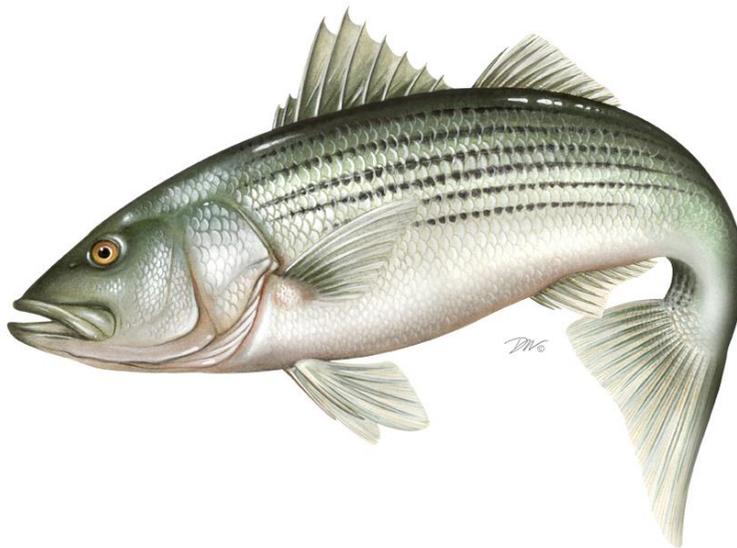


**ATLANTIC STATES MARINE FISHERIES COMMISSION**

**REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN**

**FOR ATLANTIC STRIPED BASS**  
*(Morone saxatilis)*

**2020 FISHING YEAR**



Prepared by the Plan Review Team

Approved August 3, 2021

Updated September 2021

(MD and PRFC commercial harvest data updates)



*Sustainable and Cooperative Management of Atlantic Coastal Fisheries*

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## 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, Addendum VI -2019
<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 Act<sup>1</sup> 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

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<sup>1</sup> 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.<sup>2</sup>

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 2002<sup>3</sup>. 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

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<sup>2</sup> 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.

<sup>3</sup> 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.

size limit can be less than 18 inches under Amendment 6. The same minimum size standards regulate 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.

Five 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 was triggered 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, and changed commercial and recreational measures to reduce F to a level at or below the new target. Chesapeake Bay fisheries were required to implement lower reductions than coastal states (20.5% compared to 25%) since their fisheries were reduced by 14% in 2013 based on their management program. The addendum maintained the flexibility to implement alternative regulations through the conservation equivalency process. This practice has resulted in a variety of regulations among states. All states promulgated regulations prior to the start of their 2015 seasons.

Addendum VI was initiated in response to the 2018 benchmark assessment which indicates the stock is overfished and experiencing overfishing<sup>4</sup>. Approved in October 2019, the Addendum aims to reduce total removals by 18% relative to 2017 levels in order to achieve F target in 2020. Specifically, the Addendum reduces all state commercial quotas by 18%, and implements a 1 fish bag limit and a 28" to less than 35" slot limit for ocean fisheries and a 1 fish bag limit and an 18" minimum size limit in Chesapeake Bay to reduce total recreational removals by 18% in both regions. The Addendum's

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<sup>4</sup> In February 2017, the Board initiated 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.

measures are designed to apply the needed reductions proportionally to both the commercial and recreational sectors, although states were permitted to submit alternative regulations through conservation equivalency that achieve an 18% reduction in total removals statewide. The Board reviewed and approved management options for 2020 on a state-by-state basis in February, and all states promulgated regulations by April 1.

Addendum VI also requires the mandatory use of circle hooks when fishing with bait to reduce release mortality in recreational striped bass fisheries. States are encouraged to promote the use of circle hooks through various public outreach and education platforms to garner support and compliance with this important conservation measure. In October 2020, the Board approved state implementation plans for circle hook requirements, with the caveat that no exemptions to Addendum VI mandatory circle hook requirements will be permitted. Circle hook regulations were required to be implemented no later than January 1, 2021. In March 2021<sup>5</sup>, the Board approved a clarification on the definition of bait and methods of fishing<sup>6</sup> that require circle hooks, which must be implemented by states as part of Addendum VI compliance. Per Commission standards, states can implement more restrictive measures. The Board also approved guidance<sup>7</sup> on how to address incidental catch of striped bass when targeting other species with non-circle hooks with bait attached. This guidance is not a compliance criterion since incidental catch was not originally part of Addendum VI.

#### *Under Development: Draft Amendment 7*

In August 2020, the Board initiated development of Amendment 7 to the FMP. The purpose of the amendment is to update the management program in order to reflect current fishery needs and priorities given the status and understanding of the resource and fishery has changed considerably since implementation of Amendment 6 in 2003. The Board intends for the amendment to build upon the Addendum VI action to end overfishing and initiate rebuilding. In February 2021, the Board approved for public comment the Public Information Document (PID) for Draft Amendment 7. As the first step in the amendment process, the PID was a broad scoping document seeking public input on a number of important issues facing striped bass management. After the PID public comment period that included 11 virtual public hearings and more than 3,000 submitted comments, the Board approved in May 2021 the following issues for development in Draft Amendment 7: recreational release mortality, conservation equivalency, management triggers, and measures to protect the 2015 year class. The Plan Development Team (PDT) is currently developing options for these four issues for inclusion in a draft amendment document. The Board will meet in August 2021 to review the PDT's progress on the Draft Amendment and recommend any further changes to the document. Based on progress made on the Draft Amendment, the Board's next opportunity to meet and consider possible approval of the document for public comment will be in October 2021.

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<sup>5</sup> See the [March 2021 meeting summary](#) for more details.

<sup>6</sup> Definition of Bait and Methods of Fishing: Circle hooks are required when fishing for striped bass with bait, which is defined as any marine or aquatic organism live or dead, whole or parts thereof. This shall not apply to any artificial lure with bait attached.

<sup>7</sup> Guidance on Incidental Catch: Striped bass caught on any unapproved method of take must be returned to the water immediately without unnecessary injury.

## II. Status of the Stocks

The 2018 benchmark stock assessment for Atlantic striped bass was peer-reviewed at the 66<sup>th</sup> Northeast Regional Stock Assessment Workshop (SAW)/Stock Assessment Review Committee (SARC) meeting in November 2018. The assessment addressed several of the recommendations from the 57<sup>th</sup> 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 (NEFSC 2018a). 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 (NEFSC 2018b). 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 2020, total Atlantic striped bass removals (commercial and recreational, including harvest, commercial discards and recreational release mortality) was estimated at 5.1 million fish, which is a 7% decrease relative to 2019 (Table 3; Figure 5). The recreational sector accounted for 87% 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 FMP Review reports published prior to 2019.

The commercial fishery harvested 3.56 million pounds (577,363 fish) in 2020, which is a 17% decrease by weight relative to 2019 (12% decrease by number; Table 4; Table 5). This decrease aligns with the 18% reduction in commercial quotas implemented through Addendum VI in 2020, although some states implemented a different level of reduction in their commercial quotas through approved state conservation equivalency plans. The ocean quota utilization was about the same in 2020 (53%) as in 2019 (51%), while the Chesapeake Bay quota utilization decreased to 76% in 2020 from 91% in 2019. Despite the coastwide decrease in commercial harvest, ocean fishery conditions for some states may have improved from 2019 to 2020, which could be attributed to the increased availability of year classes moving through certain areas. The impacts of COVID-19 on the striped bass commercial fishery likely varied among states and varied depending on timing within the season. Some states heard from industry that restaurant closures and low prices had negative impacts on the commercial season, particularly during the early part of the pandemic.

Commercial harvest from Chesapeake Bay accounted for 64% of the total commercial harvest by weight; Maryland landed 38%, Virginia landed 19%, and NY landed 13% (Table 5; Figure 6). Additional harvest came from PRFC (11%), Massachusetts (11%), Delaware (4%), and Rhode Island (3%). The proportion of commercial harvest coming from Chesapeake Bay is much higher in numbers of fish; roughly 85% in 2020 (Table 6). This is because fish harvested in Chesapeake Bay have a lower average weight than fish harvested in ocean fisheries. Coastwide commercial dead discards were estimated at 65,319<sup>8</sup> fish, which accounts for <2% of total removals in 2020 (Table 3).

Total recreational catch (harvest and live releases) was estimated at 32.4 million fish in 2020, which is a 5% increase from 2019 (Table 7). Total recreational harvest (A+B1) in 2020 is estimated at 1.71 million fish (14.8 million pounds), and represents a 21% decrease relative to 2019 (37% decrease by weight) (Table 8; Table 9). Maryland landed the largest proportion of recreational harvest in number of fish<sup>9</sup> (43%), followed by New Jersey (30%), New York (12%), and Massachusetts (4%), and Connecticut (4%) (Table 9). The proportion of recreational harvest in numbers from Chesapeake Bay was estimated at 46% in 2020, compared to 38% in 2019.

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<sup>8</sup> Commercial dead discard estimates are derived via a generalized additive model (GAM), and are therefore re-estimated for the entire time series when a new year of data is added.

<sup>9</sup> By weight, New Jersey had the largest proportion of harvest (44%), followed by Maryland (23%), New York (15%), Connecticut (6%), and Massachusetts (5%) (Table 8).

The vast majority 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 fish that are released alive die as a result of being caught. In 2020, recreational anglers caught and released an estimated 30.7 million fish, of which 2.8 million are assumed to have died (Table 7). This represents a 7% increase relative to 2019.

The PRT noted that the ocean and Chesapeake Bay regions had different levels of recreational harvest reductions in 2020. The ocean region saw a 31% decrease in recreational harvest in numbers of fish, while the Bay experienced only a 3% decrease compared to 2019 (Table 7). According to MRIP, the overall number of trips directed at striped bass (primary and secondary target) were similar from 2019 to 2020 (~2% increase) on a coastwide scale (Table 11). However, the Chesapeake Bay fishery experienced a 36% increase in targeted trips (711,535 more trips) from 2019 to 2020. The number of targeted trips in the Chesapeake Bay in 2020 was similar to the number in 2017 and 2018. The PRT noted that COVID-19 may have impacted recreational sectors differently in 2020. For-hire trips may have been limited due to restrictions on the number of people permitted on vessels; however, anecdotally, shore and private trips may have increased. It is important to recognize that impacts from COVID-19 were likely not uniform across states or sectors.

#### **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 River (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 small mesh gill net attendance requirements, single barbless hook requirements in some areas, minimum size limits, and a no-harvest slot limit in the Roanoke River to maintain a sustainable harvest and reduce regulatory discard mortality in all sectors. 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 stock assessment a forward-projecting fully-integrated, age-structured statistical model to estimate population parameters and reference points for the A-R striped bass stock for 1991-2017. The model was peer reviewed by an outside panel of experts and approved for management use

by the Board in May 2021. The A-R stock is managed using reference points for female spawning stock biomass (SSB) and fishing mortality (F) with threshold values based on 35% spawning potential ratio and target values based on 45% spawning potential ratio. The 2020 assessment estimated female SSB in 2017 (terminal year) was 78,576 pounds (35.6 metric tons), which is below the SSB threshold of 267,390 pounds (121 metric tons). The assessment estimated *F* in 2017 was 0.27, which is above the *F* threshold of 0.18. These results show that the stock is overfished and overfishing is occurring (Figures 3 and 4).

	<b>Target</b>	<b>Threshold</b>	<b>Terminal Year (2017) Estimate</b>
<b>Female SSB</b>	350,371 lbs.	267,390 lbs.	78,576 lbs.
<b>Fishing Mortality (F)</b>	0.13	0.18	0.27

Based on the assessment results, North Carolina implemented a 2020 Revision to Amendment 1 that lowers the annual TAL for Albemarle Sound and Roanoke River management areas for 2021 and 2022 in order to reduce *F* to the target level. The new TAL is 51,216 pounds, which is a 57% reduction from 2017 landings (NCDMF 2020).

*Albemarle Sound and Roanoke River Atlantic Striped Bass Fisheries*

In 2020, total commercial and recreational harvest in the Albemarle Sound Management Area (ASMA) and the Roanoke River Management Area (RRMA) was 167,161 pounds (40,090 fish). Commercial harvest in the ASMA was 124,385 pounds (26,900 fish). Recreational harvest in the ASMA was 25,450 pounds (7,656 fish), and recreational harvest in the RRMA was 17,326 pounds (5,534 fish). However, due to COVID-19 restrictions, the recreational creel survey in the ASMA ended March 27 instead of April 30 and the creel survey in the RRMA ended March 18 instead of ending in Mid-May. No attempt was made to develop harvest or release estimates for the remainder of the season in either management area.

**V. Status of Research and Monitoring**

Amendment 6 and its Addenda I-VI set the regulatory and monitoring measures for the coastwide striped bass fishery in 2020. 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 surveys 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 2020, the ocean commercial quota was 2,411,154 pounds and was not exceeded. Table 10 contains final 2020 quotas per Addendum VI and approved conservation equivalency programs and harvest that occurred in 2020.

### Chesapeake Bay Commercial Quota

In 2020, the Chesapeake Bay-wide quota was 2,998,374 pounds and was allocated to Maryland, the PRFC, and Virginia based on historical harvest. In 2020, the Bay-wide quota was not exceeded. Table 10 contains jurisdiction-specific quotas and harvest that occurred in 2020 for Chesapeake Bay. In 2020, commercial harvest from Chesapeake Bay accounted for 64% of total commercial landings by weight, and averaged 61% annually under Addendum IV (2015-2019).

### Chesapeake Bay Spring Harvest of Migrant Striped Bass

Historically, recreational fishermen in 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. The Commonwealth of Virginia closed the spring trophy season beginning in 2019.

The 2020 estimate of migrant fish harvested during the Maryland trophy season was 6,947 fish (1,395 fish by charter boats; 5,552 fish by private anglers), which is a 49% decrease compared to 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 2018b). 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). Virginia harvest in wave-1 is estimated for stock assessment via the ratio of landings and tag returns in wave-6 and regression analysis (refer to the methods described in NEFSC 2018a 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 recreational striped bass harvest during wave-1 in the ocean for 2012-2020, and Virginia has reported zero ocean harvest for six of the last seven years. Similarly, North Carolina's 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 and the Striped Bass Technical Committee (TC) annually review 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 TC to the Management Board.

For the 2021 review of JAIs, the analysis evaluates the 2018, 2019, and 2020 JAI values. One state (North Carolina) met the criteria for recruitment failure in 2020 (Figure 8). North Carolina's JAI values for 2018 (0.40), 2019 (1.20), and 2020 (0.02) were below its respective Q1 (1.33). Maine's JAI was below its respective Q1 value in 2019 and 2020 and Maryland's JAI value was below its respective Q1 value in 2020. Although New York's JAI value was below its respective Q1 in 2019, its value in 2020 was almost double its long-term average. Virginia's JAI value in 2020 was also above its respective long-term average (Figure 8). New Jersey was unable to conduct its juvenile abundance survey due to COVID-19 so a 2020 JAI value for New Jersey is not available.

The 2020 assessment for the A-R stock recognized the declining recruitment trend and noted that harvest does not appear to be the only factor contributing to the decline (Lee et al. 2020). The assessment's peer reviewers identified other factors, specifically flow conditions and predation by blue catfish, which could be impacting recruitment. The TC met in July 2021 to review potential factors contributing to A-R recruitment declines and to consider recommending action to the Management Board. Considering North Carolina's recent management action to reduce striped bass total allowable landings for the Albemarle Sound and Roanoke River management areas (NCDMF 2020) as well as ongoing monitoring and analysis of river flow impacts on recruitment, the TC recommended no action by the Board at this time.

### Addendum III: Commercial Fish Tagging Program

Addendum III to Amendment 6 includes compliance requirements for monitoring commercial fishery harvest tagging programs. In 2020, all states implemented commercial tagging programs consistent with the requirements of Addendum III. Table 17 describes commercial tagging programs by state. The PRT notes that in multiple states, only about half, or less than half in some cases, of issued commercial tags were reported used. The PRT emphasizes the importance of tag accounting to account for unused tags at the end of each fishing year. In Maryland, although unused tags are normally required to be returned in order for an audit to be conducted, this was not possible due to COVID-19. Maryland noted this audit may be revisited as conditions allow. Maryland reported 250,736 tags used out of 497,820 issued. The PRT recommends that Commission staff work with the Law Enforcement Committee and the PRT to regularly follow-up with all states on tag accounting and other questions about state commercial tagging programs as needed.

### Addendum VI: 18% Reduction in Removals

2020 was the first implementation year of Addendum VI, which implemented measures to reduce total striped bass removals by 18% relative to 2017 levels in order to achieve the fishing mortality target in 2020. Tables 12a-12c list total removals (harvest plus discards/release mortality for commercial and recreational) in numbers of fish for 2017 and 2020. In 2020, a 27.5% reduction in total removals coastwide (numbers of fish) was realized relative to total removals coastwide in 2017. For the ocean region, a 33% reduction in total removals (numbers of fish) was realized relative to 2017 removals. For the Chesapeake Bay, an 18% reduction in total removals (numbers of fish) was realized relative to 2017 removals.

Tables 13 and 14 list the realized change for recreational removals (in numbers of fish) and commercial harvest (in pounds) by state from 2017 to 2020. Table 13 also includes the predicted reduction in recreational removals from state conservation equivalency plans, where applicable. The PRT notes that differences in performance are influenced by many factors, including changes in effort, fish availability/year classes, and environmental factors. The TC has discussed the challenge of trying to evaluate performance since the effects of different management measures cannot be isolated from the effects of effort changes and fish availability. There is a lot of year-to-year variability even under consistent regulations due to different year classes moving through the stock and variability in effort and angler behavior. During the TC's review of Addendum VI conservation equivalency proposals, the TC noted there is a high level of uncertainty in the percent reductions calculated due to the effect of changes in angler behavior (effort) and the size structure and distribution of the population (availability of legal and sub-legal fish), and these changes are difficult to account for and cannot be accurately quantified.

### Note on 2020 MRIP Data

The component of the Marine Recreational Information Program (MRIP) that samples dockside catch rate data (Access Point Angler Intercept Survey - APAIS) was interrupted by the pandemic. Due to this interruption, catch rate data were imputed as needed from 2018 and 2019 to generate total catch estimates in 2020. The contribution of imputed data for Atlantic striped bass recreational harvest and release estimates by state ranged from 0-100% (Table 15).

### Addendum VI: Circle Hook Requirement

Addendum VI circle hook regulations were required to be implemented by the states in January 2021. In March 2021, the Board approved a clarification on the definition of bait and methods of fishing that require circle hooks, which must be implemented by states as part of Addendum VI compliance. The PRT notes differences among the definitions of bait implemented by the states (Table 16) with some definitions being more restrictive than the Board-approved definition. A few states have not defined bait, which could be considered more restrictive (per Commission standards, states can implement more restrictive measures). Additionally, some state regulations are more restrictive by not specifying any exemptions, as compared to the Board-approved exemption for bait on artificial lures.

In March 2021, the Board also approved guidance on how to address incidental catch of striped bass when targeting other species with non-circle hooks with bait attached. Although this guidance is not a

compliance criterion since incidental catch was not originally part of Addendum VI, several states have already implemented this guidance (Table 16).

The PRT notes that New Jersey's rule to implement the circle hook requirements has been delayed in the regulatory process and is expected to be fully implemented by October 4, 2021. New Jersey was unable to implement the circle hook requirement through the timelier Notice of Administrative Change (NOAC) process, which is typically used to maintain compliance with FMPs, because recreational gear modifications are not authorized to be completed through the NOAC process. Therefore, New Jersey added the circle hook requirement to an existing rulemaking proposal that was published in the NJ Register on March 1, 2021 for a public comment period that ended April 30, 2021. The rulemaking adoption formally launched Friday, July 9, 2021 and includes 30 review days for each the NJDEP Commissioner and the Governor's Office, and projects a target filing date of September 10, 2021, in the NJ Register, with a final adoption upon publication on October 4, 2021.

#### Law Enforcement Reporting

States are asked to report and summarize law enforcement cases that occurred the previous season in annual compliance reports. In 2020, 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. Plan Review Team Comments and Recommendations**

- Based on annual state compliance reports (ASMFC 2021), the PRT determined that all states in 2020 implemented a management and monitoring program consistent with the provisions of Amendment 6 and Addenda I – VI, with one inconsistency noted below.
- As identified in last year's FMP Review (ASMFC 2020), the PRT notes one inconsistency with 2020 implementation of the Addendum VI slot limit. New York's recreational regulations for 2020 (and for 2021) state a slot limit of "28" to 35" TL". This does not explicitly indicate whether the upper limit is inclusive or not.
- The PRT notes that Maryland's 2021 summer closure period (no targeting July 16-31) is different from their approved 2020 summer closure period (no targeting August 16-31).
- A summary of 2020 fishery regulations by state is provided in Table 1 and Table 2. Each state's commercial tag monitoring program is described in Table 17, and state compliance with fishery-independent and -dependent monitoring requirements are summarized in Table 18.
- As described in the commercial tagging section, the PRT notes that in multiple states, only half or less than half of issued commercial tags were reported used. The PRT emphasizes the importance of tag accounting to account for unused tags at the end of each fishing year. In Maryland, although unused tags are normally required to be returned in order for an audit to be conducted, this was not possible due to COVID-19. Maryland noted this audit may be revisited as conditions allow. Maryland reported 250,736 tags used out of 497,820 issued. The PRT recommends that Commission staff work with the Law Enforcement Committee and the PRT to regularly follow-up with all states on tag accounting and other questions about state commercial tagging programs as needed.

- As described in the Addendum VI section, the PRT notes the following about the circle hook requirements implemented in 2021:
  - There are differences among the definitions of bait implemented by the states (Table 16), with some more restrictive than others.
  - Several states have implemented the guidance on incidental catch, which is not a compliance criterion since incidental catch was not originally part of Addendum VI.
  - New Jersey's rule for the circle hook requirements has been delayed in the regulatory process and is expected to be fully implemented by October 4, 2021.
- The PRT notes that while the New York spawning stock monitoring program in the Hudson River does meet the FMP's fishery-independent monitoring requirements, 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.
- Finally, the PRT notes that many fishery monitoring efforts in 2020 have been impacted due to the COVID-19 pandemic, including fishery-independent surveys, APAIS interviews, and sampling of commercial and recreational catch. Table 18 notes which 2020 programs were impacted by COVID-19, as identified by state compliance reports. The PRT recognizes that these impacts may continue into 2021 for some monitoring programs.

#### **VIII. Research Recommendations**

Research recommendations were developed by the 2018 Benchmark Stock Assessment Subcommittee and the 66<sup>th</sup> SARC and are listed in the final [stock assessment report](#) starting on report page 569.

## IX. References

- Atlantic States Marine Fisheries Commission (ASMFC). 2020. Review of the Interstate Fishery Management Plan for Atlantic Striped Bass (*Morone saxatilis*): 2019 Fishing Year.
- ASMFC. 2021. Atlantic Striped Bass Annual Compliance Reports.
- Lee, L.M., T.D. Tears, Y. Li, S. Darsee, and C. Godwin (editors). 2020. Assessment of the Albemarle Sound-Roanoke River striped bass (*Morone saxatilis*) in North Carolina, 1991-2017. North Carolina Division of Marine Fisheries, NCDMF SAP-SAR-2020-01, Morehead City, North Carolina. 171 p.
- North Carolina Department of Marine Fisheries (NCDMF). 2013. Amendment 1 to the North Carolina Estuarine Striped Bass Fishery Management Plan. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. Morehead City, NC. 826 pp.
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- NCDMF. 2020. November 2020 Revision to Amendment 1 to the North Carolina Estuarine Striped Bass Fishery Management Plan. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. Morehead City, NC. 12 pp.
- Northeast Fisheries Science Center (NEFSC). 2018a. 66<sup>th</sup> Northeast Regional Stock Assessment Workshop (66<sup>th</sup> SAW) Assessment Report. US Dept Commer. Northeast Fish Sci Cent Ref Doc. 19-08; 719 p.
- Northeast Fisheries Science Center (NEFSC). 2018b. 66<sup>th</sup> Northeast Regional Stock Assessment Workshop (66<sup>th</sup> SAW) Assessment Summary Report. US Dept Commer. Northeast Fish Sci Cent Ref Doc. 19-01; 45 p.
- Shepherd, G.R., R.W. Laney, M. Appelman, D. Honabarger and C.L. Wright. 2017. Biennial Report to Congress on the Progress and Findings of Studies of Striped Bass Populations --2017. National Marine Fisheries Service, Silver Spring, MD. 11 p.

**X. Tables**

Table 1. Summary of Atlantic striped bass commercial regulations in 2020. Source: 2021 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 (TL) and TRIP LIMITS	SEASONAL QUOTA	OPEN SEASON
ME	Commercial fishing prohibited		
NH	Commercial fishing prohibited		
MA	≥35" minimum size; no gaffing undersized fish. 15 fish/day with commercial boat permit; 2 fish/day with rod and reel permit.	735,240 lbs. Hook & Line only.	6.24 until quota reached, Mondays and Wednesdays only. (In-season adjustment added Tuesdays effective Sept 1.) July 3rd, July 4th and Labor Day closed. Cape Cod Canal closed to commercial striped bass fishing.
RI	Floating fish trap: 26" minimum size unlimited possession limit until 70% of quota reached, then 500 lbs. per licensee per day	Total: 148,889 lbs., split 39:61 between the trap and general category. Gill netting prohibited.	4.1 – 12.31
	General category (mostly rod & reel): 34" min. 5 fish/vessel/day limit.		5.20-6.30, 7.1-12.31, or until quota reached. Closed Fridays, Saturdays, and Sundays during both seasons.
CT	Commercial fishing prohibited; bonus program in CT suspended indefinitely in 2020.		
NY	26"-38" size; (Hudson River closed to commercial harvest)	640,718 lbs. 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" to <28" slot size	215,912 lbs.	5.15 – 12.31 (permit required)
PA	Commercial fishing prohibited		
DE	Gill Net: 20" min in DE Bay/River during spring season. 28" in all other waters/seasons.	Gillnet: 135,350 lbs. No fixed nets in DE River.	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 trip limit.
	Hook and Line: 28" min	Hook and line: 7,124 lbs.	Hook and Line: 4.1–12.31, 200 lbs./day trip limit

(Table 1 continued – Summary of commercial regulations in 2020).

STATE	SIZE LIMITS (TL) and TRIP LIMITS	SEASONAL QUOTA	OPEN SEASON
MD	Chesapeake Bay and Rivers: 18–36” Common pool trip limits: Hook and Line - 250 lbs./license/week Gill Net - 300 lbs./license/week	1,445,394 lbs. (part of Bay-wide quota) – Initial quota  1,442,120 lbs. – Adjusted quota due to 2019 overage	Bay Pound Net: 6.1-12.31 Bay Haul Seine: 6.1-12.31 Bay Hook & Line: 6.4-12.31 Bay Drift Gill Net: 1.1-2.28, 12.1-12.31
	Ocean: 24” minimum	Ocean: 89,094 lbs.	1.1-5.31, 10.1-12.31
PRFC	18” min all year; 36” max 2.15–3.25	572,861 lbs. (part of Bay-wide quota)	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, 11.9-12.31 Misc. Gear: 2.15-3.25, 6.1-12.15
VA	Bay and Rivers: 18” min; 28” max size limit 3.15–6.15	983,393 lbs. (part of Bay-wide quota)	1.16-12.31
	Ocean: 28” min	125,034 lbs.	
NC	Ocean: 28” min	295,495 lbs. (split between gear types).	Seine fishery was not opened Gill net fishery was not opened Trawl fishery was not opened

Table 2. Summary of Atlantic striped bass recreational regulations in 2020. Source: 2021 State Compliance Reports. Minimum sizes and slot size limits are in total length (TL).

STATE	SIZE LIMITS (TL)/REGION	BAG LIMIT	GEAR/FISHING RESTRICTIONS	OPEN SEASON
ME	≥ 28" and <35"	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 C&R only 5.1-6.30
NH	≥ 28" and <35"	1 fish/day	Gaffing and culling prohibited; Use of corrodible non-offset circle hooks required if angling with bait	All year
MA	≥ 28" and <35"	1 fish/day	Hook & line only; no high-grading; gaffs and other injurious removal devices prohibited. Private angler circle hook requirement when fishing with natural bait (exception for artificial lures).	All year
RI	≥ 28" and <35"	1 fish/day	The use of circle hooks is required by any vessel or person while fishing recreationally with bait for striped bass	All year
CT	≥ 28" and <35"	1 fish/day	Inline circle hooks only when using whole, cut or live natural bait (Dec 1st, 2020). Spearing and gaffing prohibited	All year
NY	Ocean and DE River: Slot Size: 28 -35	1 fish/day	Angling only. Spearing permitted in ocean waters. C&R only during closed season.	Ocean: 4.15-12.15 Delaware River: All year
	HR: Slot Size: 18 -28	1 fish/day	Angling only.	Hudson River: 4.1-11.30
NJ	1 fish at 28 to < 38" (effective 4/1/2020)	1 fish/day	Non-offset circle hooks must be used when using bait with a #2 sized hook or larger in Delaware River & tributaries from 4.1-5.31.	Closed 1.1 – Feb 28 in all waters except in the Atlantic Ocean, and closed 4.1-5.31 in the lower DE River and tributaries
PA	Upstream from Calhoun St Bridge: 1 fish at ≥ 28" to <35"			
	Downstream from Calhoun St Bridge: 1 fish at ≥ 28" to <35, and 2 fish at 21-24" slot size limit from 4.1 – 5.31			

(Table 2 continued – Summary of recreational regulations in 2020).

STATE	SIZE LIMITS/REGION	BAG LIMIT	GEAR/FISHING RESTRICTIONS	OPEN SEASON
DE	≥ 28" and <35"	1 fish/day	Hook & line, spear (for divers) only. Circle hooks required in spawning season.	All year. C&R only 4.1-5.31 in spawning grounds. 20"-25" slot from 7.1-8.31 in DE River, Bay & tributaries
MD	Ocean: ≥ 28" and <35"	1 fish/day		All year
	Chesapeake Bay and tribs^	C&R only	no eels; no stinger hooks; barbless hooks when trolling; circle or J-hooks when using live bait; max 6 lines when trolling	1.1-2.28, 3.1-3.31, 12.11-12.31
	Chesapeake Bay: 35" min	1 fish/day	Geographic restrictions apply.	5.1-5.15
	Chesapeake Bay: 1 fish/day, 19" minimum size; 2/fish/day for charter with only 1 fish >28"		Geographic restrictions apply; circle hooks if chumming or live-lining; no treble hooks when bait fishing.	5.16-5.31
	Chesapeake Bay and tribs: 1 fish/day, 19" minimum size; 2/fish/day for charter with only 1 fish >28"		All Bay and tribs open; circle hooks if chumming or live-lining; no treble hooks when bait fishing.	6.1-8.15, 9.1-12.10
PRFC	Spring Trophy: 1 fish/day, 35" minimum size		No more than two hooks or sets of hooks for each rod or line; no live eel; no high-grading	5.1-5.15
	Summer and Fall: 2 fish/day, 20" min		No more than two hooks or sets of hooks for each rod or line.	5.16-7.6 and 8.21-12.31; closed 7.7-8.20 (No Direct Targeting)

^ Susquehanna Flats: C&R only Jan 1 – March 31 (no treble hooks when bait fishing); 1 fish at 19"-26" slot May 16 – May 31.

(Table 2 continued – Summary of recreational regulations in 2020).

STATE	SIZE LIMITS/REGION	BAG LIMIT	GEAR/FISHING RESTRICTIONS	OPEN SEASON
DC	18" minimum size	1 fish/day	Hook and line only	5.16-12.31
VA	Ocean: 28"-36" slot limit	1 fish/day	Hook & line, rod & reel, hand line only. No gaffing. Circle hooks required if/when fishing with live bait (as of July 2020).	1.1-3.31, 5.16-12.31
	Ocean Spring Trophy: NO SPRING TROPHY SEASON			
	Chesapeake Bay Spring Trophy: NO SPRING TROPHY SEASON			
	Bay Spring: 20"-28" slot limit	1 fish/day	Hook & line, rod & reel, hand line only. No gaffing. Circle hooks required if/when fishing with live bait (as of July 2020).	5.16-6.15
	Bay Fall: 20 - 36" slot limit	1 fish/day	Hook & line, rod & reel, hand line only. No gaffing. Circle hooks required if/when fishing with live bait (as of July 2020).	10.4-12.31
NC	≥ 28" and <35"	1 fish/day	No gaffing allowed. Circle hooks required when fishing with natural bait.	All year

Table 3. Total removals (harvest plus discards/release mortality) of Atlantic striped bass by sector in numbers of fish, 1990-2020. Note: Harvest is from state compliance reports/MRIP (July 8, 2021), 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	47,859	578,897	442,811	1,163,455
1991	158,491	92,480	798,260	715,478	1,764,709
1992	256,476	193,281	869,779	937,611	2,257,147
1993	314,526	115,859	789,037	812,404	2,031,826
1994	325,401	166,105	1,055,523	1,360,872	2,907,900
1995	537,412	188,507	2,287,578	2,010,689	5,024,186
1996	854,102	257,749	2,487,422	2,600,526	6,199,800
1997	1,076,591	325,998	2,774,981	2,969,781	7,147,351
1998	1,215,219	347,343	2,915,390	3,259,133	7,737,085
1999	1,223,572	337,036	3,123,496	3,140,905	7,825,008
2000	1,216,812	209,329	3,802,477	3,044,203	8,272,820
2001	931,412	182,606	4,052,474	2,449,599	7,616,091
2002	928,085	199,770	4,005,084	2,792,200	7,925,139
2003	854,326	131,319	4,781,402	2,848,445	8,615,492
2004	879,768	157,724	4,553,027	3,665,234	9,255,753
2005	970,403	146,126	4,480,802	3,441,928	9,039,259
2006	1,047,648	158,808	4,883,961	4,812,332	10,902,750
2007	1,015,114	160,728	3,944,679	2,944,253	8,064,774
2008	1,027,837	106,791	4,381,186	2,391,200	7,907,013
2009	1,049,838	130,200	4,700,222	1,942,061	7,822,321
2010	1,031,430	134,817	5,388,440	1,760,759	8,315,446
2011	944,777	85,503	5,006,358	1,482,029	7,518,667
2012	870,684	198,911	4,046,299	1,847,880	6,963,774
2013	784,379	114,009	5,157,760	2,393,425	8,449,573
2014	750,263	111,753	4,033,746	2,172,342	7,068,103
2015	621,952	84,463	3,085,725	2,307,133	6,099,273
2016	609,028	88,171	3,500,434	2,981,430	7,179,063
2017	592,670	98,343	2,937,911	3,421,110	7,050,035
2018	621,123	100,646	2,244,765	2,826,667	5,793,201
2019	653,807	84,013	2,150,936	2,589,045	5,477,801
2020	577,363	65,319	1,709,973	2,760,231	5,112,886

\* Commercial dead discard estimates are derived via a generalized additive model (GAM), and are therefore re-estimated for the entire time series when a new year of data is added.

Note: Maryland and PRFC commercial harvest data updated September 2021.

Table 4. Total harvest of Atlantic striped bass by sector, 1990-2020. Note: Harvest is from state compliance reports/MRIP (Query July 8, 2021). 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	715,902	8,207,515	8,923,417
1991	158,491	798,260	956,751	966,096	10,640,601	11,606,697
1992	256,476	869,779	1,126,255	1,508,064	11,921,967	13,430,031
1993	314,526	789,037	1,103,563	1,800,176	10,163,767	11,963,943
1994	325,401	1,055,523	1,380,924	1,877,197	14,737,911	16,615,108
1995	537,412	2,287,578	2,824,990	3,775,586	27,072,321	30,847,907
1996	854,102	2,487,422	3,341,524	4,822,874	28,625,685	33,448,559
1997	1,076,591	2,774,981	3,851,572	6,078,566	30,616,093	36,694,659
1998	1,215,219	2,915,390	4,130,609	6,552,111	29,603,199	36,155,310
1999	1,223,572	3,123,496	4,347,068	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	6,750,491	54,091,836	60,842,327
2004	879,768	4,553,027	5,432,795	7,317,897	53,031,074	60,348,971
2005	970,403	4,480,802	5,451,205	7,121,492	57,421,174	64,542,666
2006	1,047,648	4,883,961	5,931,609	6,568,970	50,674,431	57,243,401
2007	1,015,114	3,944,679	4,959,793	7,047,179	42,823,614	49,870,793
2008	1,027,837	4,381,186	5,409,023	7,190,701	56,665,318	63,856,019
2009	1,049,838	4,700,222	5,750,060	7,217,380	54,411,389	61,628,769
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	870,684	4,046,299	4,916,983	6,516,761	53,256,619	59,773,380
2013	784,379	5,157,760	5,942,139	5,819,678	65,057,289	70,876,967
2014	750,263	4,033,746	4,784,009	5,937,949	47,948,610	53,886,559
2015	621,952	3,085,725	3,707,677	4,829,997	39,898,799	44,728,796
2016	609,028	3,500,434	4,109,462	4,848,772	43,671,532	48,520,304
2017	592,670	2,937,911	3,530,581	4,816,395	37,952,581	42,768,976
2018	621,123	2,244,765	2,865,888	4,741,342	23,069,028	27,810,370
2019	653,807	2,150,936	2,804,743	4,284,831	23,556,287	27,841,118
2020	577,363	1,709,973	2,287,336	3,560,917	14,858,984	18,419,901

Note: Maryland and PRFC commercial harvest data updated September 2021.

Table 5. Commercial harvest by region in pounds (x1000), 1995-2020. Source: state compliance reports. ^Estimates exclude inshore harvest.

Year	Ocean								Chesapeake Bay				Grand Total
	MA	RI	NY	DE	MD	VA	NC^	Total	MD	PRFC	VA	Total	
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	731.9	983.0	3,834.2	6,078.6
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	190.2	753.3	191.2	103.9	166.4	201.2	2,661.7	1,721.8	676.6	1,690.4	4,088.7	6,750.5
2004	1,214.2	215.1	741.7	176.5	134.2	161.3	605.4	3,248.3	1,790.3	772.3	1,507.0	4,069.6	7,317.9
2005	1,102.2	215.6	689.8	174.0	46.9	185.2	604.5	3,018.2	2,008.7	533.6	1,561.0	4,103.3	7,121.5
2006	1,322.3	5.1	688.4	184.2	91.1	195.0	74.2	2,560.2	2,116.3	673.5	1,219.0	4,008.7	6,569.0
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	727.8	1,413.3	4,408.4	7,217.4
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	733.7	1,339.6	3,924.7	6,516.8
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	188.3	516.3	144.1	34.6	138.1	0.0	1,887.5	1,436.9	538.0	967.6	2,942.5	4,830.0
2016	938.7	174.7	575.0	136.5	19.7	139.2	0.0	1,983.9	1,425.5	537.1	902.3	2,864.9	4,848.8
2017	823.4	175.3	701.2	141.8	80.5	133.9	0.0	2,056.1	1,439.8	492.7	827.8	2,760.3	4,816.4
2018	753.7	176.6	617.2	155.0	79.8	134.2	0.0	1,916.6	1,424.3	449.4	951.0	2,824.7	4,741.3
2019	584.7	144.2	358.9	132.6	82.8	138.0	0.0	1,441.2	1,475.2	417.3	951.1	2,843.6	4,284.8
2020	386.9	115.9	473.5	138.0	83.6	77.2	0.0	1,275.1	1,273.8	400.3	611.7	2,285.8	3,560.9

Note: Maryland and PRFC commercial harvest data updated September 2021.

Table 6. Commercial harvest and discards by region in numbers of fish (x1000), 1995-2020. Source: harvest is from state compliance reports, discards is from ASMFC. ^Estimates exclude 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	
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	141.7	46.8	188.5	725.9
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	168.8	89.0	257.7	1,111.9
1997	44.0	7.1	37.6	33.2	8.4	17.3	25.8	173.4	620.3	87.8	195.2	903.2	249.7	76.3	326.0	1,402.6
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	313.9	33.5	347.3	1,562.6
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	305.2	31.9	337.0	1,560.6
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	176.9	32.5	209.3	1,426.1
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	140.5	42.2	182.6	1,114.0
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	151.2	48.6	199.8	1,127.9
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	98.8	32.5	131.3	985.6
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	111.4	46.3	157.7	1,037.5
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	87.2	58.9	146.1	1,116.5
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	99.0	59.8	158.8	1,206.5
2007	54.2	13.9	78.5	31.1	11.6	10.6	16.8	216.7	587.6	86.5	124.3	798.4	94.3	66.4	160.7	1,175.8
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	63.6	43.1	106.8	1,134.6
2009	59.4	16.8	82.6	21.6	12.5	8.9	9.0	210.9	605.6	89.6	143.8	839.0	60.5	69.7	130.2	1,180.0
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	40.4	94.5	134.8	1,166.2
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	35.0	50.5	85.5	1,030.3
2012	61.5	15.0	67.1	15.7	6.9	10.8	0.3	177.3	465.6	90.7	137.0	693.4	25.5	173.4	198.9	1,069.6
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	36.5	77.5	114.0	898.4
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	46.3	65.5	111.8	862.0
2015	42.3	11.3	45.6	11.0	2.6	7.7	0.0	120.4	298.3	71.0	132.2	501.5	33.8	50.7	84.5	706.4
2016	48.0	11.7	51.0	8.8	1.2	7.6	0.0	128.3	284.9	73.7	122.2	480.8	41.3	46.8	88.2	697.2
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	78.1	20.2	98.3	691.0
2018	37.8	10.1	52.2	11.4	3.5	6.9	0.0	121.9	286.4	64.4	148.4	499.3	61.4	39.3	100.6	721.8
2019	29.6	7.3	29.6	8.2	3.3	6.9	0.0	84.9	356.7	62.6	149.6	568.9	19.4	64.6	84.0	737.8
2020	19.6	5.0	44.1	8.4	3.4	4.4	0.0	84.9	299.9	66.6	125.9	492.4	18.6	46.7	65.3	642.7

\* Commercial dead discard estimates are derived via a generalized additive model (GAM), and are therefore re-estimated for the entire time series when a new year of data is added.

Note: Maryland and PRFC commercial harvest data updated September 2021.

Table 7. Total recreational catch, releases, and release mortality in numbers of fish by region (x1000), 1995-2020. Source: MRIP (Query July 8, 2021). 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
1995	1,260	1,028	2,288	16,587	5,754	22,341	17,847	6,782	24,629	1,493	518	2,011
1996	1,362	1,125	2,487	22,384	6,511	28,895	23,746	7,636	31,382	2,015	586	2,601
1997	1,514	1,261	2,775	22,819	10,178	32,998	24,333	11,439	35,773	2,054	916	2,970
1998	1,647	1,268	2,915	29,294	6,918	36,213	30,941	8,187	39,128	2,637	623	3,259
1999	1,758	1,366	3,123	26,139	8,760	34,899	27,897	10,125	38,022	2,353	788	3,141
2000	2,198	1,604	3,802	25,090	8,734	33,824	27,289	10,338	37,627	2,258	786	3,044
2001	2,758	1,294	4,052	21,073	6,145	27,218	23,831	7,440	31,270	1,897	553	2,450
2002	2,756	1,249	4,005	23,653	7,371	31,024	26,409	8,620	35,030	2,129	663	2,792
2003	3,124	1,658	4,781	20,678	10,971	31,649	23,802	12,628	36,431	1,861	987	2,848
2004	3,078	1,475	4,553	27,868	12,857	40,725	30,946	14,332	45,278	2,508	1,157	3,665
2005	3,182	1,299	4,481	28,663	9,580	38,244	31,845	10,879	42,724	2,580	862	3,442
2006	2,789	2,095	4,884	41,239	12,232	53,470	44,028	14,327	58,354	3,711	1,101	4,812
2007	2,327	1,618	3,945	25,135	7,579	32,714	27,462	9,196	36,659	2,262	682	2,944
2008	3,025	1,356	4,381	21,878	4,691	26,569	24,904	6,046	30,950	1,969	422	2,391
2009	2,898	1,803	4,700	16,740	4,838	21,578	19,638	6,641	26,279	1,507	435	1,942
2010	3,906	1,483	5,388	13,606	5,957	19,564	17,512	7,440	24,952	1,225	536	1,761
2011	3,617	1,389	5,006	12,644	3,823	16,467	16,261	5,212	21,473	1,138	344	1,482
2012	3,071	975	4,046	11,242	9,290	20,532	14,314	10,265	24,578	1,012	836	1,848
2013	3,723	1,435	5,158	19,463	7,131	26,594	23,186	8,565	31,751	1,752	642	2,393
2014	2,276	1,758	4,034	15,107	9,031	24,137	17,382	10,789	28,171	1,360	813	2,172
2015	1,770	1,316	3,086	15,419	10,216	25,635	17,189	11,532	28,721	1,388	919	2,307
2016	1,817	1,683	3,500	17,794	15,333	33,127	19,611	17,016	36,627	1,601	1,380	2,981
2017	1,738	1,200	2,938	28,963	9,050	38,012	30,701	10,249	40,950	2,607	814	3,421
2018	1,195	1,050	2,245	22,739	8,669	31,407	23,933	9,719	33,652	2,046	780	2,827
2019	1,342	809	2,151	21,131	7,636	28,767	22,473	8,445	30,918	1,902	687	2,589
2020	923	787	1,710	22,710	7,959	30,669	23,633	8,746	32,379	2,044	716	2,760

Table 8. Recreational harvest by region in pounds (x1000), 1995-2020. Source: MRIP (Query July 8, 2021). ^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	
1995	83	127	2,739	1,049	1,331	5,594	8,587	301	0.0	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	0.0	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	0.0	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	3.8	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	0.0	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	0.0	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	7.7	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	2.8	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	0.0	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	0.0	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	8.6	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	1.7	0.0	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	0.0	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	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	0.0	31,156	7,786	957	8,743	39,899
2016	189	191	3,731	1,776	912	12,053	12,790	86	7.2	0.0	0.0	31,735	10,912	1,024	11,936	43,672
2017	318	394	5,664	1,655	1,560	8,885	10,886	666	0.0	1.8	0.0	30,030	7,309	613	7,922	37,953
2018	142	130	4,925	1,121	1,165	3,453	7,012	33	0.0	0.0	0.0	17,982	4,683	404	5,087	23,069
2019	415	291	2,698	2,300	685	7,072	6,674	44	7.3	0.0	0.0	20,187	3,145	224	3,370	23,556
2020	180	29	776	483	830	2,202	6,584	16	0.0	0.0	0.0	11,100	3,480	280	3,759	14,859

Table 9. Recreational harvest by region in numbers of fish (x1000), 1995-2020. Source: MRIP (Query July 8, 2021). ^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	
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	59.8	94.9	477.3	626.4	27.8	0.0	0.1	0.0	1,738.3	1,091.6	108.0	1,199.6	2,937.9
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
2019	38.0	14.7	195.6	104.1	67.1	498.0	412.9	10.9	1.0	0.0	0.0	1,342.2	764.1	44.6	808.7	2,150.9
2020	19.0	3.2	67.2	36.9	71.2	203.7	520.1	1.6	0.0	0.0	0.0	922.9	734.8	52.2	787.0	1,710.0

Table 10. Results of 2020 commercial quota accounting in pounds. Source: 2021 state compliance reports. 2020 quota was based on Addendum VI and approved conservation equivalency programs.

State	Add VI (base)	2020 Quota <sup>^</sup>	2020 Harvest	Overage
<b>Ocean</b>				
Maine*	154	154	-	-
New Hampshire*	3,537	3,537	-	-
Massachusetts	713,247	735,240	386,924	0
Rhode Island	148,889	148,889	115,891	0
Connecticut*	14,607	14,607	-	-
New York	652,552	640,718	473,461	0
New Jersey**	197,877	215,912	-	-
Delaware	118,970	142,474	137,986	0
Maryland	74,396	89,094	83,594	0
Virginia	113,685	125,034	77,239	0
North Carolina	295,495	295,495	0	0
<b>Ocean Total</b>	<b>2,333,409</b>	<b>2,411,154</b>	<b>1,275,095</b>	<b>0</b>
<b>Chesapeake Bay</b>				
Maryland	<b>2,588,603</b>	1,442,120	1,273,757	0
Virginia		983,393	611,745	0
PRFC		572,861	400,319	0
<b>Bay Total</b>		<b>2,998,374</b>	<b>2,285,821</b>	<b>0</b>

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

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

<sup>^</sup> 2020 quota changed through conservation equivalency for MA (735,240 lbs), NY (640,718 lbs), NJ (215,912 lbs), DE (142,474 lbs), MD (ocean: 89,094 lbs; bay: 1,445,394 lbs), PRFC (572,861 lbs), VA (ocean: 125,034 lbs; bay: 983,393 lbs).

Note: Maryland's Chesapeake Bay quota for 2020 was adjusted to account for the overage in 2019.

Table 11. Number of directed trips for Atlantic striped bass (primary and secondary target) for 2017-2020. Source: MRIP (Query July 8, 2021).

<b>Year</b>	<b>Ocean</b>	<b>Chesapeake Bay</b>	<b>Coastwide Total</b>
2017	16,794,554	2,634,244	19,428,798
2018	15,686,903	2,650,311	18,337,214
2019	16,189,653	1,967,387	18,157,040
2020	15,859,277	2,678,922	18,538,199

Note: Maryland and PRFC commercial harvest data updated September 2021.

Tables 12a-12c. Total removals in numbers of fish (harvest plus discards/release mortality) of Atlantic striped bass by sector in numbers of fish for 2017 and 2020. Harvest is from state compliance reports/MRIP (Query July 8, 2021), discards/release mortality is from ASMFC. Estimates exclude inshore harvest from North Carolina.

Table 12a. Coastwide removals in numbers of fish for 2017 and 2020.

	Commercial		Recreational		Total	
	Commercial Removals	% Change from 2017	Recreational Removals	% Change from 2017	Total Removals	% Change from 2017
2017	691,013	-7%	6,359,021	-30%	7,050,035	-27.5%
2020	642,682		4,470,204		5,112,886	

Table 12b. Ocean removals in numbers of fish for 2017 and 2020.

	Commercial		Recreational		Total	
	Commercial Removals	% Change from 2017	Recreational Removals	% Change from 2017	Total Removals	% Change from 2017
2017	211,608	-51%	4,344,953	-32%	4,556,562	-33%
2020	103,524		2,966,848		3,070,371	

Table 12c. Chesapeake Bay removals in numbers of fish for 2017 and 2020.

	Commercial		Recreational		Total	
	Commercial Removals	% Change from 2017	Recreational Removals	% Change from 2017	Total Removals	% Change from 2017
2017	479,405	12%	2,014,068	-25%	2,493,473	-18%
2020	539,158		1,503,357		2,042,515	

Note from MRIP: Due to COVID-related disruptions to the Access Point Angler Intercept Survey and subsequent gaps in catch records, 2020 catch estimates are based in part on imputed data.

Note: Some states chose a less than 18% commercial quota reduction in exchange for a greater than 18% reduction in recreational removals in their CE plans.

Table 13. Realized percent change in recreational removals in numbers of fish (harvest plus release mortality) of Atlantic striped bass by state from 2017 to 2020 and predicted percent change in recreational removals from approved conservation equivalency plans (where applicable). Harvest is from MRIP (Query July 8, 2021), release mortality is from ASMFC. Estimates exclude inshore harvest from North Carolina. NA = Percent reduction not calculated if implementing Addendum VI measure.

State	Realized % Change Recreational Harvest	Realized % Change Recreational Release Mortality	Realized % Change Rec. Removals (Harvest + Release Mortality)	Predicted % Change in Rec. Removals from CE Plan
Maine	-14%	-21%	<b>-21%</b>	NA
New Hampshire	-92%	-37%	<b>-49%</b>	NA
Massachusetts	-83%	-60%	<b>-66%</b>	NA
Rhode Island	-38%	-17%	<b>-23%</b>	NA
Connecticut	-25%	-45%	<b>-41%</b>	NA
New York	-57%	142%	<b>11%</b>	-23.8%
New Jersey	-17%	43%	<b>-2%</b>	-25%
Delaware	-94%	80%	<b>-16%</b>	-20%
Maryland	-33%	-10%	<b>-24%</b>	-20.6%
Virginia	-52%	-31%	<b>-41%</b>	-23.4%
North Carolina <sup>^</sup>	-	-100%	<b>-100%</b>	NA
<b>Coastwide Total</b>	<b>-42%</b>	<b>-19%</b>	<b>-30%</b>	

<sup>^</sup>Offshore recreational harvest for North Carolina was 0 fish in 2017 and 2020. Offshore estimated release mortality for North Carolina was 463 fish in 2017 and 0 fish in 2020.

Note from MRIP: Due to COVID-related disruptions to the Access Point Angler Intercept Survey and subsequent gaps in catch records, 2020 catch estimates are based in part on imputed data.

Note: Increased recreational releases in NY, NJ, and DE contributed to realized reductions in total recreational removals being less than predicted for those states.

Table 14. Percent change in commercial harvest by weight of Atlantic striped bass by state from 2017 to 2020 and percent change in commercial quota from 2017 to 2020. Note: Harvest is from state compliance reports. Estimates exclude inshore harvest from North Carolina.

State	% Change in Commercial Harvest by weight	% Change in Commercial Quota <sup>+</sup>
<b>Ocean</b>		
Maine		
New Hampshire		
Massachusetts	-53%	-18%*
Rhode Island	-34%	-18%
Connecticut		
New York	-32%	-18%*
New Jersey		
Delaware	-3%	-1.8%
Maryland (ocean)	4%	-1.8%
Virginia (ocean)	-42%	-9.8%
North Carolina <sup>^</sup>	-	-18%
<b>Ocean Total</b>	<b>-38%</b>	
<b>Chesapeake Bay</b>		
Maryland (Ches. Bay)	-12%	-1.8%
PRFC (Ches. Bay)	-19%	-1.8%
Virginia (Ches. Bay)	-26%	-7.7%
<b>Chesapeake Bay Total</b>	<b>-17%</b>	
<b>Coastwide Total</b>	<b>-26%</b>	

+ 2020 quota changed through conservation equivalency for MA, NY, NJ, DE, MD, PRFC, VA.

\*MA and NY 2020 quotas were based on an 18% reduction from 2017 quota and spawner-per-recruit (SPR) analysis that accounted for changing the commercial size limits.

<sup>^</sup>North Carolina reported no offshore commercial harvest in 2017 and 2020.

Note: Some states chose a less than 18% commercial quota reduction in exchange for a greater than 18% reduction in recreational removals in their CE plans.

Table 15. Contribution of imputed data to 2020 MRIP estimates for Atlantic striped bass by state. Source: MRIP (Query July 8, 2021).

State	Contribution of Imputed Data to Observed Harvest (A) Rate	Contribution of Imputed Data to Reported Harvest (B1) Rate	Contribution of Imputed Data to Released Alive (B2) Rate
Maine	0%	0%	0%
New Hampshire	12%	100%	7%
Massachusetts	4%	2%	3%
Rhode Island	1%	0%	13%
Connecticut	87%	28%	56%
New York	69%	13%	9%
New Jersey	57%	36%	32%
Delaware	59%	0%	13%
Maryland	9%	8%	7%
Virginia	7%	4%	36%
North Carolina	42%	84%	73%

Note from MRIP: Due to COVID-related disruptions to the Access Point Angler Intercept Survey and subsequent gaps in catch records, 2020 catch estimates are based in part on imputed data. Columns labeled 'Contribution of Imputed Data to {ESTIMATE} rate' represent the weighted percentage of catch rate information that can be attributed to imputed catch data.

Table 16. State circle hook requirements (excerpt from state regulations as of July 2021) as compared to the Board-approved bait definition and incidental catch guidance (listed below) for Addendum VI. Source: State regulations (linked in table).

Y = state adopted Board-approved bait definition, exemption for artificial lure with bait attached, and/or incidental catch guidance;  
 MR = state regulations are more restrictive than the bait definition and/or exemption for artificial lure with bait attached;  
 N = state has not adopted incidental catch guidance.

Definition of Bait and Methods of Fishing: Circle hooks are required when fishing for striped bass with bait, which is defined as any marine or aquatic organism live or dead, whole or parts thereof. This shall not apply to any artificial lure with bait attached.

Guidance on Incidental Catch: Striped bass caught on any unapproved method of take must be returned to the water immediately without unnecessary injury.

STATE	CIRCLE HOOK REQUIREMENT	BAIT DEFINITION	METHOD EXEMPT	INCIDENTAL CATCH GUIDANCE
<a href="#">ME</a>	It is unlawful to use any hook other than a circle hook when using bait...Striped bass incidentally caught on any unapproved hook type must be returned to the water immediately without unnecessary injury. For the purposes of this section, <i>bait is defined as any marine or freshwater organism live or dead, whole or parts thereof, and earthworms, including but not limited to, night crawlers (Lumbricus terrestris).</i> <b>Exception:</b> Rubber or latex tube rigs will be exempt from the circle hook restriction as long as they conform with the following: the lure must consist of a minimum of 8” of latex or rubber tubing with a single hook protruding from the end portion of the tubing where bait may be attached. Use of treble hooks is not allowed with these rigs	MR	MR	Y
<a href="#">NH</a>	Non-offset, corrodible circle hooks required if angling with bait.	MR*	MR	N
<a href="#">MA</a>	Mandatory Use of Circle Hooks. Recreational fishermen shall use circle hooks when fishing for striped bass with whole or cut natural baits. This shall not apply to any artificial lure. Striped bass caught on any unapproved method of take must be returned to the water immediately without unnecessary injury. <i>Bait means any marine or aquatic organism, live or dead, whole or parts thereof.</i>	Y	Y	Y

(Table 16 continued – Summary of circle hook regulations).

STATE	CIRCLE HOOK REQUIREMENT	BAIT DEFINITION	METHOD EXEMPT	INCIDENTAL CATCH GUIDANCE
<a href="#">RI</a>	<p>F. Circle hooks: 1. The use of circle hooks is required by any person while fishing recreationally with bait for striped bass.</p> <p>a. <i>Bait is defined as any marine or aquatic organism live or dead, whole or parts thereof.</i></p> <p>b. The circle hook requirement shall not apply to any artificial lure with bait attached.</p> <p>2. Striped bass caught on any unapproved method of take must be returned to the water immediately without unnecessary injury.</p>	Y	Y	Y
<a href="#">CT</a>	<p>No person shall engage in angling for striped bass with natural bait unless such person uses an inline circle hook. Any striped bass taken incidentally by use of natural bait on a hook other than an inline circle hook shall be returned immediately to the waters from which taken. The provisions of this subsection (h) shall not apply to any artificial lure with bait attached, or to the use of a fly...<i>For purposes of this subsection, "natural bait" means any organism, in whole or in part, that is live or dead</i></p>	MR	Y	Y
<a href="#">NY</a>	<p>Recreational anglers are required to use a non-offset (inline) circle hook when fishing for striped bass when using <i>any marine or aquatic organism or terrestrial invertebrate, live or dead, whole or parts thereof.</i> This requirement shall not apply to any artificial lure with any marine or aquatic organism or terrestrial invertebrate, live or dead, whole or parts thereof attached. Striped bass caught on any unapproved method of take must be returned to the water immediately without unnecessary injury.</p>	MR	Y	Y
<a href="#">NJ</a>	<p><b><i>Pending (expected 10/4/2021) N.J.A.C. 7:25-18.1:</i></b>            Hook and line fishermen are restricted to the use of non-offset circle hooks while fishing with bait. <i>Bait is defined as any marine or aquatic organism live or dead, whole or parts thereof.</i> This restriction shall not apply to an artificial lure with bait attached. A circle hook is a non-offset hook where the point is pointed perpendicularly back towards the shank. Non-offset means that the point and barb are in the same plane as the shank. Striped bass caught using an unapproved method of take must be returned to the water immediately without unnecessary injury.</p>	Pending	Pending	Pending
<a href="#">PA</a>	<p>It is unlawful to fish with bait for any species of fish in the tidal Delaware Estuary, including tributaries from the mouths of the tributaries upstream to the limit of tidal influence using any hook type other than non-offset (in-line) circle hooks.</p>	MR*	MR	N

(Table 16 continued – Summary of circle hook regulations).

STATE	CIRCLE HOOK REQUIREMENT	BAIT DEFINITION	METHOD EXEMPT	INCIDENTAL CATCH GUIDANCE
<a href="#">DE</a>	It is unlawful for any recreational fisherman to fish for striped bass with bait using any hook other than a non-offset circle hook. This shall not apply to any artificial lure with bait attached. <i>"Bait" means any marine or aquatic organism live or dead, whole or parts thereof.</i>	Y	Y	Y
<a href="#">MD</a>	Chesapeake Bay and Tributaries: (2) When fishing for striped bass, a person recreationally angling in the Chesapeake Bay or its tidal tributaries shall only use a circle hook when <i>using fish, crabs, or worms as bait, or processed bait.</i> Atlantic Ocean: When fishing for striped bass, a person recreationally angling in the Atlantic Ocean, its coastal bays, or their tributaries shall only use a circle hook when <i>using fish, crabs, or worms as bait, or processed bait.</i> <i>"Fish" means finfish, crustaceans, mollusks, and amphibians and reptiles which spend the majority of their life cycle in water, and any part, egg, offspring, or dead body of any of these species.</i>	MR	MR	N
<a href="#">PRFC</a>	Non-offset (inline) Circle Hooks are required to be used when using cut or whole natural bait.	MR*	MR	N
<a href="#">DC</a>	The mandatory use of non-offset circle hooks will be required when fishing for striped bass with bait to reduce release mortality in recreational fisheries. In addition to anglers targeting striped bass, a non-offset circle hook will be required regardless of the targeted species when recreationally fishing with <i>bait of any kind (e.g., fish, worms, shrimp, chicken livers, corn, dough balls)</i> and using a hook size of number two (#2) or greater. <i>Bait – does not include artificial lures (bucktails, crankbaits, rigged soft plastics, etc.), but does include any other fresh, frozen, live, cut, scented moldable offering used to attract fish.</i>	MR	Y	N
<a href="#">VA</a>	Any person fishing recreationally shall use non-offset, corrodible, non-stainless steel circle hooks when fishing with bait. <i>"Bait" means any whole or part of any marine or aquatic organism, live or dead.</i>	Y	MR	N
<a href="#">NC</a>	It is unlawful to fish for or possess striped bass from the Atlantic Ocean for recreational purposes using hook and line gear with natural bait unless using a non-stainless steel, non-offset (inline) circle hook, regardless of tackle or lure configuration. <i>Natural bait is defined as any living or dead organism (animal or plant) or parts thereof.</i>	MR	MR	N

\*The PRT assumes that if bait is not specifically defined, the regulation would be considered more restrictive since circle hooks would be required for any type of bait.

Table 17. Status of Commercial Tagging Programs by state for 2020.

State	Total Participants	Tags Issued	Tags Used	Point of Tag (sale/harvest)	<sup>1</sup> 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	170	46,520	19,605	Sale	Y	Y	Y	one tag color	Y
RI	26	13,760	5,037	Sale	Y	Y	N	two tag colors by gear	Y
NY	407	62,430	44,073	Harvest	Y	Y	N	One tag color	Y
DE*	238	17,396	8,439	Both	Y	Y	N	Harvest: two tag colors by gear Sale: one color	Y
MD <sup>±</sup>	762	497,820	250,736	Harvest	Y	Y	N	Three tag colors by fishery and area	Y
PRFC	313	81,525	68,939	Harvest	Y	Y	N	Five tag colors by gear	N
VA	374	185,350	130,373	Harvest	Y	Y	Y	two tag colors by area	Y
NC <sup>^</sup>	46	33,560	26,895	Sale	Y	Y	Y	Three tag colors by area	N

<sup>1</sup> States are required to allocate commercial tags to permit holders based on a biological metric. Most states use the average weight per fish from the previous year, or some variation thereof. Actual biological metric used is reported in Annual Commercial Tag Monitoring 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.

± Unused tags are normally required to be returned to MDDNR to allow a thorough audit of tag use. This was not possible again in 2021 due to ongoing COVID-19 shutdowns. This audit may be revisited in the future as conditions allow.

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

Table 18. Status of compliance with monitoring and reporting requirements in 2020. 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 Status
	Requirement(s)	Status	Requirement(s)	Status	
ME	JAI	Y	-	NA	Y
NH	-	NA	-	NA	Y
MA	TAG*	Y	composition, catch & effort (C&R), tag program	Y	Y
RI	-	NA	composition (C&R), catch & effort (R), tag program	Y	Y
CT	-	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	-	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	composition, catch & effort (C&R), tag program	Y	Y
DC	-	NA	-	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

\*Part or all of the monitoring program could not be conducted due to COVID-19.

**XI. Figures**

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

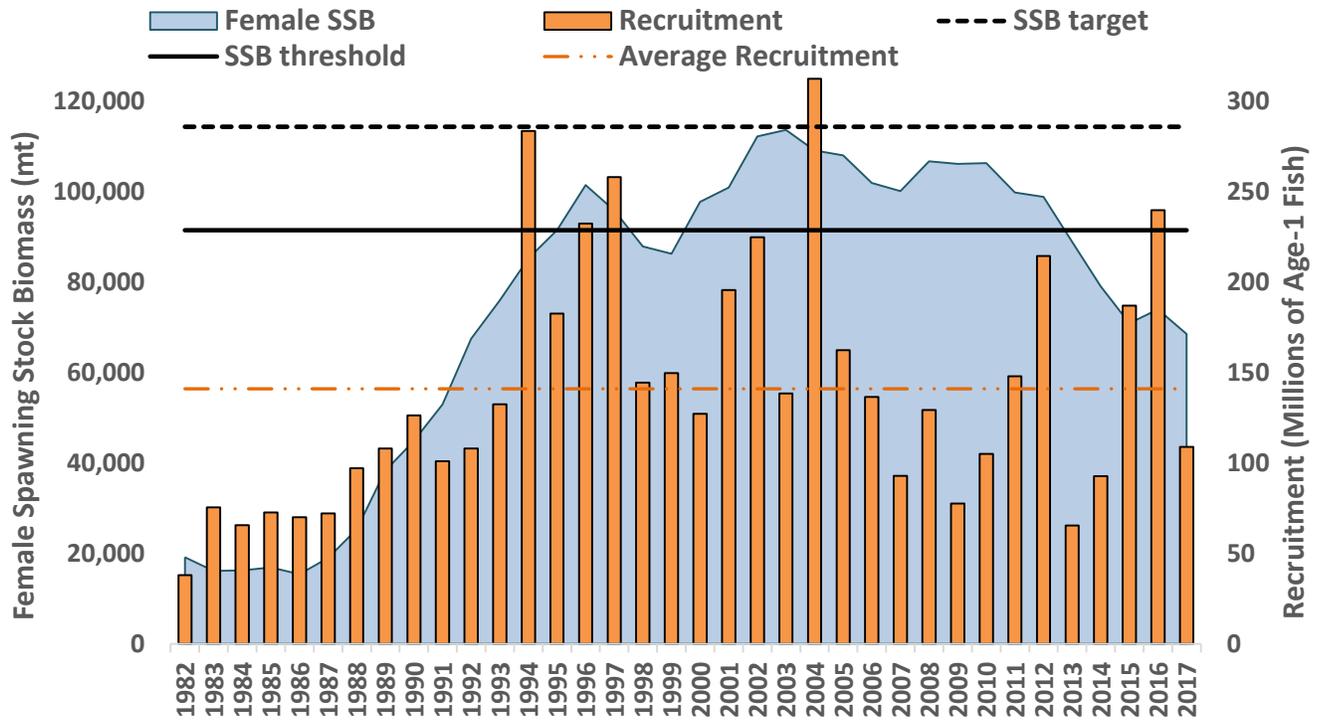


Figure 2. Atlantic striped bass fishing mortality, 1982-2017. Source: 2018 Benchmark Stock Assessment.

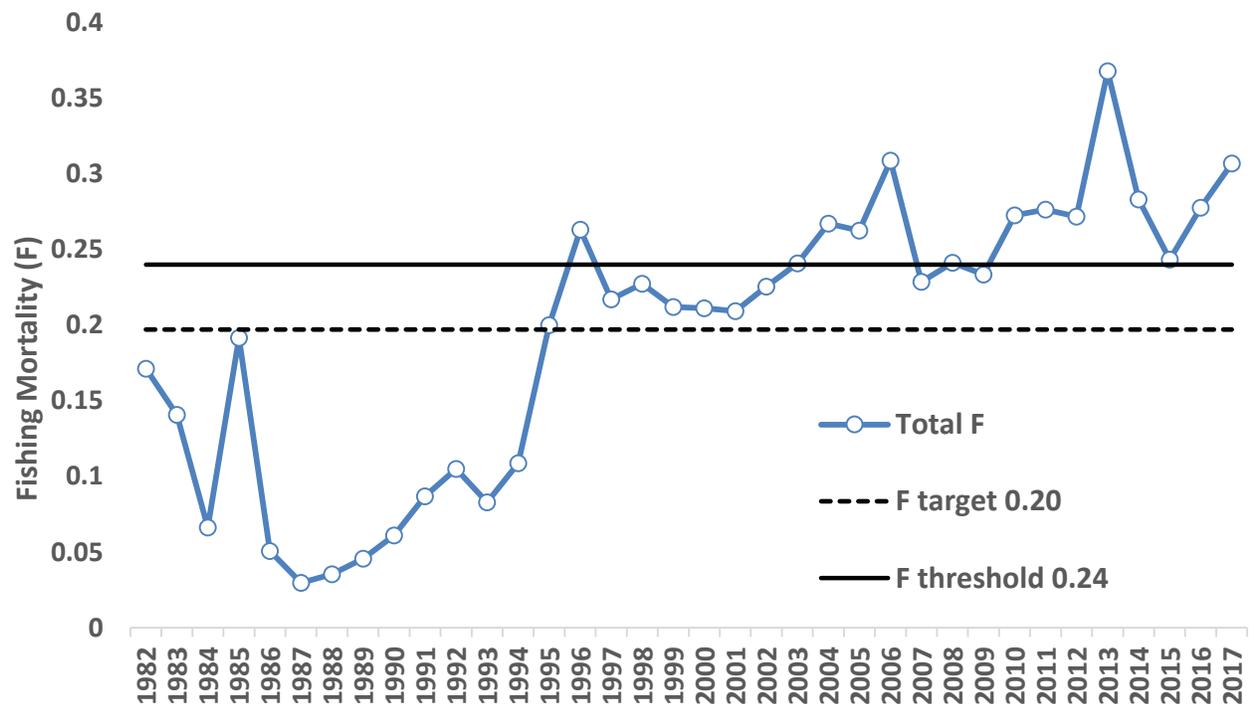


Figure 3. Albemarle Sound-Roanoke River striped bass female spawning stock biomass and recruitment (abundance of age-1), and biological reference points, 1991-2017. Source: 2020 A-R Stock Assessment (Lee et al. 2020).

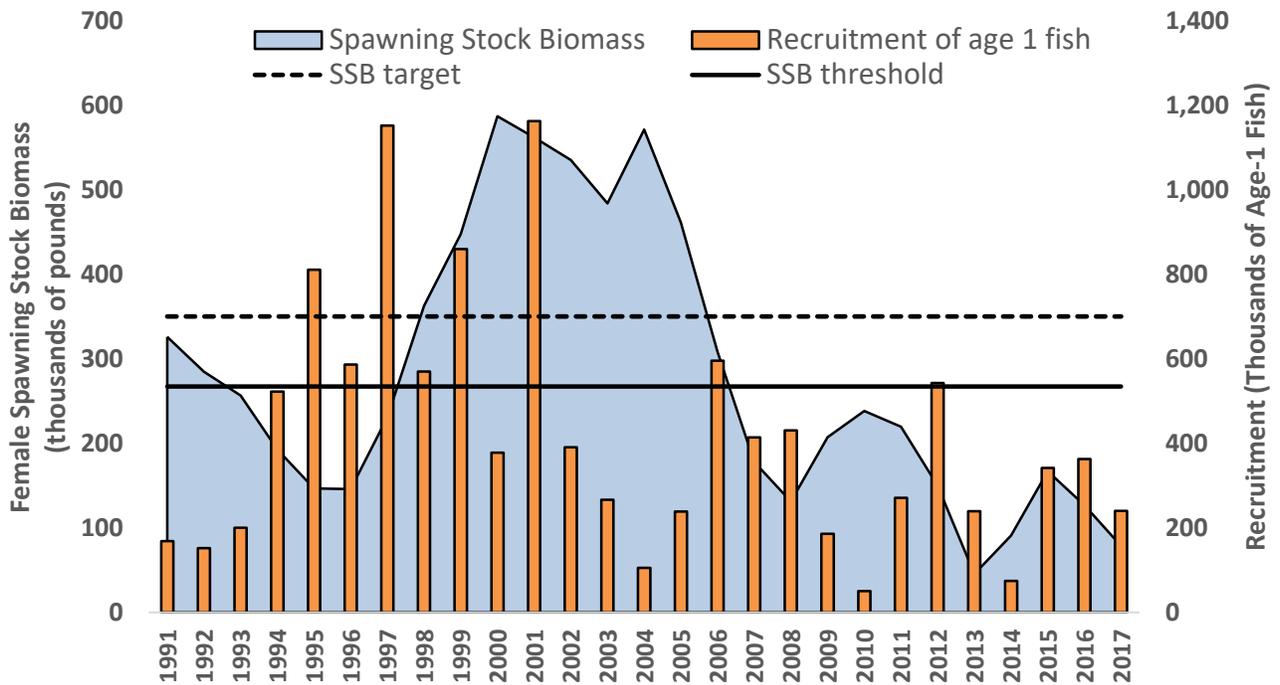


Figure 4. Albemarle Sounds-Roanoke River striped bass fishing mortality (F) estimates, and biological reference points, 1991-2017. Source: 2020 A-R Stock Assessment (Lee et al. 2020).

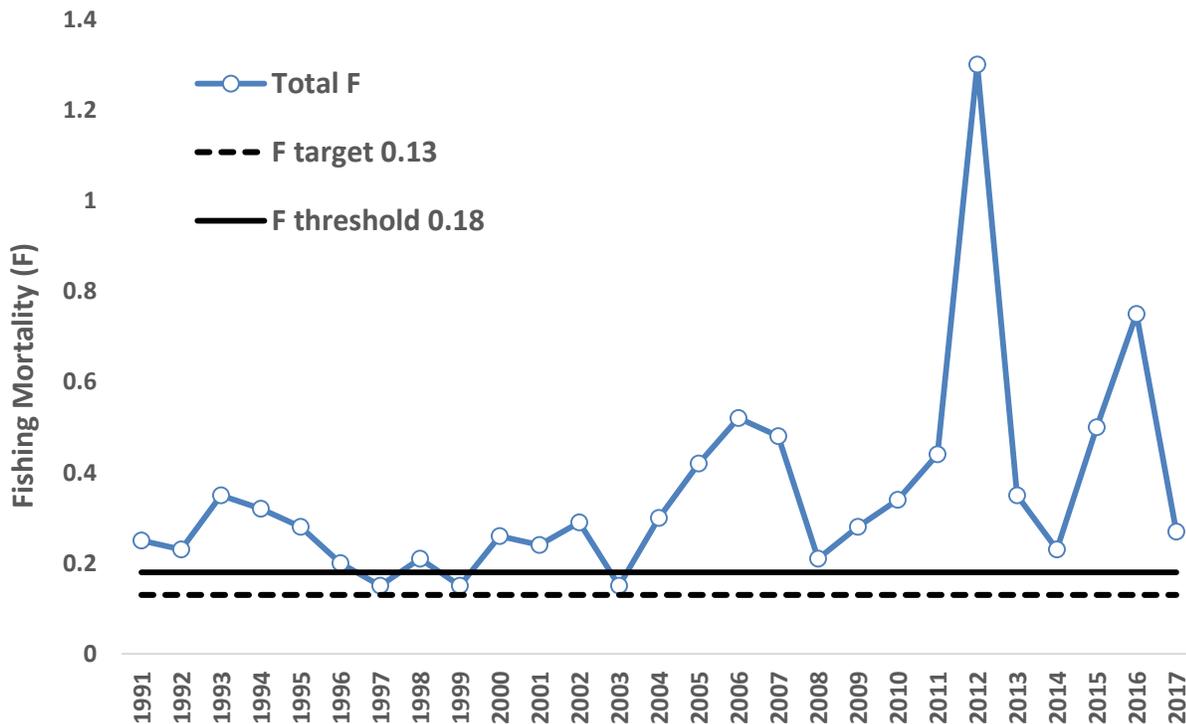


Figure 5. Total Atlantic striped bass removals by sector in numbers of fish, 1982-2020. Note: Harvest is from state compliance reports/MRIP, discards/release mortality is from ASMFC. Estimates exclude inshore harvest from A-R.

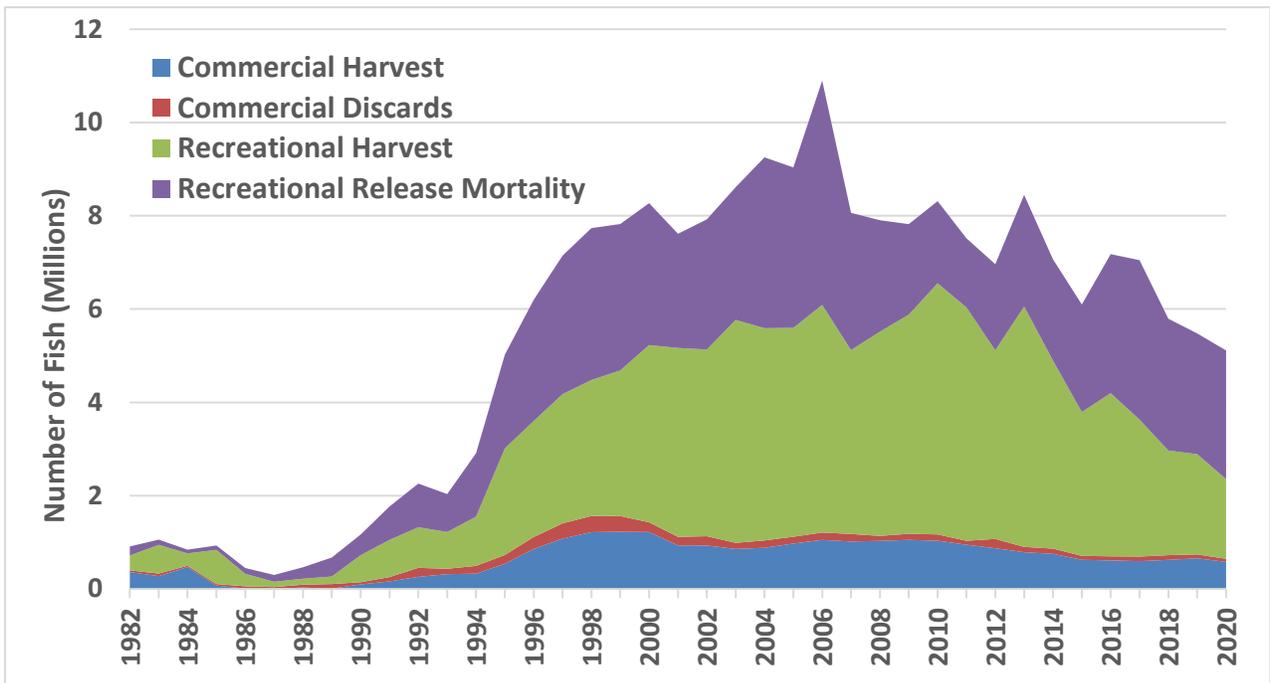


Figure 6. Commercial Atlantic striped bass landings by state in pounds, 1990-2020. Source: State compliance reports. Commercial harvest and sale prohibited in ME, NH, CT, and NJ. NC is ocean only.

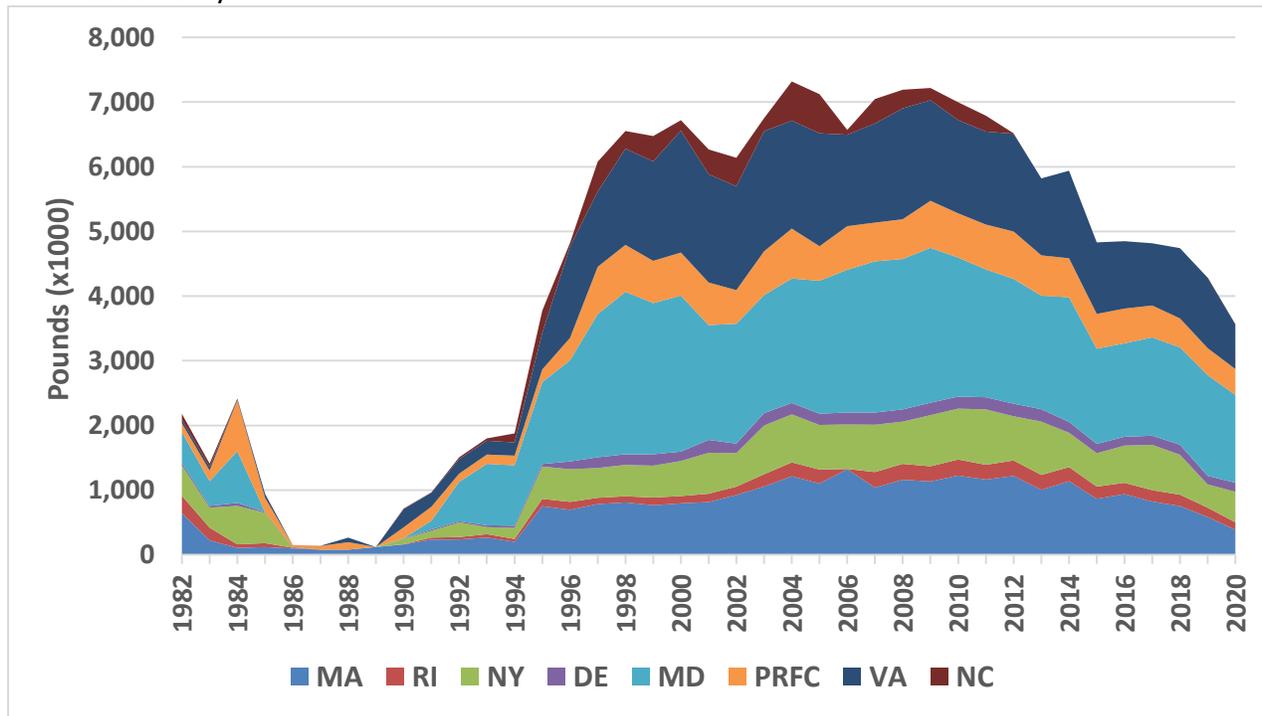


Figure 7. Total recreational catch and the proportion of fish released alive, 1982-2020. Source: MRIP/ASMFC. Estimates exclude inshore harvest from A-R.

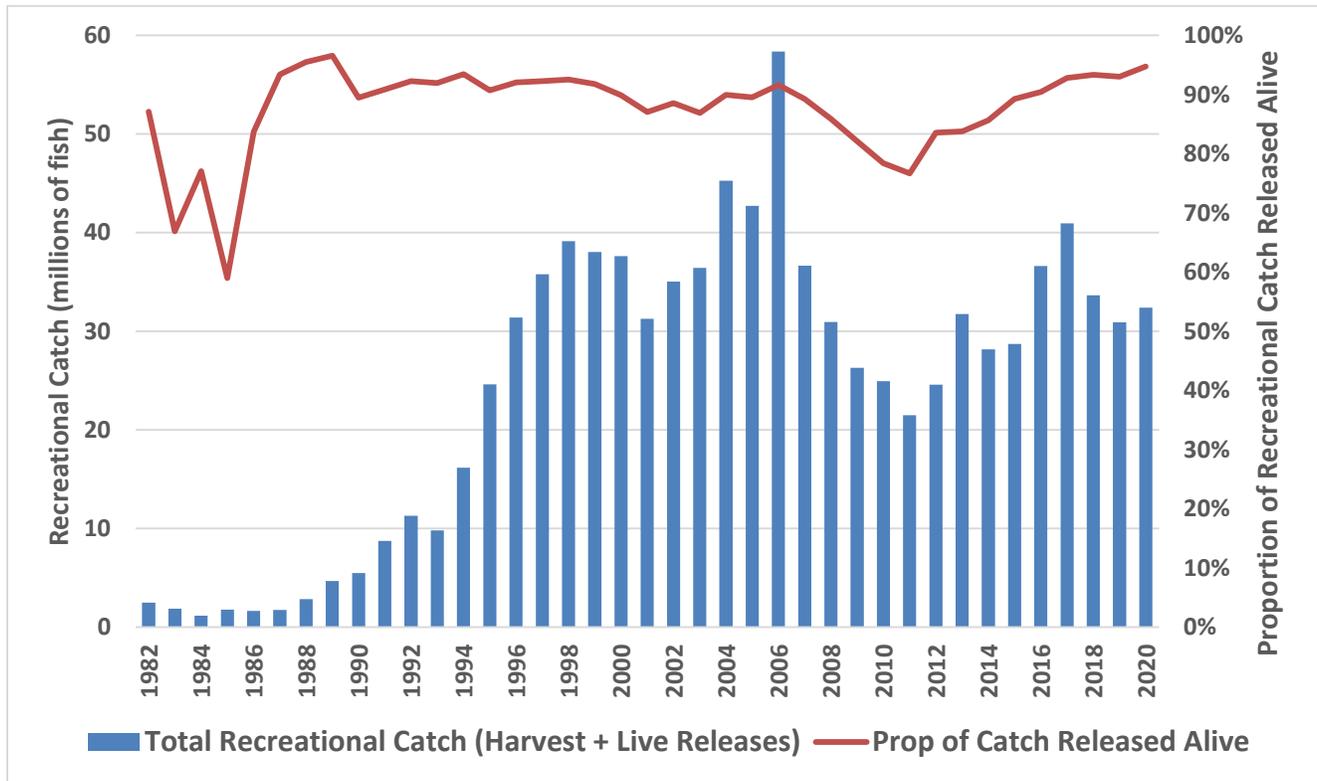


Figure 8. Juvenile abundance index analysis for Maine, New York, Jew Jersey, Maryland, Virginia, and North Carolina, 2020. Source: Annual State Compliance Reports. Q1 = first quartile. An open bar in the last three years indicates a value below the Q1 threshold.

