1 – 12.31, except spawning ground closure from 4.1 – 5.31 in the lower Delaware River and tributaries |
| PA | Upstream from Calhoun St Bridge: 1 fish at ≥ 28" minimum size, year round Downstream from Calhoun St Bridge: 1 fish at ≥ 28" minimum size, 1.1 – 3.31 and 6.1 – 12.31 2 fish at 21"-25" slot size limit, 4.1 – 5.31 | | | |
| DE | 28" minimum size, no harvest 38-43" (inclusive) | 2 fish/day | Hook & line, spear (for divers) only. Circle hooks required in spawning season. | All year except 4.1-5.31 in spawning grounds (C&R allowed). In Del. River, Bay & tributaries, may only harvest 20-25" slot from 7.1-8.31 |

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Appendix 1, recreational regulations in 2017 (continued). C&R = catch and release

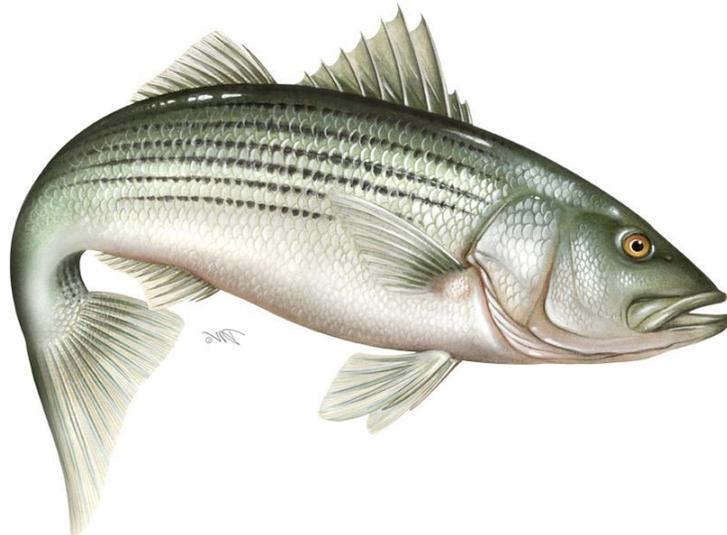
| STATE | SIZE LIMITS | BAG LIMIT | OTHER | OPEN SEASON |
|-------|---|---|--|--|
| MD | Ocean: 28"-38" slot limit or ≥44" CB Spring Trophy: 35" minimum CB Summer/Fall^: 20" minimum and only one fish can be >28" | Ocean: 2 fish/day CB Spring Trophy: 1 fish/day CB Summer/Fall^: 2 fish/day | See compliance report for specifics. | Ocean: All year CB: C&R only 1.1-4.14^ CB Spring Trophy: 4.15-5.15 Bay Summer/Fall: 5.16-12.20 |
| PRFC | Spring Trophy: 35" minimum Summer/Fall: 20" minimum and only 1 fish can be >28" | Trophy: 1 fish/day Summer/Fall: 2 fish/day | No more than two hooks or sets of hooks for each rod or line | Spring Trophy: 4.15 -5.15 Summer/Fall: 5.16-12.31 |
| DC | 20" minimum and only one fish can be >28" | 2 fish/day | Hook & line only | 5.16-12.31 |
| VA | Ocean: 28" minimum Ocean Trophy: 36" minimum CB Trophy: 36" minimum CB Spring: 20-28" (with 1 fish >36") CB Fall: 20" minimum and only one fish can be >28" | Ocean: 1 fish/day Ocean Trophy: 1 fish/day Bay Trophy: 1 fish/day Bay Spring: 2 fish/day Bay Fall: 2 fish/day | Hook & line, rod & reel, hand line only. Gaffing is illegal in Virginia marine waters. No possession in the spawning reaches of the Bay during trophy season | Ocean: 1.1-3.31, 5.16-12.31 Ocean Trophy: 5.1-5.15 Bay Trophy: 5.1-6.15 Bay Spring: 5.16-6.15 Bay Fall: 10.4-12.31 |
| NC | Ocean: 28" minimum | Ocean: 1 fish/day | No gaffing allowed. | Ocean: All year |

^in Susquehanna Flats and Northeast River: C&R only from 1.1-5.3 and 1 fish/day at 20-26" slot size limit from 5.16-5.31

2019 REVIEW OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
FISHERY MANAGEMENT PLAN FOR

ATLANTIC STRIPED BASS
(Morone saxatilis)

2018 FISHING SEASON



Atlantic Striped Bass Plan Review Team

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Gary Shepherd, National Marine Fisheries Service

Drafted July 2019

I. Status of the Fishery Management Plan

| | |
|---------------------------------------|---|
| <u>Date of FMP Approval:</u> | Original FMP – 1981 |
| <u>Amendments:</u> | Amendment 1 – 1984 Amendment 2 – 1984 Amendment 3 – 1985 Amendment 4 – 1989; Addendum I – 1991, Addendum II – 1992, Addendum III – 1993, Addendum IV – 1994 Amendment 5 – 1995; Addendum I – 1997, Addendum II – 1997, Addendum III – 1998, Addendum IV – 1999, Addendum V – 2000 Amendment 6 – 2003; Addendum I – 2007, Addendum II – 2010, Addendum III – 2012, Addendum IV – 2014 |
| <u>Management Unit:</u> | Migratory stocks of Atlantic striped bass from Maine through North Carolina |
| <u>States With Declared Interest:</u> | Maine - North Carolina, including Pennsylvania |
| <u>Additional Jurisdictions:</u> | District of Columbia, Potomac River Fisheries Commission, National Marine Fisheries Service, United States Fish and Wildlife Service |
| <u>Active Boards/Committees:</u> | Atlantic Striped Bass Management Board, Advisory Panel, Technical Committee, Stock Assessment Subcommittee, Tagging Subcommittee, Plan Review Team, and Plan Development Team |

The Atlantic States Marine Fisheries Commission (Commission) developed a Fisheries Management Plan (FMP) for Atlantic Striped Bass in 1981 in response to poor juvenile recruitment and declining landings. The FMP recommended increased restrictions on commercial and recreational fisheries, such as minimum size limits and harvest closures on spawning grounds. Two amendments were passed in 1984 recommending additional management measures to reduce fishing mortality. To strengthen the management response and improve compliance and enforcement, the Atlantic Striped Bass Conservation Act (P.L. 98-613) was passed in late 1984. The Striped Bass Act¹ mandated the implementation of striped bass regulations passed by the Commission and gave the Commission authority to recommend to the Secretaries of Commerce and Interior that states be found out of compliance when they failed to implement management measures consistent with the FMP.

The first enforceable plan under the Striped Bass Act, Amendment 3, was approved in 1985, and required size regulations to protect the 1982-year class – the first modest size cohort since the previous decade. The objective was to increase size limits to allow at least 95% of the females in the 1982 year class to spawn at least once. Smaller size limits were permitted in producer areas than along

¹ The 1997 reauthorization of the Striped Bass Act also required the Secretaries of Commerce and Interior provide a biennial report to Congress highlighting the progress and findings of studies of migratory and estuarine Striped Bass. The ninth such report was recently provided to Congress (Shepherd et al. 2017).

the coast. Several states, beginning with Maryland in 1985, opted for a more conservative approach and imposed a total moratorium on striped bass landings for several years. The amendment contained a trigger mechanism to relax regulations when the 3-year moving average of the Maryland juvenile abundance index (JAI) exceeded an arithmetic mean of 8.0 – which was attained with the recruitment of the 1989 year class. Also, in 1985, the Commission determined the Albemarle Sound-Roanoke River (A-R) stock in North Carolina contributed minimally to the coastal migratory population, and was therefore allowed to operate under an alternative management program.

Amendment 4, implemented in 1989, aimed to rebuild the resource rather than maximize yield. The amendment allowed state fisheries to reopen under a target fishing mortality (F) of 0.25, which was half the estimated F needed to achieve maximum sustainable yield (MSY). The amendment allowed an increase in the target F once spawning stock biomass (SSB) was restored to levels estimated during the late 1960s and early 1970s. The dual size limit concept was maintained (coastal versus producer areas), and a recreational trip limit and commercial season was implemented to reduce the harvest to 20% of that in the historic period of 1972-1979. A series of four addenda were implemented from 1990-1994 to maintain protection of the 1982 year class.

In 1990, to provide additional protection to striped bass and ensure the effectiveness of state regulations, NOAA Fisheries passed a final rule (55 Federal Register 40181-02) prohibiting possession, fishing (catch and release fishing), harvest, and retention of Atlantic striped bass in the Exclusive Economic Zone (EEZ), with the exception of a defined transit zone within Block Island Sound. Atlantic striped bass may be transported through this defined area provided that the vessel is not used to fish while in the EEZ and the vessel remains in continuous transit, and that the fish were legally caught in adjoining state waters.

In 1995, the Atlantic striped bass migratory stock was declared recovered by the Commission (the A/R stock was declared recovered in 1997) and Amendment 5 was adopted to increase the target F to 0.33, midway between the existing F target (0.25) and F_{MSY} . Target F was allowed to increase again to 0.40 after two years of implementation. Regulations were developed to achieve the target F (which included measures to restore commercial harvest to 70% of the average landings during the 1972-1979 historical period) and states were allowed to submit proposals to implement alternative regulations that were deemed conservationally equivalent to the Amendment 5 measures. From 1997-2000, a series of five addenda were implemented to respond to the latest stock status information and adjust the regulatory program to achieve each change in target F.

In 2003, Amendment 6 was adopted to address five limitations within the existing management program: 1) potential inability to prevent the Amendment 5 exploitation target from being exceeded; 2) perceived decrease in availability or abundance of large striped bass in the coastal migratory population; 3) a lack of management direction with respect to target and threshold biomass levels; 4) inequitable effects of regulations on the recreational and commercial fisheries, and coastal and

producer area sectors; and 5) excessively frequent changes to the management program. Accordingly, Amendment 6 completely replaced the existing FMP for Atlantic striped bass.²

The goal of Amendment 6 is “to perpetuate, through cooperative interstate management, migratory stocks of striped bass; to allow commercial and recreational fisheries consistent with the long-term maintenance of a broad age structure, a self-sustaining spawning stock; and also to provide for the restoration and maintenance of their essential habitat.” In support of this goal, the following objectives are included:

1. Manage striped bass fisheries under a control rule designed to maintain stock size at or above the target female spawning stock biomass level and a level of fishing mortality at or below the target exploitation rate.
2. Manage fishing mortality to maintain an age structure that provides adequate spawning potential to sustain long-term abundance of striped bass populations.
3. Provide a management plan that strives, to the extent practical, to maintain coastwide consistency of implemented measures, while allowing the States defined flexibility to implement alternative strategies that accomplish the objectives of the FMP.
4. Foster quality and economically viable recreational, for-hire, and commercial fisheries.
5. Maximize cost effectiveness of current information gathering and prioritize state obligations in order to minimize costs of monitoring and management.
6. Adopt a long-term management regime that minimizes or eliminates the need to make annual changes or modifications to management measures.
7. Establish a fishing mortality target that will result in a net increase in the abundance (pounds) of age 15 and older striped bass in the population, relative to the 2000 estimate.

Amendment 6 modified the F target and threshold, and introduced a new set of biological reference points (BRPs) based on female SSB, as well as a list of management triggers based on the BRPs. The coastal commercial quotas were restored to 100% of the states’ average landings during the 1972-1979 historical period, except for Delaware’s coastal commercial quota which remained at the level allocated in 2002³. In the recreational fisheries, all states were required to implement a two-fish bag limit with a minimum size limit of 28 inches, except for the Chesapeake Bay fisheries, North Carolina fisheries that operate in the A/R, and states with approved alternative regulations. The Chesapeake Bay and A/R regulatory programs were predicated on a more conservative F target than the coastal migratory stock, which allowed these states/jurisdictions (hereafter states) to implement separate seasons, harvest caps, and size and bag limits as long as they remain under that F target. No minimum size limit can be less than 18 inches under Amendment 6. The same minimum size standards regulate

² While NOAA Fisheries continues to implement a complete ban on the fishing and harvest of striped bass in the EEZ, Amendment 6 includes a recommendation to consider reopening the EEZ to striped bass fisheries. In September 2006, NOAA Fisheries concluded that it would be imprudent to open the EEZ to striped bass fishing because it could not be certain that opening the EEZ would not lead to increased effort and an overfishing scenario.

³ The decision to hold Delaware’s commercial quota at the 2002 level is based on tagging information that indicated F on the Delaware River/Bay stock is too high, and uncertainty regarding the status of the spawning stock for the Delaware River/Bay.

the commercial fisheries as the recreational fisheries, except for a minimum 20 inch size limit in the Delaware Bay spring American shad gillnet fishery.

States are permitted the flexibility to deviate from these regulations by submitting conservation equivalency proposals to the Plan Review Team (PRT). All proposals are subject to technical review and approval by the Atlantic Striped Bass Management (Board). It is the responsibility of the state to demonstrate through quantitative analysis that the proposed management program is equivalent to the standards in the FMP, or will not contribute to the overfishing of the resource.

Four addenda to Amendment 6 have been implemented. Addendum I, approved in 2007, established a bycatch monitoring and research program to increase the accuracy of data on striped bass discards and recommended development of a web-based angler education program. Also in 2007, President George W. Bush issued an Executive Order (E.O. 13449) prohibiting the sale of striped bass (and red drum) caught within the EEZ. Addendum II was approved in 2010 and established a new definition of recruitment failure such that each index would have a fixed threshold rather than a threshold that changes annually with the addition of each year's data. Addendum III was approved in 2012 and requires all states with a commercial fishery for striped bass to implement a uniform commercial harvest tagging program. The addendum was initiated in response to significant poaching events in the Chesapeake Bay and aims to limit illegal harvest of striped bass.

Addendum IV, approved in 2014, currently sets the regulatory program for striped bass fisheries. The addendum was initiated in response to the 2013 benchmark assessment which indicated a steady decline in SSB since the mid-2000s. The addendum established new F reference points, as recommended by the 2013 benchmark. In order to reduce F to a level at or below the new target, coastal states are required to implement 1-fish bag limit and 28" minimum size limit to achieve a 25% reduction from 2013 removals in the ocean fishery. Chesapeake Bay fisheries are required to implement regulations to achieve a 20.5% reduction from 2012 removals since their fisheries were reduced by 14% in 2013 based on their management program. The addendum maintains the flexibility to implement alternative regulations through the conservation equivalency process. This practice has resulted in a variety of regulations among states (Table 1 and Table 2). All states promulgated regulations prior to the start of their 2015 seasons.

In February 2017, the Board initiated the development of Draft Addendum V to consider liberalizing coastwide commercial and recreational regulations. The Board's action responded to concerns raised by Chesapeake Bay jurisdictions regarding continued economic hardship endured by its stakeholders since the implementation of Addendum IV and information from the 2016 stock assessment update indicating that F was below target in 2015, and that total removals could increase by 10% to achieve the target F. However, the Board chose to not advance the draft addendum for public comment largely due to harvest estimates having increased in 2016 without changing regulations. Instead, the Board decided to wait until it reviews the results of the 2018 benchmark stock assessment before considering making changes to the management program.

II. Status of the Stocks

The 2018 benchmark stock assessment for Atlantic striped bass was peer-reviewed at the 66th Northeast Regional Stock Assessment Workshop (SAW)/Stock Assessment Review Committee (SARC) meeting in November 2018. The assessment addressed several of the recommendations from the 57th SAW/SARC, including developing new maturity-at-age estimates for the coastal migratory stock and evaluating stock status definitions relative to uncertainty in biological reference points. The assessment also made progress on developing a spatially and temporally explicit catch-at-age model incorporating tag-based movement (migration) information. Although the Peer Review Panel did not accept the migration model for management use, it recommended continued work to improve the model for future assessments.

The accepted model is a forward projecting statistical catch-at-age (SCA) model which uses catch-at-age data and fishery-dependent and -independent survey indices to estimate annual population size and fishing mortality. Indices of abundance track relative changes in the population over time while catch data provide information on the scale of the population size. Age structure data (numbers of fish by age) provide additional information on recruitment (number of age-1 fish entering the population) and trends in mortality.

The biological reference points (BRPs) currently used for management are based on the 1995 estimate of female spawning stock biomass (SSB). The 1995 estimate of female SSB is used as the SSB threshold because many stock characteristics (such as an expanded age structure) were reached by this year and the stock was declared recovered. The SSB target is equal to 125% of SSB threshold. To estimate the associated fishing mortality (F) threshold and target, population projections were made by using a constant F and changing the value until the SSB threshold or target was achieved. For the 2018 benchmark, the BRP values have been updated. The benchmark incorporates the newly calibrated recreational catch estimates based on the Marine Recreational Information Program's (MRIP) Fishing Effort Survey (FES), resulting in higher estimates of SSB and therefore higher estimates for the SSB threshold and target (refer to *Section III* for more information). The SSB threshold is estimated at 91,436 metric tons (202 million pounds), with an SSB target of 114,295 metric tons (252 million pounds). The new MRIP estimates did not have a large effect on the estimates of fishing mortality, and the updated F threshold and target values are very similar to the previous F reference points. The F threshold is estimated at 0.24, and the target is estimated at 0.20

Based on the results of the 2018 benchmark, Atlantic striped bass is overfished and experiencing overfishing. In 2017, female SSB was estimated at 68,476 metric tons (151 million pounds) which is below the SSB threshold (Figure 1). Female SSB declined steadily since the time series high in 2003 and has been below threshold since 2013. The recent decline in female SSB appears to be attributed to a period of low recruitment since about 2005 (Figure 1). However, the 2011, 2014, and 2015 year classes (representing the 2012, 2015, and 2016 age-1 recruitment estimates) were above average. Total F was estimated at or above F threshold in 13 of the last 15 years, and was estimated above threshold in 2017 at 0.31 (Figure 2).

III. Status of the Fishery in the Ocean and Chesapeake Bay

In 2018, total Atlantic striped bass removals (commercial and recreational, including harvest, commercial discards and recreational release mortality) was estimated at 5.78 million fish, which is an 18% decrease relative to 2017 (Table 3; Figure 5). The recreational sector accounted for 88% of total removals by number. It should be noted that the recreational catch estimates reported here reflect the new, improved MRIP mail-based survey and are not directly comparable to past FMP Review reports.

The commercial fishery harvested 4.71 million pounds (622,451 fish) in 2018, which is a 2% increase by number but a 2% decrease by weight relative to 2017 (Table 4; Table 5). Harvest from Chesapeake Bay accounted for 65% of the total by weight; Maryland landed 32%, Virginia landed 23%, and PRFC landed 10% (Table 5; Figure 6). Additional harvest came from Massachusetts (16%), New York (13%), Rhode Island (4%), and Delaware (3%). The proportion of total harvest coming from Chesapeake Bay in numbers of fish is much higher; roughly 80% annually since 1990 (Table 6). This is because fish harvested in Chesapeake Bay have a lower average weight per fish than fish harvested in ocean fisheries. Commercial dead discards were estimated at 90,092 fish, and account for 2% of total removals in 2018 (Table 6).

Total recreational catch (harvest and releases) was estimated at 33.7 million fish which is an 18% decrease from 2017 and is likely attributed to the observed decrease in fishing effort for trips targeting striped bass in the ocean (Table 7). Total recreational harvest (A+B1) in 2018 is estimated at 2.24 million fish (23.1 million pounds), and represents a 23% decrease relative to 2017 (39% decrease by weight) (Table 8; Table 9). Maryland landed the largest proportion of recreational harvest in number of fish⁴ (44%), followed by New Jersey (21%), Massachusetts (17%), New York (8%), and Connecticut (4%) (Table 9). The proportion of recreational harvest in numbers from Chesapeake Bay has increased in recent years and was estimated at 47% in 2018.

The vast majority (89% on average since 1990) of recreational striped bass catch is released alive either due to angler preference or regulation (i.e., undersized or already caught the bag limit) (Figure 7). The assessment assumes, based on previous studies, that 9% of the fish that are released alive die as a result of being caught. In 2018, recreational anglers caught and released an estimated 31.4 million fish (93% of total catch), 2.8 million of which were assumed to have died (Table 7). This represents a 17% decrease relative to 2017. The ocean region accounted for majority of the decrease and is likely attributed to the observed decrease in fishing effort in 2018. According to MRIP, the number of fishing trips where the angler identified striped bass as the primary or secondary target species in 2018 was 18.3 million trips which is a 6% decrease relative to 2017 (19.4 million trips) in the ocean region, while effort in Chesapeake Bay remained constant at roughly 2.6 million trips targeting striped bass.

⁴ By weight, New Jersey had the largest proportion of harvest (30%), followed by Massachusetts (21%), Maryland (20%), New York (15%), and Connecticut and Rhode Island both at 5% (Table 8).

IV. Albemarle Sound and Roanoke River Management Area

Fishery Management Plan

While striped bass in North Carolina’s ocean waters are managed under the Interstate FMP, Addendum IV to Amendment 6 formally defers management of the A/R stock to the state of North Carolina using A/R stock-specific BRPs approved by the Board (NCDMF 2013, 2014).

Estuarine striped bass in North Carolina are currently managed under Amendment 1 to the North Carolina Estuarine Striped Bass Fishery Management Plan (FMP) and its subsequent revision and recent supplement (NCDMF 2013, 2014, 2019). It is a joint plan between the North Carolina Marine Fisheries Commission (NCMFC) and the North Carolina Wildlife Resources Commission (NCWRC). Amendment 1, adopted in 2013, lays out separate management strategies for the Albemarle Sound-Roanoke Rive (A-R) stock and the estuarine (non-migratory) Central and Southern striped bass stocks in the Tar-Pamlico, Neuse, and Cape Fear rivers. Management programs in Amendment 1 utilize annual total allowable landings (TAL), daily possession limits, open and closed harvest seasons, gill net mesh size and yardage restrictions, seasonal attendance requirements, barbless hook requirements in some areas, minimum size limits, and slot limits to maintain a sustainable harvest and reduce regulatory discard mortality in all sectors. Amendment 1 also maintains the stocking regime in the central and southern systems and the harvest moratorium on striped bass in the Cape Fear River and its tributaries (NCDMF 2013).

Striped bass fisheries in the Atlantic Ocean of North Carolina are managed under ASMFC’s Amendment 6 and subsequent addenda to the Interstate FMP for Atlantic Striped Bass. Amendment 6 also requires North Carolina to inform the Commission of changes to striped bass management in the A-R System.

Albemarle Sound-Roanoke River Striped Bass Stocks

The most recent A/R benchmark stock-specific assessment utilized the ASAP3 statistical catch-at-age model. The model was peer reviewed by an outside panel of experts and approved for management use by the Board in October 2014. The benchmark assessment produced new BRPs and annual harvest quota to prevent overfishing. The model was most recently updated in 2016 with catch and index data through 2014 (Flowers and Godwin 2016). Based on results of the 2016 update, and in comparison to the BRPs below, A-R striped bass are not overfished and are not experiencing overfishing.

| | <i>F</i> | <i>Female SSB</i> | <i>Total Allowable Landings (TAL)</i> |
|------------------|----------|-------------------|---|
| Threshold | 0.41 | 785,150 lbs. | 275,000 lb (split evenly between recreational and commercial sectors) |
| Target | 0.33 | 969,496 lbs. | |

In 2014, female SSB was estimated at 2,024,583 pounds which is above the peak in 2003 and the highest value in the time series (Figure 3). In 2014, F was estimated at 0.06 which is below both the F threshold and target (Figure 4). Caution should be used, however, when evaluating the estimates of SSB and F in the terminal year. The estimated SSB value in 2014 is likely an overestimate based on past years of retrospective bias exhibited by the model. Subsequent assessments, incorporating additional years of data, and possibly a revised stock-recruit relationship, will likely reduce the magnitude of the 2014 value (Flowers and Godwin 2016). A/R striped bass experienced a period of unusually strong

recruitment (number of age-1 fish entering the population) from 1994-2001 followed by a period of lower recruitment from 2002-2014 (Figure 3).

Overall, the trends in the A/R stock abundance are quite similar to the Atlantic striped bass stocks described above, with a steady decline in female SSB since about 2003. Total stock abundance reached its peak in the early 2000s, declined gradually through about 2009 and increasing slightly beginning in 2011 through the terminal year. A new benchmark A/R stock assessment with data through 2016 is currently underway and scheduled to be completed in late 2019.

Albemarle Sound and Roanoke River Atlantic Striped Bass Fisheries

In 2018, total commercial and recreational harvest in the Albemarle Sound Management Area (ASMA) and the Roanoke River Management Area (RRMA) was 154,617 pounds (39,942 fish). Commercial harvest in the ASMA was 116,057 pounds (27,735 fish). Recreational harvest in the ASMA was 11,763 pounds (3,466 fish), and recreational harvest in the RRMA was 26,797 pounds (8,741 fish).

V. Status of Research and Monitoring

Amendment 6 and its Addenda I-IV set the regulatory and monitoring measures for the coastwide striped bass fishery in 2017. Amendment 6 requires certain states to implement fishery-dependent monitoring programs for striped bass. All states with commercial fisheries or substantial recreational fisheries are required to define the catch and effort composition of these fisheries. Additionally, all states with a commercial fishery must implement a commercial harvest tagging program pursuant to Addendum III to Amendment 6.

Amendment 6 also requires certain states to monitor the striped bass population independent of the fisheries. Juvenile abundance indices are required from Maine (Kennebec River), New York (Hudson River), New Jersey (Delaware River), Maryland (Chesapeake Bay tributaries), Virginia (Chesapeake Bay tributaries), and North Carolina (Albemarle Sound). Spawning stock sampling is mandatory for New York (Hudson River), Pennsylvania (Delaware River), Delaware (Delaware River), Maryland (Upper Chesapeake Bay and Potomac River), Virginia (Rappahannock River and James River), and North Carolina (Albemarle Sound-Roanoke River). Amendment 6 requires NOAA Fisheries, USFWS, Massachusetts, New York, New Jersey, Maryland, Virginia, and North Carolina to continue their tagging programs, which provide data used to determine survivorship and migration patterns.

VI. Status of Management Measures and Issues

Coastal Commercial Quota

In 2018, the coastal commercial quota was 2,823,096 pounds and was not exceeded, however Delaware exceeded its allocation by 9,943 pounds which will be deducted from its 2019 quota. Table 10 contains state-specific quotas and harvest that occurred in 2018, and final 2019 quotas.

Chesapeake Bay Commercial Quota

In 2018, the Chesapeake Bay-wide quota was 3,120,247 pounds and was allocated to Maryland, the PRFC, and Virginia based on historical harvest. In 2017, the Bay-wide quota was not exceeded and all

jurisdictions maintained harvest below its respective quota. Table 10 contains jurisdiction-specific quotas and harvest that occurred in 2017 for the Chesapeake Bay, and final 2018 quotas. In 2018, Commercial harvest from Chesapeake Bay accounted for 52% of total commercial landings by weight, and has averaged 57% since implementation of Addendum IV in 2015.

Chesapeake Bay Spring Harvest of Migrant Striped Bass

Recreational fishermen in the Chesapeake Bay are permitted to take adult migrant fish during a limited seasonal fishery, commonly referred to as the Spring Trophy Fishery. From 1993 to 2007 the fishery operated under a quota. Beginning in 2008, the Board approved non-quota management until stock assessment indicates that corrective action is necessary to reduce F on the coastal stock. The Spring Trophy Fishery is currently managed via bag limits and minimum sizes (see *Appendix 1* for state specific measures). The 2018 estimate of migrant fish harvested during the trophy season was 17,198 fish (17,104 fish in Maryland and 94 fish in Virginia) which is decrease compared to 2017 (22,892 fish) and below the 2006-2018 average of 40,990 fish (Horne 2019).

Wave-1 Recreational Harvest Estimates

Evidence suggests that North Carolina, Virginia, and possibly other states have had sizeable wave-1 (January/February) recreational striped bass fisheries beginning in 1996 (NEFSC 2013b). MRIP, formerly the Marine Recreational Fisheries Statistics Survey (MRFSS), has sampled for striped bass in North Carolina during wave-1 since 2004 (other states are not currently covered during wave-1). For Virginia, harvest in wave-1 is estimated via the ratio of landings and tag returns in wave-6 and regression analysis (refer to the methods described in ASMFC 2016 for more detail).

However, based on fishery-independent data collected by NCDMF, ASMFC and USFWS, striped bass distributions on their overwintering grounds during December through February has changed significantly since the mid-2000s. The migratory portion of the stocks has been well offshore in the EEZ (>3 miles) effecting both Virginia's and North Carolina's striped bass winter ocean fisheries in recent years. Furthermore, North Carolina has reported zero striped bass harvest during wave-1 in the ocean for 2012-2018. Similarly, its commercial fishery has reported zero striped bass landings from the ocean during that time.

Addendum II: Juvenile Abundance Index Analysis

The following states are required to conduct striped bass young-of-year juvenile abundance index (JAI) surveys on an annual basis: Maine for the Kennebec River; New York for the Hudson River; New Jersey for the Delaware River; Maryland for the Maryland Chesapeake Bay tributaries; Virginia for the Virginia Chesapeake Bay tributaries; and North Carolina for the A/R stock.

The PRT annually reviews trends in all required JAIs. The definition of recruitment failure is a value that is below 75% (the first quartile, or Q1) of all values in a fixed time series appropriate to each juvenile abundance index (see *Addendum II* for details). If any survey's JAI falls below their respective Q1 for three consecutive years, appropriate action should be recommended by the PRT to the Management Board.

For the 2019 review of JAIs, the analysis evaluates the 2016, 2017, and 2018 JAI values. No state's JAI met the criteria for recruitment failure (Figure 8). North Carolina's JAI value was the only value below its respective Q1 in 2018. Maine's, New York's and New Jersey's JAI values were at or near the respective time series average in 2018, while Maryland's and Virginia's values were above average in 2018.

Addendum III: Commercial Fish Tagging Program

Addendum III to Amendment 6 includes compliance requirements for monitoring commercial fishery harvest tagging programs. In 2017, all states implemented commercial tagging programs consistent with the requirements of Addendum III. Table 11 describes commercial tagging programs by state.

Law Enforcement Reporting

States are asked to report and summarize law enforcement cases that occurred the previous season in annual compliance reports. In 2018, reported law enforcement cases (e.g., the number of warnings and citations) were similar to those reported in previous years. The most common violations were recreationally harvested fish under the legal size limit and possessing fish in excess of the bag limit.

VII. Annual State Compliance and Plan Review Team Recommendations

In 2018, and based on annual state compliance reports (ASMFC 2019), the PRT determined that each state and jurisdiction implemented a management program consistent with the requirements of Amendment 6 and addenda I-IV (Table 12). Refer to Table 1 and Table 2 for a summary of 2018 striped bass fishing regulations by state. In 2018, Maryland implemented a 19" minimum size limit in the Chesapeake Bay recreational fishery through conservation equivalency. The regulations also require anglers to use non-offset circle hooks when live-lining or chumming, and prohibit the use of treble hooks.

Addendum III to Amendment 6 includes compliance requirements for monitoring commercial fishery harvest tagging programs. The PRT determined that all states with commercial striped bass fisheries implemented a commercial harvest tagging program in 2018 consistent with the requirements of Addendum III. Table 11 describes each state's commercial tag program requirements.

Amendment 6 includes compliance requirements for monitoring programs (summarized in *Section V*). Compliance with these requirements is summarized in Table 12. The PRT determined that each state and jurisdiction carried out the required monitoring programs in the 2018 fishing year. It should be noted that Virginia significantly modified its spawning stock monitoring and tagging program methodologies. Specifically, the pound net component of the spawning stock survey was eliminated and replaced with multi-panel anchor gill nets, while tagging was conducted through electrofishing. Both parts of the new monitoring programs were reviewed by the TC and approved by the Board at its February 2019 meeting. The PRT also notes that while the New York spawning stock monitoring program in the Hudson River does meet the requirements of the FMP, it does not provide an index of relative abundance to characterize the Hudson River stock which was identified as a high priority research recommendation at SAW 66.

Massachusetts reported two new regulatory changes for 2019: 1) a prohibition on the gaffing of non-conforming sized striped bass (i.e., less than 34" in the commercial fishery, and less than 28" in the recreational fishery); and 2) an allowance for non-conforming sized striped bass to be imported during the state's commercial striped bass season (fish previously had to meet the state's commercial minimum size limit during the open season, plus five days after its closure).

VIII. Research Recommendations

The following categorized and prioritized research recommendations were developed by the 2018 Benchmark Stock Assessment Subcommittee and the 66th SARC:

Fishery-Dependent Priorities

High

- Continue collection of paired scale and otolith samples, particularly from larger striped bass, to facilitate development of otolith-based age-length keys and scale-otolith conversion matrices.
- Develop studies to provide information on gear specific (including recreational fishery) discard mortality rates and to determine the magnitude of bycatch mortality⁵.
- Conduct study to directly estimate commercial discards in the Chesapeake Bay.
- Collect sex ratio information on the catch and improve methods for determining population sex ratio for use in estimates of female SSB and biological reference points.

Moderate

- Improve estimates of striped bass harvest removals in coastal areas during wave 1 and in inland waters of all jurisdictions year round.

Fishery-Independent Priorities

High

- Develop and index of relative abundance from the Hudson River Spawning Stock Biomass survey to better characterize the Delaware Bay/Hudson River stock.
- Improve the design of existing spawning stock surveys for Chesapeake Bay and Delaware Bay.

Moderate

- Develop a refined and cost-efficient, fisheries-independent coastal population index for striped bass stocks.
- Collect sex ratio information from fishery-independent sources to better characterize the population sex ratio.

Modeling/Quantitative Priorities

High

- Develop better estimates of tag reporting rates; for example, through a coastwide tagging study.
- Investigate changes in tag quality and potential impacts on reporting rate.
- Explore methods for combining tag results from programs releasing fish from different areas on different dates.

⁵ Literature search and some modeling work completed

- Develop field or modeling studies to aid in estimation of natural mortality and other factors affecting the tag return rate.
- Compare M and F estimates from acoustic tagging programs to conventional tagging programs.

Moderate

- Examine methods to estimate temporal variation in natural mortality.

Low

- Evaluate truncated matrices to reduce bias in years with no tag returns and covariate based tagging models to account for potential differences from size or sex or other covariates.

Life History and Biology

High

- Continue in-depth analysis of migrations, stock compositions, sex ratio, etc. using mark-recapture data⁶.
- Continue evaluation of striped bass dietary needs and relation to health condition.
- Continue analysis to determine linkages between the Mycobacteriosis outbreak in Chesapeake Bay and sex ratio of Chesapeake spawning stock, Chesapeake juvenile production, and recruitment success into coastal fisheries.

Moderate

- Examine causes of different tag based survival estimates among programs estimating similar segments of the population.
- Continue to conduct research to determine limiting factors affecting recruitment and possible density implications.
- Conduct study to calculate the emigration rates from producer areas now that population levels are high and conduct multi-year study to determine inter-annual variation in emigration rates.

Striped Bass Research Priorities Identified as Being Met or Well in Progress

- Evaluate to what extent rising natural mortality among Chesapeake Bay striped bass affects the existing F and female SSB thresholds, which are based on a fixed M assumption ($M = 0.15$).
- Develop simulation models to look at the implications of overfishing definitions relative to development of a striped bass population that will provide “quality” fishing. Quality fishing must first be defined.
- Evaluate the stock status definitions relative to uncertainty in biological reference points.
- Develop a method to integrate catch-at-age and tagging models to produce a single estimate of F and stock status⁷.
- Develop a spatially and temporally explicit catch-at-age model incorporating tag based movement information⁸.
- Develop maturity ogives applicable to coastal migratory stocks.

⁶ Ongoing through Cooperative Winter Tagging Cruise and striped bass charter boat tagging trips. See Cooperative Winter Tagging Cruise 20 Year Report.

⁷ Model developed, but the tagging data overwhelms the model. Issues remain with proper weighting

⁸ Model developed with Chesapeake Bay and the rest of the coast as two stocks. External analysis of tagging data is used to inform the model but is not explicitly incorporated.

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X. Tables and Figures

Table 1. Summary of Atlantic Striped bass commercial regulations in 2018. Source: 2019 State Compliance Reports. Minimum sizes and slot size limits are in total length (TL). *commercial quota reallocated to recreational bonus fish program

| STATE | SIZE LIMITS | SEASONAL QUOTA | OPEN SEASON |
|-------|---|--|---|
| ME | Commercial fishing prohibited | | |
| NH | Commercial fishing prohibited | | |
| MA | 34" minimum size | 869,813 lbs. Hook & line only | 6.23 until quota reached, Monday and Thursdays only. Fishing prohibited on July 3, July 4, and Labor Day. |
| RI | Floating fish trap: 26" minimum size | Total: 181,572 lbs., split 39:61 between the trap and general category. Gill netting prohibited. | Trap: 4.1 – 12.31, or until quota reached; unlimited possession limit until 70% of quota projected to be harvested, then 500 |
| | General category (mostly rod & reel): 34" min. | | General Category: 5.20-8.04, 8.05-12.31, or until quota reached. Closed Fridays and Saturdays. 5 fish/vessel/day possession limit. |
| CT* | Commercial fishing prohibited; bonus program: 1 fish at 22" – <28" slot size, 5.1 – 12.31 (voucher required) | | |
| NY | 28"-38" minimum size (Hudson River closed to commercial harvest) | 795,795 lb. Pound nets, gill nets (6"-8" stretched mesh), hook & line. | 6.1 – 12.15, or until quota reached. Limited entry permit only. |
| NJ* | Commercial fishing prohibited; bonus program: 1 fish at 24" – <28" slot size limit, 5.1 – 12.31 (permit required) | | |
| PA | Commercial fishing prohibited | | |
| DE | Gillnet: 28" minimum size, except 20" min in Del. Bay and River during spring season. Hook and Line: 28" min | Gillnet: 137,831 lbs. Hook and line: 14,509 lbs. | Gillnet: 2.15-5.31 (2.15-3.30 for Nanticoke River) & 11.15-12.31; drift nets only 2.15-28 & 5.1-31; no fixed nets in DE River. No trip limit. |

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(Table 1 continued – Summary of commercial regulations in 2018)

| STATE | SIZE LIMITS | SEASONAL QUOTA | OPEN SEASON |
|-------|---|--|--|
| MD | Ocean: 24" minimum CB and Rivers: 18"–36" | Ocean: 90,727 lbs. CB and Rivers: 1,471,888 lbs. (part of Bay-wide quota). | Ocean: 1.1-5.31, 10.1-12.31, Mon- Fri Bay Pound Net: 6.1-11.30, Mon-Sat Bay Haul Seine: 6.1-11.30, Mon-Fri Bay Hook & Line: 6.4-12.29, Mon-Thu Bay Drift Gill Net: 1.1-2.28, 12.3-12.31, Mon-Fri |
| PRFC | 18"-36" slot limit 2.15-3.25 and 18" minimum size all other seasons | 583,362 lbs. (part of Bay-wide quota). Allocated by gear and season. | Hook & line: 1.1-3.25, 6.1-12.31 Pound Net & Other: 2.15-3.25, 6.1-12.15 Gill Net: 1.1-3.25, 11.13-12.31 Misc. Gear: 2.15-3.25, 6.1-12.15 |
| DC | Commercial fishing prohibited | | |
| VA | Ocean: 28" min CB and Rivers: 18" minimum and 18"-28" slot | Ocean: 136,141 lbs. CB and Rivers: 1,064,997 lbs. (part of Bay- wide quota). ITQ- system for both areas. | Ocean: 1.16-12.31 CB and Rivers: 1.16-12.31 |
| NC | Ocean: 28" | 360,360 lbs. (split between gear types). Number of fish allocated to each permit holder. Allocation varies by permit. | Seine fishery was open for 120 days, 150 fish/permit Gill net fisher was open for 45 days, 50 fish/permit Trawl fishery was not opened due to lack of striped bass presence. |

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Table 2. Summary of Atlantic Striped bass recreational regulations in 2018. Source: 2019 State Compliance Reports. Minimum sizes and slot size limits are in total length (TL).

| STATE | SIZE LIMITS | BAG LIMIT | GEAR/FISHING RESTRICTIONS | OPEN SEASON |
|-------|--|------------|--|--|
| ME | ≥ 28" minimum size | 1 fish/day | Hook & line only; circle hooks only when using live bait | All year, except spawning areas are closed Dec 1 – April 30 and catch and release only May 1 – June 30 |
| NH | ≥ 28" minimum size | 1 fish/day | Gaffing and culling prohibited | All year |
| MA | ≥ 28" minimum size | 1 fish/day | Hook & line only; no high-grading | All year |
| RI | ≥ 28" minimum size | 1 fish/day | None | All year |
| CT | ≥ 28" minimum size | 1 fish/day | Spearing and gaffing prohibited | All year |
| NY | Ocean and Delaware River: ≥ 28" minimum size | 1 fish/day | Angling only. Spearing permitted in ocean waters. Catch and release only during closed season. | Ocean: April 15 – Dec 15 Delaware River: All year |
| | Hudson River: 18-28" slot limit, or ≥40" | | | Hudson River: April 1 – Nov 30 |
| NJ | 1 fish at 28 to < 43", and 1 fish ≥ 43" | | | Closed Jan 1 – Feb 28 in all waters except in the Atlantic Ocean, and April 1 – May 31 in the lower Delaware River and tributaries (spawning ground closure) |
| PA | Upstream from Calhoun St Bridge: 1 fish at ≥ 28" minimum size | | | |
| | Downstream from Calhoun St Bridge: 1 fish at ≥ 28" minimum size, from 4.1 – 5.31, a 2 fish at 21-25" slot size limit | | | |
| DE | 28" minimum size, no harvest 38-43" (inclusive). | 2 fish/day | Hook & line, spear (for divers) only. Circle hooks required in spawning season. | All year. Catch and release only April 1 - May 31 in spawning grounds. In Del. River, Bay & tributaries, may only harvest 20-25" slot from July 1 - Aug 31 |

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(Table 2 continued – Summary of recreational regulations in 2018).

| STATE | SIZE LIMITS | BAG LIMIT | GEAR/FISHING RESTRICTIONS | OPEN SEASON |
|-----------------------|--|------------|--|--|
| MD[^] | Ocean: 28"-38" slot, or >44" | 2 fish/day | | All year |
| | CB: Catch and Release Only | C&R only | no eels | Jan 1 - Feb 28, March 1 – April 20 (mainstem only, tributaries closed) |
| | CB Spring Trophy: 35" minimum | 1 fish/day | mainstem only from Baltimore to VA line | April 21 - May 15 |
| | CB Summer and Fall: 19" minimum, only 1 fish can be >28" | 2 fish/day | non-offset circle hooks when live-lining or chumming, no treble hooks when bait fishing | May 16 - 31, mainstem Bay only, Baltimore to VA line; June 1 - Dec 15 all Bay and Tributaries open |
| PRFC | Spring Trophy: 35" minimum | 1 fish/day | Downstream of Rt. 301 Bridge - No more than two hooks or sets of hooks per rod or line. No high-grading allowed and no live eel. | April 20 - May 15 |
| | Summer and Fall: 20" minimum and only 1 fish can be >28" | 2 fish/day | No more than two hooks or sets of hooks for each rod or line | May 16 - Dec 31 |
| DC | 20" minimum size and only one fish can be >28" | 2 fish/day | hook and line only | May 16 - Dec 31 |
| VA | Ocean: 28" minimum size | 1 fish/day | Hook & line, rod & reel, hand line only. Gaffing is illegal in Virginia marine waters. | Jan 1 - March 31 and May 16 - Dec 31 |
| | Ocean Spring Trophy: 36" min | 1 fish/day | | May 1 - May 15 |
| | CB Trophy: 36" minimum | 1 fish/day | No possession of striped bass in the Spawning Reaches | May 1 - June 15 |
| | Chesapeake Bay Spring: 20"-28" | 2 fish/day | One fish can be greater 36" during the trophy season only | May 16 - June 15 |
| | CB Fall: 20" minimum | 2 fish/day | size and only one fish can be >28" | Oct 4 - Dec 31 |
| NC | Ocean: ≥ 28" minimum size | 1 fish/day | No gaffing allowed | All year |

[^] Susquehanna Flats: C&R only Jan 1 – May 3; 1 fish at 19"-26" slot May 16 – May 31. Northeast River: C&R only May 16 – May 31

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Table 3. Total removals (harvest plus discards/release mortality) of Atlantic striped bass by sector in numbers of fish, 1990-2018. Note: Harvest is from ACCSP/MRIP, discards/release mortality is from ASMFC. Estimates exclude inshore harvest from North Carolina.

| Year | Commercial | | Recreational | | Total Removals |
|------|------------|----------|--------------|-------------------|----------------|
| | Harvest | Discards | Harvest | Release Mortality | |
| 1990 | 93,888 | 46,630 | 578,897 | 442,811 | 1,162,226 |
| 1991 | 158,491 | 90,439 | 798,260 | 715,478 | 1,762,667 |
| 1992 | 256,476 | 197,240 | 869,779 | 937,611 | 2,261,106 |
| 1993 | 314,483 | 116,921 | 789,037 | 812,404 | 2,032,844 |
| 1994 | 325,401 | 160,198 | 1,055,523 | 1,360,872 | 2,901,993 |
| 1995 | 537,412 | 187,185 | 2,287,578 | 2,010,689 | 5,022,865 |
| 1996 | 854,094 | 261,022 | 2,487,421 | 2,600,526 | 6,203,063 |
| 1997 | 1,076,460 | 331,383 | 2,774,981 | 2,969,781 | 7,152,605 |
| 1998 | 1,215,219 | 348,852 | 2,915,390 | 3,259,133 | 7,738,594 |
| 1999 | 1,223,572 | 332,101 | 3,123,495 | 3,140,905 | 7,820,072 |
| 2000 | 1,216,812 | 203,084 | 3,802,477 | 3,044,203 | 8,266,575 |
| 2001 | 931,412 | 174,926 | 4,052,474 | 2,449,599 | 7,608,411 |
| 2002 | 928,085 | 191,099 | 4,005,084 | 2,792,200 | 7,916,468 |
| 2003 | 854,326 | 129,813 | 4,781,402 | 2,848,445 | 8,613,986 |
| 2004 | 879,768 | 160,196 | 4,553,027 | 3,665,234 | 9,258,224 |
| 2005 | 970,403 | 145,094 | 4,480,802 | 3,441,928 | 9,038,227 |
| 2006 | 1,047,648 | 158,260 | 4,883,960 | 4,812,332 | 10,902,201 |
| 2007 | 1,015,226 | 166,397 | 3,944,679 | 2,944,253 | 8,070,556 |
| 2008 | 1,027,837 | 108,962 | 4,381,186 | 2,391,200 | 7,909,184 |
| 2009 | 1,049,959 | 128,191 | 4,700,222 | 1,942,061 | 7,820,433 |
| 2010 | 1,031,430 | 133,064 | 5,388,440 | 1,760,759 | 8,313,693 |
| 2011 | 944,777 | 87,924 | 5,006,358 | 1,482,029 | 7,521,088 |
| 2012 | 870,606 | 191,577 | 4,046,299 | 1,847,880 | 6,956,361 |
| 2013 | 784,379 | 112,097 | 5,157,760 | 2,393,425 | 8,447,661 |
| 2014 | 750,263 | 121,253 | 4,033,747 | 2,172,342 | 7,077,604 |
| 2015 | 623,313 | 101,343 | 3,085,725 | 2,307,133 | 6,117,515 |
| 2016 | 607,084 | 105,119 | 3,500,434 | 2,981,430 | 7,194,066 |
| 2017 | 592,670 | 108,475 | 2,934,293 | 3,419,651 | 7,055,089 |
| 2018 | 622,451 | 90,092 | 2,244,766 | 2,826,667 | 5,783,976 |

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Table 4. Total harvest of Atlantic striped bass by sector, 1990-2018. Note: Harvest is from ACCSP/MRIP. Estimates exclude inshore harvest from North Carolina.

| Year | Numbers of Fish | | | Pounds | | |
|------|-----------------|--------------|-----------|------------|--------------|------------|
| | Commercial | Recreational | Total | Commercial | Recreational | Total |
| 1990 | 93,888 | 578,897 | 672,785 | 715,951 | 8,207,515 | 8,923,466 |
| 1991 | 158,491 | 798,260 | 956,751 | 962,833 | 10,640,601 | 11,603,434 |
| 1992 | 256,476 | 869,779 | 1,126,255 | 1,510,276 | 11,921,967 | 13,432,243 |
| 1993 | 314,483 | 789,037 | 1,103,520 | 1,787,741 | 10,163,767 | 11,951,508 |
| 1994 | 325,401 | 1,055,523 | 1,380,924 | 1,872,374 | 14,737,911 | 16,610,285 |
| 1995 | 537,412 | 2,287,578 | 2,824,990 | 3,775,586 | 27,072,321 | 30,847,907 |
| 1996 | 854,094 | 2,487,421 | 3,341,515 | 4,822,874 | 28,625,685 | 33,448,559 |
| 1997 | 1,076,460 | 2,774,981 | 3,851,441 | 6,077,751 | 30,616,093 | 36,693,844 |
| 1998 | 1,215,219 | 2,915,390 | 4,130,609 | 6,552,111 | 29,603,199 | 36,155,310 |
| 1999 | 1,223,572 | 3,123,495 | 4,347,067 | 6,474,290 | 33,564,988 | 40,039,278 |
| 2000 | 1,216,812 | 3,802,477 | 5,019,289 | 6,719,521 | 34,050,817 | 40,770,338 |
| 2001 | 931,412 | 4,052,474 | 4,983,886 | 6,266,769 | 39,263,154 | 45,529,923 |
| 2002 | 928,085 | 4,005,084 | 4,933,169 | 6,138,180 | 41,840,025 | 47,978,205 |
| 2003 | 854,326 | 4,781,402 | 5,635,728 | 6,806,583 | 54,091,836 | 60,898,419 |
| 2004 | 879,768 | 4,553,027 | 5,432,795 | 7,335,116 | 53,031,074 | 60,366,190 |
| 2005 | 970,403 | 4,480,802 | 5,451,205 | 7,121,319 | 57,421,174 | 64,542,493 |
| 2006 | 1,047,648 | 4,883,960 | 5,931,608 | 6,785,006 | 50,674,431 | 57,459,437 |
| 2007 | 1,015,226 | 3,944,679 | 4,959,905 | 7,047,195 | 42,823,614 | 49,870,809 |
| 2008 | 1,027,837 | 4,381,186 | 5,409,023 | 7,190,685 | 56,665,318 | 63,856,003 |
| 2009 | 1,049,959 | 4,700,222 | 5,750,181 | 7,216,792 | 54,411,389 | 61,628,181 |
| 2010 | 1,031,430 | 5,388,440 | 6,419,870 | 6,996,713 | 61,431,360 | 68,428,073 |
| 2011 | 944,777 | 5,006,358 | 5,951,135 | 6,789,792 | 59,592,092 | 66,381,884 |
| 2012 | 870,606 | 4,046,299 | 4,916,905 | 6,516,868 | 53,256,619 | 59,773,487 |
| 2013 | 784,379 | 5,157,760 | 5,942,139 | 5,819,678 | 65,057,289 | 70,876,967 |
| 2014 | 750,263 | 4,033,747 | 4,784,010 | 5,937,949 | 47,948,610 | 53,886,559 |
| 2015 | 623,313 | 3,085,725 | 3,709,038 | 4,830,124 | 39,898,799 | 44,728,923 |
| 2016 | 607,084 | 3,500,434 | 4,107,518 | 4,831,442 | 43,671,532 | 48,502,974 |
| 2017 | 592,670 | 2,934,293 | 3,526,963 | 4,803,867 | 37,896,549 | 42,700,416 |
| 2018 | 622,451 | 2,244,766 | 2,867,217 | 4,714,661 | 23,069,028 | 27,783,689 |

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Table 5. Commercial harvest by region in pounds (x1000), 1990-2018. Source: ACCSP. ^Estimates exclude inshore harvest.

| Year | Ocean | | | | | | | | Chesapeake Bay | | | | Grand Total |
|------|---------|-------|-------|-------|-------|-------|-------|---------|----------------|-------|---------|---------|-------------|
| | MA | RI | NY | DE | MD | VA | NC^ | Total | MD | PRFC | VA | Total | |
| 1990 | 159.7 | 4.0 | 81.9 | 6.5 | 0.0 | 10.1 | 9.8 | 272.0 | 3.6 | 169.1 | 271.3 | 444.0 | 716.0 |
| 1991 | 235.2 | 28.0 | 105.2 | 21.1 | 19.8 | 4.6 | 6.2 | 420.1 | 113.9 | 216.8 | 212.0 | 542.7 | 962.8 |
| 1992 | 237.1 | 39.0 | 226.6 | 17.8 | 18.4 | 17.2 | 27.7 | 583.8 | 590.9 | 127.4 | 208.2 | 926.5 | 1,510.3 |
| 1993 | 266.6 | 40.0 | 109.4 | 28.0 | 4.8 | 11.3 | 36.5 | 496.5 | 945.4 | 143.5 | 202.4 | 1,291.2 | 1,787.7 |
| 1994 | 200.0 | 39.8 | 171.3 | 33.9 | 17.9 | 30.2 | 139.7 | 632.7 | 915.9 | 149.9 | 173.9 | 1,239.6 | 1,872.4 |
| 1995 | 751.5 | 113.5 | 500.8 | 38.5 | 79.3 | 46.2 | 344.6 | 1,874.3 | 1,185.0 | 198.5 | 517.8 | 1,901.3 | 3,775.6 |
| 1996 | 695.9 | 122.6 | 504.4 | 120.5 | 75.7 | 165.9 | 58.2 | 1,743.2 | 1,487.7 | 346.8 | 1,245.2 | 3,079.7 | 4,822.9 |
| 1997 | 784.9 | 96.5 | 460.8 | 166.0 | 94.0 | 179.1 | 463.1 | 2,244.4 | 2,119.2 | 731.1 | 983.0 | 3,833.4 | 6,077.8 |
| 1998 | 810.1 | 94.7 | 485.9 | 163.7 | 84.6 | 375.0 | 273.0 | 2,287.0 | 2,426.7 | 726.2 | 1,112.2 | 4,265.1 | 6,552.1 |
| 1999 | 766.2 | 119.7 | 491.8 | 176.3 | 62.6 | 614.8 | 391.5 | 2,622.9 | 2,274.8 | 653.3 | 923.4 | 3,851.4 | 6,474.3 |
| 2000 | 796.2 | 111.8 | 542.7 | 145.1 | 149.7 | 932.7 | 162.4 | 2,840.5 | 2,261.8 | 666.0 | 951.2 | 3,879.0 | 6,719.5 |
| 2001 | 815.4 | 129.7 | 633.1 | 198.6 | 113.9 | 782.4 | 381.1 | 3,054.1 | 1,660.9 | 658.7 | 893.1 | 3,212.6 | 6,266.8 |
| 2002 | 924.9 | 129.2 | 518.6 | 146.2 | 93.2 | 710.2 | 441.0 | 2,963.2 | 1,759.4 | 521.0 | 894.4 | 3,174.9 | 6,138.2 |
| 2003 | 1,055.5 | 246.3 | 753.3 | 191.2 | 103.9 | 166.4 | 201.2 | 2,717.8 | 1,721.8 | 676.6 | 1,690.4 | 4,088.7 | 6,806.6 |
| 2004 | 1,214.2 | 232.3 | 741.7 | 176.5 | 134.2 | 161.3 | 605.4 | 3,265.5 | 1,790.3 | 772.3 | 1,507.0 | 4,069.6 | 7,335.1 |
| 2005 | 1,102.2 | 215.5 | 689.8 | 174.0 | 46.9 | 185.2 | 604.5 | 3,018.0 | 2,008.7 | 533.6 | 1,561.0 | 4,103.3 | 7,121.3 |
| 2006 | 1,322.3 | 221.1 | 688.4 | 184.2 | 91.1 | 195.0 | 74.2 | 2,776.3 | 2,116.3 | 673.5 | 1,219.0 | 4,008.7 | 6,785.0 |
| 2007 | 1,039.3 | 240.6 | 731.5 | 188.7 | 96.3 | 162.3 | 379.5 | 2,838.1 | 2,240.6 | 599.3 | 1,369.2 | 4,209.1 | 7,047.2 |
| 2008 | 1,160.3 | 245.9 | 653.1 | 188.7 | 118.0 | 163.1 | 288.4 | 2,817.6 | 2,208.0 | 613.8 | 1,551.3 | 4,373.1 | 7,190.7 |
| 2009 | 1,134.3 | 234.8 | 789.9 | 192.3 | 127.3 | 140.4 | 190.0 | 2,809.0 | 2,267.3 | 727.2 | 1,413.3 | 4,407.8 | 7,216.8 |
| 2010 | 1,224.5 | 248.9 | 786.8 | 185.4 | 44.8 | 127.8 | 276.4 | 2,894.7 | 2,105.8 | 683.2 | 1,313.0 | 4,102.0 | 6,996.7 |
| 2011 | 1,163.9 | 228.2 | 855.3 | 188.6 | 21.4 | 158.8 | 246.4 | 2,862.5 | 1,955.1 | 694.2 | 1,278.1 | 3,927.3 | 6,789.8 |
| 2012 | 1,218.5 | 239.9 | 683.8 | 194.3 | 77.6 | 170.8 | 7.3 | 2,592.0 | 1,851.4 | 733.8 | 1,339.6 | 3,924.8 | 6,516.9 |
| 2013 | 1,004.5 | 231.3 | 823.8 | 191.4 | 93.5 | 182.4 | 0.0 | 2,526.9 | 1,662.2 | 623.8 | 1,006.8 | 3,292.8 | 5,819.7 |
| 2014 | 1,138.5 | 216.9 | 531.5 | 167.9 | 120.9 | 183.7 | 0.0 | 2,359.4 | 1,805.7 | 603.4 | 1,169.4 | 3,578.5 | 5,937.9 |
| 2015 | 866.0 | 188.5 | 516.3 | 144.1 | 34.6 | 138.1 | 0.0 | 1,887.6 | 1,436.9 | 538.0 | 967.6 | 2,942.5 | 4,830.1 |
| 2016 | 938.7 | 174.7 | 575.0 | 136.5 | 19.7 | 139.2 | 0.0 | 1,983.9 | 1,425.5 | 519.8 | 902.3 | 2,847.5 | 4,831.4 |
| 2017 | 823.4 | 175.3 | 688.7 | 141.8 | 80.5 | 133.9 | 0.0 | 2,043.5 | 1,439.8 | 492.7 | 827.8 | 2,760.3 | 4,803.9 |
| 2018 | 753.7 | 176.6 | 591.1 | 155.0 | 79.8 | 134.2 | 0.0 | 1,890.5 | 1,424.3 | 448.8 | 951.0 | 2,824.2 | 4,714.7 |

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Table 6. Commercial harvest and discards by region in numbers of fish (x1000), 1990-2018. Source: harvest is from ACCSP, discards is from ASMFC. ^excludes inshore harvest.

| Year | Ocean | | | | | | | | Chesapeake Bay | | | | Discards | | | Grand Total Removals |
|------|-------|------|------|------|------|------|------|-------|----------------|------|-------|---------|----------|-------|-------|----------------------|
| | MA | RI | NY | DE | MD | VA | NC^ | Total | MD | PRFC | VA | Total | Ocean | Bay | Total | |
| 1990 | 6.6 | 0.8 | 11.8 | 0.7 | 0.0 | 0.3 | 0.8 | 21.0 | 0.8 | 0.0 | 72.1 | 72.9 | 38.0 | 8.6 | 46.6 | 140.5 |
| 1991 | 10.8 | 3.6 | 15.1 | 3.1 | 1.2 | 0.4 | 0.4 | 34.6 | 30.8 | 44.5 | 48.6 | 123.9 | 39.2 | 51.3 | 90.4 | 248.9 |
| 1992 | 11.2 | 9.1 | 20.4 | 2.7 | 1.1 | 0.6 | 1.7 | 46.8 | 133.4 | 23.3 | 53.0 | 209.7 | 56.2 | 141.1 | 197.2 | 453.7 |
| 1993 | 13.3 | 6.3 | 11.2 | 4.3 | 0.3 | 1.0 | 3.4 | 39.8 | 211.0 | 24.6 | 39.2 | 274.7 | 41.8 | 75.1 | 116.9 | 431.4 |
| 1994 | 10.0 | 4.5 | 15.4 | 4.9 | 0.9 | 2.3 | 8.0 | 45.9 | 223.1 | 25.2 | 31.2 | 279.5 | 94.9 | 65.3 | 160.2 | 485.6 |
| 1995 | 39.9 | 19.7 | 43.7 | 5.6 | 4.0 | 9.9 | 23.4 | 146.1 | 267.0 | 29.3 | 95.0 | 391.3 | 144.4 | 42.8 | 187.2 | 724.6 |
| 1996 | 37.3 | 18.6 | 40.5 | 20.7 | 9.0 | 14.1 | 3.3 | 143.5 | 486.2 | 46.2 | 178.2 | 710.6 | 169.6 | 91.4 | 261.0 | 1,115.1 |
| 1997 | 44.0 | 7.1 | 37.6 | 33.2 | 8.4 | 17.3 | 25.8 | 173.4 | 620.3 | 87.6 | 195.2 | 903.1 | 248.8 | 82.6 | 331.4 | 1,407.8 |
| 1998 | 44.3 | 8.8 | 45.1 | 31.4 | 10.3 | 41.1 | 14.2 | 195.2 | 729.6 | 93.3 | 197.1 | 1,020.1 | 312.7 | 36.2 | 348.9 | 1,564.1 |
| 1999 | 40.9 | 11.6 | 49.9 | 34.8 | 10.2 | 48.7 | 21.1 | 217.2 | 776.0 | 90.6 | 139.8 | 1,006.3 | 298.0 | 34.1 | 332.1 | 1,555.7 |
| 2000 | 42.1 | 9.4 | 54.9 | 25.2 | 13.3 | 54.5 | 6.5 | 205.8 | 787.6 | 91.5 | 132.0 | 1,011.0 | 170.9 | 32.2 | 203.1 | 1,419.9 |
| 2001 | 45.8 | 10.9 | 58.3 | 34.4 | 11.1 | 42.3 | 25.0 | 227.7 | 538.8 | 87.8 | 77.1 | 703.7 | 136.5 | 38.4 | 174.9 | 1,106.3 |
| 2002 | 49.8 | 11.7 | 47.1 | 30.4 | 10.2 | 38.8 | 23.2 | 211.3 | 571.7 | 80.3 | 64.7 | 716.8 | 144.9 | 46.2 | 191.1 | 1,119.2 |
| 2003 | 56.4 | 15.5 | 68.4 | 31.5 | 11.6 | 10.5 | 5.8 | 199.6 | 427.9 | 83.1 | 143.7 | 654.7 | 95.0 | 34.8 | 129.8 | 984.1 |
| 2004 | 63.6 | 16.0 | 70.4 | 28.4 | 14.1 | 10.4 | 31.0 | 233.9 | 447.0 | 92.6 | 106.3 | 645.9 | 110.0 | 50.2 | 160.2 | 1,040.0 |
| 2005 | 60.5 | 14.9 | 70.6 | 26.3 | 6.1 | 11.3 | 27.3 | 217.1 | 563.9 | 80.6 | 108.9 | 753.3 | 86.2 | 58.9 | 145.1 | 1,115.5 |
| 2006 | 70.5 | 15.4 | 73.6 | 30.2 | 10.9 | 11.5 | 2.7 | 214.9 | 645.1 | 92.3 | 95.4 | 832.7 | 98.6 | 59.6 | 158.3 | 1,205.9 |
| 2007 | 54.2 | 13.9 | 78.5 | 31.1 | 11.6 | 10.6 | 16.8 | 216.7 | 587.6 | 86.6 | 124.3 | 798.5 | 96.9 | 69.5 | 166.4 | 1,181.6 |
| 2008 | 61.1 | 16.6 | 73.3 | 31.9 | 14.0 | 10.8 | 13.4 | 221.0 | 580.7 | 82.0 | 144.1 | 806.8 | 65.7 | 43.2 | 109.0 | 1,136.8 |
| 2009 | 59.4 | 16.8 | 82.6 | 21.6 | 12.5 | 8.9 | 9.0 | 210.9 | 605.6 | 89.7 | 143.8 | 839.1 | 63.5 | 64.7 | 128.2 | 1,178.1 |
| 2010 | 60.4 | 15.7 | 82.4 | 19.8 | 5.4 | 9.4 | 13.7 | 206.7 | 579.2 | 90.6 | 154.9 | 824.7 | 43.6 | 89.5 | 133.1 | 1,164.5 |
| 2011 | 58.7 | 14.3 | 87.4 | 20.5 | 2.1 | 12.2 | 10.9 | 206.0 | 488.9 | 96.1 | 153.7 | 738.7 | 37.8 | 50.1 | 87.9 | 1,032.7 |
| 2012 | 61.5 | 15.0 | 67.1 | 15.7 | 6.9 | 10.8 | 0.3 | 177.3 | 465.6 | 90.6 | 137.0 | 693.3 | 27.8 | 163.7 | 191.6 | 1,062.2 |
| 2013 | 58.6 | 13.8 | 76.2 | 17.7 | 7.6 | 10.0 | 0.0 | 183.8 | 391.5 | 78.0 | 131.0 | 600.5 | 41.9 | 70.2 | 112.1 | 896.5 |
| 2014 | 58.0 | 10.5 | 52.9 | 14.9 | 8.5 | 10.0 | 0.0 | 154.8 | 362.2 | 81.5 | 151.8 | 595.5 | 53.4 | 67.8 | 121.3 | 871.5 |
| 2015 | 42.3 | 12.7 | 45.6 | 11.0 | 2.6 | 7.7 | 0.0 | 121.8 | 298.3 | 71.0 | 132.2 | 501.5 | 37.6 | 63.7 | 101.3 | 724.7 |
| 2016 | 48.0 | 12.9 | 51.0 | 8.8 | 1.2 | 7.6 | 0.0 | 129.5 | 284.9 | 70.7 | 122.0 | 477.6 | 45.3 | 59.9 | 105.1 | 712.2 |
| 2017 | 41.2 | 10.1 | 61.6 | 9.5 | 3.5 | 7.6 | 0.0 | 133.5 | 263.6 | 67.5 | 128.0 | 459.2 | 84.4 | 24.1 | 108.5 | 701.1 |
| 2018 | 37.8 | 11.5 | 52.2 | 11.4 | 3.5 | 6.9 | 0.0 | 123.3 | 286.4 | 64.3 | 148.4 | 499.2 | 56.7 | 33.4 | 90.1 | 712.5 |

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Table 7. Total recreational catch, releases, and release mortality in numbers of fish by region (x1000), 1990-2018. Source: MRIP. Estimates exclude inshore harvest from North Carolina.

| Year | Harvest (A+B1) | | | Releases (B2) | | | Total Catch (A+B1+B2) | | | Release Mortality (9% of B2) | | |
|------|----------------|---------|---------|---------------|----------|----------|-----------------------|----------|----------|------------------------------|---------|---------|
| | Ocean | Bay | Total | Ocean | Bay | Total | Ocean | Bay | Total | Ocean | Bay | Total |
| 1990 | 234.8 | 344.1 | 578.9 | 3,094.5 | 1,825.6 | 4,920.1 | 3,329.3 | 2,169.7 | 5,499.0 | 278.5 | 164.3 | 442.8 |
| 1991 | 431.7 | 366.6 | 798.3 | 4,683.2 | 3,266.5 | 7,949.8 | 5,114.9 | 3,633.1 | 8,748.0 | 421.5 | 294.0 | 715.5 |
| 1992 | 517.4 | 352.4 | 869.8 | 6,932.1 | 3,485.8 | 10,417.9 | 7,449.5 | 3,838.2 | 11,287.7 | 623.9 | 313.7 | 937.6 |
| 1993 | 457.2 | 331.9 | 789.0 | 6,093.9 | 2,932.9 | 9,026.7 | 6,551.0 | 3,264.7 | 9,815.8 | 548.4 | 264.0 | 812.4 |
| 1994 | 495.3 | 560.3 | 1,055.5 | 10,446.9 | 4,673.9 | 15,120.8 | 10,942.2 | 5,234.2 | 16,176.3 | 940.2 | 420.7 | 1,360.9 |
| 1995 | 1,259.8 | 1,027.7 | 2,287.6 | 16,586.8 | 5,754.2 | 22,341.0 | 17,846.7 | 6,781.9 | 24,628.6 | 1,492.8 | 517.9 | 2,010.7 |
| 1996 | 1,362.0 | 1,125.5 | 2,487.4 | 22,384.2 | 6,510.6 | 28,894.7 | 23,746.1 | 7,636.0 | 31,382.2 | 2,014.6 | 586.0 | 2,600.5 |
| 1997 | 1,514.1 | 1,260.8 | 2,775.0 | 22,819.1 | 10,178.4 | 32,997.6 | 24,333.3 | 11,439.3 | 35,772.6 | 2,053.7 | 916.1 | 2,969.8 |
| 1998 | 1,647.0 | 1,268.4 | 2,915.4 | 29,294.5 | 6,918.1 | 36,212.6 | 30,941.5 | 8,186.5 | 39,128.0 | 2,636.5 | 622.6 | 3,259.1 |
| 1999 | 1,757.8 | 1,365.7 | 3,123.5 | 26,139.3 | 8,759.7 | 34,898.9 | 27,897.0 | 10,125.4 | 38,022.4 | 2,352.5 | 788.4 | 3,140.9 |
| 2000 | 2,198.3 | 1,604.2 | 3,802.5 | 25,090.4 | 8,734.0 | 33,824.5 | 27,288.7 | 10,338.3 | 37,627.0 | 2,258.1 | 786.1 | 3,044.2 |
| 2001 | 2,758.1 | 1,294.4 | 4,052.5 | 21,072.6 | 6,145.2 | 27,217.8 | 23,830.7 | 7,439.6 | 31,270.2 | 1,896.5 | 553.1 | 2,449.6 |
| 2002 | 2,756.1 | 1,249.0 | 4,005.1 | 23,653.3 | 7,371.2 | 31,024.4 | 26,409.4 | 8,620.2 | 35,029.5 | 2,128.8 | 663.4 | 2,792.2 |
| 2003 | 3,123.8 | 1,657.6 | 4,781.4 | 20,678.5 | 10,970.9 | 31,649.4 | 23,802.3 | 12,628.5 | 36,430.8 | 1,861.1 | 987.4 | 2,848.4 |
| 2004 | 3,078.1 | 1,474.9 | 4,553.0 | 27,868.1 | 12,856.7 | 40,724.8 | 30,946.2 | 14,331.7 | 45,277.8 | 2,508.1 | 1,157.1 | 3,665.2 |
| 2005 | 3,182.2 | 1,298.6 | 4,480.8 | 28,663.2 | 9,580.4 | 38,243.6 | 31,845.4 | 10,879.0 | 42,724.4 | 2,579.7 | 862.2 | 3,441.9 |
| 2006 | 2,789.0 | 2,094.9 | 4,884.0 | 41,238.5 | 12,231.8 | 53,470.4 | 44,027.6 | 14,326.7 | 58,354.3 | 3,711.5 | 1,100.9 | 4,812.3 |
| 2007 | 2,327.1 | 1,617.6 | 3,944.7 | 25,135.4 | 7,578.5 | 32,713.9 | 27,462.4 | 9,196.2 | 36,658.6 | 2,262.2 | 682.1 | 2,944.3 |
| 2008 | 3,025.4 | 1,355.8 | 4,381.2 | 21,878.2 | 4,690.7 | 26,568.9 | 24,903.6 | 6,046.5 | 30,950.1 | 1,969.0 | 422.2 | 2,391.2 |
| 2009 | 2,897.7 | 1,802.5 | 4,700.2 | 16,740.0 | 4,838.5 | 21,578.5 | 19,637.7 | 6,641.0 | 26,278.7 | 1,506.6 | 435.5 | 1,942.1 |
| 2010 | 3,905.9 | 1,482.6 | 5,388.4 | 13,606.5 | 5,957.5 | 19,564.0 | 17,512.4 | 7,440.0 | 24,952.4 | 1,224.6 | 536.2 | 1,760.8 |
| 2011 | 3,617.1 | 1,389.3 | 5,006.4 | 12,643.8 | 3,823.1 | 16,467.0 | 16,260.9 | 5,212.4 | 21,473.3 | 1,137.9 | 344.1 | 1,482.0 |
| 2012 | 3,071.5 | 974.8 | 4,046.3 | 11,242.0 | 9,290.0 | 20,532.0 | 14,313.5 | 10,264.8 | 24,578.3 | 1,011.8 | 836.1 | 1,847.9 |
| 2013 | 3,723.2 | 1,434.5 | 5,157.8 | 19,463.0 | 7,130.6 | 26,593.6 | 23,186.2 | 8,565.2 | 31,751.4 | 1,751.7 | 641.8 | 2,393.4 |
| 2014 | 2,275.5 | 1,758.2 | 4,033.7 | 15,106.6 | 9,030.6 | 24,137.1 | 17,382.1 | 10,788.8 | 28,170.9 | 1,359.6 | 812.8 | 2,172.3 |
| 2015 | 1,770.1 | 1,315.7 | 3,085.7 | 15,419.0 | 10,215.9 | 25,634.8 | 17,189.0 | 11,531.5 | 28,720.5 | 1,387.7 | 919.4 | 2,307.1 |
| 2016 | 1,817.2 | 1,683.2 | 3,500.4 | 17,794.0 | 15,333.0 | 33,127.0 | 19,611.2 | 17,016.2 | 36,627.4 | 1,601.5 | 1,380.0 | 2,981.4 |
| 2017 | 1,732.3 | 1,201.9 | 2,934.3 | 28,951.5 | 9,044.6 | 37,996.1 | 30,683.8 | 10,246.6 | 40,930.4 | 2,605.6 | 814.0 | 3,419.7 |
| 2018 | 1,194.6 | 1,050.1 | 2,244.8 | 22,738.7 | 8,668.7 | 31,407.4 | 23,933.3 | 9,718.9 | 33,652.2 | 2,046.5 | 780.2 | 2,826.7 |

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Table 8. Recreational harvest by region in pounds (x1000), 1990-2018. Source: MRIP. ^Estimates exclude inshore harvest.

| Year | Ocean | | | | | | | | | | | | Chesapeake Bay | | | Grand total |
|------|-------|-----|--------|-------|-------|--------|--------|-------|-------|-------|-------|--------|----------------|-------|--------|-------------|
| | ME | NH | MA | RI | CT | NY | NJ | DE | MD | VA | NC^ | Total | MD | VA | Total | |
| 1990 | 79 | 21 | 400 | 146 | 209 | 1,653 | 2,531 | 26 | 0 | 0 | 0 | 5,066 | 6 | 3,135 | 3,141 | 8,208 |
| 1991 | 30 | 8 | 866 | 350 | 162 | 4,221 | 2,047 | 134 | 0 | 0 | 10 | 7,828 | 718 | 2,095 | 2,813 | 10,641 |
| 1992 | 134 | 89 | 4,096 | 643 | 240 | 1,691 | 2,190 | 90 | 0 | 0 | 0 | 9,173 | 1,182 | 1,566 | 2,748 | 11,922 |
| 1993 | 28 | 110 | 1,909 | 416 | 636 | 2,883 | 1,360 | 284 | 0 | 84 | 6 | 7,716 | 858 | 1,590 | 2,448 | 10,164 |
| 1994 | 143 | 82 | 3,683 | 267 | 452 | 5,000 | 947 | 134 | 0 | 2 | 90 | 10,800 | 1,443 | 2,495 | 3,938 | 14,738 |
| 1995 | 83 | 127 | 2,739 | 1,049 | 1,331 | 5,594 | 8,587 | 301 | 0 | 141 | 232 | 20,184 | 3,115 | 3,773 | 6,889 | 27,072 |
| 1996 | 95 | 183 | 2,983 | 1,626 | 1,405 | 10,739 | 3,959 | 795 | 0 | 812 | 392 | 22,990 | 2,789 | 2,847 | 5,636 | 28,626 |
| 1997 | 223 | 538 | 5,133 | 1,997 | 2,263 | 8,543 | 2,179 | 374 | 0 | 1,096 | 865 | 23,211 | 3,203 | 4,203 | 7,405 | 30,616 |
| 1998 | 305 | 262 | 7,359 | 1,544 | 1,807 | 4,889 | 4,182 | 645 | 579 | 545 | 636 | 22,754 | 3,023 | 3,826 | 6,849 | 29,603 |
| 1999 | 196 | 181 | 4,995 | 1,904 | 1,327 | 7,414 | 9,473 | 312 | 4 | 110 | 339 | 26,256 | 2,323 | 4,986 | 7,309 | 33,565 |
| 2000 | 347 | 109 | 4,863 | 2,008 | 890 | 7,053 | 9,768 | 925 | 0 | 416 | 277 | 26,656 | 3,503 | 3,892 | 7,395 | 34,051 |
| 2001 | 446 | 334 | 7,188 | 2,044 | 1,101 | 5,058 | 12,314 | 695 | 314 | 382 | 1,082 | 30,959 | 2,928 | 5,376 | 8,304 | 39,263 |
| 2002 | 775 | 322 | 10,261 | 2,708 | 1,251 | 5,975 | 9,621 | 589 | 0 | 1,135 | 998 | 33,634 | 2,643 | 5,563 | 8,206 | 41,840 |
| 2003 | 458 | 466 | 10,252 | 4,052 | 2,666 | 10,788 | 12,066 | 763 | 14 | 392 | 966 | 42,882 | 5,246 | 5,964 | 11,210 | 54,092 |
| 2004 | 554 | 268 | 9,329 | 2,460 | 2,229 | 6,437 | 13,303 | 870 | 57 | 1,067 | 6,656 | 43,230 | 4,860 | 4,941 | 9,801 | 53,031 |
| 2005 | 546 | 384 | 7,541 | 3,155 | 3,133 | 11,637 | 14,289 | 680 | 8 | 487 | 3,947 | 45,808 | 7,753 | 3,860 | 11,614 | 57,421 |
| 2006 | 610 | 244 | 6,787 | 1,569 | 2,854 | 9,845 | 12,716 | 586 | 3 | 921 | 2,975 | 39,109 | 6,494 | 5,071 | 11,565 | 50,674 |
| 2007 | 422 | 93 | 7,010 | 2,077 | 2,786 | 10,081 | 8,390 | 207 | 0 | 516 | 1,965 | 33,547 | 5,249 | 4,027 | 9,277 | 42,824 |
| 2008 | 607 | 182 | 8,424 | 970 | 2,273 | 18,000 | 12,407 | 847 | 0 | 1,690 | 750 | 46,150 | 5,639 | 4,877 | 10,515 | 56,665 |
| 2009 | 781 | 222 | 9,410 | 2,185 | 1,458 | 7,991 | 17,040 | 940 | 138 | 48 | 187 | 40,399 | 8,672 | 5,340 | 14,012 | 54,411 |
| 2010 | 218 | 238 | 9,959 | 2,102 | 2,323 | 18,190 | 17,454 | 895 | 107 | 206 | 1,198 | 52,891 | 6,482 | 2,059 | 8,541 | 61,431 |
| 2011 | 245 | 659 | 11,953 | 3,066 | 981 | 13,151 | 15,715 | 605 | 9 | 308 | 4,467 | 51,157 | 6,220 | 2,214 | 8,435 | 59,592 |
| 2012 | 152 | 432 | 14,941 | 2,096 | 1,835 | 13,096 | 11,551 | 644 | 21 | 2 | 0 | 44,768 | 3,819 | 4,670 | 8,488 | 53,257 |
| 2013 | 331 | 831 | 9,025 | 4,428 | 4,236 | 16,819 | 19,451 | 1,073 | 1,051 | 67 | 0 | 57,313 | 5,137 | 2,607 | 7,744 | 65,057 |
| 2014 | 423 | 203 | 7,965 | 3,402 | 2,665 | 13,998 | 8,886 | 381 | 159 | 0 | 0 | 38,083 | 8,877 | 989 | 9,866 | 47,949 |
| 2015 | 132 | 202 | 7,799 | 1,394 | 2,585 | 8,695 | 9,982 | 340 | 28 | 0 | 0 | 31,156 | 7,786 | 957 | 8,743 | 39,899 |
| 2016 | 189 | 191 | 3,731 | 1,776 | 912 | 12,053 | 12,790 | 86 | 7 | 0 | 0 | 31,735 | 10,912 | 1,024 | 11,936 | 43,672 |
| 2017 | 318 | 394 | 5,666 | 1,652 | 1,557 | 8,825 | 10,880 | 666 | 0 | 2 | 0 | 29,960 | 7,309 | 627 | 7,937 | 37,897 |
| 2018 | 142 | 130 | 4,925 | 1,121 | 1,165 | 3,453 | 7,012 | 33 | 0 | 0 | 0 | 17,982 | 4,683 | 404 | 5,087 | 23,069 |

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Table 9. Recreational harvest by region in numbers of fish (x1000), 1990-2018. Source: MRIP. ^Estimates exclude inshore harvest.

| Year | Ocean | | | | | | | | | | | | Chesapeake Bay | | | Grand Total |
|------|-------|------|---------|-------|-------|---------|---------|------|------|------|-------|---------|----------------|-------|---------|-------------|
| | ME | NH | MA | RI | CT | NY | NJ | DE | MD | VA | NC^ | Total | MD | VA | Total | |
| 1990 | 6.2 | 0.5 | 20.5 | 6.3 | 7.6 | 68.0 | 123.0 | 2.7 | 0.0 | 0.0 | 0.0 | 234.8 | 1.5 | 342.6 | 344.1 | 578.9 |
| 1991 | 10.5 | 0.5 | 51.1 | 16.6 | 7.8 | 203.1 | 131.1 | 9.9 | 0.0 | 0.0 | 1.0 | 431.7 | 117.9 | 248.7 | 366.6 | 798.3 |
| 1992 | 10.6 | 4.4 | 229.2 | 40.0 | 11.7 | 76.7 | 134.6 | 7.6 | 0.0 | 0.0 | 2.7 | 517.4 | 177.9 | 174.4 | 352.4 | 869.8 |
| 1993 | 1.3 | 5.0 | 116.4 | 26.9 | 35.8 | 140.5 | 100.9 | 19.2 | 0.0 | 10.7 | 0.5 | 457.2 | 113.6 | 218.3 | 331.9 | 789.0 |
| 1994 | 6.9 | 8.9 | 159.6 | 13.7 | 23.3 | 200.3 | 67.1 | 8.4 | 0.0 | 0.5 | 6.5 | 495.3 | 228.7 | 331.6 | 560.3 | 1,055.5 |
| 1995 | 4.0 | 7.4 | 124.3 | 70.9 | 75.8 | 250.3 | 671.4 | 25.8 | 0.1 | 13.4 | 16.5 | 1,259.8 | 491.1 | 536.7 | 1,027.7 | 2,287.6 |
| 1996 | 4.1 | 11.0 | 156.6 | 100.6 | 95.9 | 511.6 | 301.2 | 59.7 | 0.0 | 89.6 | 31.7 | 1,362.0 | 564.2 | 561.3 | 1,125.5 | 2,487.4 |
| 1997 | 43.0 | 29.9 | 365.6 | 124.7 | 149.0 | 450.5 | 171.2 | 29.1 | 0.0 | 91.1 | 60.1 | 1,514.1 | 552.4 | 708.4 | 1,260.8 | 2,775.0 |
| 1998 | 65.3 | 14.8 | 500.9 | 91.1 | 114.1 | 383.8 | 289.2 | 51.0 | 24.3 | 71.3 | 41.2 | 1,647.0 | 596.2 | 672.2 | 1,268.4 | 2,915.4 |
| 1999 | 37.5 | 9.9 | 327.1 | 116.6 | 88.2 | 450.9 | 657.1 | 28.3 | 1.6 | 14.1 | 26.4 | 1,757.8 | 530.9 | 834.8 | 1,365.7 | 3,123.5 |
| 2000 | 77.3 | 6.0 | 306.2 | 156.8 | 84.0 | 494.6 | 939.8 | 88.3 | 0.0 | 27.2 | 18.1 | 2,198.3 | 810.9 | 793.3 | 1,604.2 | 3,802.5 |
| 2001 | 91.9 | 23.5 | 551.0 | 149.8 | 78.2 | 364.2 | 1,267.5 | 70.6 | 64.1 | 36.7 | 60.7 | 2,758.1 | 513.3 | 781.1 | 1,294.4 | 4,052.5 |
| 2002 | 135.2 | 28.1 | 723.5 | 181.5 | 92.5 | 439.3 | 957.6 | 65.7 | 0.0 | 76.4 | 56.3 | 2,756.1 | 464.4 | 784.6 | 1,249.0 | 4,005.1 |
| 2003 | 99.7 | 41.3 | 797.2 | 226.4 | 181.7 | 678.4 | 942.8 | 75.7 | 0.9 | 29.3 | 50.4 | 3,123.8 | 816.0 | 841.6 | 1,657.6 | 4,781.4 |
| 2004 | 118.3 | 22.1 | 666.7 | 159.6 | 134.5 | 458.1 | 1,042.1 | 66.6 | 11.0 | 75.9 | 323.2 | 3,078.1 | 657.5 | 817.4 | 1,474.9 | 4,553.0 |
| 2005 | 118.3 | 35.5 | 536.1 | 195.6 | 202.6 | 854.6 | 958.1 | 48.8 | 3.6 | 34.2 | 194.9 | 3,182.2 | 815.5 | 483.1 | 1,298.6 | 4,480.8 |
| 2006 | 140.9 | 20.9 | 483.2 | 129.3 | 168.3 | 614.8 | 972.2 | 44.5 | 0.4 | 80.6 | 134.2 | 2,789.0 | 1,342.0 | 753.0 | 2,094.9 | 4,884.0 |
| 2007 | 95.5 | 8.1 | 471.9 | 135.8 | 163.9 | 602.8 | 722.2 | 17.2 | 0.0 | 28.0 | 81.8 | 2,327.1 | 1,127.3 | 490.3 | 1,617.6 | 3,944.7 |
| 2008 | 133.4 | 11.9 | 514.1 | 73.4 | 132.8 | 1,169.9 | 791.0 | 67.7 | 0.0 | 94.4 | 36.9 | 3,025.4 | 779.7 | 576.1 | 1,355.8 | 4,381.2 |
| 2009 | 146.5 | 17.3 | 695.0 | 138.4 | 100.3 | 574.2 | 1,141.5 | 64.8 | 10.2 | 3.0 | 6.5 | 2,897.7 | 1,094.4 | 708.1 | 1,802.5 | 4,700.2 |
| 2010 | 37.3 | 21.4 | 808.2 | 162.0 | 170.2 | 1,449.0 | 1,091.4 | 61.4 | 12.5 | 25.3 | 67.1 | 3,905.9 | 1,139.3 | 343.2 | 1,482.6 | 5,388.4 |
| 2011 | 48.5 | 54.2 | 873.5 | 202.2 | 91.1 | 1,005.3 | 1,038.9 | 43.7 | 0.8 | 51.2 | 207.6 | 3,617.1 | 1,112.1 | 277.2 | 1,389.3 | 5,006.4 |
| 2012 | 31.4 | 37.3 | 1,010.6 | 130.7 | 137.1 | 927.5 | 742.4 | 51.3 | 2.9 | 0.3 | 0.0 | 3,071.5 | 716.7 | 258.1 | 974.8 | 4,046.3 |
| 2013 | 73.3 | 63.2 | 658.7 | 308.3 | 269.6 | 902.5 | 1,324.2 | 70.6 | 48.4 | 4.4 | 0.0 | 3,723.2 | 1,136.7 | 297.9 | 1,434.5 | 5,157.8 |
| 2014 | 86.4 | 16.5 | 523.5 | 172.0 | 131.8 | 804.5 | 501.9 | 26.2 | 12.6 | 0.0 | 0.0 | 2,275.5 | 1,627.0 | 131.2 | 1,758.2 | 4,033.7 |
| 2015 | 14.4 | 10.0 | 485.3 | 67.0 | 140.8 | 406.8 | 600.3 | 41.9 | 3.5 | 0.0 | 0.0 | 1,770.1 | 1,108.0 | 207.7 | 1,315.7 | 3,085.7 |
| 2016 | 14.2 | 17.6 | 230.1 | 128.4 | 63.3 | 697.7 | 659.6 | 5.9 | 0.5 | 0.0 | 0.0 | 1,817.2 | 1,545.1 | 138.1 | 1,683.2 | 3,500.4 |
| 2017 | 22.0 | 37.7 | 392.3 | 59.6 | 94.5 | 472.3 | 625.9 | 27.8 | 0.0 | 0.1 | 0.0 | 1,732.3 | 1,091.6 | 110.3 | 1,201.9 | 2,934.3 |
| 2018 | 16.0 | 13.4 | 389.5 | 39.2 | 85.5 | 181.7 | 465.3 | 4.2 | 0.0 | 0.0 | 0.0 | 1,194.6 | 993.3 | 56.8 | 1,050.1 | 2,244.8 |

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Table 10. Results of 2018 Commercial Quota Accounting in pounds. Source: 2019 state compliance reports.

| State | Add IV Quota | 2018 Quota | 2018 harvest | overage | 2019 Quota |
|-----------------------|---------------------|-------------------|---------------------|----------------|-------------------|
| Ocean | | | | | |
| Maine* | 188 | 188 | - | | 188 |
| New Hampshire* | 4,313 | 4,313 | - | | 4,313 |
| Massachusetts | 869,813 | 847,290 | 753,731 | | 869,813 |
| Rhode Island† | 182,719 | 181,572 | 176,639 | | 181,572 |
| Connecticut** | 17,813 | 17,813 | - | | 17,813 |
| New York | 795,795 | 795,795 | 591,092 | | 795,795 |
| New Jersey** | 241,313 | 241,313 | - | | 241,313 |
| Delaware | 145,085 | 145,085 | 155,028 | 9,943 | 135,142 |
| Maryland† | 98,670 | 90,727 | 79,836 | | 90,727 |
| Virginia | 138,640 | 138,640 | 122,929 | | 138,640 |
| North Carolina | 360,360 | 360,360 | 0 | | 360,360 |
| Ocean Total | 2,854,709 | 2,823,096 | 1,879,255 | 9,943 | 2,835,676 |
| Chesapeake Bay | | | | | |
| Maryland | 1,471,888 | 1,471,888 | 1,424,303 | | 1,471,888 |
| Virginia | 1,064,997 | 1,064,997 | 951,092 | | 1,064,997 |
| PRFC | 583,362 | 583,362 | 448,815 | | 583,362 |
| Bay Total | 3,120,247 | 3,120,247 | 2,824,210 | | 3,120,247 |

* Commercial harvest/sale prohibited, with no re-allocation of quota.

** Commercial harvest/sale prohibited, with re-allocation of quota to the recreational fishery.

† Ocean commercial quota reduced through conservation equivalency for MD (90,727 lbs) and RI (181,572 lbs)

Table 11. Status of Commercial Tagging Programs by state for 2018.

| State | Number of Participants | Number of Tags Issued | Number of Tags Used | Point of Tag (sale/harvest) | ¹ Biological Metric (Y/N) | Year, State and Unique ID on Tag (Y/N) | Size Limit on Tag (Y/N) | Tag Colors | Annual Tag Color Change (Y/N) |
|-------|------------------------|-----------------------|---------------------|-----------------------------|--------------------------------------|--|-------------------------|--|-------------------------------|
| MA | 92 | 53,100 | 37,777 | Sale | Y | Y | Y | one tag color | Y |
| RI | 23 | 15,390 | 10,121 | Sale | Y | Y | N | two tag colors by gear | Y |
| NY | 436 | 76,605 | 52,218 | Harvest | Y | Y | N | One tag color | Y |
| DE* | 260 | 19,155 | 11,356 | Both | Y | Y | N | Harvest: two tag colors by gear Sale: one color | Y |
| MD | 862 | 454,356 | 295,348 | Harvest | Y | Y | N | Three tag colors by gear and permit | Y |
| PRFC | 339 | 79,158 | 64,346 | Harvest | Y | Y | N | Five tag colors by gear | N |
| VA | 388 | 155,254 | 151,250 | Harvest | Y | Y | Y | two tag colors by area | Y |
| NC^ | 88 | 36,766 | 31,147 | Sale | Y | Y | Y | Three tag colors by area | N |

¹ States are required to allocate commercial tags to permit holders based on a biological metric. Most states used the average weight per fish from the previous year, or some variation thereof. Actual biological metric used is to be included in State Annual Commercial Tag Reports.

* The number of tags issued represent the combined total from tags used by harvesters and weigh stations, such that each fish has two tags

^ All commercial tags were used in the internal waters of North Carolina

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Table 12. Status of compliance with monitoring and reporting requirements in 2018. JAI = juvenile abundance index survey, SSB = spawning stock biomass survey, tag = participation in coastwide tagging program, Y = compliance standards met, N = compliance standards not met, NA = not applicable, R = recreational, C = commercial

| Jurisdiction | Fishery-independent monitoring | | Fishery-dependent monitoring | | Annual reporting |
|--------------|--------------------------------|--------|--|--------|------------------|
| | Requirement(s) | Status | Requirement(s) | Status | Status |
| ME | JAI | Y | composition, catch and effort (R) | NA | Y |
| NH | NA | NA | composition, catch and effort (R) | NA | Y |
| MA | tag | Y | composition, catch & effort (C&R), tag program | Y | Y |
| RI | NA | NA | composition (C&R), catch & effort (R), tag program | Y | Y |
| CT | NA | NA | composition, catch & effort (R) | Y | Y |
| NY | JAI, SSB, tag | Y | composition, catch & effort (C&R), tag program | Y | Y |
| NJ | JAI, tag | Y | composition, catch & effort (R) | Y | Y |
| PA | SSB | Y | composition, catch and effort (R) | NA | Y |
| DE | SSB, tag | Y | composition, catch & effort (C), tag program | Y | Y |
| MD | JAI, SSB, tag | Y | composition, catch & effort (C&R), tag program | Y | Y |
| PRFC | NA | NA | composition, catch & effort (C&R), tag program | Y | Y |
| DC | NA | NA | composition, catch and effort (R) | NA | Y |
| VA | JAI, SSB, tag | Y | composition, catch & effort (C&R), tag program | Y | Y |
| NC | JAI, SSB, tag | Y | composition, catch & effort (C&R), tag program | Y | Y |

Figure 1. Atlantic striped bass female spawning stock biomass and recruitment, 1982-2017. Source: 2018 Benchmark Stock Assessment

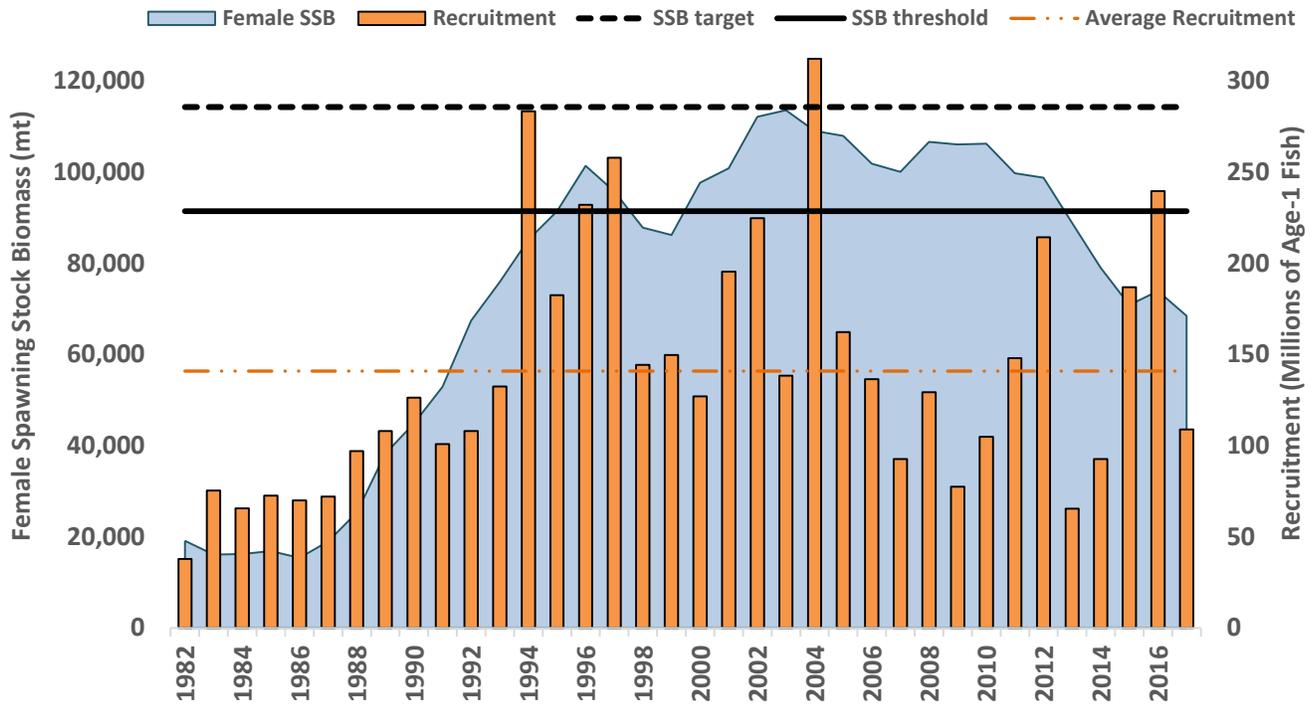


Figure 2. Atlantic striped bass fishing mortality, 1982-2017. Source: 2018 Benchmark Stock Assessment

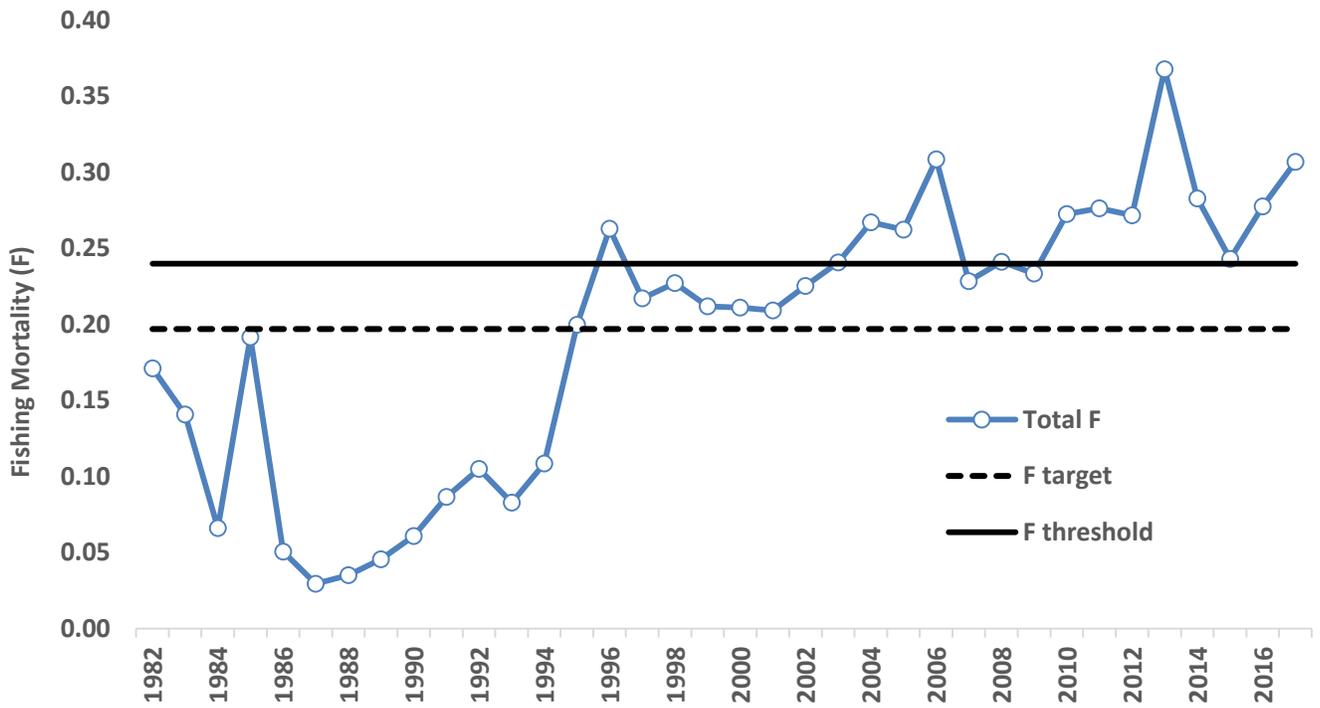


Figure 3. Albemarle Sound-Roanoke River striped bass female spawning stock biomass and recruitment (abundance of age-1), and biological reference points, 1982-2014. Source: Stock Status of Albemarle Sound-Roanoke River Striped bass, 2016

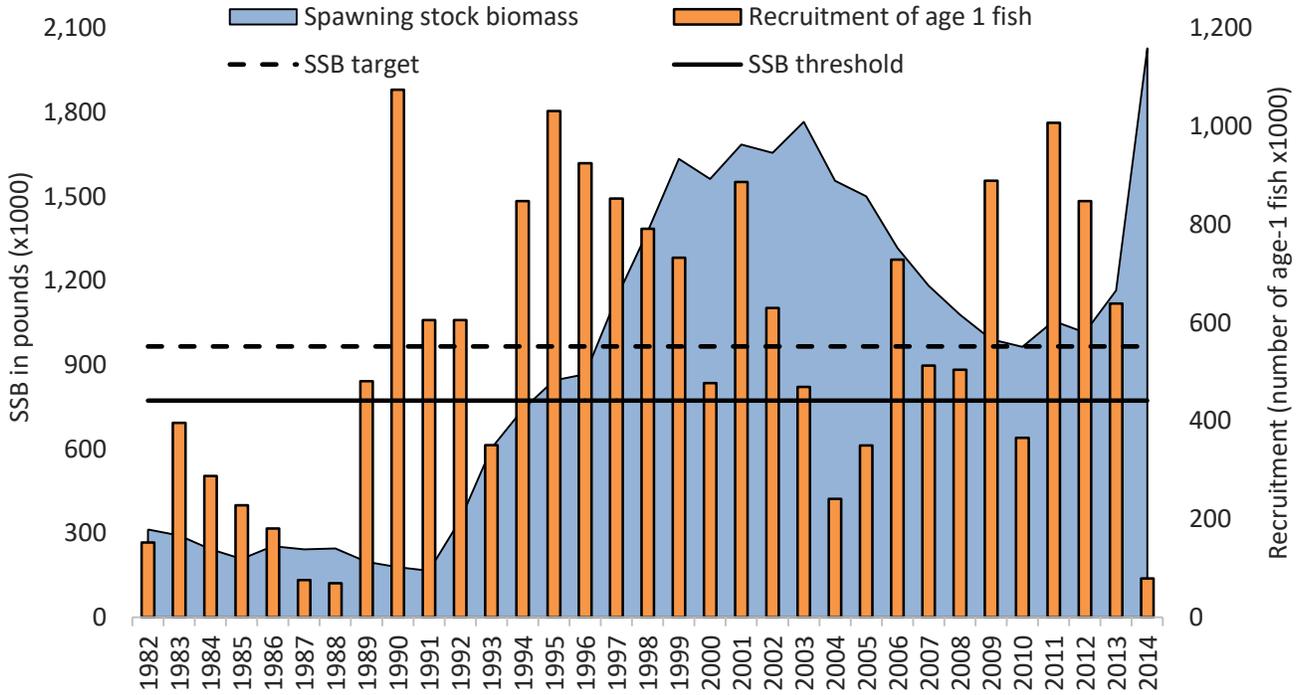


Figure 4. Albemarle Sounds-Roanoke River striped bass fishing mortality (F) estimates, and biological reference points, 1982-2014. Source: Stock Status of Albemarle Sound-Roanoke River Striped bass, 2016.

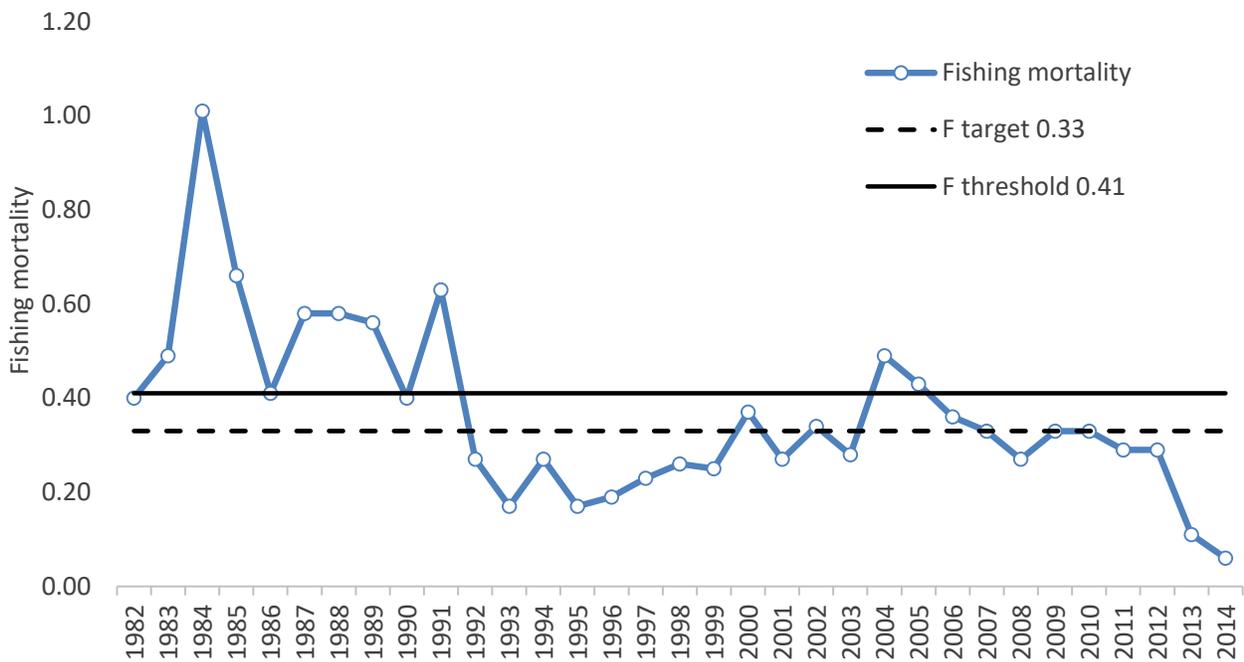


Figure 5. Total striped bass removals by sector in numbers of fish, 1982-2018. Note: Harvest is from ACCSP/MRIP, discards/release mortality is from ASMFC. Estimates exclude inshore harvest from A/R.

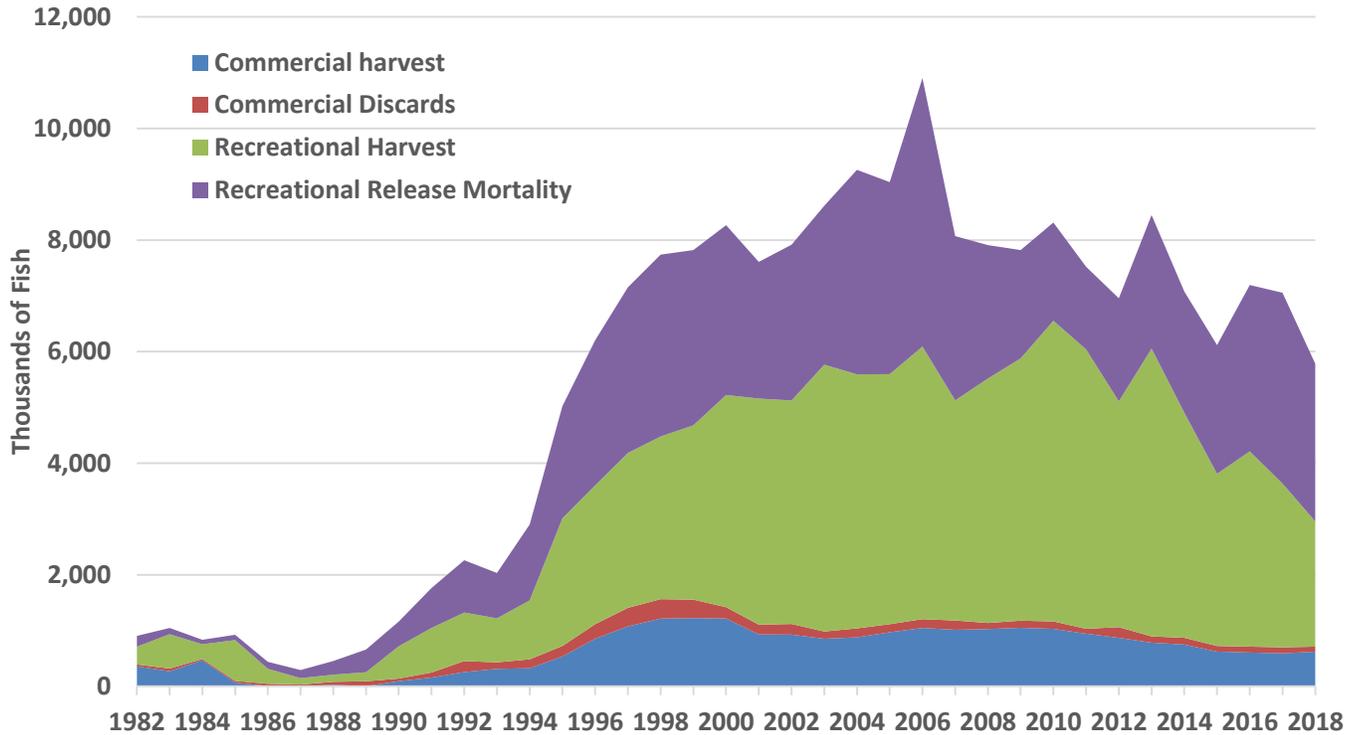


Figure 6. Commercial Atlantic striped bass landings by state in pounds, 1990-2018. Source: ACCSP. Commercial harvest and sale prohibited in ME, NH, CT, and NJ. NC is ocean only.

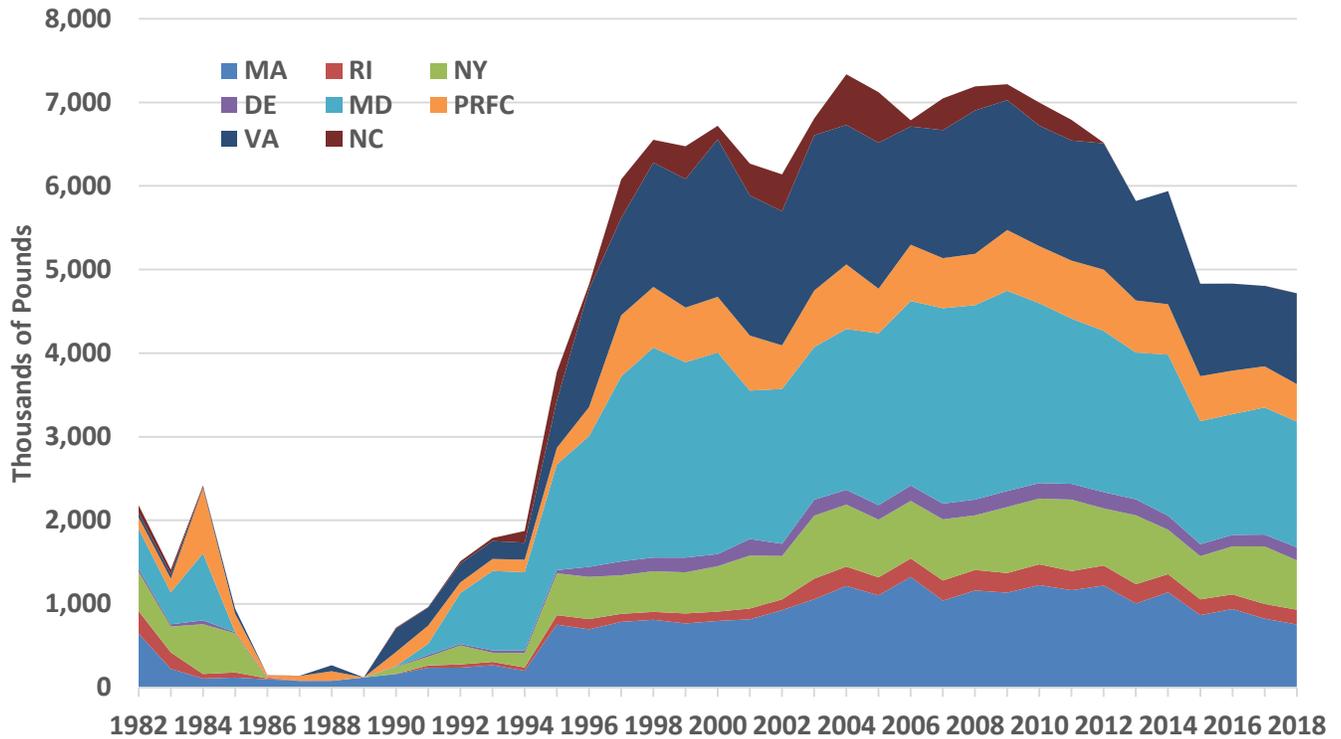


Figure 7. Total recreational catch and the proportion of fish released alive, 1982-2018. Source: MRIP/ASMFC. Estimates exclude inshore harvest from A/R.

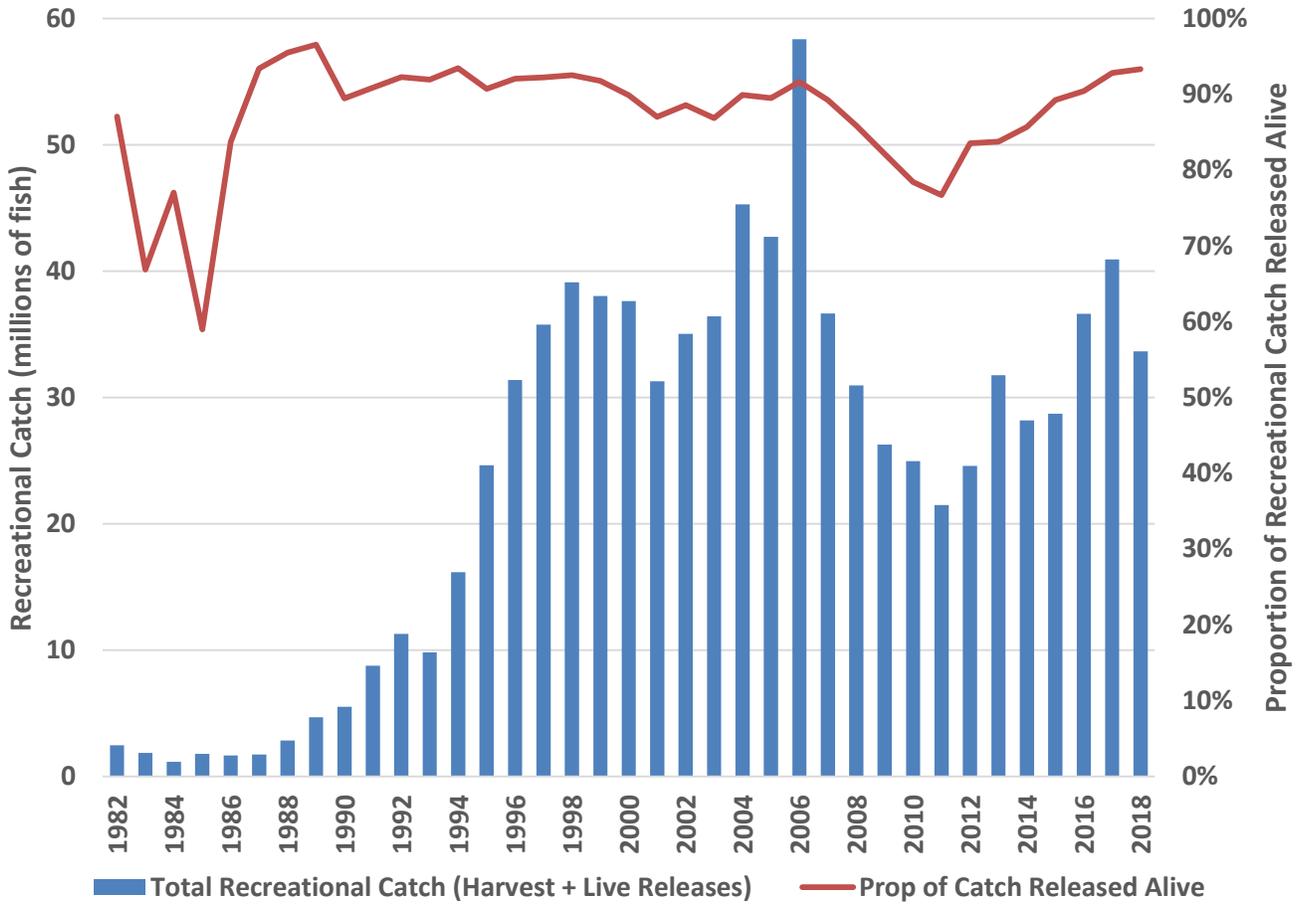
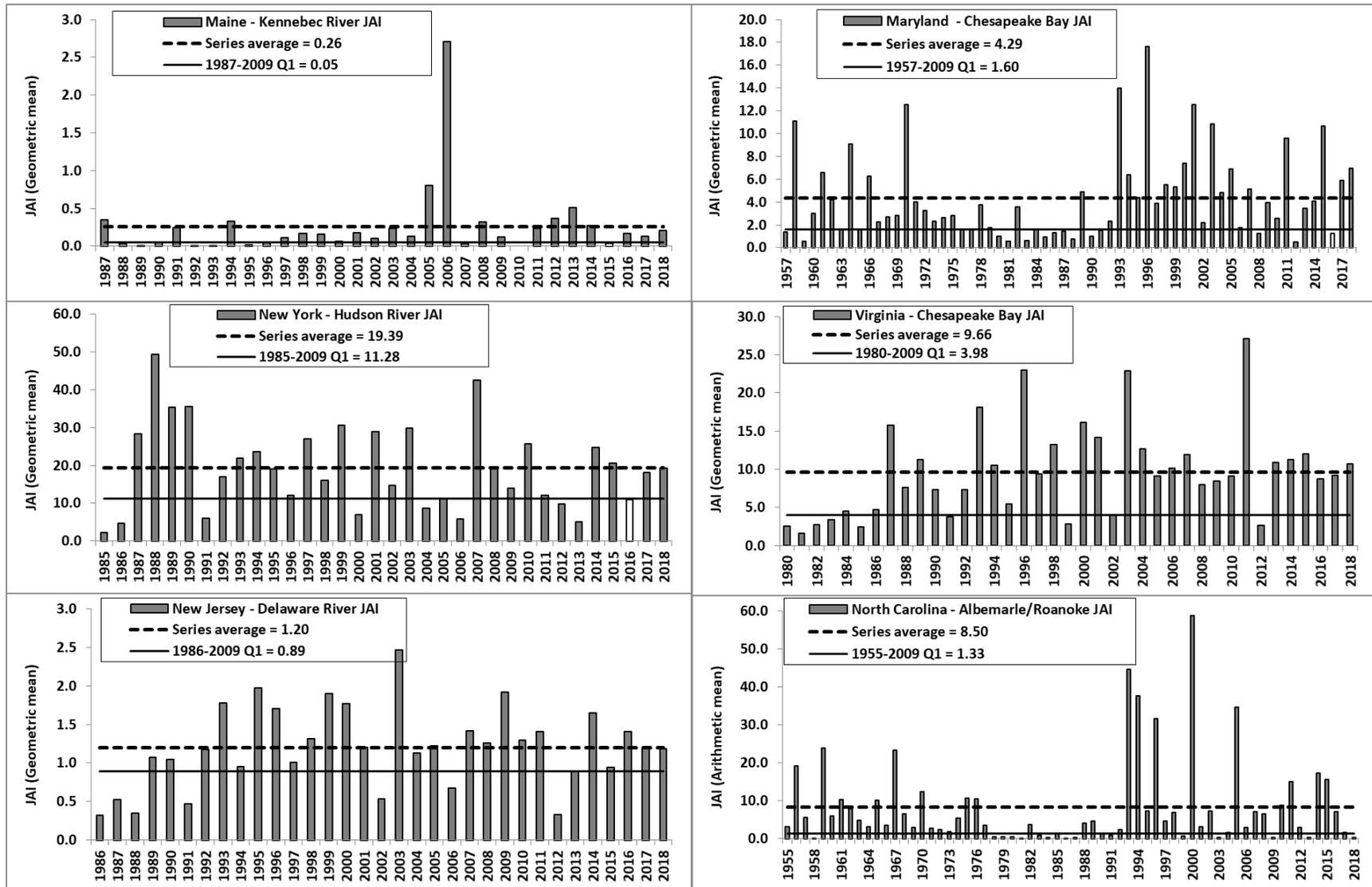


Figure 8. Juvenile abundance index analysis for Maine, New York, Jew Jersey, Maryland, Virginia, and North Carolina. Source: Annual State Compliance Reports. Q1 = first quartile. An open bar in the last three years indicates a value below the Q1 threshold.



From: wfdjr@verizon.net
To: [Comments](#)
Subject: Striped Bass Regulations
Date: Thursday, July 25, 2019 8:09:53 PM

I am greatly saddened, as I know you are, in the declining Striped Bass population. I have been fishing for Striped Bass for over 30 years from New York to Virginia. In my experience one of the most grievous actions that I believe is decimating the Striped Bass population is the harvesting of egg laden Striped Bass—to me it does not make sense. Most states do not allow the harvesting of crabs with eggs, so why do many states allow the harvesting striped bass with eggs?

If the harvesting of striped bass from say January 1 to May 1 was eliminated, I believe that we would see a rapid increase in the coastal Striped Bass population. Alternatively I believe that catch and release with in line circle hooks should be encouraged. Back in the 90s Maryland did a Striped Bass catch and release mortality study on the Susquehanna Flats on pre spawn and post spawn fish, and the mortality rate was found to be extremely low—I think about 2% or less, and that was without the use of circle hooks.

Thus if you eliminated the harvesting of egg laden Striped Bass, and encourage catch and release, I believe we would see Striped Bass populations rebound, enhance fishing opportunities, and would eventually lead to greater harvest opportunities at other times of the year. Another effective way to increase Striped Bass populations would be of course to give it game fish status.

Thank you for your consideration of these matters.

Sincerely
William DePace

Max Appelman

From: Jules <julienfrank@gmail.com>
Sent: Friday, July 26, 2019 11:16 AM
To: joseph.myers@asmfc.org; Katie Drew; Max Appelman
Subject: 2020 Striped Bass Regulations / ASFMC August Meeting

Hello Max, Katie, Joseph,

I hope this finds you all well, I'm writing you today ahead of the 08/08/19 Atlantic Striped Bass Management Board meeting with hopes that these comments will contribute to the overall process used to arrive at regulation proposals that put the needs of the stock above the wants of the "user groups".

Striped Bass are overfished and overfishing is occurring. Under the current Striped Bass management plan the ASFC has committed to end overfishing within one year, and rebuild the stock within 10 - ideally these two endeavors will not be treated as items independent of each other.

It's my understanding that the "government shutdown" amongst other issues played a role in delaying action for 2019 but it is critical that we implement new measures for 2020 to better protect the spawning stock biomass - and more specifically our BOFFF's (big old fat fecund female fish).

It is also important that any new regulations be applied as uniformly as possible across the spectrum of interested parties. To do otherwise would fuel what is already a healthy amount of finger-pointing and infighting - we all played our part in arriving where we are at today.

Additionally, many conservation-minded anglers are rightfully fuming at the notion of redefining targets and thresholds. I don't know personally if there have been any official internal proposals for redefining targets but to do so would be unacceptable - hopefully you can share some insight here.

An angler's personal experiences tend to be written off as anecdotal, and that makes sense when dealing with a single angler. However, through participation with the NYSFC (New York Surf Fishing Contest), membership with the High Hill Striper Club, and countless hours on the beach/water it's been collectively evident amongst some of the most accomplished recreational anglers in the state that the Striped Bass are in trouble and we needed new regulations at least 3-4 seasons ago

In closing, I'm aware of some of the proposed regulations: 35" minimum, slot fish, circle hooks with bait, emergency closures, etc. I sincerely plead that you deploy as many of these options necessary to get this truly iconic fish back on track.

Please let the needs of these fish be the loudest voice in the room this August.

I sincerely thank you all for your time and consideration. Have a fantastic weekend.

Kind regards,

Julien Frank

Max Appelman

From: kris magnotti <gloryhorse78@gmail.com>
Sent: Sunday, July 28, 2019 10:00 PM
To: Max Appelman
Subject: Striped bass management

To Whom This May Concern,

Hello I'm writing this email to voice my concerns over the upcoming ASMFC meeting in August on the management of striped bass. I am a Long Island resident and Surfcaster of 16 years. I know the information on the overfishing of striped bass has finally surfaced and I hope the commission will initiate an addendum to lower the fish mortality rate as well as rebuild the stock for the years to come. This needs to happen NOW. These regulations should come ASAP so that they can be in place for the 2020 season and an amendment should NOT be implemented to change current threshold numbers. I know the ASMFC has a plan to end overfishing within a year and to rebuild the stock within the next ten. Please, we want them to honor this management requirement. As a fisherman that is part of a club that releases 99.9% of our catches I want only the best for the fishery. I would love to share the experience of catching these wonderful fish with my son for years to come.

Thank you for your time.

Kris Magnotti

Sent from my iPhone

Max Appelman

From: Adam Sotiryadis <adamsotiryadis@yahoo.com>
Sent: Wednesday, July 24, 2019 7:39 PM
To: Max Appelman
Subject: August ASFMC meeting

Dear Mr. Appleman,

I am writing to you as a life long fisherman from Long Island. I am a 3rd generation fisherman, I fish over 160 dis per year. I urge you to take steps to save our fishery. This is by far the worst season I have had since 1982 the period before a moratorium was needed. *Striped Bass are overfished and overfishing is occurring. Commissioners must address this situation by voting to initiate an addendum at the August Commission Meeting. Such addendum should lower fishing mortality to the point where it would not only end overfishing, but put the stock on track to rebuild within a reasonable time-frame. While it's too late for new regulations to be in place for the 2019 fishing season, they MUST be in place for 2020. Reference points SHOULD NOT BE ADJUSTED*

THEY CAN NOT DECIDE ON AN AMENDMENT which would delay any new regulations until 2021 at the earliest, and would open the door to lowering the "goal posts" on what a healthy stack would look like Under the current striped bass management plan, ASMFC is committed to end overfishing in one year and rebuild the stock within ten years. It is critical that the stock is rebuilt to target not threshold levels. It is also critical that ASMFC honors this management requirement.

When I was the same age as my son Danny is now, the striped bass fishing was abysmal, it was 1982. Like my son I fished every day before or after school, that's the BEST part of being a Long Islander! When the fish disappeared I focused on High School sports because fishing was NOT worth my time. My son Danny has won the NY State fishing contest in 2016 in the children's division for blue fish, in 2015 he finished 3rd. Today he says they are no fish & he chooses to also focus on his HS sports. What does that say about fisheries management if every generation faces a striped bass crisis.

Your decisions at the August ASFMC meeting can very well dictate the the future for the striped bass we can either relive the mismanagement of the mid 80's or take preemptive steps to craft regulations that will be beneficial for everyone associated with striped bass fishing.

Thank you for your time & I trust you will take steps to help these fish rebuild!

*Adam Sotiryadis
917-371-8854*

Max Appelman

From: Pete Utschig <pgz52@yahoo.com>
Sent: Wednesday, July 24, 2019 9:50 AM
To: Max Appelman
Subject: Letter to the ASMFC from concerned anglers

Please include this letter in the upcoming supplemental board meeting materials for August.

I am an avid Striped Bass fisherman and outdoorsman and my family, friends and I spend tens of thousands of dollars every year fishing for Striped Bass. This Money is spent on gas, food, hotels, and fishing tackle all to target the striped bass and helps fuel local economy. Nearly all the fish we catch are released and we do our best to practice catch and release to help protect the striped bass fishery.

Over the past couple of fishing seasons, I have seen a drastic decline in the population of the Striped Bass and the amount of effort it takes to catch a striped bass is now more than double of what it was just a few years ago. The amount of time I spend on the water fishing, speaking with fellow anglers and reading fishing reports gives this testimonial legitimacy.

The ASMFC 2018 Striped bass stock assessment shows that striped bass are being overfished and overfishing is occurring. Action must be taken now to reduce fishing mortality below the threshold and closer to the target by 2020. The ASMFC needs to honor the commitment they made when they adopted Amendment 6 and rebuild the striped bass stock within ten years. The abundance of striped bass is critical to local communities, the tackle trade, and recreational fisherman.

The Striped bass should be regulated so the stock can be enjoyed by all, Commercial, for Hire, and the Recreational communities. The recreational community needs an abundant striped bass population so that there's a reasonable expectation that you can catch a fish or we'll continue losing anglers that support the fishing community.

The majority of striped bass in the migratory population spawn in the Southern most portion of its range and the Chesapeake Bay is experiencing water quality issues, destruction of spawning areas, and depletion of its food sources making the importance of more stringent regulations important to bring SSB above the threshold and closer to the target. We all understand the importance of an abundant Striped Bass fishery and what it means to the recreational and commercial fishing industry and local communities. We need to act today to rebuild the stocks for tomorrow and eliminate the downward trend of the population.

Thank You for your time
Pete Utschig
Sent from my iPhone



July 26, 2019

Dr. Mike Armstrong, Chairman
Atlantic Striped Bass Management Board
Atlantic States Marine Fisheries Commission
1050 North Highland Street, Suite 200A-N
Arlington, Virginia 22201

RE: Ending Overfishing and Rebuilding Striped Bass through Addendum VI

Dear Dr. Armstrong and Members of the Atlantic Striped Bass Management Board,

Founded by anglers in 1973,¹ *Wild Oceans* is the nation's oldest conservation group dedicated to marine fishery resources. Our organization was heavily involved in the successful recovery of striped bass along the Atlantic seaboard, working with the Atlantic States Marine Fisheries Commission as far back as 1978 and with Congress on the Atlantic Striped Bass Conservation Act of 1984. Years of sacrifice and dedication on the part of fishermen up and down the East Coast led to the full recovery of striped bass by 1995. Striped bass became the "poster fish" for successful, collaborative interstate conservation.

The newly-published striped bass stock assessment alarmingly concludes that striped bass are once again overfished and overfishing is occurring,² We urge the Management Board to act swiftly to end overfishing and reduce fishing mortality to the target level, *with a greater than 50% chance of success*, as soon as possible and no later than 2020. In addition, we strongly support rebuilding the striped bass population in less than 10 years as required by Amendment 6 to the Interstate Fishery Management Plan for Atlantic Striped Bass.³ Both of these objectives should be addressed in Addendum VI to Amendment 6 prior to the addendum being released for public comment. Furthermore, Addendum VI options should be consistent with

¹ As the National Coalition for Marine Conservation (NCMC)

² Northeast Fisheries Science Center (NEFSC). 2019. 66th Northeast Regional Stock Assessment Workshop (66th SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 19-08; 1170 p. Available from: <https://www.nefsc.noaa.gov/publications/crd/crd1908/>

³ The stock rebuilding schedule in Amendment 6 (Section 2.6.2) explicitly states that "if at any time the Atlantic striped bass population is declared overfished and rebuilding needs to occur, the Management Board will determine the rebuilding schedule at that time. The only limitation imposed under Amendment 6 is that the rebuilding schedule is not to exceed 10 years."

the management goals and objectives listed in Amendment 6, which we fully support – in particular, the emphasis on “long-term maintenance of a broad age structure.” The abundance of older striped bass, the most productive spawners, is crucial to maintaining a healthy and stable stock.

Wild Oceans believes that the goals, objectives, reference point definitions and actions specified in Amendment 6 offer the best and most expedient path forward for ending overfishing and rebuilding a healthy and resilient striped bass population. Therefore, we strongly oppose the postponed motion from the April 2019 meeting that would initiate an amendment to alter this course, potentially causing undue delays and weakening conservation measures.

Finally, we remind the Management Board of the important work underway to develop ecological reference points for Atlantic menhaden, arguably the most critical component of the striped bass diet. It is impossible to sustain a healthy striped bass population for the long term if management does not account for its ecological needs, especially the needs of a population undergoing recovery. The Atlantic menhaden ecosystem-based benchmark assessment and the models supporting the assessment must remain a high priority for the Commission and must stay on schedule for completion in 2020.

Thank you for your consideration.

Sincerely,

A handwritten signature in blue ink that reads "Pam Lyons Gromen". The signature is fluid and cursive, with the first letters of each name being capitalized and prominent.

Pam Lyons Gromen
Executive Director

1075 Tooker Avenue
West Babylon, NY 11704
July 30, 2019

James J. Gilmore Jr.
New York State Department of Environmental Conservation
Division of Marine Resources
200 North Belle Meade Road, Suite 1
East Setauket, NY 11733-3400

Sen. Todd Kaminsky
55 Front St., Room 1
Rockville Centre, NY 11570-4040

Emerson Hasbrouck
Cornell Cooperative Extension
Marine Program
423 Griffing Av, #100
Riverhead, NY 11901-3071

Dear ASMFC Commissioner:

I am contacting you with respect to actions that are scheduled to be taken when the Atlantic States Marine Fisheries Commission's Atlantic Striped Bass Management Board (the "Management Board") meets on August 8, 2019, more particularly, the vote to approve an addendum to the striped bass management plan for public comment, and the vote on a motion to initiate a new amendment to the striped bass management plan.

The benchmark striped bass stock assessment that was completed in 2018 and formally released in February 2019 (the "2018 Assessment") revealed that the striped bass stock is experiencing overfishing, and has become overfished.¹ In response to that finding, I ask that you support actions to reduce striped bass fishing mortality to the target level within one year, and to rebuild the striped bass biomass to the target level within ten years, both as required by *Amendment 6 to the Interstate Fishery Management Plan for Atlantic Striped Bass* ("Amendment 6").

To better assure that any measures adopted achieve such goals, I further ask that the addendum contain provisions that 1) prohibit the transfer of striped bass between sectors, 2) limit the use of conservation equivalency to situations where there is a compelling biological argument for doing so, 3) hold recreational fishermen accountable, at the fleet level, for not achieving mandated fishing mortality reductions, and 4) hold states that opt for conservation-equivalent measures accountable should such allegedly equivalent management measures fail to meet mandated fishing mortality reductions.

¹ Northeast Fisheries Science Center, *66th Northeast Regional Stock Assessment Workshop (66th SAW) Assessment Report*, April 2019, p. 564, available at <https://www.nefsc.noaa.gov/publications/crd/crd1908/crd1908.pdf>

I also ask that you oppose the motion to initiate a new amendment to the striped bass management plan.

My rationale for such requests is set forth below.

I

FISHING MORTALITY MUST BE REDUCED TO THE TARGET LEVEL WITHIN ONE YEAR

Amendment 6 contains a “management trigger” that states “If the Management Board determines that the fishing mortality threshold is exceeded in any year, the Board must adjust the striped bass management program to reduce the fishing mortality rate to a level that is at or below the target within one year.”² At its May 2019 meeting, the Management Board initiated an addendum process intended to satisfy that requirement.³

Reducing fishing mortality to the target level is an essential element of the striped bass management program, as the fishing mortality target was calculated to be the level of fishing mortality that would maintain striped bass abundance at the female spawning stock biomass target.⁴ Allowing fishing mortality to remain above the fishing mortality target makes it highly unlikely that such biomass target could be attained; should fishing mortality be allowed to remain above the fishing mortality threshold, the biomass is likely to remain overfished, and even to continue to decline.

The addendum that was initiated at the Management Board’s May meeting will probably consider a number of alternatives intended to reduce fishing mortality to the target level. Which of those alternatives is ultimately chosen is less important than assuring that, whichever alternative is chosen, fishing mortality will be reduced to the target level. To that end, there are some issues that should be considered.

A

A 50% probability of success is not enough

The use of a 50% probability of success as a management standard arose out of the appellate court’s decision in *Natural Resources Defense Council v. Daley*.⁵ There, the court found that any lesser standard would not satisfy the legal requirement that a federal fishery management action must offer a “fairly high level of confidence” that it will succeed.

² Atlantic States Marine Fisheries Commission, *Amendment 6 to the Interstate Fishery Management Plan for Atlantic Striped Bass*, 2003, p. 31, available at <http://www.asmfmc.org/uploads/file/sbAmendment6.pdf>

³ Atlantic States Marine Fisheries Commission, “Atlantic Striped Bass Benchmark Stock Assessment Finds Resource Overfished and Overfishing Occurring,” May 1, 2019, available at <http://www.asmfmc.org/uploads/file/5cc9dafdpr14AtlStripedBassAssmt.pdf>

⁴ Northeast Fisheries Science Center, 2018 Assessment, p. 462

⁵ 209 F. 3rd 747 (DC Circuit, 2000)

While the Atlantic States Marine Fisheries Commission (“ASMFC”) is not bound by such federal ruling, it is still worth noting that a 50% probability of success is viewed as a *minimum* standard for federal management plans, and not as the target, or optimum, probability level. Federal management plans, particularly in the Mid-Atlantic region,⁶ typically see allowances made for scientific, and sometimes for management, uncertainty; while a 50% probability of success might barely meet the acceptable standards in the unheard-of case where all conceivable uncertainty has been resolved, that 50% probability is quickly called into doubt once uncertainty is added to the equation.

Unfortunately, the impacts of uncertainty were well illustrated in the 2018 Assessment’s findings, which seem to have caught a number of Management Board members by surprise, and were certainly far more pessimistic than the results of the previous benchmark assessment that was completed in 2013⁷ (the “2013 Assessment”).

Since the ASMFC does not have a formalized risk policy, it should better assure the efficacy of its management plans by adopting measures that don’t have a 50% probability of failure.

B

Circle hooks should be required for all bait fishing

Recreational release mortality was the greatest single contributor to striped bass fishing mortality in 2017.⁸ Any successful effort to reduce such release mortality would both reduce dead discards in the fishery and make a significant contribution to reducing the fishing mortality level.

The easiest way to reduce release mortality is to require the use of circle hooks in all bait fisheries for striped bass. Maryland took that step in 2018; its report on the first year of that program indicates that the circle hook mandate has significantly decreased release mortality of striped bass in that state.⁹ There is no reason to believe that a universal circle hook requirement, if included in the addendum now being contemplated, would be any less effective.

Certainly, such requirement would be beneficial in New York, where anglers still frequently employ not only traditional J-hooks, but also treble hooks, in the bait fishery for striped bass. I was reminded of that twice in recent weeks, as I walked into tackle shops to find anglers purchasing small (perhaps #4/0 or #5/0) treble hooks that they intended to use when live-lining menhaden and other live baits. At certain

⁶ Mid-Atlantic Fishery Management Council, “Mid-Atlantic Fishery Management Council ABC Control Rule Framework and Risk Policy,” available at http://archive.nefmc.org/press/risk_policy_workshop/tab%205/3_MAFMC%20ABC%20Control%20Rule%20framework.pdf

⁷ Northeast Fisheries Science Center, *57th Northeast Regional Stock Assessment Workshop (57th SAW) Assessment Report*, December 2013.

⁸ Celestino, M., “2018 Stock Assessment of Atlantic Striped Bass” (Power Point presentation), February 2019, available at

http://www.asmfc.org/files/Meetings/2019WinterMeeting/AtlStripedBassBoardPresentations_Feb2019.pdf

⁹ Maryland Department of Natural Resources, “Maryland’s Conservation Equivalency Effectiveness Report,” January 2019, available at

<http://www.asmfc.org/files/Meetings/2019WinterMeeting/AtlanticStripedBassBoardSupplemental.pdf>

times during the year, New York also sees many anglers employ the “snag-and-drop” technique, in which large, weighted treble hooks are used to foul-hook menhaden, which are then allowed to drop below the school where they are often eaten by a striped bass.

The damage that such treble hooks can cause when they embed themselves in the gills, gut or gullet of a striped bass is a good reason, in itself, to impose a universal circle hook requirement.

II

THE MANAGEMENT BOARD MUST NOT IGNORE AMENDMENT 6’S REQUIREMENT THAT IT REBUILD THE STOCK TO TARGET WITHIN TEN YEARS

The language of Amendment 6 is perfectly clear: “If the Management Board determines that the biomass has fallen below the threshold in any given year, the Board must adjust the striped bass management program to rebuild the biomass to the to the target level within the timeline established by *Section 2.6.2*.”¹⁰

Section 2.6.2, in turn, reads “If at anytime the Atlantic striped bass population is declared overfished and rebuilding needs to occur, the Management Board will determine the rebuilding schedule at that time. The only limitation imposed under Amendment 6 is that ***the rebuilding schedule is not to exceed 10 years***. [emphasis added]”¹¹

Yet, despite what appears to be a clear and unambiguous requirement to rebuild the striped bass stock within a time certain, when the Management Board voted to begin the addendum process at its May 2018 meeting, it did not direct the Plan Development Team to address rebuilding at all. Although Max Appelman, the Fishery Management Plan Coordinator, expressly informed the Management Board that “The Board is required to adjust the management program to return F to a level at or below target within one year, and to rebuild biomass to the target, and that rebuilding schedule cannot exceed a ten year period...its very important that the Board provide good direction to the Development Team on which issues to consider, and also on how those issues should be approached or explored,”¹² the Management Board seems to have intentionally ignored the mandatory rebuilding language.

The most that the Management Board was willing to do was accede to the request of Capt. John McMurray, the proxy for New York’s legislative representative, to task the Atlantic Striped Bass Technical Committee (the “Technical Committee”) to determine what measures would be needed to timely rebuild the stock, and report back at the upcoming August meeting.¹³

¹⁰ ASMFC, *Amendment 6*, p. 31

¹¹ ASMFC, *Amendment 6*, p. 22

¹² Atlantic States Marine Fisheries Commission, Draft Proceedings of the Atlantic Striped Bass Management Board Meeting April 2019, p. 25, available at <http://www.asmfc.org/files/Meetings/2019SummerMtg/AtlanticStripedBassBoard.pdf>

¹³ ASMFC, Draft Proceedings of the April 2019 meeting, p. 39

Once that report is provided, the Management Board will be effectively committing management malpractice if it fails to include rebuilding measures in the proposed amendment for public consideration.

A

Uncertainty is not an excuse for inaction

This is not the first time that the Management Board has ignored the clear mandate of Amendment 6, and failed to take action to rebuild the stock when required to do so.

In 2014, after the 2013 Assessment revealed that remedial action was needed, the Management Board was faced with two relevant management triggers. One, management trigger 3, required that when fishing mortality rose above the target level for two consecutive years, and biomass fell below target in one of those years, management action had to be taken to reduce fishing mortality to or below the target level within one year. The Management Board complied with that mandate by adopting *Addendum IV to Amendment 6 to the Atlantic Striped Bass Interstate Fishery Management Plan* (“Addendum IV”) in October 2014.¹⁴

However, a second management trigger, management trigger 4, expressly stated that “If the Management Board determines that the female spawning stock biomass falls below the target for two consecutive years and the fishing mortality rate exceeds the target in either of those years, the Management Board must adjust the striped bass management program to rebuild the biomass to a level that is at or above the target in the timeframe established in *Section 2.6.2*.”¹⁵

Despite the mandatory language of that provision, the Management Board chose to ignore the rebuilding requirement, probably because Michael Wayne, who was then the Fishery Management Plan Coordinator, advised the Management Board that

Management Trigger 2 [sic] in Amendment 6 says that you need to rebuild the [spawning stock biomass] back to target over a specified timeframe that should not exceed ten years. I think there is a sort of a combination of things happening. The Board is acting to reduce [fishing mortality]. Through that action we see the projection that [spawning stock biomass] will start increasing towards its target, but we’re uncomfortable with projecting out far enough to tell you when it will reach its target because the further on the projections we go the more uncertainty that is involved. Therefore, I think the trend is to get back towards the target, but we can’t tell you how quickly that will happen.¹⁶

¹⁴ Atlantic States Marine Fisheries Commission, *Addendum IV to Amendment 6 to the Atlantic Striped Bass Interstate Fishery Management Plan*, October 2014, available at

http://www.asmfc.org/uploads/file/54d2aa96AtIStripedBassAddendumIV_Oct2014.pdf

¹⁵ ASMFC, *Amendment 6*, p. 31

¹⁶ Atlantic States Marine Fisheries Commission, *Proceedings of the Atlantic Striped Bass Management Board Meeting August 2014*, p. 10, available at

http://www.asmfc.org/uploads/file/5522c64fAtIStripedBassProceedings_Aug2014.pdf

It was strange and very dubious advice, and not only because it is probably not the role of the Fishery Management Plan Coordinator to recommend that the Management Board ignore explicit provisions of its own management plan.

While it's certainly true that uncertainty increases as population projections are extended out in time, such uncertainty is hardly so daunting that it militates against the creation of ten-year rebuilding plans. The Magnuson-Stevens Fishery Conservation and Management Act, which governs all fishing in federal waters, sets ten years as its default rebuilding timeline, and allows plans to be extended out longer when biology or other factors render a ten-year rebuild impossible.¹⁷

Thus, it is clearly feasible to address the uncertainty inherent in a 10-year rebuilding plan, both by creating buffers for scientific and management uncertainty, and by performing periodic stock assessment updates every two or three years, which provide managers to adjust a rebuilding plan should the recovery veer off course.

The ASMFC has already demonstrated that it can rebuild the striped bass biomass to the target level within ten years, even when the stock is at far lower levels of abundance than where it stands today. When *Amendment 3 to the Interstate Management Plan for Atlantic Striped Bass*¹⁸ ("Amendment 3") was adopted in 1985, the female spawning stock biomass stood at roughly 40 million pounds, roughly one-fourth of where it stands today.¹⁹ Yet only ten years after Amendment 3 was adopted, the stock had been completely rebuilt.²⁰ There is no reason why the Management Board shouldn't find equal success rebuilding the stock today.

Finally, the Management Board must realize that uncertainty is unavoidable, and even exists when no action is taken. Mr. Waine ignored that fact in 2014, when he recommended against a rebuilding plan but confidently advised that "the trend is to get back towards target." Unfortunately, that wasn't the case; as the 2018 Assessment has revealed, in reality, "the trend" was really for further decline.

If the Management Board had initiated a rebuilding plan as part of Addendum IV, that decline might have been detected earlier, and action might have been taken to prevent the biomass from sinking to the level where it stands today.

B

A rebuilding plan better assures that rebuilding will actually occur

The ASMFC has had little success in rebuilding overfished stocks. While its record can be measured from a number of different starting points, including the ASMFC's creation in 1942, the passage of the Atlantic

¹⁷ 16 U.S.C. 1854 (e)(4)(A)(ii)

¹⁸ Atlantic States Marine Fisheries Commission, *Amendment 3 to the Interstate Management Plan for Atlantic Striped Bass*, October 1985, available at <http://www.asmfc.org/uploads/file/StripedBassAmendment3.pdf>

¹⁹ See Atlantic States Marine Fisheries Commission, "Atlantic Striped Bass," available at <http://www.asmfc.org/species/atlantic-stripped-bass>

²⁰ *Ibid.*

Striped Bass Conservation Act²¹ in 1984 or the passage of the Atlantic Coastal Fisheries Cooperative Management Act²² in 1993, the fact remains that in all of its history, the ASMFC has never successfully rebuilt and maintained a single fish stock. The one stock that it has managed to rebuild, Atlantic striped bass, is again languishing at an overfished level, with little reason to believe that it will recover in the foreseeable future.

The ASMFC's dismal record stands in stark contrast to that of federal fishery managers who, as of June 30, 2019, have successfully rebuilt 45 stocks of fish,²³ and have placed a number of other, once-overfished stocks solidly on the road to recovery.

While such direct comparison doesn't account for some unique challenges faced by the ASMFC, such as the impact of dams on anadromous species,²⁴ much of the federal managers' success can be attributed to a law that require overfished stocks to be rebuilt within a time certain, and gives managers no discretion to ignore rebuilding or delay the rebuilding deadline.²⁵

The ASMFC's failure to create and actively oversee a ten-year rebuilding plan for Atlantic striped bass will virtually assure that the striped bass, like all other depleted species managed solely by the ASMFC, will not soon recover.

C

A failure to initiate a rebuilding plan will seriously damage the ASMFC'S credibility

When the ASMFC adopted Amendment 6 and the management triggers therein, it entered into a covenant with striped bass stakeholders and with the general public that it would take action when such management triggers were tripped.

I make that statement not on a theoretical level, but as someone who was actively involved in the striped bass debate when Amendment 6 was being developed. At that time, I was among the many striped bass anglers who believed that, based on the best available science then available, Amendment 6's target fishing mortality rate of 0.31 was too high to develop a broad age structure in the striped bass spawning stock.

We argued for a fishing mortality target that was set no higher than 0.25. Although we lost that fight, we were assured by members of the Management Board that we had little to worry about, because the management triggers in Amendment 6 provided a firewall, that would guarantee action if the biomass fell low enough to trip the relevant management triggers.

²¹ 16 U.S.C. 5151 *et seq*

²² 16 U.S.C. 5101 *et seq*

²³ National Marine Fisheries Service, "Fishery Stock Status Updates," available at <https://www.fisheries.noaa.gov/national/population-assessments/fishery-stock-status-updates#2019-quarterly-updates>

²⁴ See Atlantic States Marine Fisheries Commission, "Shad & River Herring," available at <http://www.asmfc.org/species/shad-river-herring>

²⁵ 16 U.S.C. 1854(e)

That wasn't what happened when trigger 4 was tripped five years ago, and there is little reason to believe that the tripped trigger 2 will lead to meaningful management action today. The Management Board's decision to ignore the very clear language of Amendment 6, stating that it "must" act, provides stakeholders little reason to believe that the ASMFC will stand by its commitments to manage and conserve any fish stock, including the Atlantic striped bass.

The ASMFC's failure to take action to rebuild the stock within ten years, as expressly provided in Amendment 6, makes it appear all too likely that many Management Board are trying to avoid living up to their responsibilities as stewards of a public-trust resource, and making the hard decisions that are necessary to assure the long-term health of fish stocks.

The ASMFC's failure to adopt a ten-year rebuilding plan will also confirm the belief, which is spreading through the striped bass angling community, and through the broader angling community as well, that the only way to rehabilitate the ASMFC's credibility and its effectiveness as a management body is to pass legislation that will hold the ASMFC to the same standards, including standards for legal review, that currently apply to federal fishery managers.

Many members of the Management Board would strongly prefer not to see that happen. However, their failure to comply with the clear language of the striped bass management plan will merely serve to convince more people that such legislation is badly needed.

III

MISCELLANEOUS CONSIDERATIONS RELATED TO THE ADDENDUM

A

Transfer of striped bass between sectors should not be permitted

The striped bass stock is overfished and experiencing overfishing. So long as those conditions exist, the sole priority of fishery managers should be reducing fishing mortality to a level that will end overfishing and rebuild the overfished stock.

Managers need not impose draconian measures. Each state's commercial quota is set in Addendum IV,²⁶ and the commercial fishery can be adequately managed by reducing such state quotas by whatever percentage is deemed necessary achieve the management plan's conservation goals. Interstate transfers of commercial quotas, in order to erase one state's overage with another state's unused quota, is a routine remedy that need not be discontinued, as even with such transfers, the legitimate commercial harvest would not exceed the permitted level.

However, some state legislatures have outlawed commercial striped bass fishing. Traditionally, such so-called "gamefish legislation" has been promoted as a conservation measure,²⁷ but the conservation

²⁶ ASMFC, *Addendum IV*, p. 9

²⁷ See Coastal Conservation Association Texas, "President Orders Gamefish Status for Striped Bass, Red Drum," *Texas Saltwater Fishing Magazine*, December 2007, available at

benefits of any such legislation are diluted, if not altogether dissipated, when a state's unused commercial quota is transferred for use by the recreational sector, something that is currently being done in at least two states, Connecticut and New Jersey.²⁸

If the transfer of commercial quota to the recreational sector was prohibited, fishing mortality could be reduced by a modest amount, without causing undue harm to anglers in the affected states, who would merely be placed on an equal footing with anglers elsewhere on the coast who share the same coastwide set of regulations.

At the same time, transfers of catch from the recreational to the commercial sector should also be banned. While such transfers are harder to quantify, given that anglers fish under a "soft" fishing mortality target rather than against a hard-poundage quota, it is conceivable that some states might attempt to craft allegedly conservation-equivalent regulations that minimize commercial landings reductions in exchange for more restrictive angling regulations.

No such effort should be permitted. The current commercial quotas are based on each state's commercial landings during the period 1972-1979,²⁹ and thus have a rational basis that would be disrupted by arbitrary changes initiated by any individual state. There is no conservation purpose served by making such change.

B

Limit the use of conservation equivalency

Consistent, coast-wide regulations benefit the striped bass stock and the management process by providing more accurate recreational harvest data, that can be collected on a coast-wide basis. Because the Marine Recreational Information Program ("MRIP") survey used to estimate recreational landings provides more precise data when the sample size is larger,³⁰ coastwide estimates are more precise than data obtained at a state-by-state level, and the impact of regulations on recreational landings can thus be better discerned.

Because state-level estimates are less precise than coastwide estimates, the data used to craft conservation equivalent regulations is less reliable than that used to craft coast-wide regulations, increasing the risk that supposedly equivalent regulations will not achieve the required harvest reductions. Thus, the use of conservation equivalency should be limited to states and/or regions where it is justified by the biology/life history of the striped bass (e.g., regulations adopted for Chesapeake Bay) rather than out of a mere desire to permit anglers to take home more fish on any given trip (e.g., New Jersey's 2-fish bag limit).

<https://www.texassaltwaterfishingmagazine.com/fishing/education/conservation/president-orders-game-fish-status-red-drum-striped-bass>

²⁸ ASMFC, *Addendum IV*, p. 9

²⁹ ASMFC, *Amendment 6*, p. 32

³⁰ National Marine Fisheries Service, "Recreational Fishing Data, Survey Statistics Overview," available at <https://www.fisheries.noaa.gov/recreational-fishing-data/survey-statistics-overview#accounting-for-errors>

While the ASMFC considers conservation equivalency to be “an integral part of the Commission management process,”³¹ it also advises that “The [Plan Development Team] should consider stock status, stock structure, data availability, range of the species, socio-economic information, and the potential for more conservative management when stocks are overfished or overfishing is occurring when making a recommendation on conservation equivalency.”³²

Given that the current status of the striped bass is “overfished,” that the stock is composed of fish from three primary spawning grounds that migrate all along the New England and Mid-Atlantic coast,³³ and that conservative management is indicated given that the striped bass stock is currently both overfished and experiencing overfishing, the ASMFC’s Conservation Equivalency policy would militate against the use of conservation equivalency in the striped bass fishery at this time, for all but the most compelling, biologically-driven situations.

C

The recreational sector should be held accountable if it fails to meet the mandated reductions

1

Such accountability should be imposed at the fleet, not state, level

Federal fishery management plans require that annual catch limits be established for virtually all managed fisheries, and that fishermen be held accountable when those limits are exceeded.³⁴ The ASMFC has imposed similar limits and accountability measures on the commercial striped bass fishery, and requires that “In the event that a state/jurisdiction exceeds its quota, the amount in excess of its annual quota will be deducted from the state’s allowable quota in the following year.”³⁵

No such strictures are placed on the recreational fishery. Such fishery is managed by means of a “soft” fishing mortality target, rather than by a hard quota, and when recreational fishermen exceed that mortality target, they face no consequences.

The most egregious example of that situation occurred in Chesapeake Bay, where Addendum IV required both commercial and recreational fishermen to reduce fishing mortality by 20.5%, compared to the 2012 base year.³⁶ However, a stock assessment update performed after the close of the 2015 season, the first season subject to Addendum IV regulations, revealed that while the commercial fishery achieved the mandated reduction, the recreational fishery in Chesapeake Bay not only failed to adequately reduce its harvest, but actually *increased* fishing mortality by more than 58 percent.³⁷

³¹ Atlantic States Marine Fisheries Commission, *Conservation Equivalency: Policy and Technical Guidance Document*, October 2016, p. 1

³² ASMFC, *Conservation Equivalency*, p. 2

³³ Northeast Fisheries Science Center, 66th SAW, pp. 471-472

³⁴ 16 U.S.C. 1853(a)(15)

³⁵ ASMFC, *Addendum IV*, p. 9

³⁶ ASMFC, *Addendum IV*, p. 8

³⁷ Atlantic States Marine Fisheries Commission Atlantic Striped Bass Technical Committee, “Memorandum: Performance Evaluation of Addendum IV Regulatory Measures in 2015,” October 5, 2015, p. 5, available at <http://www.asmfc.org/files/Meetings/2016AnnualMeeting/AtlanticStripedBassBoard.pdf>

Despite such a severe overage, the Management Board took no action to rein in excessive recreational harvest in Chesapeake Bay, while one state fishery manager from the Chesapeake region defended his state's overage, essentially arguing that the overage was, in reality, a "kind of a likely reduction" because, given the abundant 2011 year class available to Chesapeake Anglers, the overage would have been even higher if regulations hadn't been changed at all.³⁸

The fact that such arguments can be successfully made before the Management Board partially explains why the striped bass stock is overfished and experiencing overfishing today. The best management plan ever conceived is worthless if its provisions are not enforced. Yet recreational overharvest continues in the Chesapeake today.

In the 2012 base year, anglers harvested an estimated 716,742 striped bass in the inland water of the State of Maryland; if they had complied with Addendum IV's supposedly required 20.5% reduction, annual harvest in the years 2015-2018 should have been somewhere around 570,000 fish. Instead, the actual harvest was estimated to be 1,107,991 fish in 2015 (194% of target), 1,545,086 fish in 2016 (271% of target), 1,091,645 fish in 2017 (192% of target) and 993,304 fish in 2018 (174% of target).³⁹

While such overages certainly weren't the primary cause of the current, distressed state of the stock, it's difficult to argue that they didn't at least contribute to the situation.

Nonetheless, striped bass are a migratory species, and are appropriately managed on a coast-wide basis. It would probably be counterproductive to try to manage recreational harvest at the state level. However, given that striped bass are managed with two sets of recreational regulations, one applied to the coast and one applied to Chesapeake Bay (I'm leaving the Albemarle-Roanoke stock out of this discussion given its limited impact on the migratory population), it would be entirely appropriate to hold anglers accountable for overages at the fleet level. Such an approach would mandate more restrictive levels at any time that anglers along the entire coast, or throughout Chesapeake Bay, failed to meet the mandated harvest reductions.

2

Accountability measures should be applied at the state level if conservation-equivalent measures don't meet the mandated reduction

Every sector, and every state, will benefit if overfishing is ended and the striped bass stock is rebuilt; accordingly, every sector and every state should share the conservation burden required to meet such goals.

In the ideal situation, anglers along the entire coast would share a single set of regulations, while a second set would govern all anglers who fish in Chesapeake Bay. However, history informs us that at

³⁸ Atlantic States Marine Fisheries Commission, *Atlantic Striped Bass Management Board Proceedings October 2016*, p. 0, available at http://www.asmfc.org/uploads/file/589a31bfAtlStripedBassBoardProceedings_Oct2016.pdf

³⁹ Data on which such calculations were based obtained from personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, July 30, 2019

least one state will probably try to adopt conservation-equivalent regulations in order to allow a higher bag limit, a lower minimum size or some combination of such measures.

As noted in an earlier section, there is always some level of error in MRIP estimates, and such error inevitably increases when such estimates are made at the state, rather than the coast-wide, level. That error is incorporated into conservation equivalency calculations, and can result in supposedly “equivalent” measures that fail to meet the mandated harvest reduction.

In such cases, the state that rejected coastwide measures in favor of conservation equivalency should be held accountable for such failure, be required to adopt more restrictive regulations that will adequately constrain harvest and, if such failure continues in consecutive years, be subject to payback provisions. The success of any ASMFC management program hinges on cooperative management; when one state opts for conservation equivalent management measures, in an effort to confer an advantage on its anglers and angler-related businesses, such state must still be held responsible for shouldering its full share of the conservation burden.

Conservation-equivalent states will undoubtedly complain that MRIP estimates aren’t precise enough to permit the imposition of accountability measures. That may, in fact, be true. However, if such data is deemed to be adequate for conservation equivalency purposes, it should be deemed equally adequate for the purpose of imposing accountability. It is inconsistent, and somewhat hypocritical, to deem it good for one of those purposes and not the other.

IV

THERE SHOULD BE NO NEW AMENDMENT TO THE MANAGEMENT PLAN

At the February 2019 Management Board meeting, Fishery Management Plan Coordinator Max Appelman told the Management Board that “there is a lot of flexibility in the Adaptive Management Section of Amendment 6. I was just reviewing this prior to the Board meeting. Almost everything is covered in the addendum process, *except the management objectives and goals*. Just about anything else can be done through an addendum, including reference points. [emphasis added]”⁴⁰

That being the case, the current effort to initiate a new amendment to the management plan should be setting off red flags in stakeholders’ and managers’ minds.

The management plan’s current goal is both simple and appropriate: “To perpetuate, through cooperative interstate fisheries management, migratory stocks of striped bass; to allow commercial and recreational fisheries consistent with the long-term maintenance of a broad age structure, a self-sustaining spawning stock; and also to provide for the restoration and maintenance of their essential habitat.”⁴¹

⁴⁰ Atlantic States Marine Fisheries Commission, *Proceedings of the Atlantic Striped Bass Management Board February 2019*, p. 17, available at <http://www.asmfmc.org/uploads/file/5cd5d83cAtlStripedBassBoardProceedingsFeb2019.pdf>

⁴¹ ASMFC, *Amendment 6*, p. iv

The most notable part of the goal is its commitment to “fisheries consistent with the long-term maintenance of a broad age structure,” because such age structure is critically important to a stock that sees recruitment fluctuate widely from year to year, and which is dependent upon occasional and irregularly-timed large year classes to maintain a healthy abundance.⁴²

Yet to maintain such a broad age structure, fishing mortality must be constrained. Higher levels of fishing mortality tend to sharply reduce the number of older, larger females in a population. Such situation creates serious risk to the long-term health of the striped bass stock, which may experience low recruitment levels for a number of consecutive years. In such a situation, where most of the older females have been removed from the spawning stock, and few young females are recruiting in to replace them, the stock can experience a serious decline in abundance that will be very difficult to reverse. It was just such a situation that led the striped bass stock to collapse in the 1970s.⁴³

Ms. Nicole Lengyel, a member of the Technical Committee, advised the Management Board nearly two years ago that

There is a tradeoff between preserving spawning stock biomass and allowing fishing. As we just heard, the Board has raised concern that the current biological reference points may be too conservative, for various biological, ecological, and socio-economic reasons, and may be restricting fishing unnecessarily. The current management objectives and acceptable risk levels were laid out in Amendment 6 to the striped bass [fishery management plan] back in 2003. The [Technical Committee] and [Stock Assessment Subcommittee] posed to the Board several questions. Is the Board satisfied with the current management objectives, and acceptable risk levels, as laid out in Amendment 6? Does the Board want to manage the stock to maximize yield, maximize catch rates, maximize the availability of trophy fish, and what is the acceptable level of risk when it comes to preventing stock collapse?⁴⁴

Having experienced a striped bass stock collapse once, I can state with certainty that I don’t want to experience the same thing again. I note that even under current management, striped bass abundance has fallen sharply, and suggest that increasing the level of risk to the long-term health of the stock, and so increasing the risk of a stock collapse, is an ill-advised action that should be avoided.

Thus, I ask that you oppose initiating a new amendment.

⁴² See Maryland Department of Natural Resources, Juvenile Striped Bass Survey, available at <https://dnr.maryland.gov/fisheries/Pages/striped-bass/juvenile-index.aspx>

⁴³ See Rago, Paul J., Richards, R. Anne, and Shepherd, Gary R., “Restoration of Atlantic Striped Bass Populations: 1985-1989,” *A Chronicle of Striped Bass Population Restoration and Conservation in the Northwest Atlantic, 1989-2016*, National Marine Fisheries Service, September 2018, pp. 16-17

⁴⁴ Atlantic States Marine Fisheries Commission, Proceedings of the Atlantic Striped Bass Management Board October 2017, p. 9, available at http://www.asmf.org/uploads/file/5a95db21AtlStripedBassBoardProceedings_Oct2017.pdf

While I realize that the motion to initiate such amendment lists a number of issues to be considered, in addition to addressing the goals and objectives of the management plan, I note Mr. Appelman's advice that all of those issues, other than the goals and objectives, can be addressed through an addendum process.

Thus, it appears that changing the goals and objectives of the plan, in a way that increases risk to the health of the stock, would be a likely result of a new amendment process.

Such a change would not be in the long-term interests of the striped bass, or of striped bass fishermen, and should be opposed.

Thank you for considering my views on these matters.

Sincerely,



Charles A. Witek, III

cc: Capt. John McMurray
Maureen Davidson
Max Appelman



Date: July 30, 2019

Comments to:

Atlantic States Marine Fisheries Commission,

- please distribute to Striped Bass Management Board for consideration

Subject: Restoration & Protection of Atlantic Striped Bass

To Whom It May Concern:

The Atlantic Striped Bass Management Board is currently considering actions to reduce total removals and restore the Striped Bass biomass to long-term sustainable levels. We submit these comments for your consideration and charts for reference.

With regard to Addendum VI, in broad terms the Management Board seeks to implement a plan to achieve a 17% reduction in total removals, with a 50% confidence level. With respect, we believe that given the variables and uncertainties of natural effects, stock assessment methods, and the lack of accountability and disregard for quotas that has been exhibited in segments of the recreational sector, a plan starting with a 50/50 chance of success is a plan that's near-certain to miss the mark.

We respectfully request the Management Board consider revising the proposed measures to increase the chance of success to 2-Sigma (94%) confidence measure and double the reduction percentage to 34%. Increasing the confidence and reduction levels will provide more statistically relevant measures in an uncertain environment. Considering the lack of success in past performance restoration efforts and poor compliance in various states, this approach will allow room for the inevitable variability in natural response, angler compliance, and assessment science.

With regard to the motion to Amend the Atlantic Striped Bass Fishery Management Plan, please consider tabling this motion.

In the event an Amendment may be deemed appropriate by the Management Board, please postpone consideration of the Amendment process until three years after the Striped Bass stock has been assessed as fully recovered under the metrics in the existing plan, and various Addendum based on the recent 66th Stock Assessment Workshop.

In plain fact, the motion under consideration seeks to change well-established and proven metrics and to shift the baseline to favor a narrow constituency that has exhibited a flagrant and wholesale disregard for the management efforts of the ASMFC and its member states.

For your consideration, **we submit three charts:**

(Chart 1) includes a yearly account of recreational harvest, by state, for the years 2015 through 2018 as compared to the quotas set forth in Addendum IV to Amendment 6. All data from MRIP.

(Chart 2) uses the same MRIP data and ASMFC quotas as in Chart 1, with the yearly amounts aggregated to a 4-year total of harvest which is then compared to the Addendum IV quotas. In addition, the percentage of 'quota attained' over the four years by a particular state is included. Please note that based on these data, Maryland is exhibiting an egregious and flagrant disregard for the ASMFC quota. In fact, given the assessment data from the 66th SAW Report and year-class inventory data obtained from the Maryland DNR, it appears Maryland recreational anglers have decimated the 2011-year class before the majority of these young fish had an opportunity to spawn.



(Chart 3) displays data from the Maryland DNR Young of Year survey, plotted with yearly harvest data from Table B6:29 in the 66th SAW Striped Bass report. Note removals have increased substantially as recruitment shows a general decline over time, leading up to the recent overall decline in harvests. Given the low minimum size limit for Striped Bass in the Chesapeake Bay, the data readily shows Maryland recreational anglers are removing the 2011-year class as they age into the limits. The contemporary MRIP data also show the decline in MD harvests for the 2017 and 2018 seasons.

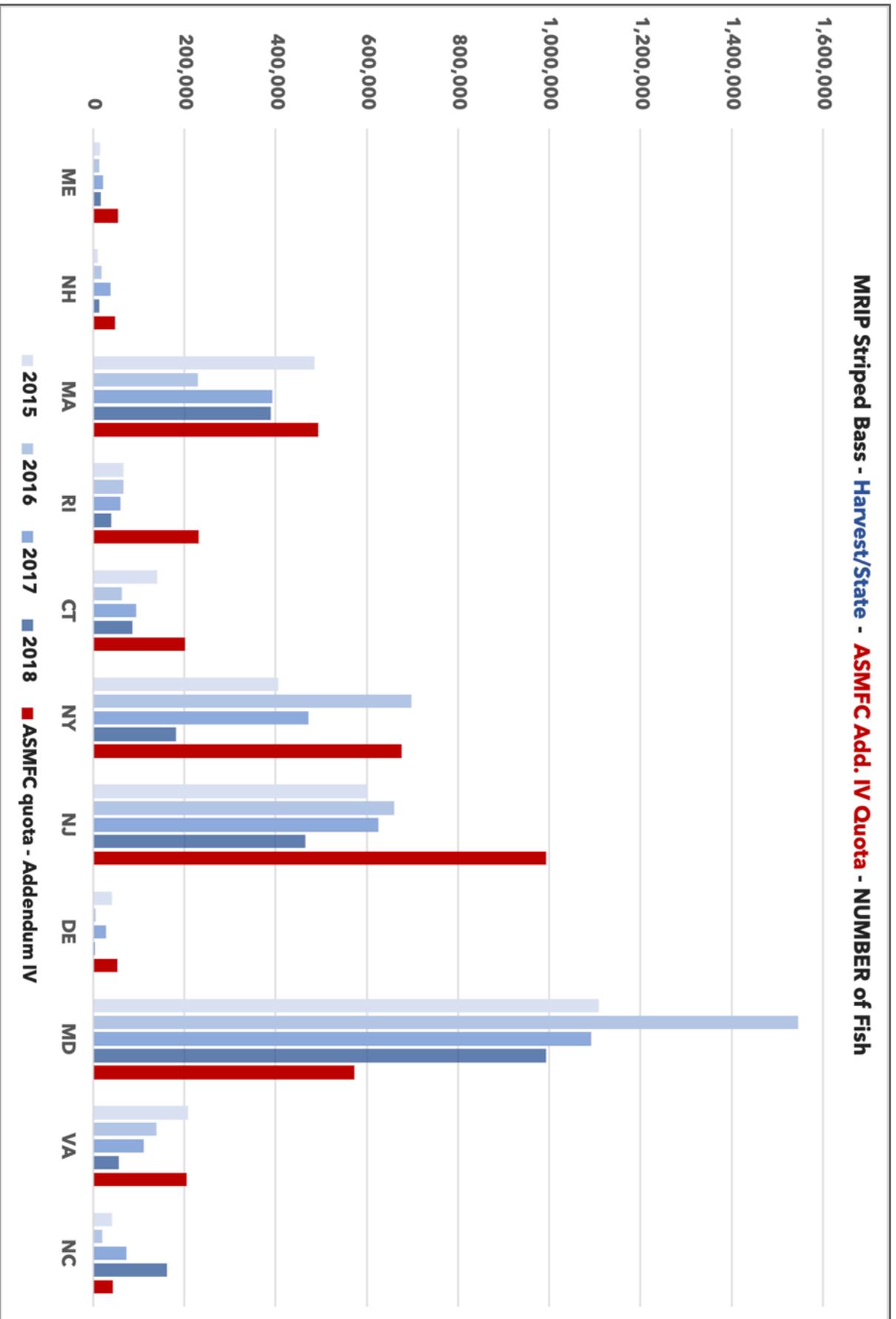
Based on these data, the increasing concentration of angler effort in the Chesapeake Bay, the willful disregard for science-based catch reductions and lack of enforcement by the State, Maryland is contributing an outsized proportion of damage to the stock overall. Coupled with the overall decline in ecosystem health in the areas critical to 70-90% of the overall Striped Bass recruitment effort, a viable case could be made to **initiate a moratorium on Striped Bass fishing in the Chesapeake until such time as the stock is able to rebuild itself.**

Sincerely,

Mark Eustis,
Managing Director.



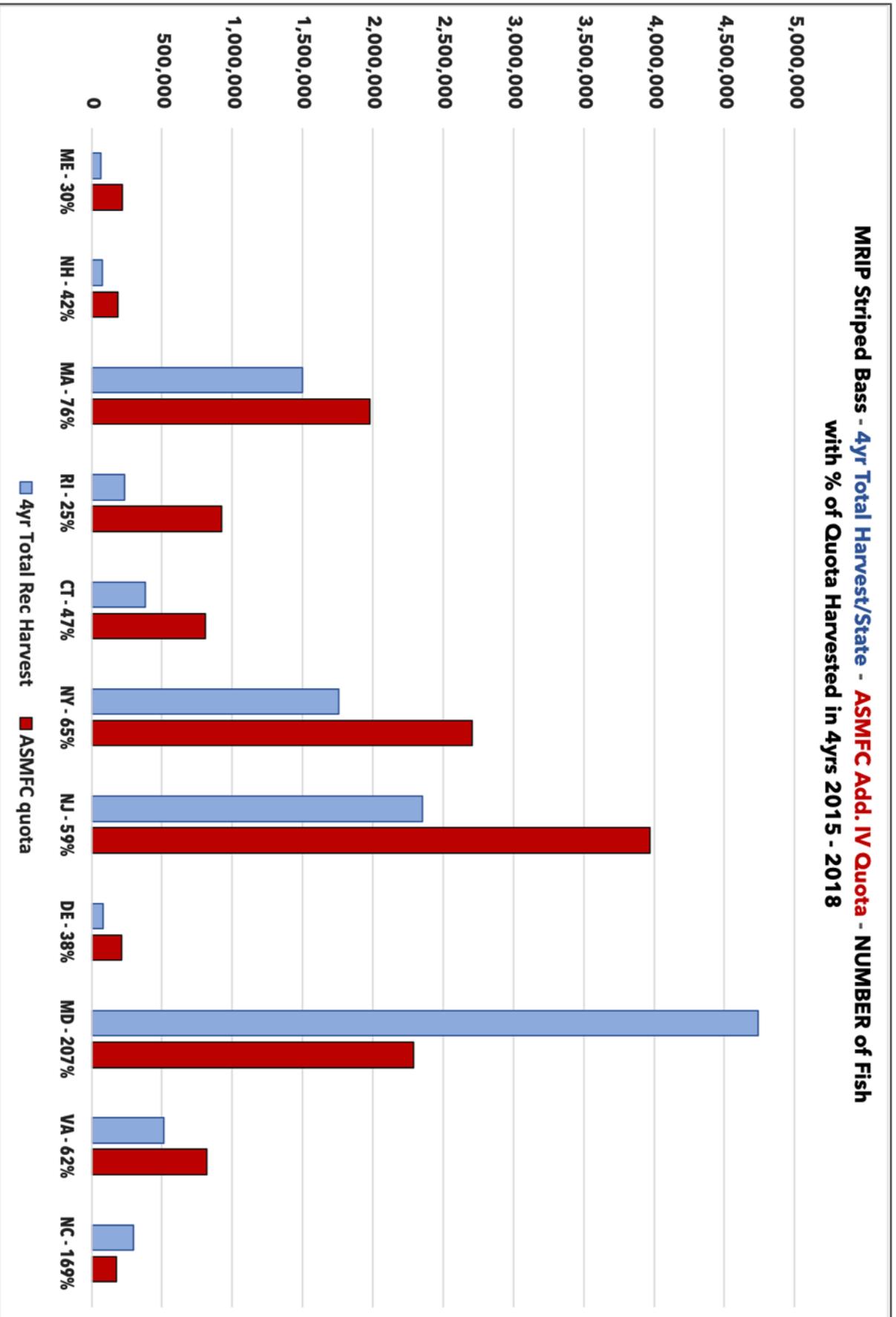
Chart 1



Statistical data (Numbers of Fish) from:
NOAA Fisheries Service, MRIP Catch Time Series Database
Quota information from:
ASMFC Addendum IV to Amendment 6 to the Atlantic Striped Bass Interstate Fishery Management Plan



Chart 2

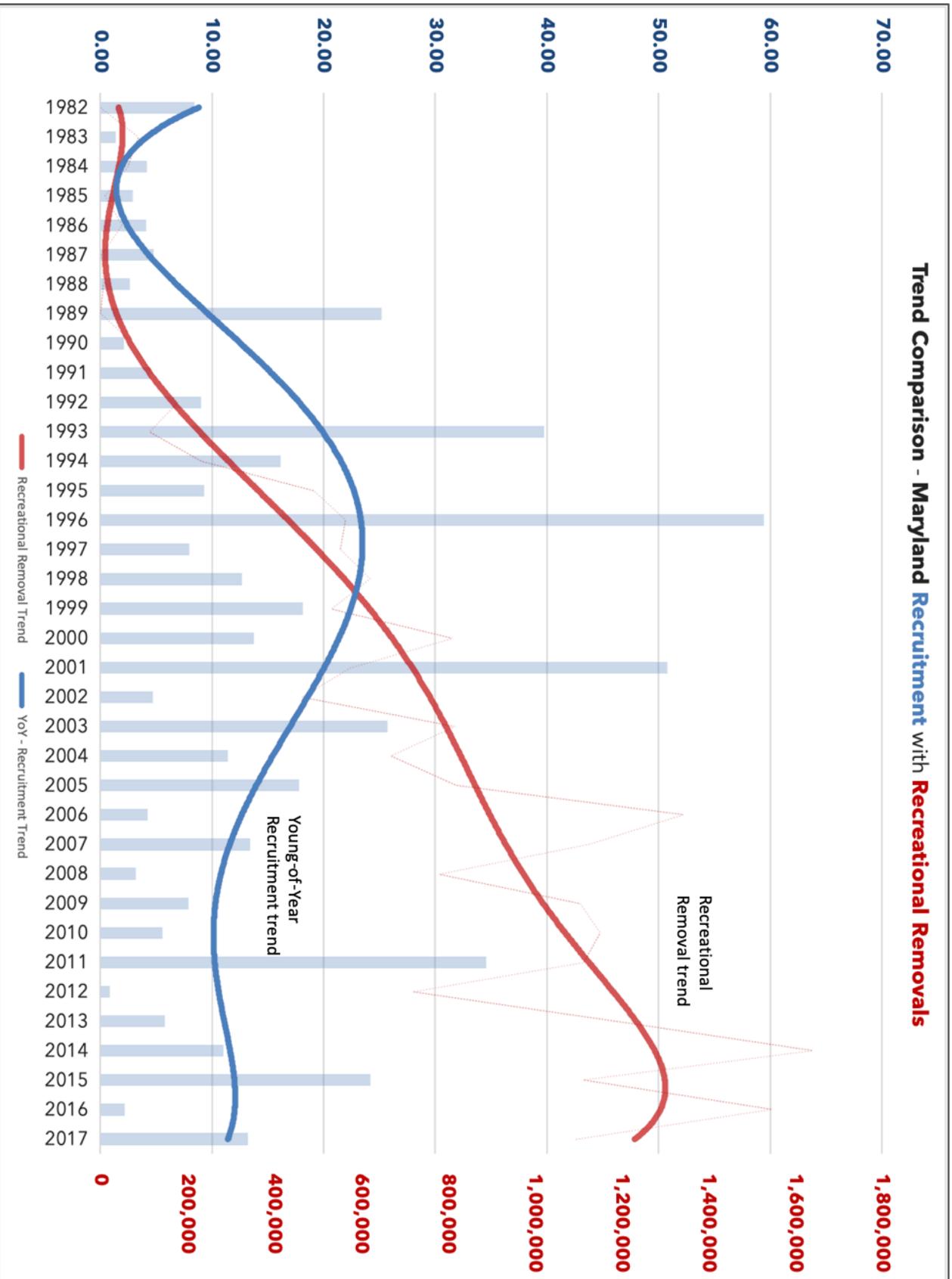


Statistical data (Numbers of Fish) from:
NOAA Fisheries Service, MRIIP Catch Time Series Database
Quota information from:
ASMFC Addendum IV to Amendment 6 to the Atlantic Striped Bass Interstate Fishery Management Plan



Chart 3

Trend Comparison - Maryland Recruitment with **Recreational Removals**



Authoritative Data from:
 Maryland DNR Fisheries, Young of Year study; ASMFC 2019 Striped Bass Assessment - Table B6.29 - 66th SAW Final Report

Compiled by Grey Owl Analytics