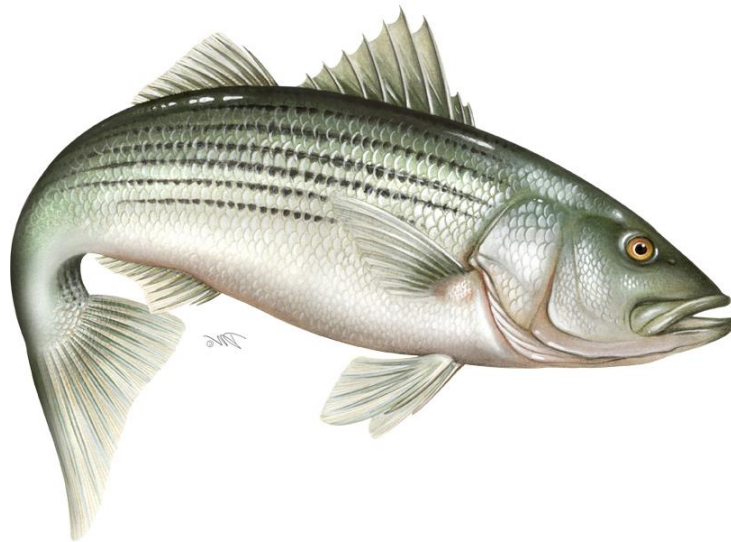


2016 REVIEW OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
FISHERY MANAGEMENT PLAN FOR

ATLANTIC STRIPED BASS
(Morone saxatilis)

2015 FISHING SEASON



Atlantic Striped Bass Plan Review Team

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Executive Summary

Atlantic Striped Bass from Maine through North Carolina are managed under Amendment 6 and Addenda I-IV to the Interstate Fishery Management Plan.

Addendum IV to Amendment 6 was approved by the Board in October 2014, and implemented prior to the start of the 2015 fishing season. The addendum contained new fishing mortality reference points, and required coastal and Chesapeake Bay states/jurisdictions to reduce removals by 25% and 20.5%, respectively, in order to reduce F to a level at or below the target.

Total striped bass harvest in 2015 is estimated at 1.96 million fish that weighed 23.0 million pounds, which is a 23% decrease by number and by weight from 2014. The recreational fishery harvested 1.33 million fish (18.2 million pounds) in 2015, while the commercial fishery harvested 623,457 fish (4.84 million pounds). Dead discards in 2015 were estimated at 755,771 fish for the recreational sector, and 299,566 fish for the commercial sector.

Rhode Island exceeded its commercial quota by 6,903 pounds in 2015, resulting in a 174,669 pound quota for 2016. All Chesapeake Bay commercial fisheries harvested below their quota in 2015.

In 2015, Addendum IV regulatory measures achieved a 22.4% reduction in harvest compared to the reference harvest-level. All sectors achieved (or exceeded) their harvest reduction goal, except for the Chesapeake Bay recreational sector (53.4% increase compared to 2012 harvest levels).

The PRT annually reviews trends in all required JAIs. If any survey's JAI falls below their respective Q1 for three consecutive years, then appropriate action should be recommended by the PRT to the Board. No management action is triggered based on the analysis of the 2013, 2014, and 2015 JAI values.

In 2015, all states implemented management programs consistent with Amendment 6 and Addenda I-IV. Monitoring requirements vary by state, and may include monitoring commercial and/or recreational catch, effort, and catch composition, monitoring commercial tagging programs, and performing juvenile abundance surveys, spawning stock surveys, and tagging programs.

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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
<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 declining juvenile recruitment and 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, which 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, which was 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 cohort to spawn at least once. Smaller size limits were permitted in the Albemarle Sound, Chesapeake Bay, Delaware Bay, and the Hudson River than along 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 reopen the fisheries when the 3-year moving average of the Maryland juvenile abundance index (JAI) exceeded an arithmetic mean of 8.0, which was attained with recruitment of the 1989 year class. Also in 1985, the Commission determined that the Albemarle Sound/Roanoke River (A/R) stock in North Carolina contributed

minimally to the coastal migratory population, and therefore, was allowed to pursue an alternative management program.

Consequently, 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). Commercial measures were implemented that would reduce landings to 20% of those in the historic period of 1972-1979. For the recreational sector, dual size limit concept was maintained. The amendment only allowed an increase in the target F once spawning stock biomass (SSB) was restored to levels estimated during the late 1960s and early 1970s. Five 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, the NOAA Fisheries passed a final rule (55 Federal Register 40181-02) prohibiting possession, fishing (i.e., 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 possessed and transported through this defined area, provided that the vessel is not used for fishing while in the EEZ and the vessel remains in continuous transit. Additionally, no bycatch of Atlantic striped bass from the EEZ may be retained and striped bass could not be targeted by catch and release fisheries.

In 1995, Chesapeake Bay and Hudson River striped bass were declared restored by the Commission (the Delaware stock was declared restored in 1995 and the A/R stock 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} , which was revised to 0.40 after two years of implementation. Regulations were developed to allow 70% of the historic harvest and achieve the target F, although states were allowed to submit proposals for alternative regulations that were conservationally equivalent. From 1997-2000, a series of five addenda were implemented to adjust target F in response to the latest stock status information, and adjust the regulatory regime to achieve each change in target F.

In 2003, Amendment 6 was adopted to address five limitations within the 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; 5) and excessively frequent changes to the management program. Amendment 6 completely replaced the FMP (and all subsequent amendments and addenda) for Atlantic striped bass.

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:

- 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.
- Manage fishing mortality to maintain an age structure that provides adequate spawning potential to sustain long-term abundance of striped bass populations.
- 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.
- Foster quality and economically viable recreational, for-hire, and commercial fisheries.
- Maximize cost effectiveness of current information gathering and prioritize state obligations in order to minimize costs of monitoring and management.
- Adopt a long-term management regime that minimizes or eliminates the need to make annual changes or modifications to management measures.
- 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 targets and thresholds, and introduced a new set of biological reference points (BRPs) based on female spawning stock biomass (SSB), as well as a list of management triggers based on the BRPs (the targets and thresholds were updated in 2008; see Sections II and IV for more information). The coastal commercial quotas for striped bass 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. 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, fisheries that operate in the Albemarle Sound, 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 jurisdictions to implement separate seasons, harvest caps, and size and bag limits as long as they remain under that F target. No minimum size limit can be less than 18 inches under Amendment 6. The same minimum size standards regulate the commercial fisheries as the recreational fisheries, except for a minimum 20 inch size limit in the Delaware Bay spring gillnet fishery.

States are permitted the flexibility to deviate from these standards by submitting proposals for review by the Striped Bass Technical Committee (TC), Advisory Panel, and Plan Review Team and contingent upon the approval of the Atlantic Striped Bass Management Board (Board). A state may request a change only if it can demonstrate that the action is "conservationally equivalent" to the management standards or will not contribute to the overfishing of the resource. This practice has resulted in a variety of regulations among states (see Tables 9 and 10).

In 2007, Addendum I was approved. The addendum established a bycatch monitoring and research program to increase the accuracy of data on Striped Bass discards and also 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. The Order also requires the Secretary of Commerce to encourage management for conservation of the resources, including State designation as gamefish where the State determines appropriate under applicable law, and to periodically review the status of the populations within US jurisdictional waters.

In 2010, Addendum II was approved. The addendum established a new definition of recruitment failure to be “a value that is below 75% of all values in a fixed time series appropriate to each juvenile abundance index.” The addendum was initially developed to consider options to increase the coastal commercial quota. The Board voted status quo in regards to the coastal commercial quota.

In 2012, Addendum III was approved. This addendum requires all states and jurisdictions with a commercial fishery to implement a 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.

In 2014, Addendum IV was approved. The addendum was initiated in response to the 2013 benchmark assessment which indicates a steady decline in spawning stock biomass since the mid-2000s. The Addendum established new fishing mortality reference points (F target and threshold), and a suite of regulatory measures to reduce F to a level at or below the new target by 2016. Prior to the start of the 2015 fishing season, all jurisdictions were required to implement regulations to achieve a 25% reduction from 2013 removals for the coastal fisheries and a 20.5% reduction from 2012 removals for Chesapeake Bay fisheries. Additionally, since tagging studies conducted on the A/R stock demonstrate that the stock contributes minimally to the coastwide complex (Callihan et al. 2014), Addendum IV defers management of the A/R stock to the State of North Carolina using stock-specific BRPs approved by the Board.

While NOAA Fisheries continues to implement a ban on the possession, fishing (i.e., catch and release fishing), harvest and retention of striped bass in the EEZ (with the exception of a defined transit zone within Block Island Sound), Amendment 6 includes a recommendation to the Secretary of Commerce to consider reopening the EEZ to commercial and recreational striped bass fisheries. In July 2003, NOAA Fisheries took steps in the rulemaking process to consider the recommendation. In September 2006, NOAA Fisheries concluded that it would be imprudent to open the EEZ to striped bass fishing and chose not to proceed further in its rulemaking. Specifically, NOAA Fisheries concluded that “(1) it could not be certain, especially after taking into account the overwhelming public perception that large trophy sized fish congregate in the EEZ, that opening the EEZ would not increase effort and lead to an increase in mortality that would exceed the threshold, and (2) both the Commission’s and NOAA Fisheries’ ability to immediately respond to an overfishing or overfished situation is a potential issue, particularly given the timeframe within which Amendment 6 was created, and the lag time in which a given year’s data is available to management” (71 Federal Register 54261-54262).

II. Status of the Stocks

Coastal Migratory Atlantic Striped Bass Stocks

The 2013 benchmark assessment for coastal migratory Atlantic striped bass was peer-reviewed at the 57th SAW/SARC, and approved by the Board in October 2014 for management use. Among other

changes, the statistical catch-at-age (SCA) model, which produces estimates of fishing mortality, abundance, recruitment and spawning stock biomass (SSB), was generalized to allow specification of multiple fleets, different stock-recruitment relationships, and year- and age-specific natural mortality rates. New fishing mortality (F) reference points were chosen to link the target and threshold F with the target and threshold female SSB. Additionally, the SARC identified high priority items for consideration in future assessments including continued improvement of the spatial modeling of the stock, and incorporating tagging data.

The assessment model was updated in 2015 with catch and index data through 2014. Based on results of the 2015 assessment update, and in comparison to the biological reference points below, coastal migratory Atlantic striped bass are not overfished and are not experiencing overfishing. Biological reference points apply to all Atlantic striped bass stocks, except for the A/R stock which has separate BRPs derived from an A/R stock specific assessment conducted by North Carolina DMF (see Section IV).

	<i>Female Spawning Stock Biomass (SSB)</i>	<i>Fully-Recruited Fishing Mortality (F)</i>
<i>Threshold</i>	SSB ₁₉₉₅ = 57,626 metric tons	0.22
<i>Target</i>	SSB _{threshold} X 1.25 = 72,032 metric tons	0.18

In 2014, female SSB was estimated at 63,918 metric tons (mt) (140.9 million pounds) which is above the SSB threshold (57,626 mt or 127.0 million pounds) but well below the target (72,032 mt or 158.8 million pounds) (Figure 1). The 2014 estimate is a slight decrease from 2013, however, female SSB estimates have continued to decline below the target and toward the threshold level since 2006.

In 2014, recruitment (age-1 abundance) was estimated at 76.1 million fish, which is below average for the most recent 15 years (92.2 million fish). Although recruitment is variable from year to year, the general trend is declining (Figure 1). The 2012 recruitment (2011 year class) estimate (125.1 million fish) is the highest value since 2006.

In 2014, the fully-recruited fishing mortality (F) rate was estimated to be 0.20, which is below the F threshold (0.22) but above the target (0.18, Figure 2). Since 2002, F has remained above the target level, oscillating back and forth across the threshold.

The next Atlantic striped bass stock assessment update will be available for Board review at its October 2016 meeting. The next benchmark stock assessment for coastal migratory Atlantic striped bass is scheduled for 2018.

III. Status of the Fishery

In 2015, total harvest of coastal migratory Atlantic striped bass (i.e., commercial landings plus recreational harvest (A + B1)) was estimated at 23.00 million pounds (1.96 million fish, Table 1 and Figure 5). This is a 23% decrease by weight and by number compared to 2014 (total harvest in 2014 was 2.56 million fish that weighed 30.0 million pounds). Per usual, harvest was dominated by the recreational sector with 79% of the total harvest by weight, and 68% by number. All coastwide harvest and discard

estimates in this report exclude inshore harvest from the A/R in North Carolina (refer to Section IV for inshore harvest estimates from the A/R in 2015).

In 2015, based on annual state compliance reports, commercial landings were estimated at 4.82 million pounds (620,034 fish), a 19% decrease by weight and by number from 2014. Chesapeake Bay jurisdictions accounted for 65% of total commercial landings by weight; Maryland landed 30%, Virginia landed 23%, and the Potomac River Fisheries Commission (PRFC) landed 11%. Additional landings came from Massachusetts (18%), New York (11%), Rhode Island (4%), and Delaware (3%). Refer to Table 2, Table 3 and Figure 6 for commercial landings and dead discard estimates by state and by year. North Carolina has not recorded any coastal commercial (or recreational) harvest since 2012 due to redistribution of the over wintering component of the mixed stocks. The overwintering stock has remained well outside of three miles in recent years, affecting Virginia's harvest in the ocean as well.

Recreational harvest is estimated via the Marine Recreational Information Program (MRIP). In 2015, coastwide recreational harvest (i.e., A + B1) was estimated at 18.18 million pounds (1.34 million fish), a 24% decrease by weight from 2014 (25% by number). New Jersey landed the largest percentage of the coastwide recreational harvest by weight (28%), followed by New York (25%), Maryland (17%), Massachusetts (15%), and Connecticut (7%). Maine, New Hampshire, Rhode Island, Delaware, and Virginia accounted for the remaining 8%. By number, Maryland landed the largest percentage of the coastwide recreation harvest (30%), followed by New Jersey (21%), New York (20%), and Massachusetts (13%). Maine, New Hampshire, Rhode Island, Connecticut, Delaware, and Virginia accounted for the remaining harvest (16%). Refer to Table 4, Table 5 and Figure 7 for recreational harvest and dead discard estimates by year.

Recreational releases are also estimated via the MRIP. Coastwide recreational releases (B2) in 2015 were estimated at 8.40 million fish, which is a 15% increase compared to 2014. Applying a 9% post release mortality rate, recreational dead discards were estimated at 755,771 fish. Accordingly, in 2015, total recreational removals (i.e., A + B1 + 9% of B2) were estimated at 2.09 million fish, which is a 14% decrease from 2014.

Commercial dead discard estimates continue to be a source of uncertainty within striped bass stock assessment. Commercial dead discards are currently estimated via the ratio of tags returned from the recreational fishery to those from the commercial fishery. The tag-return ratio is adjusted by a correction factor for underreporting to get an estimate of commercial releases. Commercial releases are then apportioned among gears based on gear-specific tag-returns. Commercial dead discards are then estimated via gear-specific post-release mortality rates. In 2015, total commercial dead discards were estimated at 299,566 fish, 32% of that estimated in 2014 (931,391 fish) and the lowest estimate since 2010. Refer to Table 6 for dead discards by sector and by year.

Wave-1 Recreational Harvest Estimates

Evidence suggests that North Carolina, Virginia, and possibly other states have had sizeable wave-1 (January/February) recreational striped bass fisheries beginning in 1996 (NEFSC 2013b). MRIP has sampled for striped bass in North Carolina during wave-1 since 2004. Other states are not currently covered during wave-1. However, striped bass distribution on their overwintering grounds during

January through February has changed significantly since the mid-2000s. The migratory portion of the stocks has been well offshore in the EEZ off Virginia and North Carolina (up to 27 miles) in recent years. North Carolina has reported zero striped bass landings in the ocean for 2012-2015.

IV. Status of Albemarle Sound and Roanoke River Stocks

The most recent A/R stock assessment (data through 2012) utilized the ASAP3 statistical catch at age model. The benchmark assessment was peer reviewed by an outside panel of experts, and approved by the Board for management use in October 2014. The model incorporated all commercial and recreational harvest and discard data, as well as abundance data from fishery independent surveys conducted by North Carolina Division of Marine Fisheries (NCDMF) and NCWRC staff. The benchmark assessment produced new BRPs and associated quotas to prevent overfishing. Based on results of the 2014 benchmark, and in comparison to the biological reference points below, A/R Atlantic striped bass are not overfished and are not experiencing overfishing.

	<i>F</i>	<i>SSB</i>	<i>Total Allowable Landings pounds (TAL)</i>
Threshold	0.41	785,150 lb.	325,905 lb.
Target	0.33	969,496 lb.	305,762 lb.

Although the stock is not overfished, female spawning stock biomass has declined steadily since its peak in 2003 (similar to the stock status trend from the 2015 assessment update for coastal migratory stocks), and is estimated at 835,462 pounds in 2012, just above the threshold of 772,588 pounds (Figure 3). A/R striped bass experienced a period of unusually strong recruitment (number of age-1 fish entering the population) from 1994-2001 followed by a period of lower recruitment from 2002-2013. In 2012, fishing mortality was estimated at 0.34 in 2012, just above the target of 0.33 (Figure 4).

In 2015, total commercial and recreational harvest in the Albemarle Sound Management Area (ASMA) and the Roanoke River Management Area (RRMA) was 240,445 pounds (72,099 fish). Commercial harvest in the ASMA was 113,475 pounds (28,828 fish). Recreational harvest in the ASMA was 70,008 pounds (23,240 fish), while recreational harvest in the RRMA was 56,962 pounds (20,031 fish). The Interstate FMP for Atlantic Striped Bass requires North Carolina to inform the Commission of changes to striped bass management in the A/R System. North Carolina must adhere to the compliance criteria in Amendment 6. After a review, the PRT determined that North Carolina’s FMP complies with the mandatory components of Amendment 6.

An update of the A/R stock assessment with data through 2014 is scheduled to be completed in the fall of 2016 and will be available for Board review at their October 2016 meeting.

V. Status of Management Measures and Issues

Addendum II: Juvenile Abundance Index Analysis

Amendment 6 requires the following states to conduct striped bass young-of-year juvenile abundance index (JAI) surveys on an annual basis: Maine for the Kennebec River; New York for the Hudson River; New Jersey for the Delaware River; Maryland for the Maryland Chesapeake Bay tributaries; Virginia for the Virginia Chesapeake Bay tributaries; and North Carolina for the A/R stock.

The PRT annually reviews trends in all required JAIs. Under the new definition per Addendum II, recruitment failure is defined as a value that is below 75% (the first quartile, or Q1) of all values in a fixed time series appropriate to each JAI. If any survey's JAI falls below their respective Q1 for three consecutive years, then appropriate action should be recommended by the PRT to the Board. The Board is the final arbiter in all management decisions.

No management action is triggered in 2016 based on review of 2013, 2014, and 2015 JAI values. Maine's JAI was below the Q1 threshold in 2015, near the long term average in 2014, and slightly above average in 2013. New York experienced a recruitment failure in 2013 but the JAI has been above average for the past two years. While New Jersey's JAI has been below average for two out of the last three years, no values were below the Q1 threshold. Maryland's 2015 JAI was well above average, with values right at the long term series average in 2013 and 2014. Virginia's JAI has been slightly above average each of the last three years. North Carolina's JAI for the A/R stock was near zero in 2013, below the Q1 threshold, but was well above average in 2014 and 2015 (Figure 8).

Addendum III: Commercial Fish Tagging Program

Addendum III to Amendment 6 includes compliance requirements for monitoring commercial fishery tagging programs. The PRT found that all states implemented commercial tagging programs consistent with the requirements of Addendum III. Table 12 describes each state's program requirements.

Addendum IV: Performance of Regulatory Measures in 2015

The Board approved Addendum IV in October 2014. The addendum established new F reference points as recommended by the 2013 benchmark assessment. A primary goal of the addendum is to reduce F to a level at or below the new target. To achieve this, prior to the start of the 2015 fishing season, all states and jurisdictions implemented measures that would reduce harvest by 25% in coastal fisheries (compared to 2013-levels) and by 20.5% in Chesapeake Bay fisheries (compared to 2012-levels) in terms of number of fish. Addendum IV regulatory measures are to remain in effect until the FMP is modified through the adaptive management process. Refer to Tables 10 and 11 for state-by-state regulations in 2015.

In 2015, states and jurisdictions achieved a 22.4% reduction in harvest, coastwide, compared to the reference harvest period in terms of number of fish (Table 7). All sectors, except for the Chesapeake Bay recreational sector, achieved the harvest reduction goal stated above. The sector-by-sector performance is as follows:

- *Coastal Commercial Fishery* – coastal commercial quotas as defined in Amendment 6 were reduced by 25%. No overages occurred in 2014, therefore no deductions were applied to 2015 quotas. In 2015, Rhode Island exceeded its quota by 6,903 pounds. Refer to Table 9 for state-by-state coastal commercial quotas and harvest in 2015, and effective quotas for 2016. Compared to 2013 harvest levels, the coastal commercial fisheries achieved a 32.6% reduction in harvest. See Table 8A for coastal commercial fishery evaluation, state-by-state.

- *Chesapeake Bay Commercial Fishery* – the Chesapeake Bay operates under a separate commercial quota. Historically, the bay-wide quota was calculated as an output from a harvest control model. The Bay-wide commercial quota was then allocated to Maryland, the PRFC, and Virginia based on historical harvest. However, Addendum IV froze the Bay-wide commercial quota at 25% of the 2012 harvest estimate, resulting in a 3,120,247 pound Bay-wide quota in 2015. In 2015, the bay-wide commercial harvest was 2,940,291 pounds and all jurisdictions harvested within their quota. Refer to Table 9 for Chesapeake Bay commercial quotas and harvest in 2015, and effective quotas for 2016. Compared to 2012 harvest levels, the Chesapeake Bay commercial fisheries achieved a 24.2% reduction in harvest. See Table 8B for the bay-wide commercial fishery evaluation.
- *Coastal Recreational Fishery* – for the recreational sector along the coast, states implemented a 28” minimum size limit, and a one fish bag limit per person per day. States may implement alternative regulations through the conservation equivalency process described in Amendment 6 (and Addendum IV), resulting in different regulations across states and sectors. Compared to 2013 harvest levels, the coastal recreational fisheries achieved a 41% reduction in harvest. See Table 8C for a state-by-state evaluation. All states, with the exception of New Jersey (18.7% reduction), achieved the target reduction of 25% or more.
- *Chesapeake Bay Recreational Fishery* – the Chesapeake Bay jurisdictions implemented regulations for the recreational sector through the conservation equivalency process in order to reduce harvest by 20.5%. Chesapeake Bay recreational fisheries did not reduce harvest in 2015 compared to 2012 harvest levels (53.4% increase in harvest). See Table 8D for bay-wide recreational fishery evaluation.

Law Enforcement Reporting

State agencies, the ASMFC, and law enforcement officers made a strong effort to educate the public of the Addendum IV regulatory changes that went in effect prior to the 2015 fishing year. Overall, there was good compliance with the regulatory changes, and most stakeholders were optimistic about the improved conservation for striped bass. Along the coast, recreational anglers were generally in favor of the size and bag limit changes, however most opposition came from the party and charter boat community regarding the change in bag limit from two fish to one. Chesapeake Bay recreational anglers were also somewhat dissatisfied with new regulations, primarily due to high numbers of fish caught that had to be released due to slot limit restrictions.

Based on compliance reports, the total number of warnings and citations issued was relatively the same compared to previous years, however it appeared that more verbal warnings were issued in 2015 which can be expected when implementing new regulations. Law enforcement officers did indicate issues with different measuring techniques between adjacent jurisdictions (e.g., fork length versus total length, and squeezing the tail fin versus laying it flat).

VI. Status of Research and Monitoring

The management plan requires certain jurisdictions to implement fishery-dependent monitoring programs for striped bass. All jurisdictions with commercial fisheries or substantial recreational fisheries are required to define the catch and effort composition of these fisheries. Additionally, all states and

jurisdictions with a commercial fishery must implement a commercial tagging program pursuant to Addendum III to Amendment 6.

The management plan also requires certain states to monitor the Striped Bass population independent of the fisheries. Juvenile abundance indices (JAIs) 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 (Roanoke River and Albemarle Sound). 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.

The PRT found that all states carried out the required monitoring programs in 2015. In 2015, Virginia implemented the Board approved design changes to their tagging and monitoring surveys. Specifically, the 24 hour soak in the Rappahannock and James River gill net survey was eliminated and replaced with a short set (0.5-2 hours). The short set survey was also conducted in the York River to expand the tagging program.

VII. Annual State Compliance

Amendment 6 and its Addenda I-IV set the regulatory and monitoring measures for the coastwide Striped Bass fishery in 2015. Based on the annual state compliance reports, the PRT determined that each state and jurisdiction implemented a management program for 2015 consistent with the requirements of Amendment 6 and Addenda I-IV (Table 13).

The following management program changes were documented for the 2016 season:

- RI – new fin clipping regulations were adopted for 2016 to stem illegal sale of recreationally caught striped bass.
- MD – The coastal commercial season to be extended. New season is January 1 – May 30, and October 1 – December 31, Monday – Thursday.
- MD – Recreational bag and size limit changes for the Atlantic Ocean. New regulations are 2 fish/day bag limit and a 28-38" slot limit OR ≥ 44 " TL.

VIII. Plan Review Team Recommendations

- The PRT found that all states implemented regulations consistent with Amendment 6 and Addenda I-IV of the Atlantic Striped Bass FMP.
- No states requested *de minimis* status at this time.

IV. Research Recommendations

Fishery-Dependent Priorities

High

- Continue collection of paired scale and otolith samples, particularly from larger striped bass, to facilitate development of otolith-based age-length keys and scale-otolith conversion matrices.¹

Moderate

- Develop studies to provide information on gear specific discard mortality rates and to determine the magnitude of bycatch mortality.²
- Improve estimates of striped bass harvest removals in coastal areas during wave 1 and in inland waters of all jurisdictions year round.
- Evaluate the percentage of fishermen using circle hooks.³

Fishery-Independent Priorities

Moderate

- Develop a refined and cost-efficient, fisheries-independent coastal population index for striped bass stocks.
 - The PRT recommends the SBTC be tasked with exploring whether the Cooperative Winter Tagging Cruise, NEAMAP, and/or NOAA Fisheries Trawl Survey datasets would prove useful in this respect.

Modeling / Quantitative Priorities

High

- Develop a method to integrate catch-at-age and tagging models to produce a single estimate of F and stock status.⁴
- Develop a spatially and temporally explicit catch-at-age model incorporating tag based movement information.⁵
 - The PRT recommends that the SAS be tasked with reviewing recent published literature examining tag-based movement information to see if they would contribute to the development of such a model (e.g., Callihan et al. 2014)
- Review a model averaging approach to estimate annual fishing mortality with tag based models. Review validity and sensitivity to year groupings.⁶
- Develop methods for combining tag results from programs releasing fish from different areas on different dates.
- Examine potential biases associated with the number of tagged individuals, such as gear specific mortality (associated with trawls, pound nets, gill nets, and electrofishing), tag induced mortality, and tag loss.⁷
- Develop field or modeling studies to aid in estimation of natural mortality or other factors affecting the tag return rate.

Moderate

- Develop maturity ogives applicable to coastal migratory stocks.
- Examine methods to estimate annual variation in natural mortality.⁸
- Develop reliable estimates of poaching loss from striped bass fisheries.
- Improve methods for determining population sex ratio for use in estimates of SSB and biological reference points.
- Evaluate truncated matrices and covariate based tagging models.

Low

- Examine issues with time saturated tagging models for the 18 inch length group.
- Develop tag based reference points.

Life History, Biological, and Habitat Priorities

High

- Continue in-depth analysis of migrations, stock compositions, etc. using mark-recapture data.⁹
- Continue evaluation of striped bass dietary needs and relation to health condition.¹⁰

- Continue analysis to determine linkages between the mycobacteriosis outbreak in Chesapeake Bay and sex ratio of Chesapeake spawning stock, Chesapeake juvenile production, and recruitment success into coastal fisheries.

Moderate

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

Low

- Determine inherent viability of eggs and larvae.
- Conduct additional research to determine the pathogenicity of the IPN virus isolated from striped bass to other warm water marine species, such as flounder, Atlantic menhaden, American and hickory shad, and largemouth Bass.

Management, Law Enforcement, and Socioeconomic Priorities

Moderate

- Examine the potential public health trade-offs between the continued reliance on the use of high minimum size limits (28 inches) on coastal recreational anglers and its long-term effects on enhanced PCB contamination among recreational stakeholders.^{11, 13}
- Evaluate striped bass angler preferences for size of harvested fish and trade-offs with bag limits.

Habitat Recommendations

- Passage facilities should be designed specifically for passing striped bass with optimum efficiency.
- Conduct studies to determine whether passing migrating adults upstream earlier in the year in some rivers would increase striped bass production and larval survival, and opening downstream bypass facilities sooner would reduce mortality of early emigrants (both adult and early-hatched juveniles).
- All state and federal agencies responsible for reviewing impact statements and permit applications for projects or facilities proposed for striped bass spawning and nursery areas shall ensure that those projects will have no or only minimal impact on local stocks, especially natal rivers of stocks considered depressed or undergoing restoration.¹¹
- Federal and state fishery management agencies should take steps to limit the introduction of compounds which are known to be accumulated in striped bass tissues and which pose a threat to human health or striped bass health.
- Every effort should be made to eliminate existing contaminants from striped bass habitats where a documented adverse impact occurs.
- Water quality criteria for striped bass spawning and nursery areas should be established, or existing criteria should be upgraded to levels that are sufficient to ensure successful striped bass reproduction.
- Each state should implement protection for the striped bass habitat within its jurisdiction to ensure the sustainability of that portion of the migratory stock. Such a program should include: inventory of historical habitats, identification of habitats presently used, specification of areas targeted for restoration, and imposition or encouragement of measures to retain or increase the quantity and quality of striped bass essential habitats.

- States in which striped bass spawning occurs should make every effort to declare striped bass spawning and nursery areas to be in need of special protection; such declaration should be accompanied by requirements of non-degradation of habitat quality, including minimization of non-point source runoff, prevention of significant increases in contaminant loadings, and prevention of the introduction of any new categories of contaminants into the area. For those agencies without water quality regulatory authority, protocols and schedules for providing input on water quality regulations to the responsible agency should be identified or created, to ensure that water quality needs of striped bass stocks are met.¹²
- ASMFC should designate important habitats for striped bass spawning and nursery areas as HAPC.
- Each state should survey existing literature and data to determine the historical extent of striped bass occurrence and use within its jurisdiction. An assessment should be conducted of those areas not presently used for which restoration is feasible.

Footnotes

- ¹ The Fish and Wildlife Service has archived otolith samples from known-age (CWT-tagged), stocked fish, for which scale ages were derived as well. These fish were collected during past Cooperative Winter Tagging Cruises and the otoliths, once aged, will increase our sample size, and since these are known-age fish, will also allow an examination of extent that which reader error affects both otolith age, and scale age.
- ² Literature search and some modeling work completed.
- ³ Work ongoing in New York through the Hudson River Angler Diary, Striped Bass Cooperative Angler Program, and ACCSP e-logbook.
- ⁴ Model developed, but the tagging data overwhelms the model. Issues remain with proper weighting.
- ⁵ Model developed with Chesapeake Bay and the rest of the coast as two fleets. However, no tagging data have been used in the model.
- ⁶ Work ongoing by the Striped Bass Tagging Subcommittee to evaluate the best years to use for the IRCR and the periods to use for the MARK models.
- ⁷ Gear specific survival being examined in Hudson River.
- ⁸ Ongoing work by the Striped Bass Tagging Subcommittee
- ⁹ Ongoing through Cooperative Winter Tagging Cruise and striped bass charter boat tagging trips. See Cooperative Winter Tagging Cruise 25 Year Report, in preparation.
- ¹⁰ Plans for a stomach content collection program in the Chesapeake Bay by the Chesapeake Bay Ecological Foundation.
- ¹¹ Ongoing in New York.
- ¹² Significant habitat designations completed in the Hudson River and New York Marine Districts.
- ¹³ Samples collected from two size groups (≥ 28 inches and 20-26 inches) in Pennsylvania and processed by the Department of Environmental Protection to compare contamination of the two size groups.

X. References

- Atlantic States Marine Fisheries Commission (ASMFC). 2013. Update of the striped bass stock assessment using final 2012 data. A report prepared by the Atlantic Striped Bass Technical Committee. 74 p. Arlington, VA.
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XI. Tables

Tables 1 – 6 report harvest and discard estimates from 1990-2015 due to space constraints.

Table 1. Total harvest of coastal migratory Atlantic striped bass by sector, 1990-2015. Source: MRIP and annual state compliance reports. All harvests based on the calendar year, and may differ from MRIP depending on date queried. Excludes inshore harvest from the A/R. Estimates may vary depending on MRIP query date.

Year	Commercial Landings		Recreational (A+B1)		Total	
	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers
1990	689,895	115,636	2,226,545	163,242	2,916,440	278,878
1991	1,471,703	153,798	3,643,994	262,469	5,115,697	416,267
1992	1,434,495	230,714	4,026,657	300,180	5,461,152	530,894
1993	1,749,628	312,860	5,651,079	428,719	7,400,707	741,579
1994	1,776,176	307,443	6,777,886	565,167	8,554,062	872,610
1995	3,390,937	534,914	12,425,549	1,089,182	15,816,486	1,624,096
1996	3,367,185	766,518	13,123,332	1,175,112	16,490,517	1,941,630
1997	5,882,643	1,108,612	15,714,071	1,648,127	21,596,715	2,756,739
1998	6,443,874	1,233,089	12,457,222	1,457,062	18,901,096	2,690,151
1999	6,545,102	1,103,812	13,478,473	1,446,388	20,023,575	2,550,200
2000	6,698,988	1,057,712	17,498,212	2,025,113	24,197,199	3,082,825
2001	6,235,788	952,820	19,144,159	2,085,127	25,379,947	3,037,947
2002	5,999,275	658,091	18,219,143	1,973,171	24,218,418	2,631,262
2003	7,072,686	874,817	24,771,639	2,545,052	31,844,325	3,419,869
2004	7,320,357	913,160	29,184,709	2,550,747	36,505,066	3,463,907
2005	7,134,538	973,572	30,222,991	2,441,938	37,357,529	3,415,510
2006	6,783,628	1,054,664	31,044,414	2,788,125	37,828,042	3,842,789
2007	7,050,692	1,023,358	26,994,977	2,523,500	34,045,669	3,546,859
2008	7,188,715	1,010,955	30,595,742	2,466,018	37,784,457	3,476,973
2009	7,215,818	1,043,512	22,937,526	2,040,680	30,153,344	3,084,191
2010	6,979,612	1,030,938	22,994,782	1,986,415	29,974,394	3,017,353
2011	6,783,239	931,570	27,235,091	2,230,256	34,018,330	3,161,826
2012	6,514,238	839,540	19,269,083	1,545,614	25,783,321	2,385,154
2013	5,816,204	765,797	26,411,290	2,120,768	32,227,494	2,886,565
2014	5,937,662	766,610	24,062,167	1,782,868	29,999,829	2,549,478
2015	4,820,489	620,034	18,184,192	1,338,080	23,004,681	1,958,114
3 yr avg	5,524,785	717,480	22,885,883	1,747,239	28,410,668	2,464,719
10 yr avg	6,509,030	908,698	24,972,926	2,082,232	31,481,956	2,990,930

Table 2. Commercial harvest (pounds) of migratory striped bass by state, 1990-2015. Source: Annual State Compliance Reports. All harvests based on the calendar year. Excludes inshore harvest from the A/R. Commercial harvest and sale prohibited in ME, NH, CT, and NJ. Commercial quota reallocated to recreational bonus program in CT and NJ; fish harvested under the bonus program are modeled as recreational removals in stock assessment.

Year	ME	NH	MA*	RI	CT	NY	NJ	DE	MD	PRFC	VA	NC	Total
1990		37	148,000	4,000		81,870		6,509	2,887	169,060	267,735	9,797	689,895
1991			235,000	28,000		105,163		21,079	191,066	216,755	668,454	6,186	1,471,703
1992			239,200	39,000		226,611		17,795	552,451	127,398	204,338	27,702	1,434,495
1993			262,600	40,000		109,362		28,032	916,764	142,742	213,665	36,463	1,749,628
1994			199,600	39,810		171,279		33,897	884,970	149,891	204,124	92,605	1,776,176
1995			782,000	113,461		500,784		38,198	856,568	198,478	557,741	343,707	3,390,937
1996			696,815	122,562		504,350		117,560	1,523,293	346,834		55,771	3,367,185
1997			785,942	96,519		460,762		165,978	2,030,061	731,114	1,153,743	458,524	5,882,643
1998			822,000	94,663		484,900		163,169	2,368,393	726,179	1,476,502	308,068	6,443,874
1999		33	788,171	119,679		491,790		187,096	2,377,393	653,266	1,538,220	389,454	6,545,102
2000			779,736	111,812		542,659		140,634	2,411,554	666,001	1,883,856	162,736	6,698,988
2001			815,054	129,654		633,095		198,802	1,774,758	658,676	1,675,469	350,280	6,235,788
2002			924,870	129,172		518,573		160,560	1,852,634	521,048	1,592,910	299,508	5,999,275
2003			1,055,439	246,312		753,261		188,419	1,813,727	676,574	1,856,831	482,123	7,072,686
2004		203	1,206,305	245,204		741,668		181,974	1,899,539	772,333	1,668,307	604,824	7,320,357
2005			1,104,737	242,303		689,821		173,815	2,055,558	533,456	1,746,247	588,601	7,134,538
2006			1,312,168	238,797		688,446		185,987	2,207,350	673,508	1,413,914	63,458	6,783,628
2007			1,040,328	240,627		729,743		188,668	2,336,886	599,261	1,534,799	380,380	7,050,692
2008			1,160,122	245,988		653,100		188,719	2,326,023	611,789	1,714,564	288,410	7,188,715
2009			1,138,291	234,368		789,891		192,311	2,394,620	727,197	1,549,145	189,995	7,215,818
2010			1,224,356	249,520		782,402		185,410	2,150,577	680,496	1,434,219	272,632	6,979,612
2011			1,163,865	228,163		854,731		188,620	1,976,473	694,151	1,434,636	242,600	6,783,239
2012			1,219,665	239,913		681,399		194,324	1,928,982	733,789	1,509,940	6,226	6,514,238
2013			1,004,459	231,280		823,801		191,424	1,755,712	623,792	1,185,736	0	5,816,204
2014			1,138,507	217,037		531,456		167,902	1,926,612	603,068	1,353,080	0	5,937,622
2015			865,753	188,475		509,135		144,068	1,471,493	536,357	1,105,208	0	4,820,489

* includes fish taken for personal consumption

Table 3. Commercial harvest (numbers) of migratory striped bass by state, 1990-2015, and annual dead discard estimates. Source: Annual State Compliance Reports. All harvests based on the calendar year. Excludes inshore harvest from the A/R. Commercial harvest and sale prohibited ME, NH, CT, and NJ. Commercial quota reallocated to recreational bonus program in CT and NJ; fish harvested under the bonus program are modeled as recreational removals in stock assessment.

Year	ME	NH	MA*	RI	CT	NY	NJ	DE	MD	PRFC	VA	NC	Total	Commercial Discards
1990			5,927	784		11,784		698	534	38,884	56,222	803	115,636	510,011
1991			9,901	3,596		15,426		3,091	31,880	44,521	44,970	413	153,798	327,167
1992			11,532	9,095		20,150		2,703	119,286	23,291	42,912	1,745	230,714	186,601
1993			13,099	6,294		11,181		4,273	211,089	24,451	39,059	3,414	312,860	347,839
1994			11,066	4,512		15,212		4,886	208,914	25,196	32,382	5,275	307,443	359,518
1995			44,965	19,722		43,704		5,565	280,051	29,308	88,274	23,325	534,914	515,454
1996			38,354	18,570		39,707		20,660	415,272	46,309	184,495	3,151	766,518	394,824
1997			44,841	7,061		37,852		33,223	706,847	87,643	165,583	25,562	1,108,612	216,745
1998			43,315	8,835		45,149		31,386	790,154	93,299	204,911	16,040	1,233,089	326,032
1999			40,838	11,559		49,795		34,841	650,022	90,575	205,143	21,040	1,103,812	236,619
2000			40,256	9,418		54,894		25,188	627,777	91,471	202,227	6,480	1,057,712	666,997
2001			40,248	10,917		58,296		34,373	549,896	87,809	148,346	22,936	952,820	310,900
2002			48,926	11,653		47,142		30,440	296,635	80,300	127,211	15,784	658,091	168,201
2003			61,262	15,497		68,354		31,531	439,482	83,091	161,777	13,823	874,817	261,974
2004			66,556	15,867		70,367		28,406	461,064	91,888	147,998	31,014	913,160	465,642
2005			65,332	14,949		70,560		26,336	569,964	80,615	119,244	26,573	973,572	798,544
2006			75,062	15,429		73,528		30,212	655,951	92,288	109,396	2,799	1,054,664	194,524
2007			57,634	13,934		78,287		31,090	598,495	86,695	140,602	16,621	1,023,358	606,599
2008			65,330	16,616		73,263		31,866	594,655	81,720	134,603	12,903	1,010,955	308,715
2009			63,875	20,725		82,574		21,590	618,076	89,693	138,303	8,675	1,043,512	611,944
2010			65,277	17,256		81,896		19,830	584,554	90,258	159,197	12,670	1,030,938	254,841
2011			63,309	14,344		87,349		20,517	490,969	96,126	148,063	10,814	931,490	617,457
2012			66,394	14,953		66,897		15,738	472,517	90,616	111,891	323	839,329	792,861
2013			62,570	13,825		76,206		17,679	399,118	78,006	117,697	0	765,101	525,581
2014			60,619	10,468		52,903		14,894	370,661	81,429	175,324	0	766,298	931,391
2015			42,250	11,325		44,809		10,990	300,929	69,981	139,750	0	620,034	299,566

* includes fish taken for personal consumption

Table 4. Recreational harvest (numbers) of migratory striped bass by state, 1990- 2015

Source: MRIP queried June 26, 2016. All harvests based on the calendar year, and may differ from MRIP depending on date queried. Excludes inshore harvest from the A/R.

Year	ME	NH	MA	RI	CT [^]	NY	NJ [^]	DE	MD	VA	NC	Total
1990	2,912	617	20,515	4,677	6,082	24,799	44,878	2,009	736	56,017	0	163,242
1991	3,265	274	20,799	17,193	4,907	54,502	38,300	2,741	77,873	42,224	391	262,469
1992	6,357	2,213	57,084	14,945	9,154	45,162	41,426	2,400	99,354	21,118	967	300,180
1993	612	1,540	58,511	17,826	19,253	78,560	64,935	4,055	104,682	78,481	264	428,719
1994	3,771	3,023	74,538	5,915	16,929	87,225	34,877	4,140	199,378	127,945	7,426	565,167
1995	2,189	3,902	73,806	29,997	38,261	155,821	254,055	15,361	355,237	149,103	11,450	1,089,182
1996	1,893	6,461	68,300	60,074	62,840	225,428	127,952	22,867	337,415	244,746	17,136	1,175,112
1997	35,259	13,546	199,373	62,162	64,639	236,902	67,800	19,706	334,068	518,483	96,189	1,648,127
1998	38,094	5,929	207,952	44,890	64,215	166,868	88,973	18,758	391,824	383,786	45,773	1,457,062
1999	21,102	4,641	126,755	56,320	55,805	195,261	237,010	8,772	263,191	411,873	65,658	1,446,388
2000	62,186	4,262	181,295	95,496	53,191	270,798	402,302	39,543	506,462	389,126	20,452	2,025,113
2001	59,947	15,291	288,032	80,125	54,165	189,714	560,208	41,195	382,557	355,020	58,873	2,085,127
2002	71,907	12,857	308,749	78,190	51,060	202,075	416,455	29,149	282,429	411,248	109,052	1,973,171
2003	57,765	24,878	407,100	115,471	95,983	313,761	391,842	29,522	525,191	455,812	127,727	2,545,052
2004	48,816	8,386	445,745	83,990	102,844	263,096	424,208	25,429	368,682	548,768	230,783	2,550,747
2005	83,617	24,940	340,743	110,490	141,290	376,894	411,532	20,438	533,929	293,161	104,904	2,441,938
2006	75,347	13,521	314,987	75,811	115,214	367,835	509,606	20,159	669,140	547,482	79,023	2,788,125
2007	53,694	6,348	315,409	101,400	118,549	474,062	289,656	8,465	765,169	353,372	37,376	2,523,500
2008	59,152	5,308	377,959	51,191	108,166	685,589	309,411	26,934	415,403	401,155	25,750	2,466,018
2009	62,153	8,587	344,401	71,427	60,876	356,311	283,024	19,539	501,845	326,867	5,650	2,040,680
2010	17,396	5,948	341,045	70,108	92,806	538,374	320,413	16,244	457,898	102,405	23,778	1,986,415
2011	18,105	32,704	255,507	88,635	63,288	674,844	393,194	18,023	445,171	146,603	94,182	2,230,256
2012	11,624	14,498	377,931	61,537	64,573	424,522	168,629	25,399	262,143	134,758	0	1,545,614
2013	23,143	17,657	298,945	218,236	143,373	490,855	345,008	19,520	477,295	118,686	0	2,152,718
2014	20,750	6,415	277,138	103,516	86,763	409,342	225,910	8,774	583,028	67,486	0	1,789,122
2015	4,720	1,828	170,770	39,857	70,522	262,181	284,257	3,101	406,371	94,473	0	1,338,080

[^] Commercial quota reallocated to recreational bonus program in CT and NJ; fish harvested under the bonus program are modeled as recreational removals in stock assessment.

Table 5. Recreational harvest (pounds) of migratory striped bass by state, 1990-2015 Source: MRIP queried June 26, 2016. All harvests based on the calendar year, and may differ from MRIP depending on date queried. Excludes inshore harvest from the A/R.

Year	ME	NH	MA	RI	CT [^]	NY	NJ [^]	DE	MD	VA	NC	Total
1990	60,483	11,363	319,092	73,349	193,011	505,440	588,974	18,115	12,967	443,751	0	2,226,545
1991	58,177	6,731	440,605	496,723	125,309	1,053,589	643,571	25,501	456,954	333,743	3,091	3,643,994
1992	107,693	44,612	972,116	203,109	196,278	921,201	746,343	25,677	613,174	187,852	8,602	4,026,657
1993	11,953	28,115	1,113,446	292,428	400,067	1,575,938	874,296	52,540	794,853	505,742	1,701	5,651,079
1994	66,451	66,017	1,686,049	109,817	355,829	1,974,759	438,080	63,832	1,096,409	870,140	50,503	6,777,886
1995	45,933	67,992	1,504,390	436,058	671,647	3,296,025	3,141,222	175,347	2,057,450	955,822	73,663	12,425,549
1996	44,802	102,271	1,291,706	950,973	915,418	4,809,381	1,736,508	281,481	1,560,389	1,340,414	89,989	13,123,332
1997	185,178	206,904	2,891,970	927,919	920,465	4,449,564	821,784	232,186	1,962,947	2,813,471	301,683	15,714,071
1998	178,584	114,342	2,973,456	671,841	989,923	2,318,291	1,333,329	236,926	1,908,344	1,581,560	150,626	12,457,222
1999	98,623	84,255	1,822,818	886,666	824,031	3,171,344	3,342,372	100,541	1,137,940	1,741,857	268,026	13,478,473
2000	269,325	71,370	2,618,216	1,160,304	515,962	4,050,569	4,286,040	346,905	2,100,854	2,005,721	72,946	17,498,212
2001	290,233	223,072	3,644,561	1,138,974	628,044	2,996,805	5,341,867	382,498	2,072,943	2,140,713	284,449	19,144,159
2002	383,270	152,342	4,304,883	1,192,295	600,482	2,813,596	4,133,678	299,561	1,423,515	2,648,115	267,406	18,219,143
2003	253,910	281,549	5,120,554	1,502,455	1,537,899	4,687,685	4,545,515	303,909	2,975,437	2,789,745	772,981	24,771,639
2004	226,200	98,995	6,112,746	1,386,138	1,617,561	3,727,105	5,548,167	330,623	2,347,752	2,956,310	4,833,112	29,184,709
2005	381,058	281,114	5,097,821	1,732,581	2,173,638	5,537,432	5,958,454	286,777	4,612,417	1,996,840	2,164,859	30,222,991
2006	323,355	179,181	4,832,355	999,300	2,030,878	6,028,409	7,067,533	260,134	3,868,944	3,694,529	1,759,796	31,044,414
2007	232,328	68,142	5,136,580	1,584,354	1,468,499	7,913,817	3,718,451	99,800	3,504,041	2,392,258	876,707	26,994,977
2008	271,768	73,807	5,763,763	751,507	1,868,335	10,925,408	4,696,090	333,149	2,728,048	2,657,976	525,891	30,595,742
2009	329,064	113,705	4,786,895	1,123,434	835,970	5,004,604	4,238,319	275,410	4,278,145	1,791,058	160,922	22,937,526
2010	104,117	67,409	4,270,401	1,096,369	1,259,008	6,997,089	5,382,743	251,853	2,630,802	481,147	453,844	22,994,782
2011	91,705	370,798	3,504,522	1,257,302	758,623	8,969,762	6,197,026	241,149	2,640,309	1,160,914	2,042,981	27,235,091
2012	57,509	163,804	5,489,928	851,460	815,545	6,540,024	2,376,866	360,106	1,260,490	1,353,351	0	19,269,083
2013	102,437	233,039	4,193,416	3,043,251	2,286,969	8,624,422	4,945,069	253,062	2,203,319	526,306	0	26,411,290
2014	100,213	78,310	4,397,183	2,161,265	1,783,224	7,552,788	4,133,460	107,421	3,251,151	497,152	0	24,062,167
2015	63,878	30,614	2,701,724	798,394	1,262,377	4,620,923	5,145,204	34,808	3,095,910	430,360	0	18,184,192

[^] Commercial quota reallocated to recreational bonus program in CT and NJ; fish harvested under the bonus program are modeled as recreational removals in stock assessment.

Table 6. Commercial Discards, Recreational Releases and Recreational Dead Discards (numbers) of coastal migratory striped bass by state, 1990-2015. Source: MRIP queried June 26, 2016. All harvests based on the calendar year, and may differ from MRIP depending on date queried. Excludes inshore harvest from the A/R.

Year	Commercial Dead Discards	Recreational (B2)	Recreational [^] Dead Discards	Total Dead Discards	%Com	%Rec
1990	510,011	1,653,594	148,823	658,834	77%	23%
1991	327,167	3,061,047	275,494	602,661	54%	46%
1992	186,601	3,367,397	303,066	489,667	38%	62%
1993	347,839	4,344,569	391,011	738,850	47%	53%
1994	359,518	7,930,839	713,776	1,073,293	33%	67%
1995	515,454	9,743,862	876,948	1,392,401	37%	63%
1996	394,824	12,288,668	1,105,980	1,500,804	26%	74%
1997	216,745	15,718,341	1,414,651	1,631,396	13%	87%
1998	326,032	14,928,367	1,343,553	1,669,585	20%	80%
1999	236,619	12,514,721	1,126,325	1,362,944	17%	83%
2000	666,997	16,808,809	1,512,793	2,179,790	31%	69%
2001	310,900	13,444,497	1,210,005	1,520,905	20%	80%
2002	168,201	13,693,056	1,232,375	1,400,577	12%	88%
2003	261,974	14,611,333	1,315,020	1,576,994	17%	83%
2004	465,642	17,053,333	1,534,800	2,000,442	23%	77%
2005	798,544	18,078,899	1,627,101	2,425,645	33%	67%
2006	194,524	23,343,299	2,100,897	2,295,421	8%	92%
2007	606,599	16,110,023	1,449,902	2,056,501	29%	71%
2008	308,715	12,510,987	1,125,989	1,434,704	22%	78%
2009	611,944	7,970,813	717,373	1,329,317	46%	54%
2010	254,841	6,258,081	563,227	818,068	31%	69%
2011	617,457	5,932,480	533,923	1,151,380	54%	46%
2012	792,861	5,191,891	467,270	1,260,131	63%	37%
2013	525,581	8,539,986	768,599	1,294,180	41%	59%
2014	931,391	7,282,547	655,429	1,586,820	59%	41%
2015	299,566	8,397,456	755,771	1,055,337	28%	72%
3 yr avg	585,513	8,073,330	726,600	1,312,112	43%	57%
10 yr avg	514,348	10,153,756	913,838	1,428,186	38%	62%

[^] Dead discards are estimated by multiplying the number of released fish by a mortality rate of 9%.

Table 7. Performance of Addendum IV commercial regulatory measures in 2015. Realized change in harvest compared to predicted harvest. All analysis in numbers of fish. Commercial estimates do not account for post release mortality or poaching. Excludes inshore harvest from the A/R. Estimates may differ from MRIP depending on date queried.

Region	Sector	Reference * Harvest Estimate	2015 Harvest (predicted)	2015 Harvest (realized)	Change in Harvest (predicted)	Change in Harvest (realized)
Chesapeake Bay	Recreational	554,985	432,365	851,118	-22.1%	53.4%
	Commercial	659,963	524,699	500,349	-20.5%	-24.2%
	Subtotal	1,214,948	957,064	1,351,467	-21.2%	11.2%
Coastal	Recreational	2,105,069	1,480,306	1,243,033	-29.7%	-41.0%
	Commercial	182,541	162,992	123,108	-10.7%	-32.6%
	Subtotal	2,287,610	1,643,298	1,366,141	-28.2%	-40.3%
	Total	3,502,558	2,600,362	2,717,608	-25.8%	-22.4%

* Addendum IV implemented regulatory measures to achieve a 20.5% reduction in removals by number from 2012 harvest-levels for Chesapeake Bay fisheries, and a 25% reduction in removals by number from 2013 harvest-levels for the coastal fisheries.

Table 8A-8D. Performance of addendum IV regulatory measures by sector in 2015. Realized change in harvest compared to predicted estimates. All analysis in numbers of fish. Recreational harvest estimates include dead discards. Commercial estimates do not account for dead discards or poaching. Source: annual state compliance reports and MRIP. Excludes inshore harvest from the A/R. Estimates may differ from MRIP depending on date queried.

8A. Atlantic Coastal Commercial Fishery

State	2013 Harvest	2015 Harvest (predicted)	2015 Harvest (realized)	Change in Harvest (predicted)	Change in Harvest (realized)
ME	-	-	-	-	-
NH	-	-	-	-	-
MA	58,547	51,165	42,250	-12.6%	-27.8%
RI	13,825	10,660	11,325	-22.9%	-18.1%
CT*	292	292	122	0.0%	-58.2%
NY	76,206	73,617	44,809	-3.4%	-41.2%
NJ*	404	404	3,301	0.0%	717.7%
DE	17,679	13,409	10,990	-24.2%	-37.8%
MD	7,608	7,380	2,601	-3.0%	-65.8%
VA	7,980	6,065	7,710	-24.0%	-3.4%
NC	0	0	0	0.0%	0.0%
Total	182,541	162,992	123,108	-10.7%	-32.6%

* Commercial sale and harvest prohibited; listed harvest is under recreational bonus program

8B. Chesapeake Bay Commercial Fishery

State	2012 Harvest	2015 Harvest (predicted)	2015 Harvest (realized)	Change in Harvest (predicted)	Change in Harvest (realized)
VA	103,703	82,473	132,040	-20.5%	27.3%
MD	465,644	370,187	298,328	-20.5%	-35.9%
PRFC	90,616	72,040	69,981	-20.5%	-22.8%
Total	659,963	524,699	500,349	-20.5%	-24.2%

8C. Atlantic Coastal Recreational Fishery

State	2013 Harvest	2015 Harvest (predicted)	2015 Harvest (realized)	Change in Harvest (predicted)	Change in Harvest (realized)
ME	61,177	42,212	23,977	-31.0%	-60.8%
NH	25,218	17,401	6,874	-31.0%	-72.7%
MA	451,137	311,285	309,918	-31.0%	-31.3%
RI	292,601	201,895	87,285	-31.0%	-70.2%
CT	213,124	147,055	132,141	-31.0%	-38.0%
NY- coastal	579,935	400,155	311,837	-31.0%	-46.2%
NY- DE River	-	-	-	-	-
NY- Hudson	-	-	-	-	-
NJ	444,658	333,049	361,606	-25.1%	-18.7%
DE	27,034	20,227	7,043	-25.2%	-73.9%
MD- Coastal	9,142	6,308	2,262	-31.0%	-75.3%
VA- Coastal	947	654	89	-31.0%	-90.6%
NC	95	66	0	-31.0%	-100.0%
Total	2,105,069	1,480,306	1,243,033	29.7%	-41.0%

8D. Chesapeake Bay Recreational Fishery

State	2012 Harvest	2015 Harvest (predicted)	2015 Harvest (realized)	Change in Harvest (predicted)	Change in Harvest (realized)
MD	458,906	357,946	654,194	-22.0%	42.6%
MD- Trophy	16,769	12,560	30,496	-25.1%	81.9%
DC	-	-	-	-	-
PRFC	-	-	-	-	-
VA	79,205	61,780	166,130	-22.0%	109.7%
VA- Trophy	105	79	299	-25.0%	184.7%
Total	554,985	432,365	851,118	-22.1%	53.4%

Table 9. Commercial Quotas, Harvests, Overages, and Adjusted Quotas (in pounds) Source of Harvest Data: State Compliance Reports. Excludes inshore harvest from the A/R.

Atlantic Coast						
State	Amd 6 Quota†	Add IV Quota°	2015 Quota	2015 harvest	overage	2016 Quota
Maine*	250	188	188	N/A		188
New Hampshire*	5,750	4,313	4,313	N/A		4,313
Massachusetts	1,159,750	869,813	869,813	865,753		869,813
Rhode Island	243,625	182,719	181,572	188,475	6,903	174,669
Connecticut**	23,750	17,813	17,813	686		17,813
New York	1,061,060	795,795	795,795	509,135		795,795
New Jersey**	321,750	241,313	241,313	21,479		241,313
Delaware	193,447	145,085	145,085	144,068		145,085
Maryland	131,560	98,670	90,727	34,626		90,727
Virginia	184,853	138,640	138,640	138,141		138,640
North Carolina	480,480	360,360	360,360	0		360,360
Coastal Total	3,806,275	2,854,706	2,845,617	1,902,363		2,838,715
Chesapeake Bay						
Jurisdiction	Add IV Quota	2015 Quota	2015 harvest	overage	2016 Quota	
Maryland	1,471,888	1,471,888	1,436,867		1,471,888	
Virginia	1,064,997	1,064,997	967,067		1,064,997	
PRFC	583,362	583,362	536,357		583,362	
Chesapeake Bay Total	3,120,247	3,120,247	2,940,291		3,120,247	
Total Commercial	5,974,953	5,965,864	4,842,654		5,958,962	

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

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

† Beginning in 2003, NY (892,293 lbs) and MD (126,396 lbs) quotas reduced due to conservation equivalency; Beginning in 2007, RI (239,963 lbs) quota reduced due to conservation equivalency.

° Addendum IV quota reduced through conservation equivalency for MD (90,727 lbs) and RI (181,572 lbs)

Table 10. Summary of Atlantic Striped Bass Commercial Regulations in 2015. Source: Annual State Compliance Reports.

STATE	SIZE LIMITS	SEASONAL QUOTA	OPEN SEASON
ME	Commercial fishing prohibited		
NH	Commercial fishing prohibited		
MA	34" TL min size	869,813 lbs. Hook & line only	6.23 until quota reached; 15 fish/day with commercial boat permit; 2 fish/day with rod and reel permit (striped bass endorsement required for both permits)
RI	Floating fish trap: 26" min General category (mostly rod & reel): 34" min.	Total: 181,572 lbs., split 39:61 between trap and general category. Gill netting prohibited.	Trap: 4.1 – 12.31, or until quota reached; unlimited possession limit until quota reached General Category: 6.8-8.31, 9.8-12.31, or until quota reached. Closed Fridays and Saturdays during both seasons. 5 fish/vessel/day possession limit.
CT	Commercial fishing prohibited		
NY	28-38" TL min size Ocean only (Hudson River closed to commercial harvest)	795,795 lb. Pound nets, gill nets (6-8" stretched mesh), hook & line.	6.1 – 12.15, or until quota reached. Limited entry permit only.
NJ	Commercial fishing prohibited		
PA	Commercial fishing prohibited		
DE	Gillnet: 20" TL min in DE Bay/River during spring season. 28" in all other waters/seasons. Hook and Line: 28" min	Gillnet: 137,831 lbs. Hook and line: 14,509 lbs.	Gillnet: 2.15-5.31 (2.15-3.30 for Nanticoke River) & 11.15-12.31; drift nets only 2.15-28 & 5.1-31; no fixed nets in DE River Hook and Line: 4.1–12.31
MD	Bay and Rivers: 18–36" Ocean: 24" minimum	Bay and River: 1,471,888 lbs. (part of Bay-wide quota). Gear specific quotas and landing limits. Ocean: 90,727 lbs.	Bay Pound Net: 6.1-12.31, Mon-Sat Bay Haul Seine: 6.1-11.27, Mon-Fri Bay Hook & Line: 6.1-11.26, Mon-Thu Bay Drift Gill Net: 1.1-3.13, 12.1-12.31 Ocean Drift Gillnet & Trawl: 1.1-4.30, 11.1-12.31, Mon-Fri

(Table 10 continued – Summary of commercial regulations in 2015)

STATE	SIZE LIMITS	SEASONAL QUOTA	OPEN SEASON
PRFC	18" min all year 36" max 2.15–3.25	583,362 lbs (part of Bay-wide quota). Allocated by gear and season.	Hook & line: 2.15-3.25, 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
DC	Commercial fishing prohibited		
VA	Bay and Rivers: 18" min, and 28" max size limit 3.26–6.15 Ocean: 28" min	Bay and Rivers: 1,064,997 lbs Ocean: 138,640 lbs. (ITQ- system for both areas)	Bay and Rivers: 1.16-12.31 Ocean: 1.16-12.31
NC	Ocean: 28"	360,360 lbs. (split between gear types). Number of fish allocated to each permit holder. Allocation varies by permit.	Seine fishery was open for 120 days Gill net fisher was open for 45 days Trawl fishery was open for 70 days

Table 11. Summary of Atlantic Striped Bass Recreational Regulations in 2015. Source: Annual State Compliance Reports.

STATE	SIZE LIMITS	BAG LIMIT	GEAR RESTRICTIONS	OPEN SEASONS
ME	≥ 28" TL minimum size	1 fish/day	Hook & line only	All year, except spawning areas are closed 12.1 – 4.30 and catch and release only 5.1 – 6.30
NH	≥ 28" TL minimum size	1 fish/day	No netting; no gaffing; no culling	All year
MA	≥ 28" TL minimum size	1 fish/day	Hook & line only	All year
RI	≥ 28" TL minimum size	1 fish/day*	None	All year
CT	≥ 28" TL minimum size Connecticut River Bonus Program: 22-28"	1 fish/day (CR Bonus: 1 fish/day)	CR Bonus Quota: 4,025 fish	All year CR Bonus 5.1-6.30 (limited to I-95 bridge to MA border)
NY	Ocean and Delaware River: 28" TL minimum size Hudson River: 18-28" slot limit, or ≥40" TL	1 fish/day	Angling only. Spearing permitted in ocean waters. Catch and release only during closed season.	Ocean: 4.15 – 12.15 Hudson River: 4.1 – 11.30 Delaware River: All year
NJ	1 fish at 28 to < 43", and 1 fish ≥ 43" TL		Striped Bass Bonus program Quota: 241,313 lbs.	Closed 1.1 – 2.28 in all waters except in the Atlantic Ocean, and 4.1 – 5.31 in the lower Delaware River and tributaries (spawning ground closure)
PA	≥ 28" TL minimum size	1 fish/day		All year. From 4.1 – 5.31, a 21-25" slot limit and 2 fish/day bag limit applies
DE	28" min, no harvest 38-43" (inclusive).	2 fish/day	Hook & line, spear (for divers) only. Circle hooks required in spawning season.	All year except 4.1-5.31 in spawning grounds (catch & release allowed). In Del. River, Bay & tributaries, may only harvest 20-25" slot from 7.1-8.31

*regulation went into effect on April 6, 2015.

(Table 11 continued – Summary of recreational regulations in 2015)

STATE	SIZE LIMITS	BAG LIMIT	OTHER	OPEN SEASON
MD	Ocean: 28" min Bay Trophy: 28 to ≤36" slot, OR ≥40" Bay Summer/Fall: (2) 20- 28" slot OR (1) 20-28" slot, (1) > 28" minimum size	Ocean: 1 fish/day Bay Trophy: 1 fish/day Bay Summer/Fall: 2 fish/day	See compliance report for specifics.	Ocean: All year SF: 1.1-5.3 Bay Trophy: 4.18-5.15 Bay Summer/Fall: 5.16-12.15
PRFC	Trophy: 28-36" TL slot limit or > 40" TL Summer/Fall: 20" min with 1 fish > 28" TL	Trophy: 1 fish Summer/Fall: 2 fish	No more than two hooks or sets of hooks for each rod or line	Trophy: 4.18 -5.15 Summer/Fall: 5.16-12.31
DC	≥ 20", only one fish >28"	2 fish	Hook & line only	5.16-12.31
VA	Ocean: 28" Bay/Coastal Trophy: 36" min (28" max in tribs) CB Spring: 20-28"; only 1 fish can be >36" CB Spring: 20-28"; only 1 fish can be >28"	Ocean: 2 fish/day Bay/Coast Trophy: 1 fish/day Bay Spring/Fall: 2 fish/day	Hook & line, rod & reel, hand line only. Gaffing is illegal in Virginia marine waters.	Ocean: 1.1-3.31, 5.16-12.31 Bay/Tribs Trophy: 5.1-6.15 Coastal Trophy: 5.1-5.15 Bay Spring: 5.16-6.15 Bay Fall: 10.4-12.31
NC	Ocean: 28" min size	Ocean: 1 fish/day	No gaffing allowed.	Ocean: All year

Table 12. Status of commercial Tagging Programs by state for 2015. Quotas are presented in pounds.

State	# of Participants	# of Tags Issued	# of Tags Used	Point of Tag	¹ Biological Metric	Year, State and Unique ID on Tag	Size Limit on Tag	Number of Tag Colors	Annual Tag Color Change
MA [^]	115	70,980	42,250	Sale	Yes	Yes	Yes	one	Yes
RI	31	14,991	11,325	Sale	Yes	Yes	No	two by gear	Yes
NY	451	72,428	44,809	Harvest	Yes	Yes	No	one	Yes
DE	111	33,000	21,980	Both	Yes	Yes	No	Harvest: two by gear Sale: one	Yes
MD	677	473,790	342,921	Harvest	Yes	Yes	No	Three by gear/permit	Yes
PRFC	340	77,222	68,715	Harvest	Yes	Yes	No	Five by season/gear	No
VA	436	153,500	139,750	Harvest	Yes	Yes	Yes	two by area	Yes
NC*	45	34,843	34,843	Sale	Yes	Yes	Yes	Three by area	No

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

[^] MA was granted an extension through Addendum III and mandated to implement a commercial tagging program prior to start of the 2014 fishing year.

* NC harvest from inshore A/R.

Table 13. Status of compliance with monitoring and reporting requirements in 2015

(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)

Jurisdiction	Fishery-independent monitoring		Fishery-dependent monitoring		Annual reporting
	Requirement(s)	Status	Requirement(s)	Status	Status
ME	JAI	Y	x	na	Y
NH	x	na	x	na	Y
MA	tag	Y	composition, catch & effort (C&R), tag program	Y	Y
RI	x	na	composition (C&R), catch & effort (R), tag program	Y	Y
CT	x	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	x	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	x	na	composition, catch & effort (C&R), tag program	Y	Y
DC	x	na	x	na	Y
VA	JAI, SSB, tag	Y	composition, catch & effort (C&R), tag program	Y	Y
NC	JAI, SSB, tag	Y	composition (C), tag program	Y	Y

XII. Figures

Figures 1 – 7 present striped bass harvest, biomass, and fishing mortality estimates from 1982-2015 when possible.

Figure 1. Coastal migratory Atlantic striped bass spawning stock biomass (SSB) and recruitment estimates, and biological reference points, 1982-2014. Source: 2015 Striped Bass Stock Assessment Update.

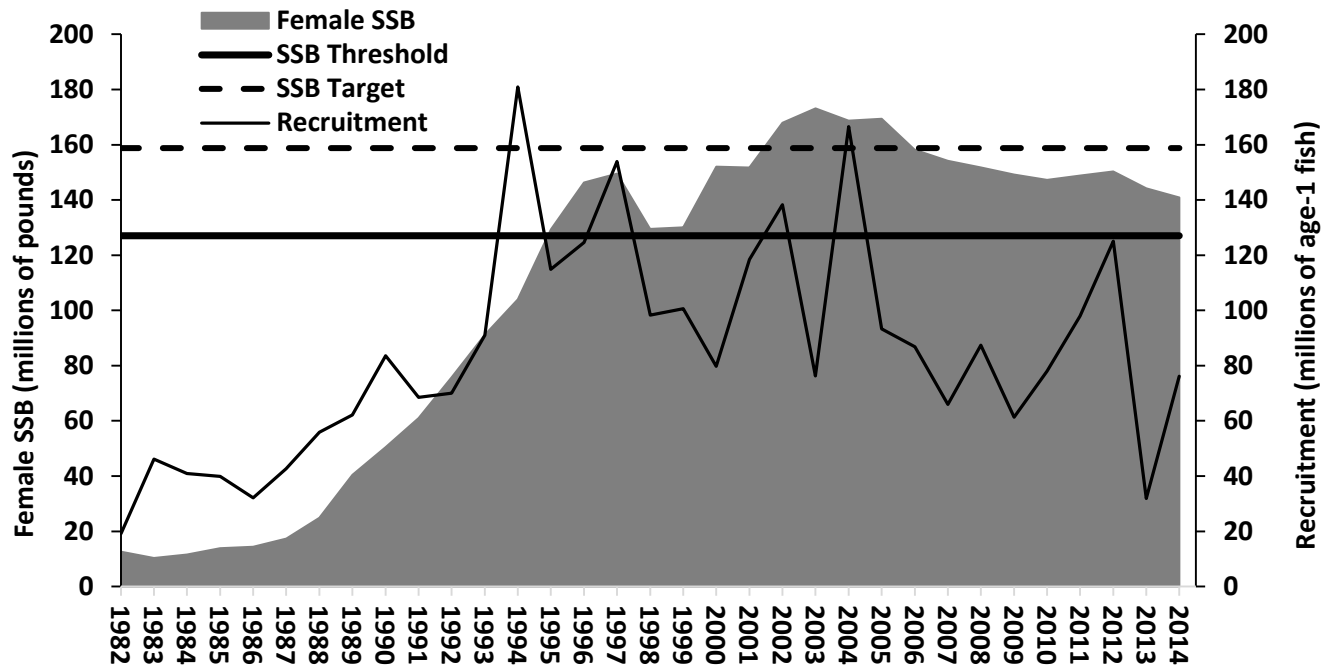


Figure 2. Coastal migratory Atlantic striped bass fishing mortality (F) estimates, and biological reference points, 1983-2014. Source: 2015 Striped Bass Stock Assessment Update

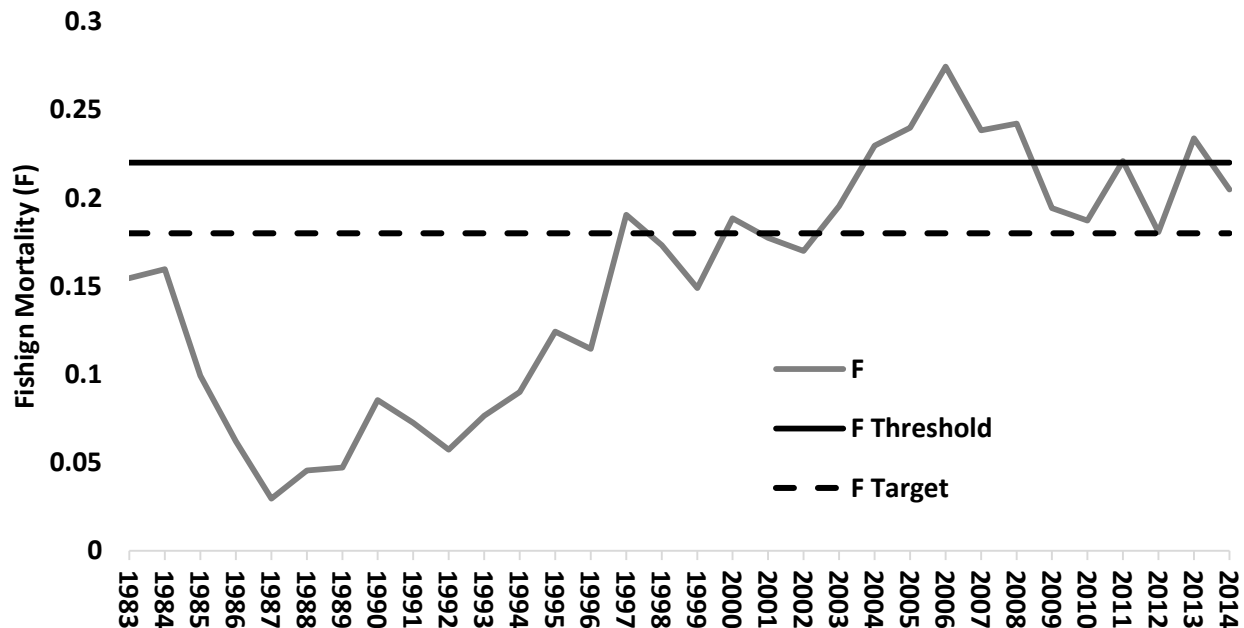


Figure 3. Albemarle/Roanoke striped bass female spawning stock biomass and recruitment (abundance of age-1), and biological reference points, 1982-2012. Source: Stock Status of Albemarle Sound-Roanoke River Striped Bass, 2014.

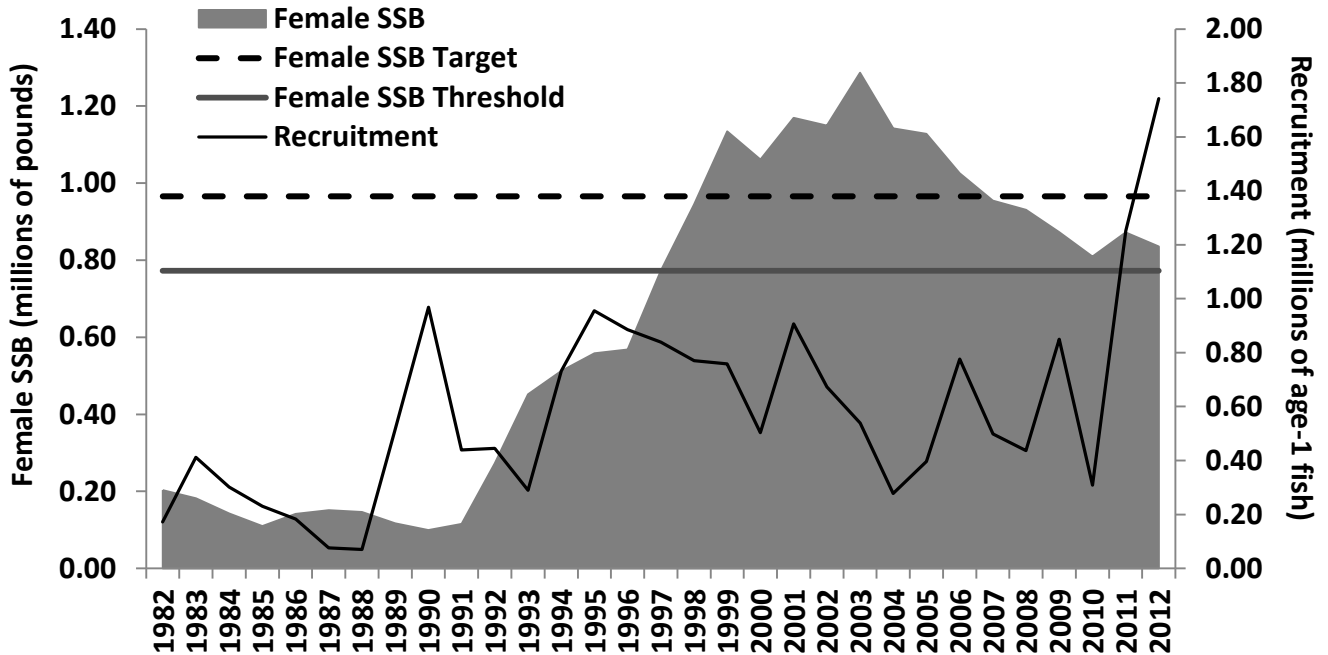


Figure 4. Albemarle/Roanoke striped bass fishing mortality (F) estimates, and biological reference points, 1982-2012. Source: Stock Status of Albemarle Sound-Roanoke River Striped Bass, 2014.

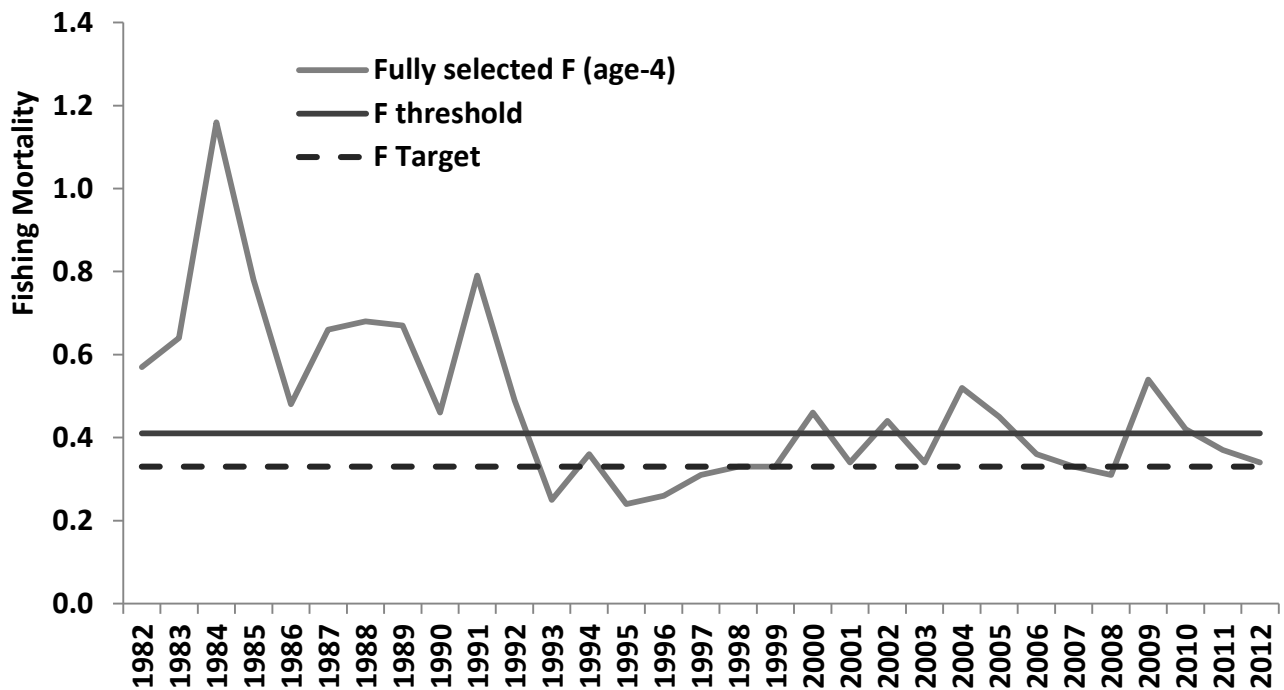


Figure 5. Total removals in millions of fish by sector, 1982-2015. Source: MRIP and annual state compliance reports. Excludes A/R inshore harvest. Estimates may differ from MRIP depending on date queried.

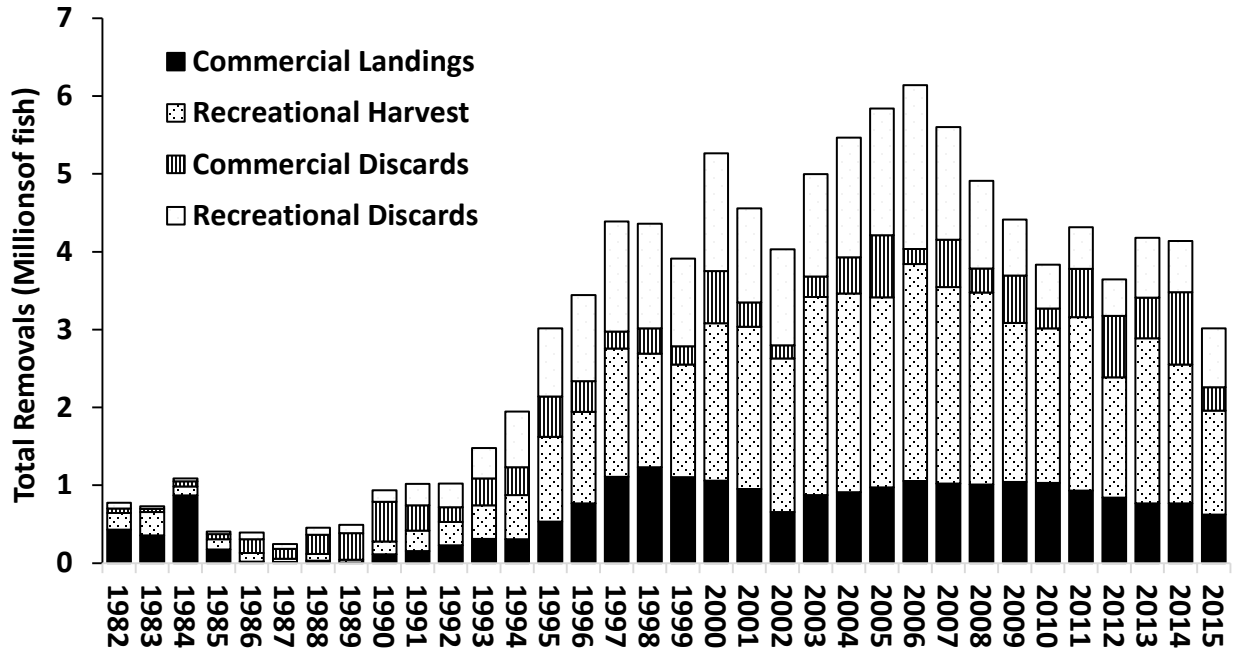


Figure 6. Commercial landings, in pounds, of migratory Striped Bass, by state, 1990-2015. Source: annual state compliance reports. All landings based on the calendar year. Excludes A/R inshore harvest. Commercial harvest and sale prohibited in ME, NH, CT, and NJ. Commercial quota reallocated to recreational bonus program in CT and NJ.

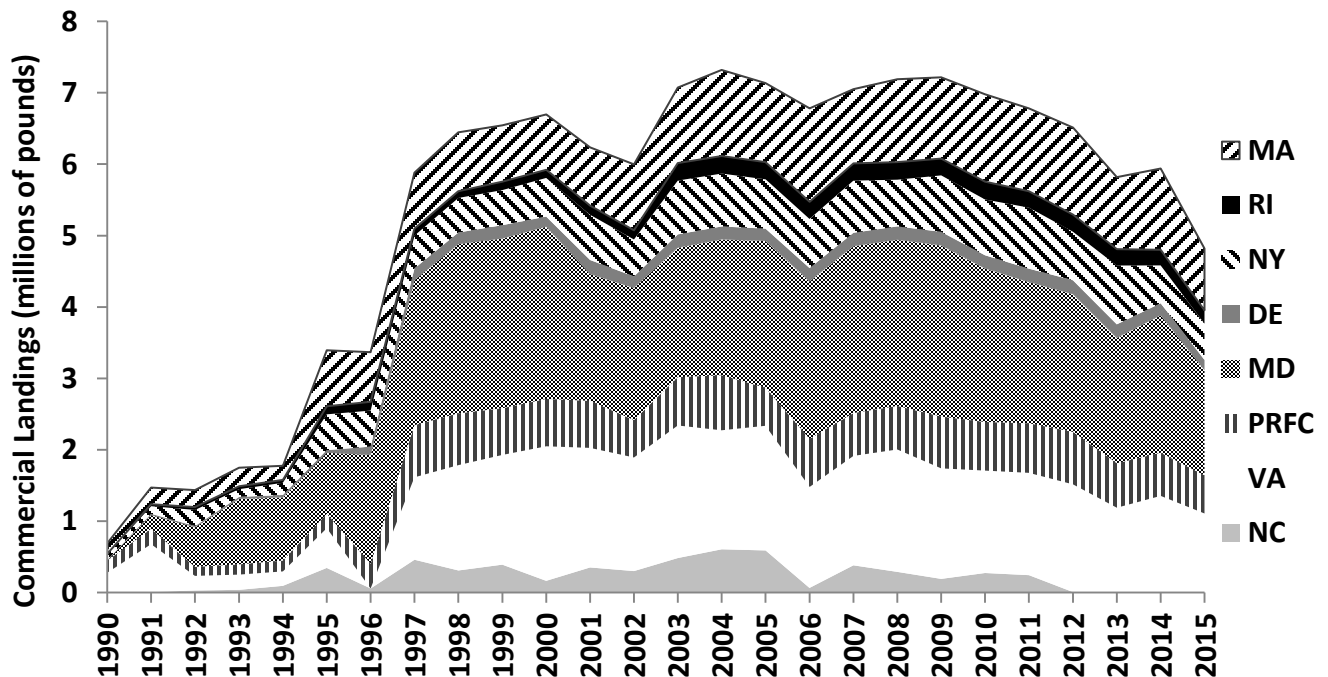
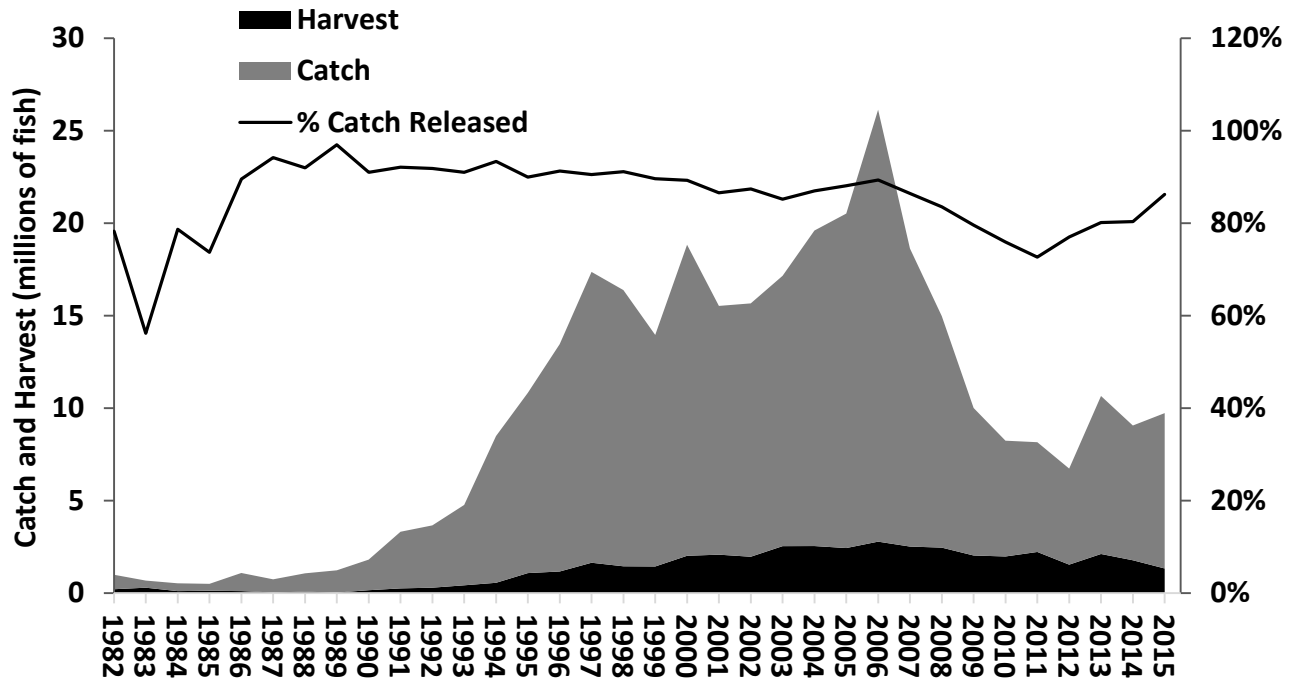


Figure 7. Recreational catch (A + B1 + B2), harvest (A + B1) and the proportion of fish released, 1982-2015. Source: Marine Recreational Information Program (MRIP) queried June 26, 2016. Estimates may differ from MRIP depending on date queried.



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Figure 8. Juvenile abundance indices from Maine, New York, Jew Jersey, Maryland, Virginia, and North Carolina. Source: Annual State Compliance Reports. Q1 = first quartile, which is the value that is below 75% of all values in a specified time series.

