

**REVIEW OF THE  
ATLANTIC STATES MARINE FISHERIES COMMISSION'S  
FISHERY MANAGEMENT PLAN FOR  
ATLANTIC STRIPED BASS  
(*Morone saxatilis*)**



**2003 FISHING YEAR**

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## **I. Status of the Fishery Management Plan**

<u>Date of FMP Approval:</u>	Original FMP: October 1981
<u>Amendments:</u>	Amendment 5: March 1995 (active through 2003) Amendment 6: February 2003 (active January 2004)
<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

Active Boards/Committees: Striped Bass Management Board, Advisory Panel, Technical Committee, Stock Assessment Subcommittee, Tagging Subcommittee, Plan Review Team, and Plan Development Team

Jurisdictions with a declared interest in striped bass are Maine through North Carolina, including Pennsylvania, the Potomac River Fisheries Commission, and the District of Columbia. Under the Atlantic Striped Bass Conservation Act (P.L. 98-613), implementation of the FMP is mandatory. Implementation of the FMP is monitored by the Commission's Striped Bass Management Board (Board) and Striped Bass Plan Review Team (PRT). Amendment 6 to the FMP was approved in February 2003 but not fully implemented until January 1, 2004. Consequently regulations in 2003 were influenced by both Amendments 5 and 6.

Under Amendment 5, the standard minimum size for Atlantic striped bass was 20 inches in the bays and estuaries and 28 inches along the coast. In coastal jurisdictions, the standard recreational regulations were two fish per day and a 365-day fishing season. No annual harvest quotas or caps were mandated for the recreational fishery. Commercial fisheries were regulated through the same minimum size standards as the recreational fishery. In 2003, the Amendment 6 coastal commercial quotas prevail and the quotas were restored to the average reported commercial landings from 1972-1979. Delaware's coastal commercial quota is the exception and remained at the level allocated in 2002 (193,447 pounds).

States are granted the flexibility to deviate from these standards by submitting proposals for review by the Striped Bass Technical Committee and Advisory Panel and contingent upon the approval of the Management Board. Alternative proposals must be "conservationally equivalent" to the management standards, which has resulted in a wide variety of regulations among states (see Tables 6 and 7). These management measures were intended to maintain the fishing mortality rate (F) at or below the target F (0.31).

Since 1995, three addenda were approved to perpetuate the Amendment 5 standards from 1997 through 2000. Based on the 1999 stock assessment the Striped Bass Management Board developed Addendum IV to reduce fishing mortality on age 8 and older striped bass. Addendum IV detailed the required management measures for each state in 2000 and 2001 to achieve the

necessary 14% reduction in the fishing mortality rate. In 2000, many states implemented changes to their management programs, but some states were already more conservative than the standards established in Amendment 5 and therefore were not required to make any reductions for 2000.

The 2000 stock assessment indicated that no additional reductions in fishing mortality were necessary to reduce the pressure on age 8 and older striped bass during the 2001 fishing year. This information prompted the Management Board to initiate the development of Addendum V in 2000. Addendum V established the management standards for 2001 and 2002 and allowed states to either maintain their current striped bass fishery regulations or implement regulations comparable to those in place for 1998 and 1999.

Amendment 6 was implemented in February of 2003 and maintains the management program in place for 2002, except for the coastal commercial fishery and producer areas other than Chesapeake Bay. As stated above, states were able increase the coastal commercial quota to the average landings reported during 1972-1979. With the Board's approval, some states (NH, MA, and CT) increased the recreational creel limit to two fish with the minimum size limit of 28 inches to comply with Amendment 6.

Under Amendment 5 and its subsequent addenda, the Exclusive Economic Zone (EEZ) remained closed to the harvest and possession of striped bass by both commercial and recreational fishermen. A recommendation was made in Amendment 6 to re-open federal waters to commercial and recreational fisheries

## **II. Status of the Stocks**

The abundance of the striped bass population has increased increasing steadily since 1982. After reaching 45 million fish in 1996, the population remained around this size, with some inter-annual variation, until 2002 when the population continued to increase. The 2004 total population abundance estimate is 11 million fish higher than the average stock size for the previous five years and 23.8% higher than the 2003 abundance estimate. A significant portion of the population's abundance can be attributed to the recruitment of the 2003 year. These age-1 fish were estimated to be about 22 million fish, the largest year class in the time series. Preliminary survey indices for the 2004 young of the year striped bass in Chesapeake Bay indicate an average year class.

The female spawning stock biomass grew steadily since 1982 and stabilized around 20 thousand metric tons from 1999-2002. In 2003, the female spawning stock biomass was estimated to be 13,600 mt or 29,982,560 pounds, assuming a 1:1 male-female ratio. During 2003, the striped bass management program was operating under Addendum V to Amendment 5, which did not have a biomass target or threshold. Amendment 6 sets the female SSB threshold just slightly above the 1995 estimate of female SSB abundance (~14,000 mt). The 2003 estimate of female SSB is just under the threshold SSB and is well under the target SSB (17.5 thousand mt or 125% of the threshold). Using the latest populations estimates from the ADAPT VPA, the 1995 female spawning stock abundance was re-estimated to be 12,726 mt. Using the re-estimated value as the SSB threshold, the population is not considered overfished.

The 2003 VPA estimate of fishing mortality on ages 8-11 is 0.62. The tag-based F estimates are not similar to the VPA's F (weighted by N) estimate, 0.53, and did not show a similar increase in F for 2003 (except for Maryland). The VPA estimate exceeds the Fthreshold of 0.41 and Ftarget of 0.30, whereas the tagging estimate is significantly below the target.

The status of the individual stocks is based on the various tagging programs. The 2003 tag-based fishing mortality rate estimate for Chesapeake Bay striped bass greater than 28" is 0.40 (MD), 0.28 for the Rappahannock River, 0.28 for the Delaware River, and 0.09 for the Hudson River. The coastal mix stock tagging programs produced a range of estimates, from 0.09 for MA to 0.24 for the New York.

The Chesapeake Bay jurisdictions use a tag-based method to determine the annual fishing mortality rate on resident, pre-migratory striped bass. This direct enumeration method is not directly comparable to the other tagging analyses or the VPA because it the fishing mortality rate during June 2002 – June 2003. For this period, the Chesapeake Bay fishing mortality was estimated to be 0.20, which is below the Chesapeake Bay Ftarget of 0.27.

The striped bass stock assessment for 1982-2002 indicates the overall abundance of the stock remained relatively stable since 1996. Based on the most current and available information, the stock is not overfished. The divergent patterns in the VPA F estimate and tag-based F estimate led to significant uncertainty in the stock assessment results for 2003. As a result, the Technical Committee could not evaluate the status of overfishing in 2003. The Striped Bass Technical Committee Report #2004-4 describes the committee's concerns and the problems associated with the stock assessment in greater detail.

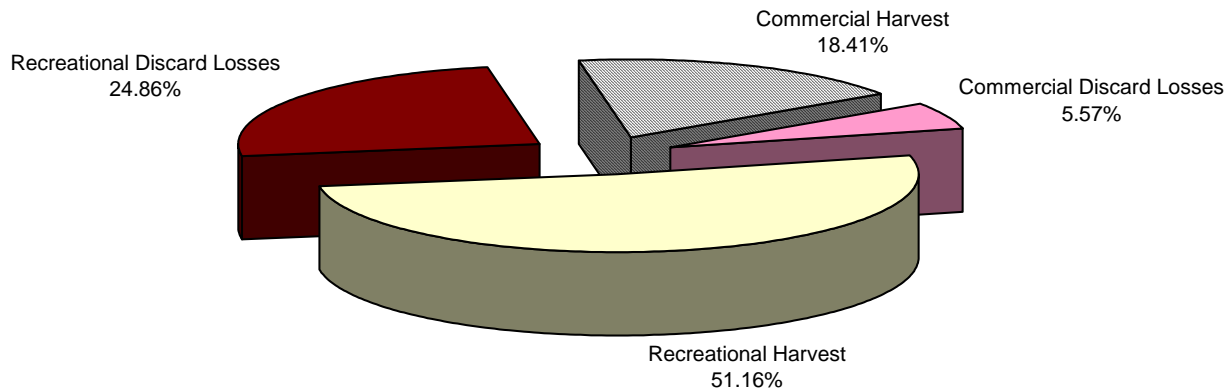
In October 1997, the Striped Bass Management Board declared the Roanoke River/Albemarle Sound (NC) striped bass stock recovered. This finding was based on the recommendation of the Technical Committee and assessment data compiled by the state of North Carolina. These data suggest that the spawning stock biomass in the Albemarle/Roanoke system has recovered to historical levels observed in the 1960s, and indicate regulatory relaxation is permissible in certain areas. In 2004, North Carolina approved a new fishery management plan for the Albemarle-Roanoke striped bass stock. The new FMP sets the target fishing mortality at 0.22 and a target spawning stock biomass of 400,000 pounds. The 2003 estimate of fishing mortality on ages 4-6 is  $F=0.15$ , well below the target. SSB is estimated to be around 1 million pounds and has exceeded the threshold since 2000. There is evidence that the stock structure is expanding with striped bass aged out to 14 years.

### **III. Status of the Fishery**

In 2003, the total coastwide recreational and commercial striped bass catch (landings + discards) was estimated to be 4,702,381 striped bass, representing a 26.3% increase in losses. The 2003 catch was above the 1996-2003 average of 4.0 million fish. Both commercial and recreational landings increased in 2003 by 579,967 fish or 3,553 metric tons. The recreational fishery landed 51.2% of the total number (2,405,707 fish or 11,486 mt), whereas the commercial fishery harvested 18.4 % (865,689 fish or 3,199 mt) (Figure 1 and Table 1). Maryland's recreational fishery harvested 21.8% of the total recreational landings, followed by Massachusetts (16.9%),

Virginia (16.7%), New Jersey (16.3), and New York (13%). Maryland also led the states in commercial landings with 50.8%, followed by Virginia (18.7%), PRFC (9.6%), New York (7.9%), and Massachusetts (6.4%). The remaining states landed 4% or less of the total commercial landings.

**Figure 1. 2003 Striped Bass Total Catch (4,702,381 fish).**



**Table 1. Striped Bass Landings (numbers of fish) from 2001-2003**

	Recreational Fishery		Commercial Fishery		Total Catch
	Harvest	Discard Losses	Harvest	Discard Losses	
<b>2001</b>	2,012,314	1,076,508	941,733	310,900	4,341,455
<b>2002</b>	1,828,367	1,118,538	654,062	168,201	3,769,168
<b>2003</b>	2,405,707	1,168,907	865,689	262,078	4,702,381

#### IV. Status of Assessment Advice

The Atlantic striped bass coastwide stock assessment was peer reviewed by the 36<sup>th</sup> Stock Assessment Workshop/Stock Assessment Review Committee (SAW/SARC) in 2002 (NEFSC 2003). In addition to reviewing the results of the stock assessment, the SARC was asked to comment specifically on the model configuration of the VPA and provide advice on the plus grouping, oldest true age for fishing mortality, and the use of all striped bass fishery independent surveys. In the Stock Assessment Report for 2002, the Striped Bass Technical Committee, Stock Assessment Subcommittee, and Tagging Subcommittee have attempted to address the issues and advice provided by the SARC. The fully recruited F calculated in the 2002 assessment was based on ages 8-11 to conform to the biological reference points in Amendment 6. Consequently, the F estimate is not directly comparable with age 5-11 Fs used in previous assessments, effectively reporting fishing mortality has exceeded the target since 1997. The SAW/SARC will peer review the next Atlantic striped bass stock assessment in 2007.

## **V. Status of Research and Monitoring**

The management plan requires several jurisdictions to implement fishery dependent monitoring programs for striped bass. Table 5 summarizes state compliance with the fishery dependent and independent monitoring requirements. All jurisdictions with commercial fisheries (Massachusetts, Rhode Island, New York, Delaware, Maryland, Virginia, PRFC and North Carolina) are required to define the catch composition (age, length, sex) of these fisheries. Jurisdictions with significant commercial fisheries (Massachusetts, New York, Maryland, Virginia, and PRFC) are required to collect catch and effort data. Jurisdictions with significant recreational fisheries (Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Maryland, Virginia and PRFC) are required to follow specific guidelines for supplementing MRFSS collection of catch composition data and catch and effort information from these fisheries.

In addition to fishery dependent monitoring programs, the management program requires several states to monitor the striped bass population independent of the fishery. Juvenile abundance indices are determined by Maine, New York, New Jersey, Maryland, Virginia, and North Carolina. Spawning stock sampling is performed by New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina. Tagging is conducted by state and federal agencies to determine survivorship and migration patterns in the coastal migratory stock (NMFS, USFWS, Massachusetts, New York, New Jersey, Delaware, Maryland, Virginia, and North Carolina).

## **VI. Status of Management Measures and Issues**

### ***Status of Amendment 6***

In 2003, the striped bass interstate fishery management program was in transition with the approval of Amendment 6 in February 2003. Effective with the approval of the FMP, the coastal commercial quota for striped bass increased to the state's historic average landings during the 1972-1979 base period, with a few exceptions. The coastal commercial quotas are specified in Amendment 6. States could take advantage of the increase immediately as long as the states maintained a minimum size limit of 28 inches or sought conservation equivalency for a smaller size limit.

The implementation deadline for the remainder of the Amendment 6 striped bass management program was January 1<sup>st</sup>, 2004. States could implement new regulations with Board approval prior to January 2004. New Hampshire, Massachusetts, and Connecticut changed their 2003 recreational regulations to the Amendment 6 standard, a 2 fish bag limit and minimum size of 28 inches. The remainder of the states maintained their regulations, complying with the management measures in Amendment 5 (reinforced through Addendum 5) or the more conservative management measures implemented through Addendum 4, which reduced fishing mortality on age 8 and older fish.

During 2003 and through the present, the NOAA Fisheries maintains a ban on all striped bass fishing activity and possession of striped bass in the Exclusive Economic Zone (EEZ) with the exception of a defined route to and from Block Island in Rhode Island.

***New Jersey Noncompliance in 2004***

In May 2004, the Management Board approved a proposal for New Jersey’s striped bass recreational fishery that included seven viable options. In the same meeting, the Board made a motion for the ISFMP Policy Board to find New Jersey out of compliance if new compliant regulations are not in place by August 1, 2004.

On August 19, 2004, pursuant to the provisions of the Atlantic Striped Bass Conservation Act of 1984, the Commission notified the Secretaries of Commerce and the Interior that the State of New Jersey was out-of-compliance with the provisions of the Striped Bass FMP. Specifically, New Jersey had not implemented the recreational measures requiring a two fish bag limit with a minimum size of 28 inches or measures deemed to be conservationally equivalent to this standard. The recreational measures are necessary to maintain population abundance and control the fishing mortality rate below the target established in the FMP.

On September 27, 2004, the State of New Jersey implemented regulations consistent with the requirements of Amendment 6. The new recreational measures for New Jersey’s state waters are a daily two fish bag limit -- one striped bass greater than or equal to 24 inches and less than 28 inches, and a second striped bass 34 inches and over. These regulations were approved by the Management Board and considered conservationally equivalent to the requirements of Amendment 6.

***Coastal Commercial Quota Overages***

Massachusetts and Rhode Island exceeded their 2002 quota, so the 2003 coastal commercial quotas were reduced for these two states. Massachusetts exceeded the adjusted 2003 coastal commercial quota, resulting in another penalty, which adjusted the 2004 quota to 1,141,191 pounds (Table 2). North Carolina uses its annual coastal commercial quota for its winter fishery. The 2002-2003 winter fishery exceeded the 2003 quota. The 2004 quota, used for the 2003-2004 winter coastal commercial fishery, was adjusted to compensate for the overage. North Carolina did not harvest the entire 2004 adjusted quota and will be able to take advantage of the full allocation in Amendment 6 (480,480 pounds).

**Table 2. Coastal Commercial Quota Overages & Adjusted Quotas (in pounds).**

	<b>Amendment 6 Quota Allocation</b>	<b>2003 Quota</b>	<b>2003 Harvest</b>	<b>Overage</b>	<b>2004 Quota</b>	<b>2004 Harvest</b>	<b>Overage</b>	<b>2005 Quota</b>
<b>MA</b>	1,159,750	1,036,880**	1,055,439	18,559	1,141,191			
<b>RI</b>	243,625	240,377**	238,025	0	243,625			
<b>NY*</b>	1,061,060	828,293	753,261	0	828,293			
<b>DE</b>	193,447	193,447	188,419	0	193,447			
<b>MD*</b>	131,560	126,936	98,149	0	126,936			
<b>VA</b>	184,853	184,853	159,786	0	184,853			
<b>NC***</b>	480,480	480,480	482,123	1,643	478,837	463,261	0	480,480

\* Quota reduced due to conservation equivalency (size limits)

\*\* Quota reduced due to an overage in 2002.

\*\*\* 2003 Harvest = winter 2002-2003; 2004 Harvest = winter 2003-2004

***Chesapeake Bay Spring Trophy Fishery***

In December 2003, the Atlantic Striped Bass Management Board approved a new methodology to establish the annual quota for the Chesapeake Bay spring trophy fishery. Every year, the Chesapeake Bay states must submit a harvest report for the current year's spring trophy fishery and propose a new quota for the subsequent year. The cap on the trophy fishery is based on the number of age 8+ striped bass in the population as determined annually by the ADAPT VPA output. In 2004, the Chesapeake Bay spring trophy fishery harvested 31,404 fish, exceeding the adjusted quota by 4,680 fish. The overage in 2004 will be deducted from the 2005 quota. The Chesapeake Bay jurisdictions propose a quota of 31,434 fish adjusted by the 2004 overage to result in an adjusted quota of 26,754 fish for the 2005 spring trophy fishery. Table 3 summarizes the caps, harvest, overages, and adjusted quotas from 2003-2005.

**Table 3. Chesapeake Bay Spring Trophy Fishery (in numbers of fish)**

	2003	2004	2005
<b>Quota</b>	30,000	40,624	31,434
<b>Harvest</b>	43,900	31,404	--
<b>Overage</b>	13,900	4,680	--
<b>Adjusted Quota*</b>	--	26,724	26,754

\*Quota minus previous year's overage.

### ***Law Enforcement***

The Law Enforcement Report noted an increase number of cases involving fishermen targeting striped bass in the EEZ, despite the continued prohibition on striped bass fishing activity and possession of striped bass in federal waters. During the spring ASMFC LEC meeting, NMFS law enforcement agreed to coordinate a coast wide effort to increase enforcement, penalties and education to reduce the illegal harvest of striped bass in the EEZ. A number of the cases throughout state waters involved possession of undersize striped bass, over the bag or size limit, illegal use of bait, fishing during a closed season and license violations. LEC reported that the increased number of cases is not a reflection of the enforceability of the FMP, rather a high priority to enforce this significant recreational and commercial fishery.

### ***Juvenile Abundance Indices***

In response to the suite of management triggers introduced in Amendment 6, the PRT summarizes the results from the juvenile abundance indices. The PRT would recommend action to the Management Board if any JAI were to show recruitment failure for three consecutive years in a row. Recruitment failure is defined as a JAI lower than 75% of all other values in the dataset. The juvenile abundance indices in New Jersey, Maryland and Virginia increased in 2003. Maryland and Virginia's young of the year (YOY) indices indicate the 2003 year class is well above the 1957-2003 average and is comparable to the strong year classes in 1993, 1996, and 2001. New Jersey's YOY survey indicates the 2003 year class was the highest on record. The Hudson River YOY index decreased slightly below the 1982-2002 average, but the 2004 YOY survey index increased slight above the average. All four programs indicate in an increased abundance in juveniles for the most recent estimate available, therefore no management action is necessary.



### ***Albemarle/Roanoke Striped Bass FMP***

The Commission's Interstate FMP for Atlantic Striped Bass requires North Carolina to inform the Commission of changes to the Albemarle-Roanoke Striped Bass FMP. While the Commission's approval of North Carolina's management plan is not required, North Carolina must adhere to the compliance criteria in Amendment 6. After the Technical Committee's review, the PRT determined the new FMP complies with the mandatory components of Amendment 6.

The management plan was last revised in 1994, so the updated FMP explores harvest options and identifies management measures and research needs to promote recovery of striped bass stock in the central and southern area. It defines both the Albemarle Sound management area and the Roanoke River management area. Because this stock is managed independently from the coastal migratory stock, it contains a separate target fishing mortality rate ( $F_{\text{target}} = 0.22$  and threshold spawning stock biomass (400,000 pounds). The annual total allowable catch is allocated to the three fisheries; 25% to the Roanoke River recreational fishery, 25% to the Albemarle Sound recreational fishery and 50% to the Albemarle Sound commercial fishery. The FMP implements overage penalties for future overages, but specifies no overage penalties would be applied to the Roanoke River overages from 1994-2002 due to a significant underage in 2003. The FMP addresses habitat and environmental issues, catch and release mortality in hook and release fisheries, discards in the multispecies gillnet fishery, enforcement of creel limits, and maintains the Albemarle Sound Management Area boundary line.

## **VI. Annual State Compliance**

Based on the annual state compliance reports, the Plan Review Team determined that each state/jurisdiction implemented a management program that was approved by the Striped Bass Management Board for the 2003 fishing year and was consistent with the requirements of Addendum V to Amendment 5 and Amendment 6 (Tables 6 and 7). Three jurisdictions altered their management program from the previous year (2002); Massachusetts, and Connecticut increased their bag limits to 2 fish and implemented a minimum size of 28 inches and New Hampshire increased to 2 fish at 28 inches, one of which can be greater than 40 inches.

Amendment 5 had several compliance requirements as part of the Interstate striped bass management program including both monitoring and regulatory requirements that are enforceable through the Atlantic Striped Bass Conservation Act. The monitoring requirements for each jurisdiction are summarized in *Section V* of this report. Compliance with these requirements is summarized in Table 5. The PRT found all states carried out the required monitoring programs and implemented the mandatory regulatory requirements in the 2003 fishing year.

Amendment 5 also required states to submit semi-annual law enforcement activity reports (which was changed to an annual report through Addendum IV). These reports, in a standardized format, detail the effort and success involved in enforcing striped bass regulations in each jurisdiction. For the 2003 fishing year, the states submitted their law enforcement

reports to the Commission's Law Enforcement Coordinator and one Law Enforcement Report was submitted on behalf of all the states in the striped bass management unit. The striped bass law enforcement report is summarized in *Section VI* of this report.

**Table 4. Status of compliance with monitoring and reporting requirements.**  
(Y = compliance standards met, N = compliance standards not met, N/A = not applicable)

State	Fishery-independent monitoring	Fishery-dependent monitoring	Annual reporting
ME	Y	N/A	Y
NH	N/A	N/A	Y
MA	Y	Y	Y
RI	N/A	Y	Y
CT	N/A	Y	Y
NY	Y	Y	Y
NJ	Y	Y	Y
PA	Y	N/A	Y
DE	Y	Y	Y, no Excel workbook
MD	Y	Y	Y
PRFC	N/A	Y	Y, no Excel workbook
DC	N/A	N/A	Y, no Excel workbook
VA	Y	Y	Y
NC	Y	Y	Y

## VII. Recommendations

### Regulatory Recommendations

All of the jurisdictions with a declared interest in the management of Atlantic striped bass had regulations in place for the 2003 fishing year that were in compliance with Addendum V to Amendment 5 to the Interstate Fishery Management Plan for Atlantic striped bass or Amendment 6's coastal commercial quotas.

- 1) The 2004 coastal commercial quota for Massachusetts and Rhode Island should be lowered by the amount over the 2003 allocation (18,559 pounds; see Table 2). The Commonwealth's annual compliance report states a reduction was made to the 2004 quota.
- 2) North Carolina already compensated for the 2003 quota overage of 1,643 pounds. The 2004 winter fishery landed less than the amount allocated for the season. North Carolina has the full Amendment 6 allotment for the 2005 winter fishery.
- 3) The 2005 Chesapeake Bay Spring Trophy quota should be reduced by 4,680 fish (Table 3). The Technical Committee and PRT recommend the approval of the proposed 2005 quota reduced by the overage (26,754 fish).

## **Management Recommendations**

The Amendment 6 management triggers do not require action if the fishing mortality exceeds  $F_{target}$  but is below  $F_{threshold}$  and above the biomass thresholds. Using the newly re-estimated value for the abundance of the 1995 female spawning stock biomass, the population is not considered overfished. The Technical Committee finds it reasonable to believe that the fishing mortality rate on the mixed coastal migratory stock has met or exceeded target  $F$  each year since 1997, but can not estimate the extent to which it was exceeded in 2003 due to the uncertainty in the ADAPT VPA and tagging analyses. Due to the uncertainty in the stock assessment results for the 2003 fishing year, the PRT recommends that the Board maintain status quo on all regulations implemented for the 2004 fishing year and do not allow any relaxation or liberalization of management measures until the Technical Committee can provide an estimate of stock status that is reasonably reliable.

## **Research Recommendations**

### **STOCK ASSESSMENT AND POPULATION DYNAMICS**

#### ***High Priority***

- Conduct analysis on current state and federal fishery dependent and independent monitoring programs to determine which, if any, accurately reflect population status.
- Develop method to integrate VPA and tagging models to produce a single estimate of  $F$  and stock status.
- Evaluate alternative catch at age models for striped bass.
- Examine reporting rates by commercial and recreational fishermen using high reward tags.
- Develop studies to provide information on gear-specific discard mortality rates and to determine the magnitude of bycatch mortality, including factors that influence their magnitude and means of reducing or eliminating this source of mortality. Additionally, increase sea sampling of commercial fisheries to better estimate levels of discards.
- Review relationship between tag-based survival estimates and VPA estimate of mortality in a management framework.
- Develop maturity ogive applicable to coastal migratory stock.
- 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.

#### ***Medium Priority***

- Improve methods for determining population sex ratio for use in estimates of spawning stock biomass and biological reference points.
- Develop refined and cost-efficient coastal monitoring regime for striped bass stocks.
- Quota calculation methods should be refined which allow better estimates among various components of the fishery.
- Examine methods to estimate annual variation in natural mortality.
- Examine trend models with simulated tagging data.
- Examine causes of different survival estimates among programs estimating similar segments of the population.
- Evaluate truncated matrices and covariate-based tagging models.
- Examine differences between R/M exploitation and survival rates.

#### ***Low Priority***

- An evaluation of the overfishing definition should be made relative to uncertainty in biological parameters.

- Simulation models should be developed to look at the implications of overfishing definitions relative to development of a striped bass population that will provide “quality” fishing. Quality fishing must first be defined.
- Examine issues with time saturated tagging models for the  $\geq 18$  inch length group.

## **RESEARCH AND DATA NEEDS**

### ***High Priority***

- Continue in-depth analysis of migrations, stock compositions, etc. using mark-recapture data.

### ***Medium Priority***

- Continue to conduct research to determine limiting factors affecting recruitment and possible density implications.
- Evaluate the percentage of fishermen using circle hooks.
- Conduct study to calculate the emigration rates from producer areas now that population levels are high and conduct multi-year study to determine inter-annual variation in emigration rates.

### ***Low Priority***

- Determine inherent viability of eggs and larvae.
- Additional research should be conducted to determine the pathogenicity of the IPN virus isolated from striped bass to other warm water marine species, such as flounder, menhaden, shad, largemouth bass and catfish.

**Table 5. Summary of Atlantic Striped Bass Recreational Regulations for 2002 & 2003 and Approved Changes for 2004.**  
**Shaded cells indicate regulatory changes from the previous fishing year.**

\* All regulations are subject to change. Readers should contact their state fisheries offices for detailed regulations.

States & Jurisdictions	2002 Fishing Year			2003 Fishing Year			FY 2004	
	Seasonal Quota (lbs)	Size & Bag Limit	Open Season	Seasonal Quota (lbs)	Size & Bag Limit	Open Season	changes?	
Maine	none	1 fish 20"-26" or 1 fish above 40"	H&L only All Year spawn areas: 5.1 - 11.30 & C&R only 5.1 - 6.30	none	1 fish 20"-26" or 1 fish above 40"	H&L only All Year spawn areas: 5.1 - 11.30 & C&R only 5.1 - 6.30		
New Hampshire	none	1 fish 28" min	All Year	none	2 fish 28" min; 1 of which can be >40"	All Year		
Massachusetts	none	1 fish 28" min	All Year	none	2 fish 28" min	All Year		
Rhode Island	none	2 fish 28" min	All Year	none	2 fish 28" min	All Year		
Connecticut	none	Shore/Private Boats: 1 fish 24"-32, 2nd fish above 41" Party/Charter: 2 fish 28" min	All Year	none	2 fish 28" min	All Year		
New York Hudson Ocean Charter/Delaware	none	1 fish 18" min	3.15 - 11.30	none	1 fish 18" min	3.15 - 11.30		
	none	1 fish 28" min	5.8 - 12.15	none	1 fish 28" min	4.15 - 12.15	2 fish 28"	
	none	2 fish 28" min	All Year	none	2 fish 28" min	All Year		
New Jersey	none	1 fish 24"-28" 2nd fish above 28"	All Year DE River spawning area: 1.1 - 3.31 and 6.1 - 12.31 Other Rivers: 3.1 - 12.31	none	1 fish 24" - 28" 2nd fish above 28"	Intra-coastal: 3.1 - 12.30 DE River spawning area: 1.1 - 3.31 and 6.1 - 12.31	1 fish 24"- 28"; 2nd fish >=34"	
	Bonus Program	225,000	28" min, need tag	All Year	321,750	28" min, need tag	All Year	
Pennsylvania	none	1 fish 24" - 28" 2nd fish above 28"	All Year Tidal DE: March, 6.1 - 12.31	none	1 fish 24" - 28" 2nd fish above 28"	All Year Tidal DE: March, 6.1 - 12.31	2 fish 28"	
Delaware	none	1 fish 24" - 28" 2nd fish above 28"	All Year DE River spawning area: 1.1 - 3.31 and 6.1 - 12.31	none	1 fish 24" - 28" 2nd fish above 28"	All Year DE River spawning area: 1.1 - 3.31 and 6.1 - 12.31	2 fish 28"	
Maryland	Trophy	part of 30,000 fish Bay cap	1 fish 28" min	4.20 - 5.15	part of 30,000 fish Bay cap	1 fish/day 28" min	4.19 - 5.15	27,134
	Summer/Fall	3,764,450	2 fish 18" - 28" or 1 fish 18" - 28" 2nd fish above 28"	Bay: 6.1 - 12.15 Potomac Tribs: 4.20 - 12.31	2,617,941	5.16 - 5.31: 2 fish 18" - 28" or 1 fish 18" - 28" 2nd fish above 28"; Brewer Channel to MD/VA line only 6.1 - 12.15: same - all areas open		
	Ocean	none	2 fish 28" min	All Year	none	2 fish 28" min	All Year	

**Table 5 continued. Summary of Atlantic Striped Bass Recreational Regulations for 2002 & 2003 and Approved Changes for 2004.**

\* All regulations are subject to change. Readers should contact their state fisheries offices for detailed regulations.

States & Jurisdictions	2002 Fishing Year			2003 Fishing Year			FY 2004
	Seasonal Quota (lbs)	Size & Bag Limit	Open Season	Seasonal Quota (lbs)	Size & Bag Limit	Open Season	changes?
Washington DC	none	2 fish 18" - 36"	5.1 - 7.31 & 9.1 - 11.14	none	2 fish 18" - 36"	5.1 - 7.31 & 9.1 - 11.14	
PRFC Trophy	part of 30,000 fish Bay cap	1 fish 28" min	4.15 - 5.15	part of 30,000 fish Bay cap	1 fish 28" min	4.19 - 5.17	
	Summer/Fall 723,150	2 fish 18" min, 1 can be >28"	5.16 - 12.31	800,000	2 fish 18" min, 1 can be >28"	5.16 - 12.31	
Virginia	Spring part Bay quota 1,701,748	2 fish 18" - 28"	5.16 - 6.15	1,701,748	2 fish 18" - 28"	5.16 - 6.15	1,364,154
	Trophy part of 30,000 fish Bay cap	1 fish 32" min	5.1 - 5.15	part of 30,000 fish Bay cap	1 fish 32" min	5.1 - 5.15	
	Fall 1,701,748	2 fish 18" min	10.4 - 12.31	1,701,748	2 fish 18" min	10.4 - 12.31	1,364,154
	Ocean none	2 fish 28" min	1.1- 3.31 & 5.16 - 12.31	none	2 fish 28" min	1.1 - 3.31 & 5.16 - 12.31	
North Carolina	Spring: 56,250	2 fish 18" min	Wed, Fri, Sat, Sun	Spring: 68,500	2 fish 18" min	Wed, Fri, Sat, Sun	
	Fall: 56,250			Fall: 68,500			
	Roanoke 112,500	3 fish 18" no fish 22" - 27"	Zone 1: 3.15 - 4.30 Zone 2: 3.1 - 4.14	137,500	2 fish 18" min no fish 22" - 27"	Zone 1: 3.15 - 4.30 Zone 2: 3.1 - 4.15	
Ocean	none	2 fish 28" min	All Year	none	2 fish 28" min	All Year	

**Table 6. Atlantic Striped Bass Commercial Fishery Regulations for 2002 & 2003 and Approved Changes for 2004.**

\* All regulations are subject to change. Readers should contact their state fisheries offices for detailed regulations.

States & Jurisdictions	2002 Fishing Year			2003 Fishing Year			2004 Fishing Year
	Commercial Quota (lbs)	Size Limit	Season	Commercial Quota (lbs)	Size Limit	Season	Changes?
Maine							
New Hampshire							
Massachusetts	802,000	34" min	H&L Only: 7.3 until quota is harvested	1,036,880**	34" min; 40 fish/day	7.6 - 8.10; no landings Thurs-Sat	1,141,191 lbs. Season Open 7.11; 30 fish/day
Rhode Island	Total: 167,938 Trap: 61,909 H&L: 106,029	Traps: 28" min H&L: 34" min	6.1 to 9.30 (H&L: 4 fish, 90% quota) 10.1 until quota harvested (H&L: 3 fish, 10% quota)	<b>Total: 240,377**</b> Trap: 96,151 H&L: 144,226	Traps: 28" min H&L: 34" min	Traps: 1.1 to 8.26 90% 8.27 - 12.31 10% of quota H&L: 6.1 - 8.26, 4fish/day, 75% 10.1 - 12.31, 3 fish/day, 25%	same (quota:243,625)
Connecticut							
New York (Hudson)							
Ocean	547,215	24" - 36"	7.1 - 12.15	828,293	24"-36"	7.1 - 12.15	change: 28" - 39", 877,180
New Jersey							
Pennsylvania							
Delaware	182,835*	20" min	Gillnet: 3.1 - 4.30 & 11.1 - 12.30 H&L: 9.1 - 21.31 Spawning Areas: 1.1 - 3.31 & 6.1 - 12.31	193,447	20" min	Gillnet: 3.1 - 4.30 & 11.1 - 12.30 H&L: 9.1 - 21.31 Spawning Areas: 1.1 - 3.31 & 6.1 - 12.31	28" min except March gillnet fishery: 20" min
Maryland***							
Bay & River	1,760,000	18"-36"	Pound Net: 6.1- 11.30 Haul Seine: 6.1-11.30 H&L: 6.18 - 11.30 Drift Gill Net: 1.1 - 2.26 & 12.2 - 12.30	<b>Total: 1,935,000</b> Gillnet: 833,788 H&L: 417,460 LbNet/Haul Seine: 683,750	18" - 36"	Gillnet: 1.1-2.28 & 12.1 - 12.30 H&L: 6.17 - 12.27 Lb Net/Haul Seine: 6.2 - 12.10	decreased Baywide quota
Ocean	91,000	24"	All Year	126,936	24"	All Year	
Washington DC							
PRFC***	883,850	18" - 35"	All gears have a season	800,000	18" - 28"/36"	All gears have a season	decreased Baywide quota
Virginia***							
Bay & River	1,701,748	18" min; 28" max	2.1 - 12.31 Max Size: 3.26 - 6.15	1,701,748	18" min 28" max	2.1 - 12.31 Max Size: 3.26 - 6.15	1,364,154
Ocean	98,000	28"	2.1 - 5.28	184,853	28"	2.1 - 12.31	
North Carolina							
Albemarle/ Roanoke	215,514	18"	Spring and Fall Season	269,998**	1.6 - 3.19: 18" min, 5 fish/operation 3.20 - 4.14: 18" min, 10 fish/operation 10.27 - 12.31: 18" min, 5 fish/operation		
Ocean	336,000	28"	Season based on gear	480,000	28"	Seasons based on gear	

\* Overage in 2001, required a reduction in 2002 quota.

\*\* Overage in 2002, required a reduction in 2003 quota.

\*\*\* Baywide Quota: 2002 = 10,500,000 lbs; 2003: 10,500,000 lbs; 2004: 8,417,00 lbs

- NY quota is less than Am6 value b/c of slot limit, cons equiv.

- MD quota is less than Am6 value b/c of lower size, cons equiv.

Changes from 2002 to 2003