*Atlantic States Marine Fisheries Commission*

# DRAFT ADDENDUM IV TO AMENDMENT 6 TO THE ATLANTIC STRIPED BASS INTERSTATE FISHERY MANAGEMENT PLAN FOR PUBLIC COMMENT

***ASMFC Vision Statement:***
***Sustainably Managing Atlantic Coastal Fisheries***

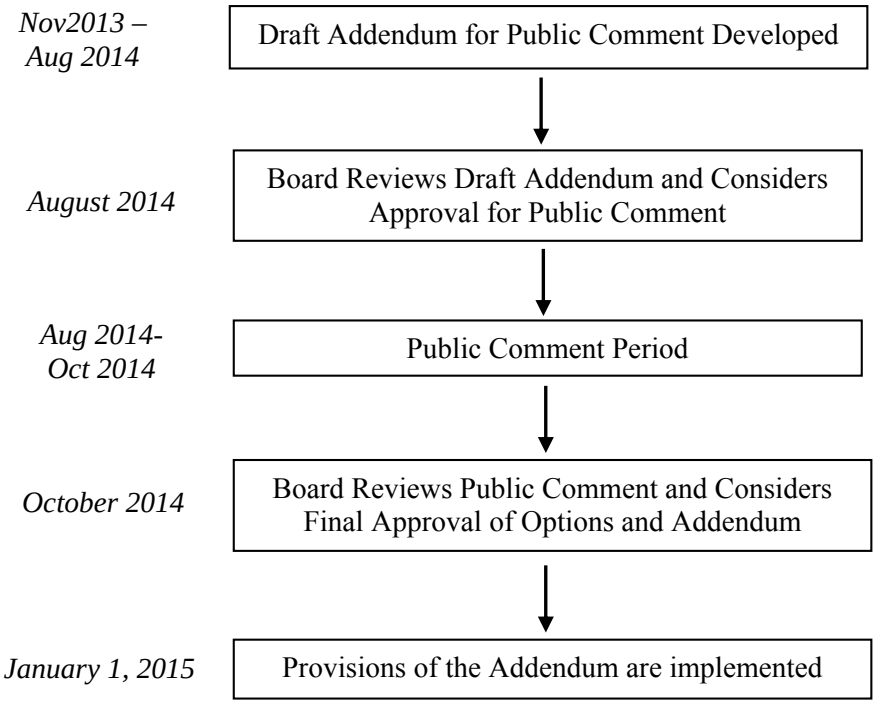
## Public Comment Process and Proposed Timeline

In October 2013, the Atlantic Striped Bass Management Board initiated an addendum to the Amendment 6 to the Interstate Fishery Management Plan for Atlantic Striped Bass to consider new biological reference points and management options to reduce fishing mortality to a level that is at or below the new target reference point. This draft addendum presents background on the Atlantic States Marine Fisheries Commission's management of striped bass, the addendum process and timeline, a statement of the problem, and proposed management options.

The public is encouraged to submit comments regarding this document at any time during the addendum process. The final date comments will be accepted is 5pm on September 30, 2014. Comments may be submitted by mail, email, or fax. If you have any questions or would like to submit comment, please use the contact information below.


Mail: Mike Waine, Fishery Management Plan Coordinator
Atlantic States Marine Fisheries Commission
1050 North Highland Street Suite 200A-N
Arlington, VA 22201

Email: mwaine@asmfc.org
(Subject: Draft Addendum IV)
Phone: (703) 842-0740
Fax: (703) 842-0741

## 1.0 Introduction

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

At its October 2013 meeting, the Atlantic Striped Bass Management Board (Board) approved the following two motions:

*Move to develop an addendum to adopt the new biological reference points for the coastal fishery as determined by the 2013 benchmark assessment, as well as biological reference points (fishing mortality) for the Chesapeake Bay and Albemarle/Roanoke stocks.*

*Move to initiate an addendum to develop a range of management measures that reduces fishing mortality to at least the fishing mortality target with implementation in January 2015.*

At its February 2014 meeting, the Board combined the two addenda into one document. As a result, Draft Addendum IV proposes changes to the biological reference points and management options to reduce fishing mortality to a level that is at or below the target within one year (implementation in January 2015).

At its May 2014 meeting, the Board continued the development of Draft Addendum IV by adding consideration of a three year timeframe to reduce F to a level at or below the target as well as management options associated with the three year timeframe. The intent of adding the three year timeframe was to reduce potential social and economic impacts by spreading out the harvest reductions over time while maintaining a January 2015 implementation date.

## 2.0 Overview

### 2.1 Statement of the Problem

The 2013 benchmark stock assessment approved by the Board for management use recommended changes to the fishing mortality (F) reference points to be consistent with the spawning stock biomass (SSB) reference points. An addendum to the FMP is required to implement new reference points for management use. Results of the benchmark stock assessment also showed F in the terminal year (2012) was above the new proposed F target, and SSB has been steadily declining below the target since 2006 (Figures 2 and 3). This indicates that even though the stock is not overfished and overfishing is not occurring, SSB is approaching its overfished threshold and stock projections show SSB will likely fall below the threshold in the coming years. In addition, a similar downtrend has been observed in total harvest with approximately a 19% decrease since 2008. In response to these concerns, this draft addendum proposes management options that reduce F to a level at or below the target within a one or three year timeframe. The range of options included in this document broadly address several management objectives including conservation of the strong 2011 year class and conservation of large spawning fish (SSB) to enhance the long term sustainably of the striped bass resource and the fisheries that it supports.

## 2.2 Background

### 2.2.1 Biological Reference Points for Striped Bass

Biological reference points are used in fisheries management as a measure of stock status and as a reference to evaluate management plan effectiveness. There are two biological reference points used in striped bass management. The first is based on F, with a threshold value set at maximum sustainable yield (MSY). Managing a population at MSY allows the largest average catch to be taken from a stock without negatively impacting the ability of the stock to replace itself. The second reference point is based on SSB, with a threshold value equal to the SSB value in 1995; the year that the striped bass stock was declared rebuilt. These threshold levels are used to determine when the stock is experiencing overfishing or is overfished, respectively. Target levels for F and SSB provide additional performance metrics. The current F target provides a buffer to account for the uncertainty in the estimate of Fmsy threshold, while the SSB target corresponds to 125% of the SSB threshold.

The 1995 SSB level has proven to be a useful reference point for striped bass; however, even though $SSB_{1995}$ is a proxy for $SSB_{msy}$ they are not the same. In other words, fishing at $F_{msy}$ does not maintain SSB at the 1995 level. Furthermore, F has always been maintained below current F target, yet SSB continues to decline towards its threshold (Figure 2). To address this issue, the 2013 benchmark stock assessment recommended new F reference points that would maintain SSB at or above its 1995 level. The new method resulted in a fishing mortality threshold of 0.22, corresponding to the SSB threshold of 127 million pounds (57,626 mt), as well as a fishing mortality target of 0.18, corresponding to the SSB target of 159 million pounds (72,032 mt). These SSB target and threshold levels are still based on the SSB value in 1995, as estimated by the 2013 benchmark stock assessment.

This draft addendum proposes to codify the F reference points contained in the 2013 benchmark stock assessment (ASMFC 2013).

### 2.2.2 Chesapeake Bay and Albemarle Sound/Roanoke River Management Areas

Separate F reference points for the Chesapeake Bay and Albemarle Sound/Roanoke River were established through conservation equivalency in Amendment 5 to compensate for the smaller minimum size limit granted to both of these management areas. Establishing a lower F target was intended to enable these management areas to harvest smaller fish without increasing the effects of harvest on the spawning stock.

To ensure the F in the Chesapeake Bay does not exceed the target, the Bay uses a harvest control model to set an annual Baywide quota. This quota is for both recreational and commercial fisheries for the Bay portions of Maryland, Virginia and the Potomac River Fisheries Commission. Use of the harvest control model enables flexibility that allows for the annual Baywide quota to increase or decrease as the exploitable stock biomass increases or decreases. Although the Chesapeake Bay stock has a different management program, it is still a major contributor to the coastal migratory stock and is therefore included in the coastwide assessment and not assessed as an independent stock.

The Albemarle Sound/ Roanoke River (A/R) stock differs in that it contributes minimally to the coastal migratory stock. Additionally the A/R stock is smaller in total abundance relative to the other producer areas and does not participate in the coastal migration until older ages. The female maturation schedule for the A/R stock is also different than the Chesapeake Bay stock (ASMFC 2013; NCDMF 2014). As a result, the A/R stock is not included in the coastwide assessment and is instead assessed independently by the State of North Carolina. This enables the development of A/R stock specific reference points for both F and SSB.

Since new reference points for the coastal migratory stock are being considered from the 2013 benchmark stock assessment, the Board requested options to consider adjusting the Chesapeake Bay and Albemarle Sound/Roanoke River management areas as well.

### 2.2.3 Ecosystem Considerations

When fishery management changes are being contemplated, food web relationships should be considered. The implementation of Amendment 6 in 2004 has maintained a fishing mortality rate below the $F_{target}$ of 0.3. The success of Amendment 6 allowed the striped bass stock to expand beyond the spawning stock biomass target during this time period. However, the 2013 benchmark stock assessment indicates that spawning stock biomass levels have decreased significantly in recent years. The impacts of biomass levels of predator species on prey species should be considered as the Commission moves toward ecosystem management. Striped bass are predators of other Commission managed species, including weakfish and shad and river herring. As the striped bass population grows the demand on prey species also increases. The increased demand on prey species may have impacts on those species undergoing rebuilding plans (Hartman, K.J. 2003). The current addendum's goal of reducing fishing mortality to target levels may impact predation on other ASMFC-managed species.

## 2.3 Description of the Fishery

Striped bass have formed the basis of one of the most important fisheries on the Atlantic coast for centuries. However, overfishing and poor environmental conditions led to the collapse of the fishery in the 1980s and a moratorium on harvest from 1985 to 1989. Through the hardship and dedication of both commercial and recreational fishers, the stock was rebuilt and continues to support fishing opportunities along the Atlantic coast.

### 2.3.1. Commercial Fishery Status

Total and state-specific commercial harvests of striped bass have varied little from year-to-year because of a quota management system that was continued through Amendment 6 in 2004 (refer to Appendix 1 for jurisdiction specific regulations). The total coastal commercial harvest from 2003 to 2013 ranged between 2.53 and 3.15 million pounds (Table 1) and averaged 2.87 million pounds. Massachusetts and New York land on average 65% of the total coastal quota. The average commercial harvest since 2003 (2.87 million pounds) is approximately a 19% underage from the allocated coastal quota in Amendment 6 after accounting for conservation equivalency programs. The coastal quota underage is mainly attributed to game fish status in several states. Additionally, in recent years migratory striped bass have not been available to the ocean fishery in North Carolina, resulting in minimal harvest.

Commercial harvest in the Chesapeake Bay from 2003 to 2013 ranged between 3.29 and 4.40 million pounds and averaged 4.06 million pounds (Table 2). Chesapeake Bay commercial harvest has continued to decline since 2009 because the Bay's quota management program is adjusted based on changes in exploitable stock biomass. The Chesapeake Bay quota has historically been split among the three Bay jurisdictions based on their percent contribution to the 1994 catch as follows, Maryland = 52.359%, Potomac River Fisheries Commission = 15.226%, and Virginia = 32.414%.

Within the Albemarle Sound/Roanoke River management areas, commercial harvest (Albemarle Sound only) from 2003 to 2013 ranged from 68,214 to 273,636 pounds and averaged 165,504 pounds (Table 2).

In total, the commercial fishery harvested an estimated 5.82 million pounds in 2013, which is lower than the harvest in 2012 (6.51 million pounds) and also lower than the 2003-2012 average harvest of 7.05 million pounds (Figure 1).

### 2.3.2 Recreational Fishery Status

The recreational fishery is currently managed with bag and size limits (refer to Appendix 1 for jurisdiction specific regulations). From 2003 to 2013, total coastal recreational harvest has ranged from a high of 31 million pounds in 2006 to a low of 19.2 million pounds in 2012 with an average of 26.4 million pounds (Figure 1; Table 4). Landings from New York (25%), Massachusetts (19%), New Jersey (19%), and Maryland (11%) have comprised approximately 74% of annual recreational landings since 2003. The number of fish released alive increased annually after the passage of Amendment 6 to a high of 23.3 million fish in 2006. Since then, the number of fish released alive has decreased by 77% to a low of 5.2 million fish in 2012. Reasons for the decline may be attributed to a reduction in stock size from the peak in 2003, a decreased availability of fish staying in nearshore areas, and changes in angler behavior in response to socioeconomic factors.

Recreational harvest in the Chesapeake Bay, between 2003 and 2013, has ranged from a high of 5.5 million pounds in 2005 to a low of 2.4 million pounds in 2012 with an average of 3.90 million pounds. The Albemarle Sound/Roanoke River (A/R) recreational quota is set at 275,000 pounds and is divided between the two management areas equally. The average combined harvest in the Albemarle Sound/Roanoke River from 2003 through 2013 was 111,598 pounds, less than half the allowable quota (Table 3).

### 2.3.3 Management History

Since Amendment 4, the foundation of the striped bass management program has been to maintain harvest below a target F. Amendment 6 modified the F targets and thresholds, and also introduced a new set of biological reference points based on female SSB. On a regular basis, SSB and F are estimated and compared to target and threshold levels. These reference points, as well as new management triggers, have enabled the Board to be more responsive to changes in the stock.

Amendment 6 also phased in new regulations for both the commercial and recreational fisheries. In 2004, the coastal commercial quotas for striped bass were restored to the states' historical

average landings during the 1972-1979 base period, a 43 percent increase from the 2002 coastal commercial quotas. 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 and Albemarle Sound/Roanoke River management areas and states with approved conservation equivalency proposals. Addendum III (August 2012) outlined measures to address illegal harvest of striped bass. States and jurisdictions are required to implement a tagging program for all commercially harvested striped bass within state or jurisdictional waters to better track harvest and minimize poaching.

The Exclusive Economic Zone (EEZ; 3-200 miles) has been closed to the harvest, possession and targeting of striped bass since 1990, with the exception of a defined route to and from Block Island in Rhode Island. A recommendation was made in Amendment 6 to re-open federal waters to commercial and recreational fisheries. However, NOAA Fisheries concluded opening the EEZ to striped bass fishing was not warranted at that time.

## 2.4 Status of the Stock

In 2012, the Atlantic striped bass stock was not overfished or experiencing overfishing relative to the new reference points defined in the 2013 benchmark assessment. Female SSB was estimated at 128 million pounds (58,200 mt) just above the SSB threshold of 127 million pounds (57,626 mt), and below the SSB target of 159 million pounds (72,032 mt; Figure 2). Total fishing mortality was estimated at 0.20, below the fishing mortality threshold of 0.22 but above the fishing mortality target of 0.18 (Figure 3).

*Recruitment*
Striped bass experienced several years of strong recruitment of age-1 fish entering the population from 1993-2004, followed by a period of lower recruitment from 2005-2010 (although not as low as the early 1980s, when the stock was overfished). Since the stock was declared recovered in 1995 the recruitment failure trigger (any state's juvenile abundance index value below 75% of all other values in their dataset for three years in a row) has not been met. The 2011 year-class (age-1 fish in 2012) was strong (i.e., abundant; Figure 2); however, overall the 2012 year-class (age-1 fish in 2013) was weak (i.e., low abundance). The 2013 juvenile abundance index was above average for Maine and Virginia, below average for New Jersey and Maryland, and below the 75% quartile for New York and North Carolina.

## 2.5 Proposed Fishing Mortality Reference Points
*Adopted options (other than status quo) would replace Amendment 6, Section 2.5.1.*

Fishing mortality based reference points are designed to manage the rate at which individual striped bass die because of fishing. If the current F exceeds the F threshold, then overfishing is occurring. This means the rate at which striped bass are dying because of fishing (i.e., harvest and dead discards) exceeds the stock's ability to maintain itself at SSB threshold. The value of the F target is set at a cautionary level intended to safeguard the fishery from reaching the overfishing threshold. The F target and threshold may change through updated stock assessments because these reference point values are estimated based on the best available data.

This section considers F reference points for the (1) coastwide population (which includes the Chesapeake Bay, Hudson River and Delaware River/Bay as a metapopulation) (2) Chesapeake

Bay Stock, and (3) Albemarle Sound/Roanoke River Stock. Separate F targets for the Chesapeake Bay and Albemarle Sound/Roanoke River were established in Amendment 5 to compensate for the smaller minimum size limit granted to both of these management areas.

### 2.5.1 Coastwide Population Reference Point Options

This section proposes to adjust the F target and threshold, based on reference points developed in the 2013 benchmark stock assessment that were approved by the 57th Northeast Regional Stock Assessment Review Committee (SARC 57) and accepted by the Board in October 2013 for management use.

**Option A:** Status Quo, 2011 Stock Assessment Update F Reference Points
The fishing mortality reference points remain unchanged and are based on maximum sustainable yield as estimated in the 2011 stock assessment update:

| Reference Point | Definition | Value (as estimated in 2011 stock assessment update) |
|---|---|---|
| Fthreshold | Fmsy | 0.34 |
| Ftarget | TC recommended value more conservative than Fmsy | 0.30 |

**Option B:** 2013 Benchmark Stock Assessment F Reference Points
The fishing mortality reference points will be adjusted to be internally consistent with the SSB target and threshold, consistent with the recommendations in the 2013 benchmark assessment:

| Reference Point | Definition | Value (as estimated in 2013 benchmark stock assessment)* |
|---|---|---|
| Fthreshold | F associated with achieving the SSB threshold | 0.22 |
| Ftarget | F associated with achieving the SSB target | 0.18 |

* The F target and threshold values may change through updated stock assessments because they are estimated based on the best available data.

### 2.5.2 Chesapeake Bay Stock Reference Point Options

This section proposes to adjust F reference points for the Chesapeake Bay management area.

**Option A:** Status Quo
F target is 0.27 as established in Amendment 6. This option is linked to Option A; status quo in section 2.5.1.

**Option B:** Use coastwide population F reference points as established in section 2.5.1.
Due to data and model limitations, the Technical Committee cannot reach consensus on separate reference points for the Chesapeake Bay management area at this time (see TC memorandum; Appendix 2). Previously, the intent of establishing a lower F target in the Chesapeake Bay was to account for the impacts of harvesting a smaller sized fish (i.e., 18 inch minimum) in the Chesapeake Bay. The new coastwide reference points coming from the 2013 benchmark stock assessment (and considered in section 2.5.1) include the effects of the Chesapeake Bay's harvest

of smaller fish on the coastwide SSB, but do not incorporate data on the sex ratio that exists in the Bay. Therefore, the coastwide population reference points represent the best available scientific advice to manage total fishing mortality on both the coastwide population and the Chesapeake Bay stock component because the Technical Committee is unable to calculate Chesapeake Bay stock specific reference points at this time.

At its August 2014 meeting, the Board tasked the TC with the continued development of stock-specific reference points for the Chesapeake Bay to be considered for future management use.

### 2.5.3 Albemarle Sound/Roanoke River Stock Reference Point Options

This section proposes to adjust reference points for the Albemarle Sound/Roanoke River management areas.

**Option A:** Status Quo
F target is 0.27 as established in Amendment 6.

**Option B:** The State of North Carolina will manage the Albemarle Sound/Roanoke River (A/R) stock using reference points from the latest North Carolina A/R stock assessment accepted by the Striped Bass Technical Committee and approved for management use by the Board. If this option is selected, the recreational and commercial fisheries in the Albemarle Sound and Roanoke River will operate under North Carolina's Fishery Management Plan while the recreational and commercial fisheries in the Atlantic Ocean will continue to operate under the same management measures as the rest of the coastal fisheries.

### 2.5.4 Reference Point Evaluation

Section 4.1 of Amendment 6 contains management triggers to prevent overfishing the Atlantic striped bass resource and ensure the objectives of Amendment 6 are achieved. The management triggers will be evaluated using recent estimates of F and SSB coming from an updated or benchmark stock assessment.

## 2.6 Timeline to Reduce F to the Target

At its May 2014 meeting, the Board approved the following motion:

*Move to include in Draft Addendum IV a modification of Management Trigger 3 under Section 4.1 in Amendment 6 to require the Board to adjust fishing mortality to a level that is at or below the target within three years.*

Management Trigger 3 as currently written in Amendment 6 is as follows:
*If the Management Board determines that the fishing mortality target is exceeded in two consecutive years and the female spawning stock biomass falls below the target within either of those years, the Management Board must adjust the striped bass management program to reduce the fishing mortality rate to a level that is at or below the target within one year.*

The intent of replacing the trigger's one year timeframe with a three year timeframe was to provide management flexibility to reduce potential social and economic impacts by spreading out required harvest reductions over time.

**Option A:** Status quo: One year time frame
Management Trigger 3 requires reducing F to a level at or below the target within one year.

*If the Board selects Option A, then the three year timeframe management scenarios presented in section 3.0 are not consistent with reducing F to a level that is at or below the target in one year and would not be viable management options.*

**Option B:** Three year time frame.
Management Trigger 3 will be revised to require reducing F to a level at or below the target within three years instead of within one year.

*If the Board selects Option B, the Board may choose management measures from either the one year or three year timeframe options in Section 3.*

## 3.0 Proposed Management Program

The coastal area can be defined as the entire management unit (i.e., all coastal and estuarine areas of all states and jurisdictions from Maine through North Carolina) excluding the Chesapeake Bay and Albemarle Sound/Roanoke River management areas. It should be noted that the current management regime permits the implementation of, Board approved, alternative regulations that are conservation equivalents to regulations approved in this document (see Section 4.6 of Amendment 6 for process). Several states currently implement conservation equivalency programs in order to have management measures to meet the needs of their state's fishery (see Appendix 1). If the Board approves changes to the current striped bass management program through this document, all states would need to re-submit conservation equivalency programs for Board approval. Additionally, states may voluntarily implement management programs that are more conservative than those required herein.

### Projecting Harvest Reductions to Achieve F Target

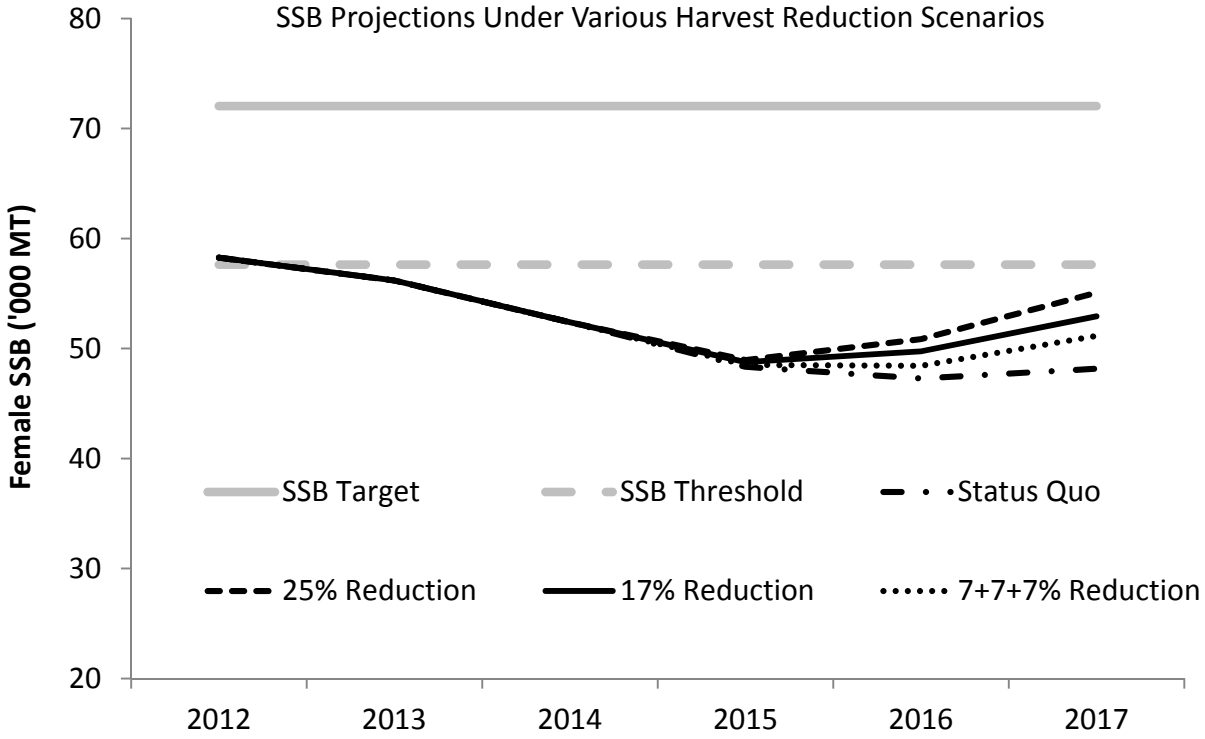
Stock projections were used to forecast future stock conditions and estimate the harvest level needed to reduce F to the proposed target over a one or three year timeframe. The Technical Committee used a forward projecting methodology to identify the percent reduction from 2013 harvest levels necessary to achieve the proposed F target over a one or three year timeframe. Projection results indicate:

- If total harvest is reduced by 25% starting in the 2015 fishing year, there is a 50% probability[1] F will be at or below its target level within one year.
- If total harvest is reduced by 17% starting in the 2015 fishing year, there is a 50% probability F will be at or below its target level within three years.

[1] A 50% probability was the minimum recommended by the TC - a higher probability of being at or below the target would require more restrictive management measures that achieve a higher reduction than the projections estimate is needed.

- If total harvest is reduced by 7% each year for three consecutive years starting in 2015 to achieve an approximate 20% reduction[2], there is a 50% probability F will be at or below its target level within three years.
- To contrast these options, if total harvest remains unchanged (status quo), there is less than a 1% probability that F will be at or below its target in one or three years.

It is important to note in all of the harvest scenarios, the probability of the stock being overfished (SSB less than the SSB threshold) is high and increases until 2015-2016. This means despite any reduction in harvest through these proposed scenarios, SSB will continue to decline reaching a low point in 2015-2016 before it begins an upward trajectory towards SSB target (see SSB projection figure below). This trend is driven by the lack of strong year classes currently in the fishery, and the emergence of the strong 2011 year class that matures into the spawning stock in 2016-2017.




**Proposed Management Scenarios**

*The following section outlines four management scenarios (including status quo) that are designed to reduce F to a level that is at or below its target within a one or three year timeframe. These scenarios, which are all mutually exclusive, include (A) status quo; (B) a 25% harvest reduction from 2013 levels to take place in 2015 to achieve F target in one year; (C) a 17% harvest reduction from 2013 levels to take place in 2015 to achieve F target over three years; and (D) a 20% reduction from 2013 levels taken incrementally through a 7% reduction in*

[2] A 7% reduction for three consecutive years is equivalent to an approximate 20% reduction over the three year period. For example: In the first year harvest (100 pounds for this example) is reduced by 7% (100 lb - 7% = 93lb). In the second year, harvest is reduced by another 7% (93lb - 7% = 86.5 lb). In the last year, harvest is reduced by a final 7% (86.5 lb - 7% = 80.4 lbs). So harvest in the last year is 80.4lb and harvest in the first year was 100 lb which means the overall reduction is 19.6% or approximately 20% from the first year.

*harvest for each of the three consecutive years starting in 2015 to achieve F target over three years.*

*As a note for all fishery management quota options: Quotas are allocated on a fishing year basis. In the event that a jurisdiction exceeds its allocation, the amount in excess of its annual quota will be deducted from the state's allowable quota in the following year.*

*States with approved conservation equivalency would need to update their proposals if a new quota allocation is chosen. The requirements of Addendum III to Amendment 6 would remain unchanged if the quota allocations are adjusted.*

***When providing input on this document, please first identify your preferred management scenario (Option A, B, C, or D) and then select your preferred management measures within that scenario. With the exception of the status quo option, there will be management options for each fishery and management area combination (recreational measures for the coastal and Chesapeake Bay fisheries and commercial measures for the coastal and Chesapeake Bay fisheries).***

*Adopted options (besides status quo) would replace the corresponding sections in Amendment 6.*

---

**Option A**: Status Quo
*The status quo option does not meet the projection harvest reductions needed from 2013 levels to reduce F to a level that is at or below its proposed target.*

**Recreational Fishery Management**
All jurisdictions will be constrained by a two fish bag limit and 28 inch minimum size limit, except for the Chesapeake Bay and Albemarle Sound/Roanoke River management areas that are constrained by an 18 inch minimum size limit and a bag limit that maintains target fishing mortality of 0.27. This option is estimated to achieve a 0% reduction from 2013 recreational harvest.

**Commercial Fishery Management**

Coastal Commercial Fishery
Each state will be allocated 100% of the base period (1972-1979) average coastal commercial landings (Section 4.3.2 of Amendment 6). This option is estimated to achieve a 0% reduction from the total 2013 commercial harvest.

| | Status Quo | For Reference |
|---|---|---|
| **State** | **Am6 Quota (lbs)** | **2013 Harvest (lbs)** |
| Maine | 250* | 0 |
| New Hampshire | 5,750* | 0 |
| Massachusetts | 1,159,750 | 1,002,519 |
| Rhode Island | 243,625† | 231,280 |
| Connecticut | 23,750** | 1,479 |
| New York | 1,061,060† | 823,801 |
| New Jersey | 321,750** | 6,096 |
| Delaware | 193,447 | 191,424 |
| Maryland | 131,560† | 93,532 |
| Virginia | 184,853 | 182,427 |
| North Carolina | 480,480 | 0 |
| **Coastal Total** | **3,806,275** | **2,532,558** |
| % Diff from 2013 harvest | +53 | 0 |

* Commercial harvest/sale prohibited, with no re-allocation of quota.
** Commercial harvest/sale prohibited, with re-allocation of quota to the recreational fishery.
†Quota reduced through management program equivalency; NY (828,293 pounds) and MD (126,396 pounds) beginning in 2004, RI (239,963 pounds) beginning in 2007.

Chesapeake Bay
The Chesapeake Bay jurisdictions would manage striped bass fisheries so as not to exceed a target fishing mortality rate of F=0.27 with an 18 inch size limit. The area to be managed under a target fishing mortality rate of 0.27 is described in Section 2.4.2 in Amendment 6. This option is estimated to achieve a 0% reduction from 2013 commercial harvest.

Albemarle Sound/Roanoke River
The State of North Carolina will manage the commercial striped bass fishery in the Albemarle Sound so as not to exceed a target fishing mortality of F=0.27. The striped bass regulations outlined in Amendment 6 for the Albemarle-Roanoke stock will cover the area described in Section 2.4.1. of Amendment 6.

---

**Option B:** Reduce F to a level that is at or below the target within one year. This represents a 25% reduction from 2013 total harvest. The desired reduction would be achieved by approximately equal relative reductions to both the commercial and recreational fisheries.

**Proposed Recreational Fishery Management Options**
*The tables below provide a suite of options for both the coastal and Chesapeake Bay recreational fisheries. When providing input on this document, please identify one preferred option each for the coastal and Chesapeake Bay fisheries.*

Coastal Recreational Fishery (All jurisdictions would implement)

| Option | Bag Limit | Size limit | Trophy fish | % reduction from 2013 harvest |
|---|---|---|---|---|
| **B1** | 1 | 28" min | n/a | 31% |
| **B2** | 1 | 30" min | n/a | greater than 31%[3] |
| **B3** | 1 | 32" min | n/a | greater than 31%[3] |
| **B4** | 1 | 28-40" slot | n/a | greater than 31%[3] |
| **B5** | 2 | 33" min | n/a | 29% |
| **B6** | 2 | 28-34" slot | n/a | 28% |
| **B7** | 2 (1 slot, 1 trophy) | 1 fish 28-34" slot | 1 fish 36" min | 28%[3] |
| **B8** | 2 (1 slot, 1 trophy) | 1 fish 28-36" slot | 1 fish 38" min | 26%[3] |
| **B9** | 2 (1 slot, 1 trophy) | 1 fish 28-37" slot | 1 fish 40" min | 26%[3] |

Chesapeake Bay Management Area Recreational Fishery (MD, PRFC and VA would implement)

| Option | Bag Limit | Size limit | Trophy fish | % reduction from 2013 harvest |
|---|---|---|---|---|
| **B10** | 1 | 18" min | n/a | 31% |
| **B11** | 2 | 21" min | n/a | 29% |
| **B12** | 2 | 18-23" slot | n/a | 26% |
| **B13** | 2 (1 slot, 1 trophy or 2 slot) | 1 or both 18-21" slot | 1 fish 36" min | 29% |
| **B14** | Chesapeake Bay Recreational Quota of 2,000,915 pounds (no established bag limit, but a minimum size of 18") | | | 25% |
| **B15** | Chesapeake Bay Recreational Quota of 1,800,740 pounds (no established bag limit, but a minimum size of 18").<br>Quota is based on a 25% reduction from 2012 harvest. | | | 32% |

Albemarle Sound/Roanoke River Management Area Recreational Fishery

The State of North Carolina will manage the recreational striped bass fisheries in the Albemarle Sound and Roanoke River based on reference points from the latest North Carolina stock assessment accepted by the Striped Bass Technical Committee and approved for management use by the Board.

**Proposed Commercial Fishery Management Options**

*The tables below provide a suite of options for both the coastal and Chesapeake Bay commercial fisheries. When providing input on this document, please identify one preferred option each for the coastal and Chesapeake Bay fisheries.*

*It is important to note none of the management options presented in the tables achieve a 25% reduction from 2013 harvest.*

Coastal Commercial Fishery

**Option B16**: Takes a 25% reduction from the Amendment 6 quota. This option does not achieve the proposed 25% reduction from 2013 harvest if all states harvest all of their allowable quota

[3] The data available to estimate the percent reduction is limited because the combination of a bag limit and size limit changes simultaneously means only measured fish from the Marine Recreational Information Program (MRIP) were included in the analysis which is a small subsample of the MRIP dataset for striped bass.

(see table below). However, this option may achieve some level of reduction from 2013 harvest if the fishery performs similar to previous years.

| | For Reference | Option B16 | For Reference |
|---|---|---|---|
| **State** | **Am6 Quota (lbs)** | **25% reduction from Am6 Quota (lbs)** | **2013 Harvest (lbs)** |
| Maine | 250* | 188 | 0 |
| New Hampshire | 5,750* | 4,313 | 0 |
| Massachusetts | 1,159,750 | 869,813 | 1,002,519 |
| Rhode Island | 243,625† | 182,719 | 231,280 |
| Connecticut | 23,750** | 17,813 | 1,479 |
| New York | 1,061,060† | 795,795 | 823,801 |
| New Jersey | 321,750** | 241,313 | 6,096 |
| Delaware | 193,447 | 145,085 | 191,424 |
| Maryland | 131,560† | 98,670 | 93,532 |
| Virginia | 184,853 | 138,640 | 182,427 |
| North Carolina | 480,480 | 360,360 | 0 |
| **Coastal Total** | **3,806,275** | **2,854,706** | **2,532,558** |
| % Diff from 2013 harvest | +50 | +13 | 0 |

* Commercial harvest/sale prohibited, with no re-allocation of quota.
** Commercial harvest/sale prohibited, with re-allocation of quota to the recreational fishery.
†Quota reduced through management program equivalency; NY (828,293 pounds) and MD (126,396 pounds) beginning in 2004, RI (239,963 pounds) beginning in 2007.

Chesapeake Bay Management Area Commercial Fishery
**Option B17**: Takes a 25% reduction from 2013 commercial quota.
**Option B18**: Takes a 25% reduction from 2012 commercial harvest.

The rationale for considering 2012 harvest data for the Chesapeake Bay fisheries as the baseline for reductions is the Bay-wide quota had already been reduced by 14% in 2013, in keeping with the Bay commitment to raise or lower quotas, with definitive changes in the exploitable stock biomass as approved by the FMP. The commercial Chesapeake Bay fisheries' quota reduction meant that harvesters were provided 14% less tags or pounds of harvestable quota in 2013, as compared to 2012 and the 2013 recreational summer and fall quotas were reduced by 14% compared to 2012. For this reason, the Chesapeake Bay requested, and the Board approved, that Draft Addendum IV also consider reductions based on 2012 harvest, rather than 2013.

*This rational also applies to options C11 and D8.*

| | For Reference | Option B17 | Option B18 | For Reference |
|---|---|---|---|---|
| **Chesapeake Bay** | **2013 Harvest (lbs)** | **25% reduction from 2013 Quota (lbs)** | **25% reduction from 2012 harvest** | **2012 Harvest (lbs)** |
| | 3,293,337 | 2,666,024 | 2,943,629 | 3,924,839 |
| % Diff from 2013 harvest | 0 | -19 | -11 | 19 |
| % Diff from 2012 harvest | -19 | -32 | -25 | 0 |

Albemarle Sound/Roanoke River Management Area Commercial Fishery
The State of North Carolina will manage the commercial striped bass fishery in the Albemarle Sound based on reference points from the latest North Carolina stock assessment accepted by the Striped Bass Technical Committee and approved for management use by the Board.

---

**Option C:** Reduce F to a level that is at or below the target within three years. This represents a 17% reduction from 2013 total harvest starting in the 2015 fishing year. There are not additional reductions in 2016 or 2017, the 17% reduction would be taken all in the first year (2015). The desired reduction would be achieved by approximately equal relative reductions to both the commercial and recreational fisheries.

**Proposed Recreational Fishery Management Options**
*The tables below provide a suite of options for both the coastal and Chesapeake Bay recreational fisheries. When providing input on this document, please identify one preferred option each for the coastal and Chesapeake Bay fisheries.*

Coastal Recreational Fishery (All jurisdictions would implement)

| Option | Bag Limit | Size limit | Trophy fish | % reduction from 2013 harvest |
|---|---|---|---|---|
| **C1** | 2 | 32" min | n/a | 21% |
| **C2** | 2 | 28-36" slot | n/a | 19% |
| **C3** | 2 (1 slot, 1 trophy) | 1 fish 28-35" slot | 1 fish 35" min | 20%[4] |

Chesapeake Bay Management Area Recreational Fishery (MD, PRFC and VA would implement)

| Option | Bag Limit | Size limit | Trophy fish | % reduction from 2013 harvest |
|---|---|---|---|---|
| **C4** | 2 | 20" min | n/a | 22% |
| **C5** | 2 | 18-26" slot | n/a | 18% |
| **C6** | 2 (1 slot, 1 trophy or 2 slot) | 1 or both 18-23" slot | 1 fish 36" min | 19% |
| **C7** | Chesapeake Bay Recreational Quota of 2,214,345 pounds (no established bag limit, but a minimum size of 18") | | | 17% |
| **C8** | Chesapeake Bay Recreational Quota of 1,992,819 pounds (no established bag limit, but a minimum size of 18"). Quota is based on a 17% reduction from 2012 harvest. | | | 25% |

[4] Reduction estimate limited by data. See footnote 3 for further explanation.

Albemarle Sound/Roanoke River Management Area Recreational Fishery

The State of North Carolina will manage the recreational striped bass fisheries in the Albemarle Sound and Roanoke River based on reference points from the latest North Carolina stock assessment accepted by the Striped Bass Technical Committee and approved for management use by the Board.

**Proposed Commercial Fishery Management Options**

*The tables below provide a suite of options for both the coastal and Chesapeake Bay commercial fisheries. When providing input on this document, please identify one preferred option each for the coastal and Chesapeake Bay fisheries.*

*It is important to note none of the management options presented in the tables achieve a 17% reduction from 2013 harvest.*

Coastal Commercial Fishery

**Option C9**: Takes a 17% reduction from the Amendment 6 quota. This option does not achieve the proposed 17% reduction from 2013 harvest if all states harvest all of their allowable quota (see table below). However, this option may achieve some level of reduction from 2013 harvest if the fishery performs similar to previous years.

| | **For Reference** | **Option C9** | **For Reference** |
|---|---|---|---|
| **State** | **Am6 Quota (lbs)** | **17% reduction from Am6 Quota (lbs)** | **2013 Harvest (lbs)** |
| Maine | 250* | 208 | 0 |
| New Hampshire | 5,750* | 4,773 | 0 |
| Massachusetts | 1,159,750 | 962,593 | 1,002,519 |
| Rhode Island | 243,625† | 202,209 | 231,280 |
| Connecticut | 23,750** | 19,713 | 1,479 |
| New York | 1,061,060† | 880,680 | 823,801 |
| New Jersey | 321,750** | 267,053 | 6,096 |
| Delaware | 193,447 | 160,561 | 191,424 |
| Maryland | 131,560† | 109,195 | 93,532 |
| Virginia | 184,853 | 153,428 | 182,427 |
| North Carolina | 480,480 | 398,798 | 0 |
| **Coastal Total** | **3,806,275** | **3,159,208** | **2,532,558** |
| % Diff from 2013 harvest | +50 | +25 | 0 |

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

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

†Quota reduced through management program equivalency; NY (828,293 pounds) and MD (126,396 pounds) beginning in 2004, RI (239,963 pounds) beginning in 2007.

Chesapeake Bay Management Area Commercial Fishery

**Option C10**: Takes a 17% reduction from the 2013 commercial quota.

**Option C11**: Takes a 17% reduction from the 2012 commercial harvest.

| | **For Reference** | **Option C10** | **Option C11** | **For Reference** |
|---|---|---|---|---|
| **Chesapeake Bay** | **2013 Harvest (lbs)** | **17% reduction from 2013 Quota (lbs)** | **17% reduction from 2012 harvest (lbs)** | **2012 Harvest (lbs)** |
| | 3,293,337 | 2,950,400 | 3,257,616 | 3,924,839 |
| % Diff from 2013 harvest | 0 | -10 | -1 | 19 |
| % Diff from 2012 harvest | -19 | -25 | -17 | 0 |

Albemarle Sound/Roanoke River Management Area Commercial Fishery

The State of North Carolina will manage the commercial striped bass fishery in the Albemarle Sound based on reference points from the latest North Carolina stock assessment that are accepted by the Striped Bass Technical Committee and approved for management use by the Board.

---

**Option D:** Reduce F to a level that is at or below the target within three years. This represents approximately a 20% reduction from 2013 total harvest achieved with a 7% reduction each year for three consecutive years starting in 2015. The desired reduction would be achieved by approximately equal relative reductions to both the commercial and recreational fisheries.

**Proposed Recreational Fishery Management Options**

*The tables below provide a suite of options for both the coastal and Chesapeake Bay recreational fisheries. When providing input on this document, please identify one preferred option each for the coastal and Chesapeake Bay fisheries.*

Coastal Recreational Fishery (All jurisdictions would implement)

**Option D1**: Size limit changes with corresponding implementation year are shown below.

| Year | Bag Limit | Size limit | Trophy fish | % reduction |
|---|---|---|---|---|
| 2015 | 2 | 30” min | n/a | Approximately a 21% reduction from 2013 harvest over three years |
| 2016 | 2 | 31” min | n/a | |
| 2017 | 2 | 32” min | n/a | |

Chesapeake Bay Management Area Recreational Fishery (MD, PRFC and VA would implement)

**Option D2**: Size limit changes with corresponding implementation year are shown below.

| Year | Bag Limit | Size limit | Trophy fish | % reduction |
|---|---|---|---|---|
| 2015 | 2 | 19” min | n/a | Approximately a 22% reduction from 2013 harvest over three years |
| 2016 | 2 | 20” min | n/a | |
| 2017 | 2 | 20” min | n/a | |

**Option D3**: Slot limit changes with corresponding implementation year are shown below.

| Year | Bag Limit | Size limit | Trophy fish | % reduction |
|---|---|---|---|---|
| 2015 | 2 | 18-35" slot | n/a | Approximately a 19% reduction from 2013 harvest over three years |
| 2016 | 2 | 18-28" slot | n/a | |
| 2017 | 2 | 18-24" slot | n/a | |

**Option D4**: Chesapeake Bay Recreational Quota (Baywide). Reductions applied to 2013 harvest.

| Year | Quota | Size limit | Trophy fish | % reduction |
|---|---|---|---|---|
| 2015 | 2,481,134 | 18" min | n/a | Approximately a 20% reduction from 2013 harvest over three years |
| 2016 | 2,307,455 | 18" min | n/a | |
| 2017 | 2,145,933 | 18" min | n/a | |

**Option D5**: Chesapeake Bay Recreational Quota (Baywide). Reductions applied to 2012 harvest.

| Year | Quota | Size limit | Trophy fish | % reduction |
|---|---|---|---|---|
| 2015 | 2,232,918 | 18" min | n/a | Approximately a 28% reduction from 2013 harvest over three years |
| 2016 | 2,076,614 | 18" min | n/a | |
| 2017 | 1,931,251 | 18" min | n/a | |

Albemarle Sound/Roanoke River Management Area Recreational Fishery

The State of North Carolina will manage the recreational striped bass fisheries in the Albemarle Sound and Roanoke River based on reference points from the latest North Carolina stock assessment accepted by the Striped Bass Technical Committee and approved for management use by the Board.

**Proposed Commercial Fishery Management Options**

*The tables below provide a suite of options for both the coastal and Chesapeake Bay commercial fisheries. When providing input on this document, please identify one preferred option each for the coastal and Chesapeake Bay fisheries.*

*It is important to note none of the management options presented in the tables achieve an overall 20% reduction from 2013 harvest.*

Coastal Commercial Fishery

**Option D6**: Takes a 7% sequential reduction from Amendment 6 quota. This option does not achieve the proposed 20% reduction from 2013 harvest if all states harvest all of their allowable quota (see table below). However, this option may achieve some level of reduction from 2013 harvest if the fishery performs similar to previous years.

| | Option D6 | 2015 | 2016 | 2017 |
|---|---|---|---|---|
| **State** | **For Reference Am6 Quota (lbs)** | **7% reduction from Am6 Quota (lbs)** | **7% reduction from 2015 Quota (lbs)** | **7% reduction from 2016 Quota (lbs)** |
| Maine | 250* | 233 | 216 | 201 |
| New Hampshire | 5,750* | 5,348 | 4,973 | 4,625 |
| Massachusetts | 1,159,750 | 1,078,568 | 1,003,068 | 932,853 |
| Rhode Island | 243,625† | 226,571 | 210,711 | 195,961 |
| Connecticut | 23,750** | 22,088 | 20,541 | 19,103 |
| New York | 1,061,060† | 986,786 | 917,711 | 853,471 |
| New Jersey | 321,750** | 299,228 | 278,282 | 258,802 |
| Delaware | 193,447 | 179,906 | 167,312 | 155,600 |
| Maryland | 131,560† | 122,351 | 113,786 | 105,821 |
| Virginia | 184,853 | 171,913 | 159,879 | 148,688 |
| North Carolina | 480,480 | 446,846 | 415,567 | 386,477 |
| **Coastal Total** | **3,806,275** | **3,539,836** | **3,292,047** | **3,061,604** |
| % Diff from 2013 harvest | +50 | +40 | +30 | +21 |

* Commercial harvest/sale prohibited, with no re-allocation of quota.
** Commercial harvest/sale prohibited, with re-allocation of quota to the recreational fishery.
†Quota reduced through management program equivalency; NY (828,293 pounds) and MD (126,396 pounds) beginning in 2004, RI (239,963 pounds) beginning in 2007.

Chesapeake Bay Commercial Fishery

**Option D7**: Takes a 7% sequential reduction from 2013 Chesapeake Bay commercial quota.

| | Option D7 | 2015 | 2016 | 2017 |
|---|---|---|---|---|
| **Chesapeake Bay** | **For Reference 2013 Harvest** | **7% reduction from 2013 Quota** | **7% reduction from 2015 Quota** | **7% reduction from 2016 Quota** |
| | 3,293,337 | 3,305,870 | 3,074,459 | 2,859,247 |
| % Diff from 2013 harvest | 0 | 0 | -7 | -13 |
| % Diff from 2012 harvest | -16 | -16 | -22 | -27 |

**Option D8:** Takes a 7% sequential reduction from 2012 Chesapeake Bay commercial harvest.

| | Option D8 | 2015 | 2016 | 2017 |
|---|---|---|---|---|
| **Chesapeake Bay** | **For Reference 2013 Harvest** | **7% reduction from 2012 harvest** | **7% reduction from 2015 Quota** | **7% reduction from 2016 Quota** |
| | 3,293,337 | 3,650,100 | 3,394,593 | 3,156,972 |
| % Diff from 2013 harvest | 0 | +11 | +3 | -4 |
| % Diff from 2012 harvest | -16 | -7 | -14 | -20 |

Albemarle Sound/Roanoke River Management Area Commercial Fishery
The State of North Carolina will manage the commercial striped bass fishery in the Albemarle Sound based on reference points from the latest North Carolina stock assessment accepted by the Striped Bass Technical Committee and approved for management use by the Board.

**3.1 Commercial Quota Transfers**
*The Board may consider commercial quota transfers for any of the four management scenarios selected above.*

**Option A:** Status quo, no commercial quota transfers.

**Option B:** Commercial quota transfer provision.
Transfers between states may occur upon agreement of two states at any time during the fishing season up to 45 days after the last day of the fishing season. All transfers require a donor state (state giving quota) and a receiving state (state accepting additional quota). There is no limit on the amount of quota that can be transferred by this mechanism, and the terms and conditions of the transfer are to be identified solely by the parties involved in the transfer. The Administrative Commissioner of the agency involved must submit a signed letter to the Commission identifying the involved states, species, and pounds of quota to be transferred between the parties. A transfer becomes effective upon receipt by Commission staff of the signed letters from the donor and receiving states, and does not require the approval of the Commission staff or Board. All transfers are final upon receipt of the signed letters at the Commission. In the event that the donor or receiving member of a transaction subsequently wishes to change the amount or details of the transaction, both parties have to agree to the change, and submit to the Commission signed letters from the Administrative Commissioner of the agencies involved. These transfers do not permanently affect the state-specific shares of the quota (i.e., the state-specific quotas remain fixed).

Once quota has been transferred to a state, the state receiving quota becomes responsible for any overages of transferred quota. That is, the amount over the final quota (that state's quota plus any quota transferred to that state) for a state will be deducted from the corresponding state's quota the following fishing season.

**3.2 Commercial Size Limits**
*The Board may consider commercial size limits for any of the four management scenarios selected above.*

**Option A:** Status quo with Amendment 6
In each jurisdiction, the commercial fishery is constrained by the same size limit regime established for the jurisdiction's recreational fishery. This means if the Board selects a different size limit for the recreational fishery, the commercial fishery would be constrained to the same size limit.

**Option B:** Status quo with existing size limits
All areas will maintain their current minimum size limit for the commercial fishery, including the Chesapeake Bay (18 inch minimum), Albemarle Sound (18 inch minimum) and the Delaware Bay shad gillnet fishery for Delaware (20 inch minimum). This option only applies if the Board selects to change the size limits for the recreational fishery.

## 4.0 Compliance Schedule

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

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

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

January 1, 2015: States implement regulations. North Carolina will need earlier implementation because their ocean commercial fishery begins on December 1, 2014.

## 5.0 ISSUE 8: Recommendation for Federal Waters

If options in section 2.5 or 3.0 are adopted through the addendum process, the Board would consider which options, if any should be recommended to NOAA Fisheries for implementation in the Exclusive Economic Zone.

## 6.0 Literature Cited

ASMFC. 2003. Amendment 6 to the Interstate Fishery Management Plan for Atlantic Striped Bass. Washington (DC): ASMFC. Fisheries Management Report No. 41. 63 p.

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.

Hartman, K.J. 2003. Population-level consumption by Atlantic coastal striped bass and the influence of population recovery upon prey communities. Fisheries Management and Ecology 10:281-290.

North Carolina Division of Marine Fisheries. 2014. Stock Status of Albemarle Sound-Roanoke River Striped Bass. N.C. Department of Environment and Natural Resources, Division of Marine Fisheries, Moorhead City, N.C. 210p.

## 7.0 Tables

Table 1. Coastal commercial harvest of Atlantic striped bass by state in pounds (2003-2013).

| Year | MA | RI | CT* | NY | NJ* | DE | MD+ | VA+ | NC** | Total Harvest |
|---|---|---|---|---|---|---|---|---|---|---|
| **2003** | 1,055,439 | 246,312 | | 753,261 | 121,410 | 188,419 | 98,149 | 159,786 | 434,369 | 3,057,145 |
| **2004** | 1,206,305 | 245,204 | | 741,668 | 81,870 | 181,974 | 115,453 | 160,301 | 421,645 | 3,154,420 |
| **2005** | 1,104,737 | 242,303 | | 689,821 | 29,866 | 173,815 | 46,871 | 184,734 | 454,521 | 2,926,668 |
| **2006** | 1,312,168 | 238,797 | | 688,446 | 23,656 | 185,987 | 91,093 | 194,934 | 352,036 | 3,087,117 |
| **2007** | 1,040,328 | 240,627 | | 729,743 | 13,615 | 188,668 | 96,301 | 165,587 | 424,723 | 2,899,592 |
| **2008** | 1,160,122 | 245,988 | | 653,100 | 7,345 | 188,719 | 118,005 | 164,400 | 299,162 | 2,836,841 |
| **2009** | 1,138,291 | 234,368 | | 789,891 | 10,330 | 192,311 | 127,327 | 140,420 | 189,995 | 2,822,933 |
| **2010** | 1,224,356 | 249,520 | | 782,402 | 12,833 | 185,410 | 44,802 | 116,338 | 272,632 | 2,888,293 |
| **2011** | 1,163,865 | 228,163 | | 854,731 | 16,332 | 188,620 | 21,401 | 158,811 | 242,600 | 2,874,523 |
| **2012†** | 1,219,665 | 239,913 | 1,062 | 681,399 | 6,285 | 194,324 | 77,551 | 170,788 | 6,226 | 2,597,213 |
| **2013** | 1,002,519 | 231,280 | 1,479 | 823,801 | 6,096 | 191,424 | 93,532 | 182,427 | - | 2,532,558 |

***** NJ and CT values reflect striped bass harvested recreationally via the Bonus Fish Program

** NC values represent harvest during the December 1-November 30 fishing year

+MD, VA and NC harvest from ocean only. Does not include Chesapeake Bay or Albemarle Sound/Roanoke River.

†The impacts of hurricane Sandy may have caused lower harvest in 2012 in some states.

Table 2. Total (commercial and recreational) Chesapeake Bay harvest in pounds (2003-2013).

| Year | Commercial | Recreational | Total Harvest | Quota |
|---|---|---|---|---|
| 2003 | 4,169,585 | 5,335,278 | 9,504,863 | 10,500,000 |
| 2004 | 4,156,977 | 4,277,549 | 8,434,526 | 8,417,000 |
| 2005 | 4,102,804 | 5,484,312 | 9,587,116 | 9,285,588 |
| 2006 | 4,008,349 | 4,859,593 | 8,867,942 | 9,590,238 |
| 2007 | 4,206,503 | 4,228,977 | 8,435,480 | 9,590,238 |
| 2008 | 4,369,971 | 3,539,541 | 7,909,512 | 10,132,844 |
| 2009 | 4,403,215 | 4,065,721 | 8,468,936 | 10,132,844 |
| 2010 | 4,092,654 | 3,173,290 | 7,265,944 | 9,489,794 |
| 2011 | 3,925,048 | 2,914,653 | 6,839,701 | 8,825,510 |
| 2012 | 3,924,839 | 2,400,987 | 6,325,826 | 8,825,510 |
| 2013 | 3,293,337 | 2,667,886 | 5,961,223 | 7,589,937 |

Table 3. Albemarle Sound / Roanoke River annual quota* and harvest in pounds (2003 – 2013).

| | Commercial | | Recreational | |
|---|---|---|---|---|
| **Year** | **Quota** | **Harvest** | **Quota** | **Harvest** |
| 2003 | 275,000 | 266,555 | 275,000 | 90,964 |
| 2004 | 275,000 | 273,636 | 275,000 | 187,288 |
| 2005 | 275,000 | 232,693 | 275,000 | 171,007 |
| 2006 | 275,000 | 186,399 | 275,000 | 120,518 |
| 2007 | 275,000 | 171,683 | 275,000 | 89,125 |
| 2008 | 275,000 | 74,921 | 275,000 | 64,353 |
| 2009 | 275,000 | 96,134 | 275,000 | 106,894 |
| 2010 | 275,000 | 199,829 | 275,000 | 83,507 |
| 2011 | 275,000 | 134,538 | 275,000 | 114,097 |
| 2012 | 275,000 | 115,940 | 275,000 | 159,727 |
| 2013 | 275,000 | 68,214 | 275,000 | 40,094 |

* Quota is allocated 25% for the Roanoke River recreational fishery, 25% for the Albemarle Sound recreational fishery, and 50% for the Albemarle Sound commercial fishery

Table 4. Total coastwide recreational harvest of Atlantic striped bass by state in pounds (2003-2013).

| **Year** | **ME** | **NH** | **MA** | **RI** | **CT** | **NY** | **NJ** | **DE** | **MD** | **VA** | **NC** | **Total** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **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 | 758,216 | 8,969,762 | 6,197,026 | 241,149 | 2,640,309 | 1,160,914 | 2,042,981 | 27,234,684 |
| **2012†** | 57,509 | 163,804 | 5,489,928 | 851,460 | 814,310 | 6,540,024 | 2,376,866 | 360,106 | 1,260,490 | 1,353,351 | - | 19,267,848 |
| **2013** | 103,106 | 227,447 | 4,828,109 | 3,076,814 | 2,129,160 | 6,749,587 | 4,643,220 | 248,183 | 2,377,734 | 478,750 | 70,798 | 24,932,908 |

Notes: The 2003 to 2006 values for Virginia do not include Technical Committee estimates of wave 1 harvest. The 2013 values do not include Technical Committee estimates of wave 1 harvest and are preliminary. †The impacts of hurricane Sandy may have caused lower harvest in 2012 in some states.

## 8.0 Figures

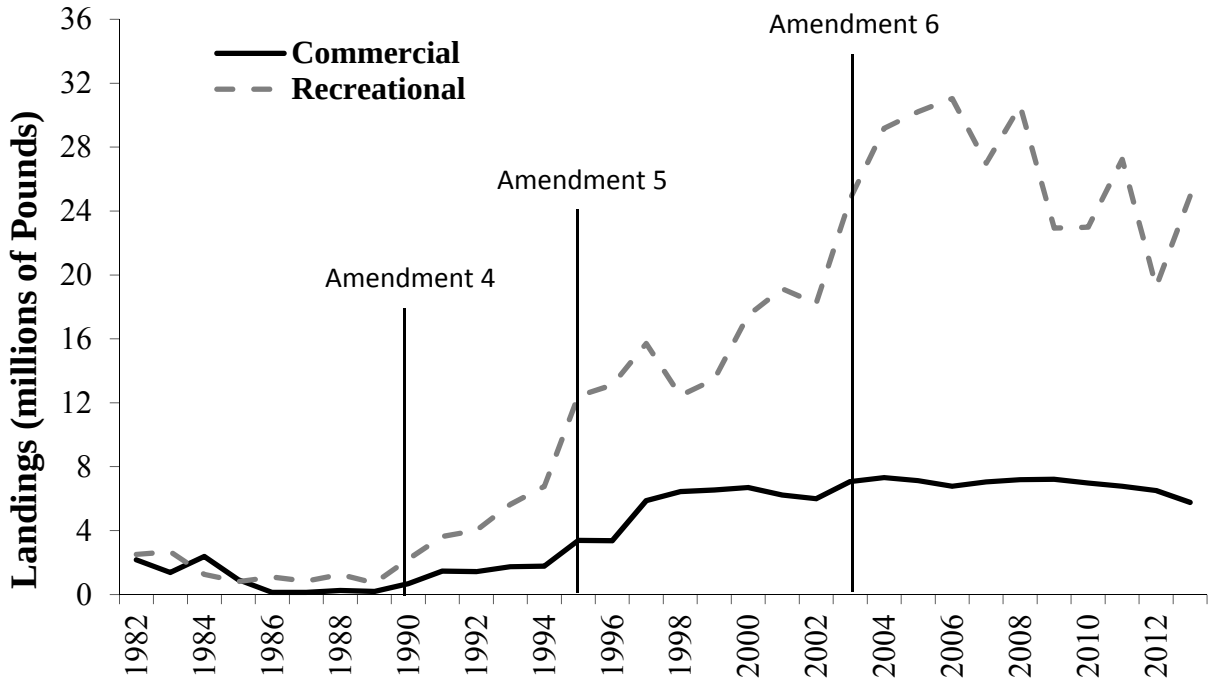



Figure 1. Annual migratory striped bass landings (in pounds) from coastal and Chesapeake Bay fisheries, 1982 – 2013.

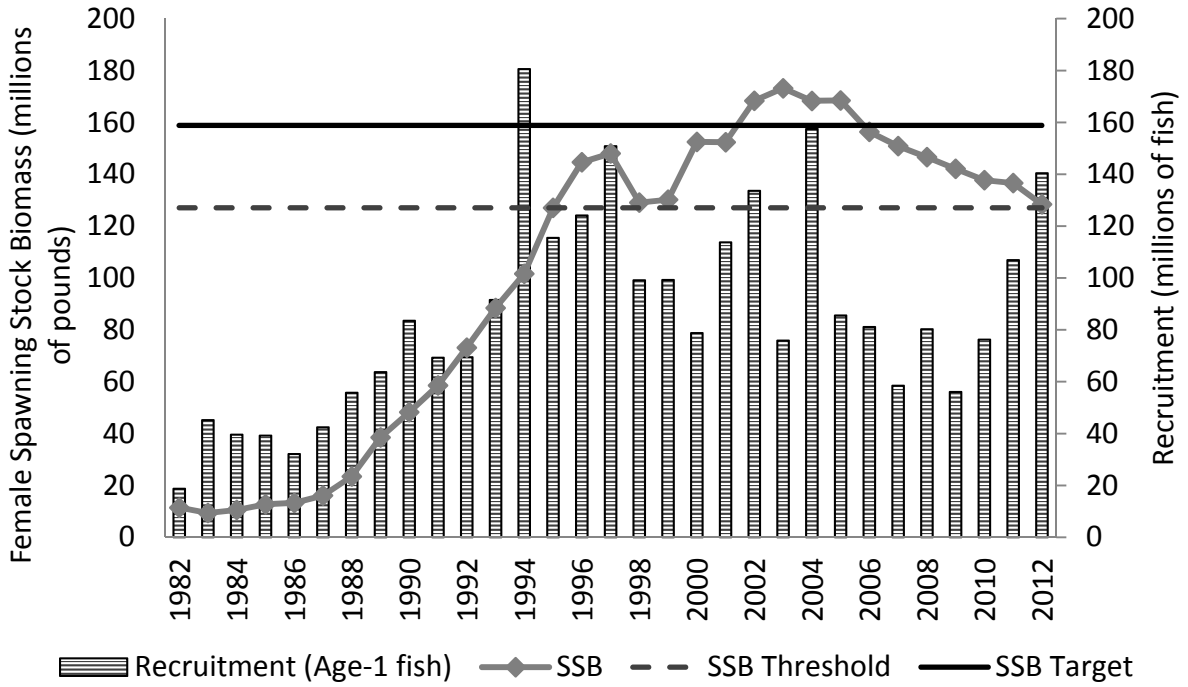
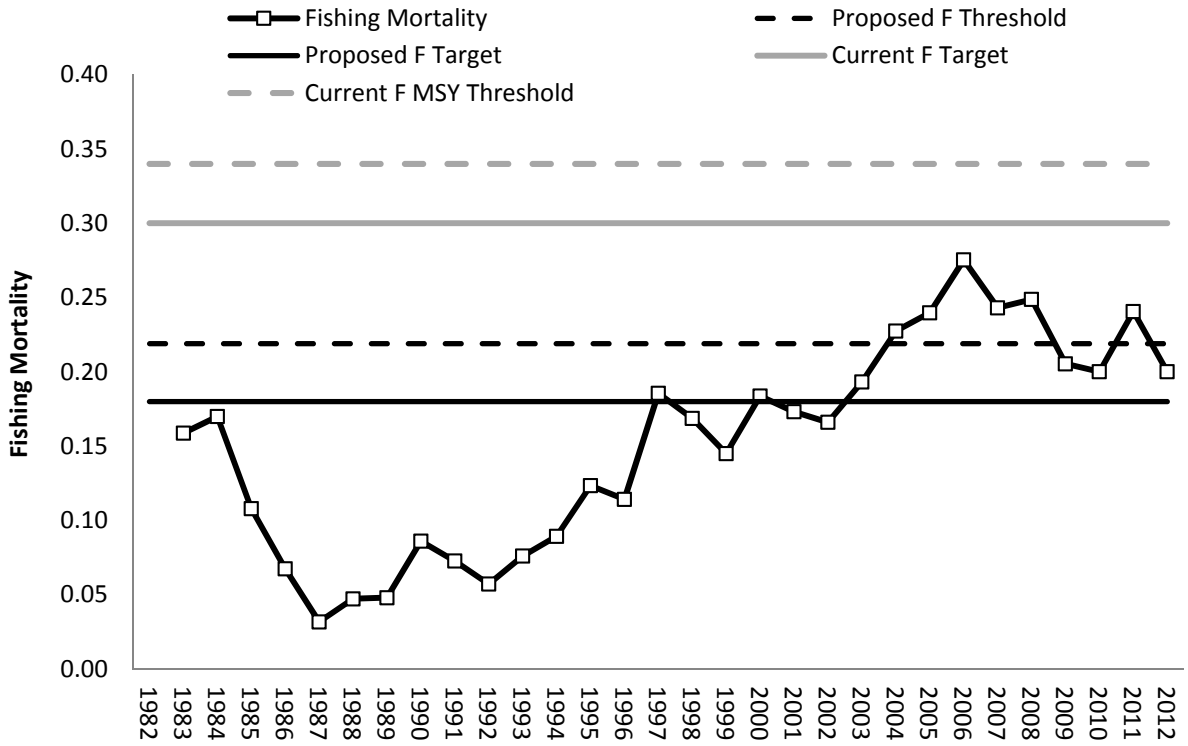



Figure 2. Atlantic striped bass female spawning stock biomass and recruitment (age-1) from 1982 to 2012.




* The F estimate for 1982 was considered unrealistic and unreasonable high, and is not shown on this graph.

Figure 3. Atlantic striped bass fishing mortality rates relative to the proposed F threshold and F target and old F MSY threshold and old F MSY target from 1982 to 2012.

**Appendix 1**

Summary of Atlantic Striped Bass Commercial Regulations in 2013

| STATE | SIZE LIMITS | SEASONAL QUOTA | OPEN SEASON |
|---|---|---|---|
| ME | Commercial fishing prohibited | | |
| NH | Commercial fishing prohibited | | |
| MA | 34” min. | 1,159,750 lb. (minus any overage from previous year)<br>Hook & line only | 7.12 until quota reached; 5 fish/day on Sun; 30 fish/day Tues-Thurs |
| RI | Floating fish trap: 26” min.<br><br>General category (mostly rod & reel): 34” min. | Total: 239,963 lb. (minus any overage from previous year)<br>Split 39:61 between trap and general category.<br>Gill netting prohibited. | Trap: 1.1 until quota reached; if 80% quota harvested before 8.26, a 500 lb/trap/day limit is imposed; from 8.27–12.31, 10,000 lb. quota set-aside available.<br>General Category: 6.1-8.31 or 75% quota; 9.13-12.31 or 100% quota; 5 fish/day Sun-Thu. |
| CT | Commercial fishing prohibited | | |
| NY | 24–36”<br>Ocean only<br>(Hudson River closed to commercial harvest) | 828,293 lb. (minus any overage from previous year). Pound nets, gill nets (6-8”stretched mesh), hook & line. | 7.1 – 12.15<br>Gill nets <6 or >8”, 7 fish/trip; trawls 21 fish/trip.<br>Gill nets prohibited in Great South, South Oyster, and Hempstead Bays. |
| NJ | Commercial fishing prohibited | | |
| PA | Commercial fishing prohibited | | |
| DE | 28” minimum except 20” spring gillnet in DE Bay/River & Nanticoke River (5.5” max mesh & 0.28mm max twine) | 193,447 lb. (minus any overage from previous year) | Gillnet: 2.15-5.31 (3.1-31 for Nanticoke) & 11.15-12.31; drift nets only 2.15-28 & 5.1-31; no fixed nets in DE River<br>Hook and Line: 4.1–12.31<br>Except 4.1-5.31 closed spawning areas |
| MD | Bay and Rivers: 18–36”<br><br>Ocean: 24” | Bay and River: 1,963,873 lbs (part of Baywide quota)<br>Gear specific quotas and landing limits<br><br>Ocean: 126,396 lb. (minus any overage from previous year) | Bay Pound Net: 6.1-11.30, Mon-Sat<br>Bay Haul Seine: 6.7-11.30, Mon-Fri<br>Bay Hook & Line: 6.7-11.30, Mon-Thu<br>Bay Drift Gill Net: 1.1-2.28, 12.1-12.31, Mon-Fri<br>Ocean Drift Gill Net & Trawl: 1.1-4.30, 11.1-12.31, Mon-Fri |

(Continued – Summary of commercial regulations in 2013)

| STATE | SIZE LIMITS | SEASONAL QUOTA | OPEN SEASON |
|---|---|---|---|
| PRFC | 18” min all year<br>36” max 2.15–3.25 | 635,623 lbs (part of Baywide quota) | Hook & line: 2.15-3.25, 6.1-12.31<br>Pound Net & Other: 2.15-3.25, 6.1-12.15<br>Gill Net: 1.1-3.25, and 11.11-12.31 |
| DC | Commercial fishing prohibited | | |
| VA | Bay and Rivers: 18” min, 28” max & complimentary gill net mesh size limit 3.26–6.15<br>Ocean: 28” minimum | Bay and Rivers: 1,430,361 lbs in 2012 (part of Baywide quota)<br><br>Ocean: 184,853 lb. (minus any overage from previous year) | Bay and Rivers: 2.1-12.31<br><br>Ocean: 2.1-12.31 |
| NC | Albemarle Sound: 18”<br><br>Ocean: 28” | Albemarle Sound: 275,000 lb<br>Ocean: 480,480 lb. (minus any overage from previous year) split 160,160 lbs each to beach seine, gill net & trawl | Albemarle Sound: 1.1-4.30, 10.1-12.31; daily trip limit ranging from 5 to 15 fish; striped bass cannot exceed 50% by weight of total finfish harvest; season and daily trip limits set by proclamation.<br>Ocean: gear requirements; open days and trip limits for beach seine, gill net, and trawl set via proclamation |

Summary of Atlantic Striped Bass Recreational Regulations in 2013

| STATE | SIZE LIMITS | BAG LIMIT | OTHER | OPEN SEASON |
|---|---|---|---|---|
| ME | 20 – 26" OR ≥40" | 1 fish | Hook & line only | All year, except spawning areas are closed 12.1 – 4.30 and catch and release only 5.1 – 6.30 |
| NH | 1 fish 28–40" & 1 fish >28" | 2 fish | No netting; no gaffing; must be landed with head and tail intact; no culling | All year |
| MA | 28" min | 2 fish | Hook & line only | All year |
| RI | 28" min | 2 fish | | All year |
| CT | 28" min, except Connecticut River Bonus Program: 22-28" | 2 fish, except CR Bonus: 1 fish | CR Bonus Quota: 4,025 fish | All year, except CR Bonus 5.4-6.30 (limited to I-95 bridge to MA border) |
| NY | Ocean Private: 1 fish 28-40" & 1 fish > 40"<br>Ocean Charter: 28" min<br>Hudson River: 18" min<br>DE River: 28" min | Ocean: 2 fish<br><br>Hudson R.: 1 fish<br>DE River: 2 fish | Angling or spearing only | Ocean: 4.15 – 12.15<br><br>Hudson River: 3.16 – 11.30<br>Delaware River: All year |
| NJ | 28" min | 2 fish, plus 1 additional through Bonus Program | Bonus program quota: 321,750 lb.<br>No netting. Non-offset circle hooks required 4.1-5.31 in DE River if using natural bait. | All year except 1.1-2.28 in intra-coastal waters plus 4.1-5.31 in lower DE River |
| PA | Non-tidal DE River: 28" min; Delaware Estuary: 28" min. except 20-26" from 4.1-5.31 | 2 fish | | Year round |
| DE | 28" min. except 20-26" from 7.1-8.31 in Del. River, Bay & tributaries | 2 fish | 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) |

(Continued – Summary of recreational regulations in 2013)

| STATE | SIZE LIMITS | BAG LIMIT | OTHER | OPEN SEASON |
|---|---|---|---|---|
| MD | Susquehanna Flats (SF): 18-26”<br><br>Chesapeake Bay Trophy: 28” min<br>Chesapeake Bay Regular: 18” min with 1 fish > 28”<br>Ocean: 28” min | SF: 1 fish<br><br>Chesapeake Bay Trophy: 1 fish<br>Chesapeake Bay Regular: 2 fish<br><br>Ocean: 2 fish | SF: non-off set circle hook if baited hooks & gap>0.5”<br><br>Chesapeake Bay Quota: 2,657,102 lbs (part of Baywide quota; includes Susquehanna Flats harvest, excludes trophy harvest) | SF: 3.1-5.31; catch & release only 3.1-5.3<br><br>Chesapeake Bay Trophy: 4.18-5.15 (most tribs closed)<br>Chesapeake Bay Regular: 5.16-12.15 (most tribs closed until 6.1)<br><br>Ocean: All year |
| PRFC | Trophy: 28”<br>Regular: 18” min with 1 fish > 28” | Trophy: 1 fish<br>Regular: 2 fish | Quota: 520,055 lbs. (part of Baywide quota; excludes trophy harvest) | Trophy: 4.20 -5.15<br>Regular: 5.16-12.31 |
| DC | 18” min with 1 fish > 28” | 2 fish | Hook & line only | 5.16-12.31 |
| VA | Bay/Coastal Trophy: 32” min (28” Potomac tribs)<br>CB Spring: 18-28”; 1 fish >32”<br>CB Fall: 18–28”; 1 fish >34”<br>Potomac Tribs: 18-28”; 1 fish >28”<br>Ocean: 28” | Bay/Coastal Trophy: 1 fish<br><br>CB Spring: 2 fish<br><br>CB Fall: 2 fish<br>Potomac Tribs: 2 fish<br>Ocean: 2 fish | Hook & line, rod & reel, hand line only<br><br>Chesapeake Bay Quota: 1,430,361lbs in 2012 (part of Baywide quota; excludes trophy harvest) | Bay Trophy: 5.1-6.15 (open 4.18 Potomac tribs)<br>Coastal Trophy: 5.1-5.15<br>CB Spring: 5.16-6.15 (no fish >32” in spawning areas)<br>CB Fall: 10.4-12.31<br>Potomac Tribs: 5.16-12.31<br>Ocean: 1.1-3.31, 5.16-12.31 |
| NC | Roanoke River: 2 fish 18-22” OR 1 fish 18-22” and 1 fish >27”<br>Albemarle Sound: 18” min.<br><br>Ocean: 28” min | Roanoke River: 2 fish<br>Albemarle Sound: 3 fish<br>Ocean: 2 fish | Roanoke River quota: 137,500 lb.<br><br>Albemarle Sound quota: 137,500 lb. | Roanoke River: 3.1 – 4.30 (single barbless hook required 3.1-6.30 from Roanoke Rapids dam downstream to US 258 bridge)<br>Albemarle Sound: Spring 1.1 – 4.30; Fall 10.1-12.31<br>Ocean: All year |

Atlantic States Marine Fisheries Commission
1050 N. Highland Street • Suite 200A-N • Arlington, VA 22201
703.842.0740 • 703.842.0741 (fax) • www.asmfc.org

# MEMORANDUM

May 6, 2014

**To:** **Atlantic Striped Bass Management Board**
**From:** **Atlantic Striped Bass Technical Committee**
**RE:** **Reference Points for the Chesapeake Bay (Appendix 2)**

The Striped Bass Management Board tasked the Technical Committee (TC) with developing reference points for the Chesapeake Bay stock. The TC evaluated five different scenarios of reference points. However, after detailed discussions, the TC concluded:

1. The TC cannot develop Chesapeake Bay stock specific reference point that explicitly accounts for migratory movements at this time.
2. The TC considered a set of reference points based on SSB/R conservation equivalency, but this methodology does not adequately take into account coastal harvest or the skewed sex-ratio of the Chesapeake Bay harvest. In addition, there is no way to measure the current F of the Chesapeake Bay fishery that is consistent with the assumptions of this type of model.
3. The TC considered a set of reference points based on SCA coastwide model. We discussed that if those were adopted, they would be very conservative because they ignore the fact that resident striped bass population in Chesapeake Bay is dominated by male fish.
4. The TC considered a method of adjustment to the SCA based reference points but the TC was uncomfortable in accepting the proposed scale of adjustment without more detailed analysis.
5. The TC agreed that stock-specific reference points are the ultimate goal for management of this species, and work on developing a sex-specific model that incorporates stock structure should be continued.
6. In the meantime the TC recommends that the new coastwide reference points should be used for the Chesapeake Bay.
7. The new coastwide reference points already include the effects of the CB fleet's unique selectivity pattern on the coastwide SSB, and represent the best available scientific advice to manage total fishing mortality on the coastwide striped bass population at this time.

The coastwide target total F is designed to maintain the spawning stock biomass at its target level over the long term. The effects of the Bay's harvest of smaller fish on the total coastwide stock are already incorporated into the coastwide population reference points due to different selectivity patterns for the Bay and Coastal fleets. As a result, the reference points approved for management use in the 2013 benchmark stock assessment represent the best available scientific advice at this time to manage fishing mortality on the entire striped bass population.

Biologically, the coastal migratory population of striped bass is comprised primarily of three stocks: the Chesapeake Bay stock, the Delaware River stock, and the Hudson River stock. Based on tagging data the Albemarle-Roanoke stock contributes insignificantly to the coastal migratory stock, and thus harvest and indices of abundance from the Albemarle Sound and Roanoke River Management Areas are not included in the coastal assessment. Sexually mature adults from the coastal migratory population return to their natal rivers to spawn on an annual basis. Currently, we lack critical data on the sex- and age-specific rates of migration between the natal Bay and rivers and the coastal population. Thus, the stock assessment model treats the coastal population as a single stock. As a result, the TC cannot develop meaningful reference points specifically for the Chesapeake Bay stock at this time.

As an alternative, the TC worked to develop F reference points that would assess the impact of the Chesapeake Bay fleet on the total coastwide stock, since that can be measured through the SCA model using F estimates for the Chesapeake Bay fleet. Such estimates were developed, but it was noted that they would be very conservative due to the dominance of smaller males in the Chesapeake Bay resident population. It is recognized that the Chesapeake Bay fleet harvests primarily small males, but that is not explicitly modeled in the current SCA because it is not a sex-specific model. Therefore, given limited amount of time and constraints in the available data, the TC could not come to a consensus on whether or how to calculate a Chesapeake Bay fleet reference point at this time.

In the meantime, the effects of Chesapeake Bay's different selectivity pattern (i.e., harvest on smaller fish) are incorporated into the target and threshold total F values developed for the entire coastwide population of striped bass. By maintaining total F at the target level, the impact of the Chesapeake Bay fleet on the total coastwide population should remain sustainable.