

2009 REVIEW OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
FISHERY MANAGEMENT PLAN FOR

ATLANTIC STRIPED BASS
(Morone saxatilis)

2008 FISHING YEAR



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Executive Summary

Atlantic striped bass from Maine through North Carolina are managed under Amendment 6 to the Interstate Fishery Management Plan, and Addendum I to Amendment 6. A second addendum to the plan is being considered.

Stock status was last estimated in 2007; the stock was not overfished and overfishing was not occurring in 2006. An updated stock assessment is due in 2009, including data through 2008. The juvenile abundance indices will also be reviewed during the assessment process.

Total striped bass harvest in 2008 is estimated at 3.05 million fish or 32.87 million pounds, a decrease of 5% by number and an increase of 11% by weight from 2007. Recreational anglers harvested 2.05 million fish (25.69 million pounds) in 2008, while commercial fishermen harvested 1.01 million fish (7.19 million pounds). Dead discards for the recreational fishery are estimated at 1.07 million fish; commercial dead discards in 2008 will be estimated during the stock assessment update.

All states have implemented management programs consistent with Amendment 6. Substantial management changes in 2008 occurred to three recreational fisheries: the opening of a catch and keep fishery in the Susquehanna Flats (MD); the lifting of the Chesapeake Bay spring trophy fishery quota; and the alignment of District of Columbia regulations with the neighboring jurisdiction's regulations. Two states exceeded their coastal commercial quotas in 2008, although the Chesapeake Bay quota was not exceeded. Monitoring of the fisheries received substantial law enforcement attention in 2008.

All states have implemented monitoring programs consistent with Amendment 6. However, several states are late in analyzing data and/or reporting information to the Commission. Requirements by state vary, and may include commercial catch, effort, and catch composition data; recreational catch, effort, and catch composition data; juvenile abundance surveys; and spawning stock surveys.

Management and research recommendations are provided.

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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 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, National Marine Fisheries Service, United States Fish and Wildlife Service
<u>Active Boards/Committees:</u>	Atlantic Striped Bass Management Board, Advisory Panel, Technical Committee, Stock Assessment Subcommittee, Tagging Subcommittee, Plan Review Team, and Plan Development Team

Under the Atlantic Striped Bass Conservation Act (P.L. 98-613), implementation of the Fishery Management Plan (FMP) is mandatory. Compliance with 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, fully implemented by January 1, 2004, and completely replaces all previous Commission plans for Atlantic striped bass.

Amendment 6 was developed to address five limitations within the previous management program: potential inability to prevent the Amendment 5 exploitation target from being exceeded; perceived decrease in availability or abundance of large striped bass in the coastal migratory population; a lack of management direction with respect to target and threshold biomass levels; inequitable effects of regulations on the recreational and commercial fisheries, and coastal and producer area sectors; and excessively frequent changes to the management program.

Amendment 6 established biological reference points (BRPs) to define overfished and overfishing status. Overfished status is defined by a threshold female spawning stock biomass (SSB) comparable to the 1995 level, with a target female SSB of 125 percent the threshold. Overfishing is defined by a threshold fishing mortality rate (F) of F_{msy} , with a target F based on the plan's objective to maintain an age structure for long-term sustainability. (The Chesapeake Bay and Albemarle-Roanoke stocks operate under a separate target F; see next paragraph.) The BRPs form the basis of a list of triggers for appropriate management response if reached.

The striped bass fisheries are managed with regulations set to achieve the target fishing mortality rate. Most recreational fisheries are constrained by a two fish creel limit, 28 inch minimum size limit, and year-round fishing season except in spawning areas. Through Management Program Equivalency, Amendment 6 allows a smaller minimum size limit (18 inches) in the Chesapeake Bay and Albemarle Sound/Roanoke River with the penalty of a lower target F.

Commercial striped bass fisheries are constrained by minimum size limits and state-by-state quotas. The same minimum size standards regulate the commercial fisheries as the recreational

fisheries, except for a 20 inch size limit in the Delaware Bay spring gillnet fishery. Amendment 6 restored the coastal commercial quotas to the average reported landings from 1972-1979, except for Delaware's coastal commercial quota, which remains at the level allocated in 2002. The responsible jurisdictions set quotas for the Chesapeake Bay and Albemarle Sound/Roanoke River commercial fisheries based on the areas' target F.

States are permitted the flexibility to deviate from these standards by submitting proposals for review by the Striped Bass Technical Committee, Advisory Panel, and Plan Review Team and contingent upon the approval of the Management Board. Alternative proposals must be "conservationally equivalent" to the management standards. This practice has resulted in a variety of regulations among states (see Tables 1 and 2).

Addendum I to Amendment 6 was approved and implemented in October 2007. The addendum establishes a bycatch monitoring and research program to increase the accuracy of data on striped bass discards, as required by Amendment 6, and also recommends that states, through the Commission if possible, develop a web-based angler education program on fishing techniques known to reduce post-release hooking mortality. The bycatch program establishes a suite of mandatory and voluntary data collection standards, discard mortality studies, and Technical Committee analyses for commercial, recreational, and for-hire fisheries.

The Exclusive Economic Zone (EEZ) has been closed to the harvest and possession 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, and submitted to the Secretary of Commerce, to re-open federal waters to commercial and recreational fisheries. Starting in July 2003 and continuing for several years, NOAA Fisheries took steps in the rulemaking process to consider the proposal. In September 2006, NOAA Fisheries concluded that it would be imprudent to open the EEZ to striped bass fishing and chose not to proceed further in its rulemaking.

II. Status of the Stocks

The most recent striped bass stock assessment was conducted by the Striped Bass Technical Committee, Stock Assessment Subcommittee, and Tagging Subcommittee in 2007 and includes data through 2006 (NEFSC 2008a, NEFSC 2008b). Two models were included as the main models for stock assessment: the age-based statistical catch-at-age (SCA) model, and the tag-based catch equation (CE) model. Based on the results of both models and comparison to the BRPs, the assessment team determined that striped bass were not overfished nor experiencing overfishing in 2006.

The assessment was peer reviewed through the 46th Northeast Regional Stock Assessment Workshop (Murphy and others 2008). The Stock Assessment Review Committee (SARC) found each term of reference to have been met and endorsed the results of the assessment. Of the candidate assessment models, the SARC found that, the SCA model "best estimated parameters that could be judged against the current biological benchmarks... Based on these, the SARC agreed with the assessment team's stock status determination that striped bass is not currently overfished and overfishing is not occurring. Fishing mortality has increased in recent years and is currently (data up to and including 2006) at or very near the target level."

The SARC also advised the assessment team to: 1) reconsider the ratio of male to female fish used in the estimation of female SSB; 2) re-estimate the F threshold (F_{msy}) based on data and stock estimates from the SCA model; and 3) link the female SSB target and threshold to the SCA model's 1995 SSB estimate. The assessment team undertook this work and in August 2008, the Board approved updated Amendment 6 biological reference points (see table below), as well as improved estimates of female SSB for 1982-2006 (developed with an empirical sex ratio). With these new estimates, the status of striped bass remains not overfished and not experiencing overfishing (Figures 1 and 2).

Striped Bass Biological Reference Points		
	Female Spawning Stock Biomass	Fully-Recruited Fishing Mortality
Threshold	$SSB_{1995} = 30,000$ metric tons	$F_{msy} = 0.34$
Target	$SSB_{threshold} \times 1.25 = 37,500$ metric tons	0.30

Spawning stock biomass and recruitment estimates were derived from the SCA model. Female SSB for 2006 is estimated at 40,639 metric tons (mt), well above the threshold SSB, as well as the target SSB (Figure 1). Female SSB grew steadily through 2003, when it peaked at 51,277 mt, but has since declined. This trend may reverse when several strong year classes enter the ages included in SSB. The 2003 cohort is the strongest in the time series. Recruitment of the 2005 cohort was estimated at 10.04 million age-1 fish, which is near the average age-1 recruitment observed since the stocks were declared recovered in 1995.

Coastwide fishing mortality rate (F) estimates are available from the SCA model and tag-based CE model (Figure 2). The F estimates from both models are for fully recruited fish, estimated as the average F on ages 8-11 fish for the SCA model, and the average F on fish 28 inches plus for the CE model. The F estimates from the SCA and CE models show similar increasing trends from the late 1980s to the late 1990s, followed by declines through 2002. After 2002, Fs from the SCA model increase to 0.31 in 2006, while Fs from the CE model remain relatively flat, estimated at 0.16 in 2006. Only the terminal estimate of F from the SCA model exceeds the F_{target} . Results from retrospective analysis of the SCA, as well as the CE model results, suggest that the 2006 F estimate may be overestimated and could decrease below F_{target} with the addition of future data. As previously mentioned, the SARC endorsed the SCA model for determining stock status.

Because Amendment 6 implemented a distinct management program for the Chesapeake Bay with a fishing mortality target of 0.27, the assessment also includes a separate estimate of fishing mortality for the area. The CE model was used with Maryland and Virginia tagging data. Chesapeake Bay F estimates range from 0.0 to 0.16 throughout the time series (1987-2006), and is estimated at 0.14 in 2006.

The CE model, which allows for a variable natural mortality, also provides program-specific estimates of F for the eight tagging programs participating in the USFWS Atlantic coastwide striped bass tagging program. Among the "producer area" programs (Delaware River, Hudson River, Potomac River and Upper Chesapeake Bay, and Rappahannock River), the 2006 stock-specific estimates of F for fully recruited fish ranged from 0.16 to 0.28. Among the coastal programs (Massachusetts, North Carolina, New Jersey Delaware Bay, and New York), the same estimates ranged from 0.11 to 0.19.

Population estimates are available from both the SCA and CE models. The estimate of total abundance for January 1, 2007 from the SCA model was 55.8 million age-1 and older fish. This estimate is about 9.0 million fish lower than the peak in 2004, and 3.2 million fish lower than the average population size of the previous 10 years. From the CE model, the 2006 population estimates were 47.9 million age 3+ fish and 13.0 million age 7+ fish. These tag-based estimates are higher than the SCA estimates, which were 38.7 million age 3+ fish and 7.8 million age 7+ fish.

III. Status of the Fishery

Total striped bass harvest in 2008 is estimated at 3.05 million fish (32.87 million pounds; Tables 3-6). The commercial and recreational fisheries harvested 33 and 67 percent by number and 22 and 78 percent by weight, respectively. Total harvest decreased by 5% by number and increased by 11% by weight from 2007.

In 2008, the recreational fishery harvested an estimated 2.05 million fish (25.69 million pounds), compared to the 2007 harvest of 2.19 million fish (22.58 million pounds; Tables 5 and 6). Recreational releases decreased by over 5 million fish to 11.85 million fish, for an estimated 1.07 million dead discarded fish (9% of releases; Table 7). Total recreational removals in 2008 (harvest and dead discards combined) decreased by over 16% from the previous year. New York harvested 21.9% of the coastwide recreational landings in number of fish, followed by Maryland (21.6%), Massachusetts (16.8%), New Jersey (15.6%), and Virginia (10.1%). The remaining states each landed less than 6% of the 2008 recreational harvest by number of fish. Massachusetts released 30.7% of the coastwide recreational releases in number of fish, followed by Connecticut (20.0%), New Jersey (12.3%), Maryland (11.9%), and New York (10.8%). The remaining states produced less than four percent of the coastwide releases each.

The commercial fishery landed an estimated 1.01 million fish (7.19 million pounds) in 2008, compared to the 2007 harvest of 1.02 million fish (7.05 million pounds; Tables 3 and 4). The Chesapeake Bay jurisdictions dominated the 2008 commercial harvest; by pounds, Maryland landed 32.4%, Virginia landed 23.9%, and PRFC landed 8.5%. Elsewhere along the coast, Massachusetts landed 16.1% and New York 9.1%. North Carolina, Delaware, and Rhode Island each landed between less than approximately 4% of the total commercial landings by pounds. Estimates of commercial dead discards in 2007 and 2008 are currently unavailable. In 2006, commercial dead discards numbered 216,753 fish (Figure 3).

See Figure 4 for the number of fish removed by commercial and recreation harvest and dead discards from 1982 to 2008 (except 2007 and 2008 commercial dead discards).

IV. Status of Assessment Advice

The benchmark 2007 Atlantic striped bass stock assessment was favorably peer reviewed at the 46th SAW. The SARC identified several topics deserving special attention or improvement in future assessments, including: examining sensitivity of assessment results to discard estimates and improving those estimates; age determination for striped bass older than about age 10; extracting more information out of the young-of-year indices; employing better methods of

averaging multiple survey indices; using regional surveys to get direct information about differences in recruitment levels for the sub-stocks of the fishery; and better standardization of state surveys (NEFSC 2008a).

The 2007 benchmark assessment will be updated in 2009 with data through 2008.

V. Status of Research and Monitoring

The management plan requires certain jurisdictions to implement fishery-dependent monitoring programs for striped bass. All jurisdictions with commercial fisheries (Massachusetts, Rhode Island, New York, Delaware, Maryland, Virginia, PRFC, and North Carolina) or significant recreational fisheries (Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Maryland, Virginia, and PRFC) are required to define the catch composition of these fisheries. Jurisdictions with significant commercial fisheries (Massachusetts, New York, Maryland, Virginia, and PRFC) and those agencies monitoring recreational fisheries (NOAA Fisheries, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Maryland, Virginia, and PRFC) are required to gather representative catch and effort data for these fisheries.

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

VI. Status of Management Measures and Issues

Status of Amendment 6

Amendment 6 and Addendum I to Amendment 6 provided the regulatory measures for the 2008 fishing year. Following Board acceptance of the 2007 stock assessment, potential issues for a second addendum were discussed in 2008. Further deliberation on initiating the addendum process was postponed until completion of the Amendment 6 BRP update, as recommended by the 46th SARC. Discussion was further postponed while the Technical Committee evaluated the performance of the fishery with the management objectives in Amendment 6. Subsequently, the Management Board issued a list of seven tasks to the Technical Committee and the Committee on Economics and Social Sciences (CESS) in preparation of considering an addendum. In May 2009, when the Technical Committee provided final responses and the CESS provided its work plan for its task, the Board initiated the development of an addendum to consider options to roll over unused coastal commercial quota up to fifty percent. The Board will consider approving Draft Addendum II for public comment in August 2009.

Coastal Commercial Quota

Table 8 shows a history of coastal commercial quotas and harvests since the implementation of Amendment 6. In 2008, four states had coastal commercial quotas lower than their Amendment 6 allocation due to quota overages in 2007 and/or conservation equivalencies related to minimum size limits: Massachusetts (overage), Rhode Island (overage and size limit), New York (size limit), and Maryland (size limit).

In 2008, two states exceeded their coastal commercial quotas and should have their 2009 quotas reduced accordingly (Table 8). Massachusetts exceeded its adjusted coastal commercial quota by 43,469 pounds, resulting in an adjusted 2009 quota of 1,116,281 pounds. Rhode Island exceeded its adjusted coastal commercial quota by 6,689 pounds, for an adjusted 2009 quota of 233,274 pounds.

The Massachusetts and Rhode Island compliance reports document slightly different quotas adopted in 2009: 1,107,456 pounds in Massachusetts, and 233,629 pounds for Rhode Island. The PRT believes that this is a result of the states calculating their 2009 quotas on preliminary harvest estimates for 2008 because that is what is available at the time.

Chesapeake Bay Quota

Amendment 6 implements a separate management program for the Chesapeake Bay due to the size availability of striped bass in this area. Based on a target fishing mortality rate of $F=0.27$, a bay-wide quota for resident fish is established for the area. In 2008, the bay-wide quota was 10,015,705 pounds. Shares are allocated to Maryland (~52%), the PRFC (~15%), and Virginia (~33%) based on historical harvest, and each jurisdiction then allocates portions of the quota to its recreational and commercial fisheries (Table 9). In 2008, the bay-wide harvest was over two million pounds less than the quota. The 2009 Bay quota will be the same as the 2008 quota.

Chesapeake Bay Spring Trophy Fishery

Recreational fishermen in the Chesapeake Bay are permitted to take adult migrant fish during a limited seasonal fishery, commonly referred to as the Spring Trophy Fishery. Starting in 1993, the fishery has been controlled by a Board-approved harvest cap: 3,000 fish in 1993, 5,000 fish in 1994, 25,000 fish in 1995, and 30,000 fish in 1996-2003. From 2004 to 2006, quotas were based on the number of age 8+ striped bass in the population, as determined by the VPA output, minus any overage from the previous year. For the 2007 season, the Board approved a target harvest of 30,000 fish (VPA calculated quota minus the 2006 overage, to be no less than 30,000 fish). The resulting harvest was 36,328 fish. The Board then approved non-quota management for the 2008 season, which resulted in a harvest of 36,166 fish (Table 10). Subsequently, Maryland proposed and the Board approved extending non-quota management until stock assessment indicates that corrective action is necessary to reduce F on the coastal stock.

Law Enforcement

The Law Enforcement Committee reports that the FMP for striped bass is enforceable as written. Striped bass enforcement is a high priority with all Atlantic states and a significant amount of effort has been expended to obtain overall compliance. Joint Enforcement Agreements (JEAs) between NOAA-Office of Law Enforcement, United States Coast Guard, and individual states exist in all states of the management unit except North Carolina. The JEAs expanded enforcement efforts in the EEZ for the fourth year in 2008. The absence of a JEA between

NOAA-OLE, USCG, and North Carolina Marine Patrol prevents expanded EEZ patrols for striped bass violations. Enforcement of the Striped Bass FMP could be enhanced with this agreement.

Some states have been aggressively monitoring commercial catches and quota allocations. These investigations are difficult and time consuming but necessary to ensure a high level of compliance. The most notable of these cases involved a five year undercover operation in Maryland, Virginia, and the District of Columbia where Agents uncovered widespread commercial violations in the Potomac River watershed. The cases were prosecuted or resolved with several jail sentences, heavy fines, and seizures of licenses and equipment. Hundreds of thousands of pounds of striped bass were taken illegally and would not have been uncovered through uniformed patrols as they exist today. Other states have also made fairly significant cases involving charter and commercial enterprises. The work done in this area emphasizes the need for strong enforcement efforts supported by the fiscal support necessary to monitor catches and deter violations. Maryland and Virginia have taken steps to improve enforcement and monitoring as a result of the recent cases. All states should review their commercial regulations to ensure that implementation of the striped bass FMP is easily monitored for compliance.

Juvenile Abundance Indices

In response to the suite of management triggers introduced in Amendment 6, the Technical Committee annually examines the trends in all required Juvenile Abundance Index (JAI) surveys. The Technical Committee is to recommend appropriate action to the Management Board if any JAI shows recruitment failure for three consecutive years. Recruitment failure is defined as a JAI lower than 75% of all other values in the dataset. The geometric mean is the preferred index of YOY striped bass abundance to model stock status.

The Technical Committee has not yet had the opportunity to examine the trends in the JAIs through 2008, but will do so at a meeting in September 2009. The Plan Review Team provides the following summary of the indices. The 2008 JAIs in Maine, New York, and New Jersey are above the time-series averages, although only the 2008 Maine JAI increased from 2007. The Maryland, Virginia, and North Carolina indices are below their time-series averages. While the 2007 Maryland and Virginia indices were above the time-series averages, 2008 marks the third year that the North Carolina index is below the time-series average, which should make technical review of the indices a priority matter.

Albemarle/Roanoke Striped Bass FMP

The Interstate FMP for Atlantic Striped Bass requires North Carolina to inform the Commission of changes to striped bass management in the Albemarle Sound/Roanoke River (A/R) System. North Carolina must adhere to the compliance criteria in Amendment 6. After a Technical Committee review, the PRT previously determined that North Carolina's FMP complies with the mandatory components of Amendment 6.

The A/R System is managed jointly for striped bass by the North Carolina Department of Environment and Natural Resources, Division of Marine Fisheries, which manages the Albemarle Sound Management Area (ASMA), and the North Carolina Wildlife Resources Commission, Division of Inland Fisheries, which manages the Roanoke River Management Area (RRMA). The 2004 FMP, which updated the 1994 FMP, set a target fishing mortality rate equal

to 0.22 and threshold spawning stock biomass equal to 400,000 pounds for the A/R System. The annual total allowable catch (550,000 pounds in 2008) is allocated evenly between the recreational and commercial fisheries, with 25% for the RRMA recreational fishery, 25% for the ASMA recreational fishery, and 50% for the ASMA commercial fishery.

Total 2008 harvest in the A/R System is estimated as 144,279 pounds, over 400,000 pounds below the 2008 TAC. Each sector harvested within its quota allocation. An additional 150,771 pounds of estimated bycatch mortality are reported.

A stock assessment of the A/R striped bass stock is currently underway. The tagging model is being updated and a statistical catch at age assessment is also being conducted. The assessment is scheduled for peer review in late summer 2009. After peer review, Advisory Committees will convene to initiate a revision of the NC Estuarine Striped Bass FMP.

VII. Annual State Compliance

Based on the annual state compliance reports, the Plan Review Team determines that each state/jurisdiction implemented a management program for 2008 that was approved by the Striped Bass Management Board and was consistent with the requirements of Amendment 6. (See Tables 1 and 2 for state-by-state regulations.) The Plan Review Team notes, however, that several states submitted reports past the June 15 due date (see Table 11).

Following Board approval (where necessary), the following regulatory changes occurred in 2008:

- Maryland adopted a catch and keep recreational fishery in the Susquehanna Flats. The fishery operates from May 16 to May 31 with a one fish limit and 18-26" slot limit. Harvest is counted towards the bay-wide quota. Circle hooks are required when fishing with a baited hook with a gap less than 1/2".
- The Chesapeake Bay Spring Trophy Fishery quota was eliminated for a one year, trial season. In 2008, the Maryland trophy fishery operated from April 19 to May 13 with a 1 fish limit and 28" minimum size limit. The PRFC implemented complementary measures, while Virginia maintained its 1 fish and 32" minimum size limit from May 1 through June 15.
- The District of Columbia changed its 2008 fishing regulations to match the neighboring PRFC regulations, that is a recreational hook and line fishery from May 16 to December 31, 2 fish limit, 18" minimum, and 28" maximum for one fish.

Following Board approval, the following regulatory changes are occurring in 2009:

- Pennsylvania adopted a 20-26" slot limit with a 2 fish creel limit in April and May in the Delaware River from the PA/DE state line upstream to the Calhoun Street Bridge. The 28" minimum size limit and 2 fish creel limit are in effect the remainder of the year.
- Delaware adopted a 20-26" slot limit with a 2 fish creel limit in July and August in its portion of the Delaware Bay, River, and tributaries. A survey of the sex ratio of landed fish will be conducted as proposed. The 28" minimum size limit and 2 fish creel limit are in effect the remainder of the year, except the closure on the spawning grounds from April through May.

- The Chesapeake Bay Spring Trophy Fishery quota was eliminated until stock assessment indicates that corrective action is necessary to lower the coastal stock fishing mortality rate. The fishery operates under a 1 fish limit and 28” minimum size limit from the third Saturday in April until May 15.

Additionally, New York indicated that it is contemplating a proposal to increase the 18” minimum size limit to 28” or adopt a slot limit in the Hudson River.

Amendment 6 includes compliance requirements for monitoring programs (summarized in *Section V*). Compliance with these requirements is summarized in Table 11. The PRT found that all states carried out the required monitoring programs in the 2008 fishing year, albeit with some delays.

Amendment 6 also requires states to submit annual law enforcement activity reports, which detail the effort and success involved in enforcing striped bass regulations in each jurisdiction. Having received reports on 2008 for each jurisdiction in the management unit, the Commission's Law Enforcement Coordinator submitted one Law Enforcement Report on the striped bass fishery. The Law Enforcement Report is summarized in *Section VI* of this report.

VIII. Recommendations

Management Recommendations

- The 2009 coastal commercial quotas for Massachusetts and Rhode Island should be lowered by the amounts the states harvested in excess of their 2008 quotas (Table 8). Quota adjustments should be based on the most accurate harvest data, even if it means a state has to revise its coastal commercial quota mid-year. The procedure for quota adjustments should be more clearly defined.
- Several states have reported divergent estimates of recreational harvest in pounds taken directly from the Marine Recreational Fisheries Statistics Survey (MRFSS) and from the conversion of MRFSS harvest in numbers to weight via a template used for the assessment data. The Stock Assessment Subcommittee should address this issue at the earliest possible opportunity, preferably before the next stock assessment.

Research Recommendations

STOCK ASSESSMENT AND POPULATION DYNAMICS

High Priority

- Develop method to integrate catch-at-age and tagging models to produce a single estimate of F and stock status (ongoing, G. Nelson).
- Develop a spatial and temporal catch at age model incorporating tag-based movement information.
- 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.

- Continue improvements to statistical catch-at-age model as recommended by 46th SARC (e.g., include error from catch estimates, fit each sector of removals individually, run additional diagnostics, account for spatial differences in indices, incorporate stock-recruitment relationship).
- Review model averaging approach to estimate annual fishing mortality with tag-based models; review validity and sensitivity to year groupings.

Medium Priority

- Improve methods for determining population sex ratio for use in estimates of spawning stock biomass and biological reference points.
- Evaluate the overfishing definition relative to uncertainty in biological parameters.
- Develop studies to provide information on gear-specific discard mortality rates and to determine the magnitude of bycatch mortality (ongoing, G. Nelson).
- Develop refined and cost-efficient fisheries-independent coastal population index for striped bass stocks.
- Examine methods to estimate annual variation in natural mortality (ongoing, Striped Bass Tagging Subcommittee).
- Examine causes of different tag-based survival estimates among programs estimating similar segments of the population.
- Evaluate truncated matrices and covariate-based tagging models.
- Develop reliable estimates of poaching loss from striped bass fisheries.
- Develop maturity ogive applicable to coastal migratory stock.
- Improve estimates of striped bass harvest removals in coastal areas during wave 1 and in inland waters of all jurisdictions year-round.
- Develop tag-based reference points.

Low Priority

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

RESEARCH AND DATA NEEDS

High Priority

- Continue in-depth analysis of migrations, stock compositions, etc. using mark-recapture data (ongoing, e.g., Cooperative Winter Tagging Cruise 20 Year Report, W. Laney)
- Continue evaluation of striped bass dietary needs and relation to health condition.
- Develop field or modeling studies to aid in estimation of natural mortality or other factors affecting the tag return rate.

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.
- Conduct additional research to determine the pathogenicity of the IPN virus isolated from striped bass to other warm water marine species, such as flounder, menhaden, shad, and largemouth bass.

Habitat Recommendations

A comprehensive list of habitat research, conservation, and restoration recommendations is provided in Greene et al., 2009.

IX. References

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X. Figures

Figure 1. Striped Bass Spawning Stock Biomass Estimates and Biological Reference Points

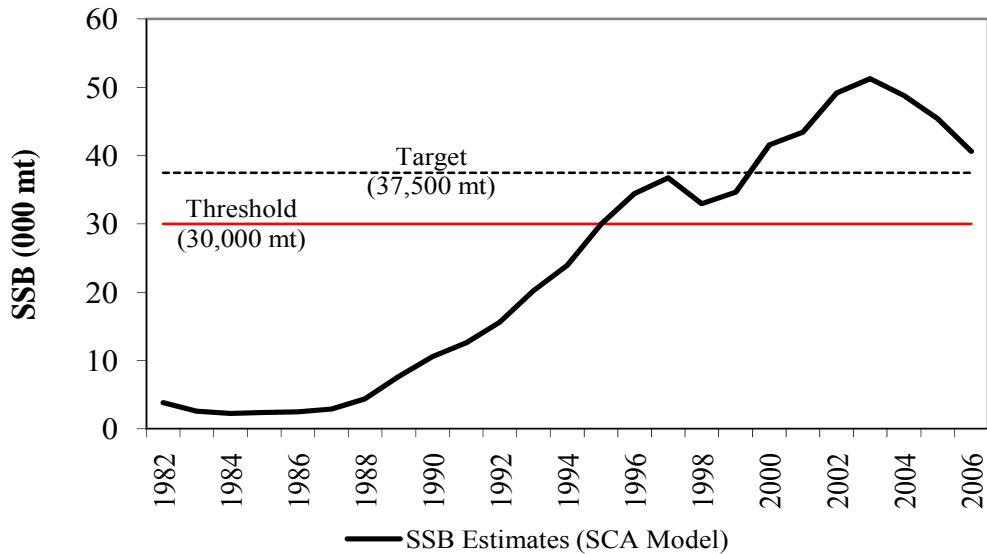


Figure 2. Striped Bass Fishing Mortality Estimates and Biological Reference Points

Notes: The 46th SARC preferred the statistical catch at age (SCA) model estimates for comparison to biological reference points. Estimates from the tag-based catch equation (CE) model, as well as retrospective estimates of F from the SCA model, indicate that the 2006 F estimate from the SCA model may be overestimated and could decline below the F target with the addition of future years of data.

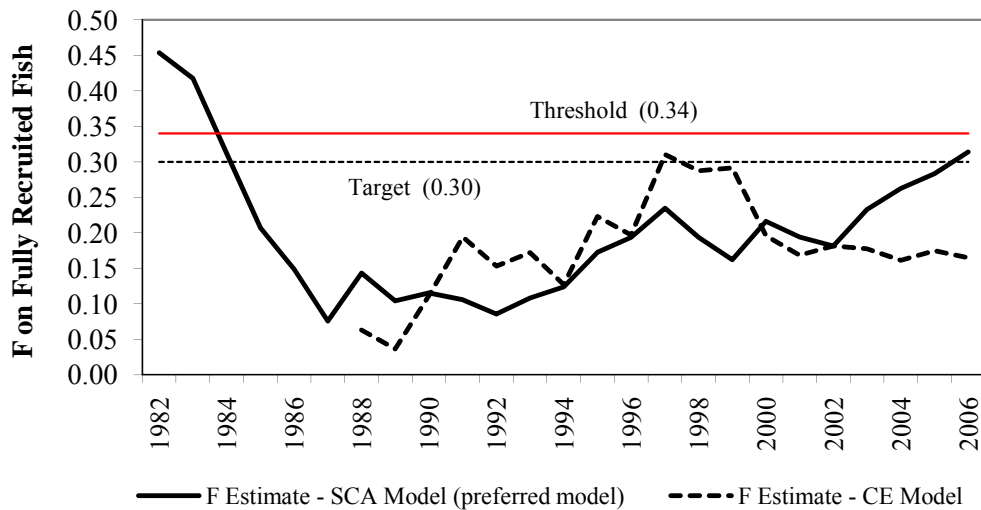


Figure 3. 2006 Striped Bass Total Catch (>6.1 million fish) (Source: 2007 Stock Assessment)

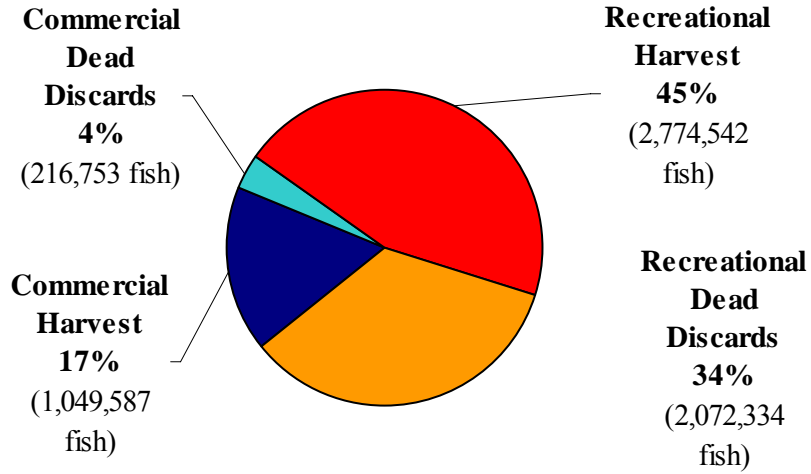
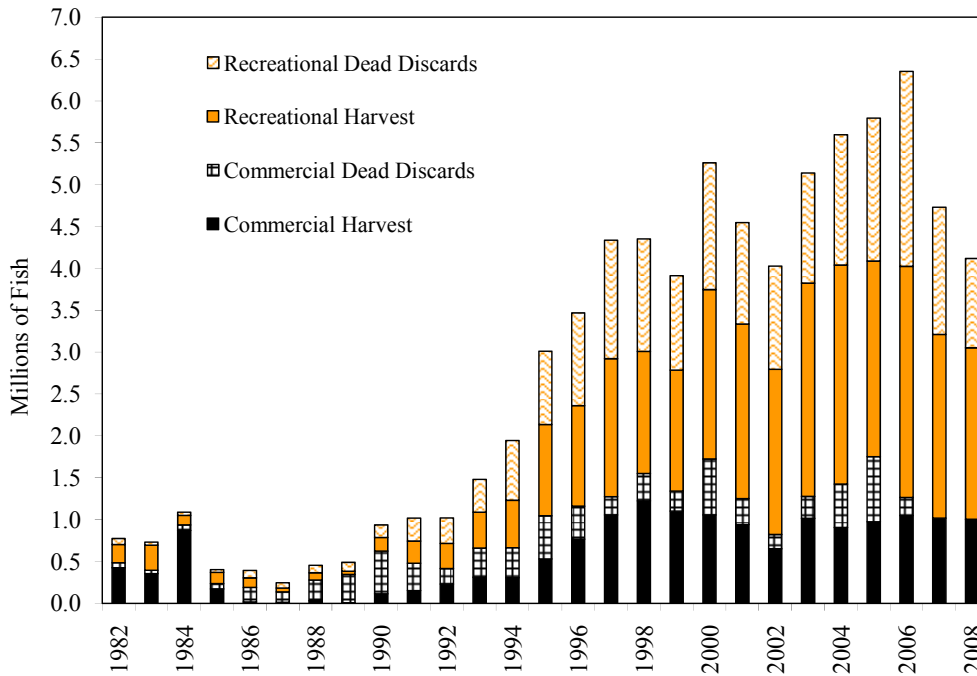


Figure 4. Commercial and Recreational Harvest and Dead Discards, 1982-2008

Sources: NMFS Fisheries Statistics Division, State Reports, and 2007 Stock Assessment

Notes: No 2007 and 2008 commercial dead discard estimates available



XI. Tables

Table 1. Summary of Atlantic Striped Bass Commercial Fishery Regulations for 2008

STATE	SIZE LIMITS	SEASONAL QUOTA	OPEN SEASON
ME	Commercial fishing prohibited		
NH	Commercial fishing prohibited		
MA	34" min.	1,116,653 lb. Hook & line only	7.12 – 9.9; 5 fish/day on Sun; 30 fish/day Tues-Thurs
RI	Trap: 26" min. General category: 34" min.	Total: 239,299 lb. Split 39:61 between trap and general category.	Trap: 1.1–8.26, when 80% caught, 500 lb/trap/day; 8.27–12.31, 10,000 lb. quota set-aside available. General: 6.1-8.31 or 75% quota; 9.1-12.31 or quota full; 5 fish/day Sun-Thu
CT	Commercial fishing prohibited		
NY	24 – 36" Ocean only	828,293 lb. for pound nets, gill nets (6-8" stretched mesh), and hook & line.	7.1 – 12.15 (Gill nets <6 or >8", 7 fish/trip; trawls 21 fish/trip)
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.	Gillnet: 2.15-5.31 (3.1-31 for Nanticoke) & 11.15-12.31; drift nets only 2.15-29 & 5.1-31; no fixed nets in DE River Hook and Line: 4.1–12.31 Except 4.1-5.31 closed spawning areas
MD	Bay and Rivers: 18"–36" Ocean: 24"	Bay and Rivers Quota: 2,254,831 lbs (with gear specific quotas and landing limits) Ocean: 126,396 lb. (with landings limit)	Bay Pound Net: 6.2-11.29, Mon-Sat Bay Haul Seine: 6.9-11.29, Mon-Fri Bay Hook & Line: 6.16-11.27, Mon-Thu Bay Drift Gill Net: 1.1-2.29, 12.1-12.31, Mon-Fri Ocean Drift Gill Net & Trawl: 1.1-4.30, 11.2-12.31, Mon-Fri
PRFC	18" min all year 36" max 2.15–3.25	848,580 lb. quota	Hook & line: 2.15- 3.25, 6.1-12.31 Pound Net & Other: 2.15-3.25, 6.1-12.15 Gill Net: 1.1-3.25 Other: 2.15- 3.25, 6.1- 12.15
DC	Commercial fishing prohibited		
VA	Bay and Rivers: 18" min, 28" max 3.26–6.15 Ocean: 28" minimum	Bay and Rivers Quota: 1,642,242 lb. Ocean Quota: 184,853 lb.	Bay and Rivers: 2.1-12.31 Ocean: 2.1-12.31
NC	Albemarle Sound: 18" Ocean: 28"	Albemarle Sound: 275,000 lb Ocean: 480,480 lb.	Albemarle Sound: 1.1-4.30, 10.1-11.30 (daily trip limits ranging from 5-15 fish) Ocean: set via proclamation with trip limits

Table 2. Summary of Atlantic Striped Bass Recreational Regulations for 2008

STATE	SIZE LIMITS	BAG LIMIT	OPEN SEASON	OTHER
ME	1 fish 20-26" OR 1 fish ≥40"	1 fish	All year except 12.1-4.30 in spawning areas, with catch & release only 5.1-6.30	Hook & line only
NH	1 fish 28-40" & 1 fish 28" min	2 fish	All year	No netting; no gaffing
MA	28" min	2 fish	All year	Hook & line only
RI	28" min	2 fish	All year	
CT	28" min	2 fish	All year	
NY	Ocean Private: 1 fish 28-40" & 1 fish > 40" Ocean Charter: 28" min Hudson: 18" min DE River: 28" min	Ocean: 2 fish Hudson: 1 fish DE River: 2 fish	Ocean: 4.15-12.15 Hudson River: 3.16-11.30 Delaware River: All year	Angling or spearing only
NJ	28" min	2 fish, plus 1 additional through Bonus Program	All year except 1.1-2.28 in intra-coastal waters plus 4.1-5.31 in lower DE River	No netting; bonus program quota: 321,750 lb
PA	28" min	2 fish	All year except 1.1-2.28 & 4.1-5.31 in tidal DE River	
DE	28" min	2 fish	All year except 4.1-5.31 in spawning grounds	Hook & line, spear (divers) only
MD	Susquehanna Flats: 18-26" Chesapeake Bay Trophy: 28" min Chesapeake Bay Regular: 18" min, 1>28" Ocean: 28" min	Susquehanna Flats: 1 fish Chesapeake Bay Trophy: 1 fish Chesapeake Bay Regular I: 2 fish Ocean: 2 fish	Susquehanna Flats: 3.1-5.31; catch & release only 3.1-5.9 Chesapeake Bay Trophy: 4.19-5.13 (most tribes closed) Chesapeake Bay Regular: 5.16-12.15 (most tribes closed until 6.1) Ocean: All year	Chesapeake Bay Quota (includes Susquehanna Flats, but not trophy season harvest): 2,956,463 lb.
PRFC	Trophy: 28" Regular: 18" min, 1>28"	Trophy: 1 fish Regular: 2 fish	Trophy: 4.19 -5.13 Regular: 5.16-12.31	Regular Quota: 683,967 lb.
DC	18" min, 1>28"	2 fish	5.16-12.31	Hook & line only
VA	Trophy: 32" min (28" Potomac tribes) CB Spring: 18-28"; 1>32" CB Fall & Potomac Tribs: 18-28"; 1>34" Ocean: 28"	Trophy: 1 fish CB Spring: 2 fish CB Fall: 2 fish (1 fish 12.21-31) Potomac: 2 fish Ocean: 2 fish	Trophy: 5.1-5.15 (open 4.15 Potomac tribes), closed spawning areas CB Spring: 5.16-6.15 (no fish >32" in spawning areas) CB Fall: 10.4-12.9, 12.21-31 Potomac Tribs: 5.16-12.31 Ocean: 1.1-3.31, 5.16-12.31	Hook & line, rod & reel, hand line only Chesapeake Bay Quota (excludes trophy harvest): 1,642,242 lb.
NC	Roanoke River: 2 fish 18-22" OR 1 fish 18-22" and 1 fish >27" Albemarle: 18" min Ocean: 28" min	Roanoke River: 2 fish Albemarle Sound: 3 fish Ocean: 2 fish	Roanoke River: 3.1 – 4.30 Albemarle Sound: 1.1 – 4.30, 10.1-12.31 Ocean: All year	Roanoke River: 137,500 lb. Albemarle Sound: 137,500 lb.

Table 3. Commercial harvest (pounds) of migratory striped bass by state, 1982-2008

Source: State Compliance Reports

Year	ME	NH	MA	RI	CT	NY	NJ	DE	MD	PRFC	VA	NC	Total
1982			643,100	270,300	6,000	470,900		25,700	478,000	136,053	53,683	92,462	2,176,198
1983			224,000	196,400	2,200	309,500		6,800	379,000	164,245	54,349	52,796	1,389,290
1984			107,200	54,500	2,000	595,300			816,000	783,140	15,351	14,501	2,387,992
1985	1,414		118,800	61,200	5,500	469,040				222,196	59,577		937,727
1986			97,300	11,100		1,100				29,370	1,205		140,075
1987			78,600	500						57,945	2,178		139,223
1988			79,553							115,251	62,095		256,899
1989			199,900			300							200,200
1990		37	148,000	4,000		81,870		6,509	2,887	169,060	267,735	9,797	689,895
1991			235,000	28,000		105,163		21,079	191,066	216,755	668,454	6,186	1,471,703
1992			239,200	39,000		226,611		17,795	552,451	127,398	204,338	27,702	1,434,495
1993			262,600	40,000		109,362		28,032	916,764	142,742	213,665	36,463	1,749,628
1994			199,600	39,810		171,279		33,897	884,970	149,891	204,124	92,605	1,776,176
1995			782,000	113,461		500,784		38,198	856,568	198,478	557,741	343,707	3,390,937
1996			696,815	122,562		504,350		117,560	1,523,293	346,834		55,771	3,367,185
1997			785,942	96,519		460,762		165,978	2,030,061	731,114	1,153,743	458,524	5,882,643
1998			822,000	94,663		484,900		163,169	2,368,393	726,179	1,476,502	308,068	6,443,874
1999		33	788,171	119,679		491,790		187,096	2,377,393	653,266	1,538,220	389,454	6,545,102
2000			779,736	111,812		542,659		140,634	2,411,554	666,001	1,883,856	162,736	6,698,988
2001			815,054	129,654		633,095		198,802	1,774,758	658,676	1,675,469	350,280	6,235,788
2002			924,870	129,172		518,573		160,560	1,852,634	521,048	1,592,910	299,508	5,999,275
2003			1,055,439	246,312		753,261		188,419	1,813,727	676,574	1,856,831	482,123	7,072,686
2004		20 3	1,206,305	245,204		741,668		181,974	1,899,539	772,333	1,668,307	604,824	7,320,357
2005			1,104,737	242,303		689,821		173,815	2,055,558	533,456	1,746,247	588,601	7,134,538
2006			1,312,168	238,797		688,446		185,987	2,207,350	673,508	1,413,914	63,458	6,783,628
2007			1,040,328	240,627		729,743		188,668	2,336,886	599,261	1,534,799	380,380	7,050,692
2008			1,160,122	245,988		653,100		188,719	2,326,023	611,789	1,714,564	288,410	7,188,715

Notes: All harvests are based on the calendar year.

Table 4. Commercial harvest (numbers) of migratory striped bass by state, 1982-2008, and annual dead discard estimates

Sources: State Compliance Reports (landings); 2007 Stock Assessment (dead discards)

Year	ME	NH	MA	RI	CT	NY	NJ	DE	MD	PRFC	VA	NC	Total	Dead Discards
1982			26,183	52,896	207	74,935		12,794	189,089	54,421	14,905	3,200	428,630	57,624
1983			9,528	48,173	83	66,334		5,806	147,079	63,171	15,962	1,405	357,541	40,127
1984			5,838	8,878	192	70,472		12,832	392,696	372,924	6,507	532	870,871	65,639
1985	90		7,601	7,173	350	52,048		1,359		82,550	23,450		174,621	62,734
1986			3,797	2,668				0		10,965	251		17,681	174,024
1987			3,284	23				0		9,884	361		13,552	125,066
1988			3,388					0		19,334	10,588		33,310	245,552
1989			7,402					0					7,402	338,827
1990			5,927	784		11,785		612	534	38,884	56,222	803	115,551	510,011
1991			10,400	3,596		15,064		3,091	31,880	44,521	44,970	413	153,935	327,167
1992			11,300	9,095		20,353		2,704	119,286	23,291	42,912	1,745	230,686	186,601
1993			13,000	6,294		11,185		4,373	211,089	24,451	39,059	3,414	312,865	347,839
1994			10,400	4,512		15,357		4,887	208,914	25,196	32,382	5,275	306,923	359,518
1995			41,200	19,722		43,705		5,520	280,051	29,308	88,274	23,325	531,105	515,454
1996			38,354	18,570		40,523		20,234	415,272	46,309	184,495	3,151	766,908	394,824
1997			44,841	7,061		37,594		32,785	656,416	87,643	165,583	25,562	1,057,485	216,743
1998			45,314	8,835		45,149		31,390	780,893	93,299	204,911	16,040	1,225,831	326,031
1999			40,838	11,559		49,914		34,841	650,022	90,575	205,143	21,010	1,103,902	236,620
2000			40,256	9,418		54,895		25,188	627,777	91,471	202,227	6,480	1,057,712	666,996
2001			40,248	10,917		58,296		34,373	538,808	87,809	148,346	22,936	941,733	310,900
2002			44,897	11,653		47,143		26,527	296,635	80,300	127,211	15,784	650,150	168,201
2003			55,433	15,497		68,354		31,530	587,438	83,090	161,778	13,823	1,016,943	262,078
2004			60,632	16,040		70,367		28,406	461,064	91,980	147,740	31,014	907,243	518,847
2005			59,473	14,949		70,560		26,336	578,989	80,615	119,258	26,572	976,752	776,951
2006			69,986	15,429		73,528		31,350	655,951	92,288	109,395	2,325	1,050,252	216,753
2007			54,266	13,934		78,287		31,090	598,495	86,608	139,627	16,838	1,019,145	NA
2008			61,076	16,599		73,263		31,866	594,655	81,728	134,603	13,369	1,007,159	NA

Note: All harvests are based on the calendar year.

Table 5. Recreational harvest (pounds) of migratory striped bass by state, 1982-2008

Source: NMFS Fisheries Statistics Division, 07.01.09

Year	ME	NH	MA	RI	CT	NY	NJ	DE	MD	VA	NC	Total
1982	2,663		2,003,948	16,012	110,964	61,438	327,024					2,522,049
1983	13,031	7,061	248,917	16,340	310,798	275,033	1,662,403	29	149,351			2,682,963
1984			33,697	12,879	91,705	896,770	58,616	139,626	44,262			1,277,555
1985	140,951		224,788		41,144	210,815	190,555		8,825	3,585		820,663
1986			298,816	97,961	21,537	33,115	644,394		3,104	5,362		1,104,289
1987		2,987	269,459	69,793	13,307	278,578	159,556		40,818	19,976		854,474
1988		13,549	421,317	108,182	47,536	348,920	136,374		1,058	178,626	972	1,256,534
1989	15,221		295,227	59,346	100,688	236,730	25,520					732,732
1990	60,483	11,363	319,092	73,349	193,011	505,440	588,974	18,115	12,967	443,751		2,226,545
1991	58,177	6,731	440,605	496,723	125,309	1,053,589	643,571	25,501	456,954	333,743	3,882	3,644,785
1992	107,693	44,612	972,116	203,108	196,278	921,201	746,343	25,677	613,174	187,852	16,197	4,034,251
1993	11,953	28,115	1,113,446	292,429	400,067	1,575,938	874,296	52,540	794,853	505,742	3,029	5,652,408
1994	66,451	66,017	1,686,049	109,818	355,829	1,974,759	438,080	63,832	1,096,409	870,140	71,195	6,798,579
1995	45,933	67,992	1,504,390	436,061	671,647	3,296,025	3,141,222	175,347	2,057,450	955,822	158,096	12,509,985
1996	44,802	102,271	1,291,706	950,978	915,418	4,809,381	1,736,508	281,481	1,560,389	1,340,414	199,675	13,233,023
1997	185,178	206,904	2,891,970	927,921	920,465	4,449,564	821,784	232,186	1,962,947	2,813,471	607,978	16,020,368
1998	178,584	114,342	2,973,456	671,847	989,923	2,318,291	1,333,329	236,926	1,908,344	1,581,560	415,585	12,722,187
1999	98,623	84,255	1,822,818	886,668	824,031	3,171,344	3,342,372	100,541	1,137,940	1,741,857	556,922	13,767,371
2000	269,325	71,370	2,618,216	1,160,305	515,962	4,050,569	4,286,040	369,030	2,100,854	2,005,721	187,276	17,634,668
2001	290,233	223,072	3,644,561	1,138,978	628,044	2,996,805	5,341,867	382,498	2,072,943	2,140,713	608,617	19,468,331
2002	383,270	152,342	4,304,883	1,192,296	600,482	2,813,596	4,133,678	266,920	1,423,515	2,648,115	602,586	18,521,683
2003	253,910	281,549	4,889,036	1,502,455	1,251,538	3,409,573	4,258,557	292,167	2,808,923	2,789,745	848,416	22,585,869
2004	171,741	121,566	5,466,059	1,169,587	921,737	2,388,825	5,458,534	311,025	2,333,042	3,101,870	5,574,787	27,018,773
2005	322,996	291,662	5,093,748	1,590,072	1,643,946	3,936,227	3,793,471	254,018	3,533,652	2,655,119	2,195,043	25,309,954
2006	385,598	212,012	4,907,270	873,965	1,388,296	4,820,089	6,623,538	206,432	3,541,582	4,133,292	2,153,231	29,245,305
2007	316,331	73,283	4,784,948	1,407,549	1,718,924	5,767,505	2,441,469	112,071	3,178,237	1,729,112	1,048,581	22,578,010
2008	238,452	92,179	5,516,183	732,564	1,799,097	7,009,424	4,743,038	209,995	2,637,998	1,767,646	938,703	25,685,279

Table 6. Recreational harvest (numbers) of migratory striped bass by state, 1982- 2008

Source: NMFS Fisheries Statistics Division, 07.01.09*

Year	ME	NH	MA	RI	CT	NY	NJ	DE	MD	VA	NC	Total
1982	929		83,933	1,757	50,081	21,278	58,294		984			217,256
1983	7,212	4,576	39,316	1,990	42,826	43,731	127,912	135	31,746			299,444
1984			3,481	1,230	5,678	57,089	13,625	16,571	16,789			114,463
1985	11,862		66,019	670	15,350	23,107	13,145		2,965	404		133,522
1986			29,434	3,291	1,760	27,477	36,999		14,077	1,585		114,623
1987		90	10,807	2,399	522	14,191	9,279		4,025	2,442		43,755
1988		647	21,050	5,226	2,672	20,230	12,141		133	24,259	347	86,705
1989	738		13,044	4,303	5,777	12,388	1,312					37,562
1990	2,912	617	20,515	4,677	6,082	24,799	44,878	2,009	736	56,017		163,242
1991	3,265	274	20,799	17,193	4,907	54,502	38,300	2,741	77,873	42,224	391	262,469
1992	6,357	2,213	57,084	14,945	9,154	45,162	41,426	2,400	99,354	21,118	967	300,180
1993	612	1,540	58,511	17,826	19,253	78,560	64,935	4,055	104,682	78,481	264	428,719
1994	3,771	3,023	74,538	5,915	16,929	87,225	34,877	4,140	199,378	127,945	7,426	565,167
1995	2,189	3,902	73,806	29,997	38,261	155,821	254,055	15,361	355,237	149,103	11,450	1,089,182
1996	1,893	6,461	68,300	60,074	62,840	225,428	127,952	22,867	337,415	250,731	35,996	1,199,957
1997	35,259	13,546	199,373	62,162	64,639	236,902	67,800	19,706	334,068	518,483	96,189	1,648,127
1998	38,094	5,929	207,952	44,890	64,215	166,868	88,973	18,758	391,824	383,786	45,768	1,457,057
1999	21,102	4,641	126,755	56,320	55,805	195,261	237,010	8,772	263,191	411,873	65,658	1,446,388
2000	62,186	4,262	181,295	95,496	53,191	270,798	402,302	39,543	506,462	389,126	20,452	2,025,113
2001	59,947	15,291	288,032	80,125	54,165	189,714	560,208	41,195	382,557	355,020	58,876	2,085,130
2002	71,907	12,857	308,749	78,190	51,060	202,075	416,455	29,149	282,429	411,248	109,052	1,973,171
2003	57,765	24,878	407,100	115,471	95,983	313,761	391,842	29,522	525,191	455,812	127,727	2,545,052
2004	36,886	10,359	400,252	84,814	75,244	242,623	448,524	25,178	380,461	633,018	278,270	2,615,629
2005	68,638	26,026	368,422	112,918	114,965	298,387	327,016	19,955	490,275	403,792	104,997	2,335,391
2006	72,827	14,748	345,105	73,650	83,390	313,464	489,319	19,076	648,644	607,344	90,753	2,758,320
2007	71,443	7,070	347,102	102,112	109,856	370,722	206,275	10,095	679,024	245,691	45,502	2,194,892
2008	49,172	6,642	343,347	56,056	112,972	448,271	318,115	16,994	442,280	206,797	44,890	2,045,536

*Values for North Carolina (1996-2003) and Virginia (1996-2006) include Technical Committee estimates of wave 1 harvest.

Table 7. Recreational releases (numbers) of migratory striped bass by state, 1982-2008, and annual dead discard estimates

Source: NMFS Fisheries Statistics Division, 07.01.09

Year	ME	NH	MA	RI	CT	NY	NJ	DE	MD	VA	NC	Total	Dead Discards[^]
1982	687		6,441	2,551	643,187	12,297	87,648		30,376			783,187	70,487
1983			34,018	5,444		1,469	117,807		213,487	11,997		384,222	34,580
1984	1,887		98,405	85,135	31,176	40,469	52,930		104,095	8,775		422,872	38,058
1985	81,153	93	12,360	40,567	26,946	57,540	5,524	702	147,103	2,598		374,586	33,713
1986	4,379		442,298	2,014	10,494	123,842			390,063	7,528		980,618	88,256
1987	18,106	435	93,660	63,849	78,434	253,986	56,697	16,988	118,395	7,611		708,161	63,734
1988	4,528	6,699	209,632	23,347	25,532	92,611	486,306	2,455	132,250	5,631		988,991	89,009
1989	16,028	4,822	193,067	38,007	125,370	365,712	265,958	4,807	114,269	72,766		1,200,806	108,073
1990	12,542	15,518	339,511	67,509	89,490	265,099	254,384	14,411	420,084	175,046		1,653,594	148,823
1991	67,490	6,559	448,735	30,975	301,476	756,663	166,198	38,334	1,036,011	208,350	256	3,061,047	275,494
1992	31,177	27,613	779,814	120,410	292,259	799,149	413,506	36,932	749,959	115,899	679	3,367,397	303,066
1993	373,064	14,979	833,566	100,993	271,318	694,107	308,253	89,543	1,556,848	100,374	1,524	4,344,569	391,011
1994	363,703	43,501	2,102,514	138,989	489,967	1,132,707	568,047	103,992	2,785,392	197,022	5,005	7,930,839	713,776
1995	505,758	285,486	3,280,882	356,324	507,124	1,209,585	694,889	115,363	2,401,277	370,949	16,225	9,743,862	876,948
1996	1,626,705	292,820	3,269,746	314,336	1,051,612	1,436,091	776,165	99,372	2,545,238	759,916	116,667	12,288,668	1,105,980
1997	1,417,976	279,298	5,417,751	606,746	722,708	1,018,892	736,734	130,073	4,019,987	1,232,323	135,853	15,718,341	1,414,651
1998	691,378	243,301	7,184,358	613,421	1,026,192	884,626	488,319	185,016	2,641,680	796,372	173,704	14,928,367	1,343,553
1999	649,816	145,730	4,576,208	360,121	704,025	1,228,628	1,152,682	105,696	2,387,615	940,755	263,445	12,514,721	1,126,325
2000	942,593	209,606	7,382,031	541,516	926,367	1,373,069	885,289	151,838	3,244,731	1,022,040	129,729	16,808,809	1,512,793
2001	870,522	164,336	5,410,899	377,474	1,107,707	824,278	965,650	162,677	2,890,054	620,947	49,953	13,444,497	1,210,005
2002	1,392,200	238,003	5,718,984	530,402	696,976	588,155	715,099	114,650	2,928,589	706,729	63,269	13,693,056	1,232,375
2003	846,708	260,167	4,361,710	448,707	843,037	1,083,808	925,885	169,012	4,652,800	970,554	48,945	14,611,333	1,315,020
2004	748,388	196,806	5,891,661	669,975	1,079,304	1,492,703	1,323,535	151,179	3,738,523	1,767,596	230,356	17,290,026	1,556,102
2005	3,024,291	512,771	4,839,752	741,022	1,713,541	1,348,377	1,197,440	224,841	3,753,328	1,484,540	109,535	18,949,438	1,705,449
2006	4,062,579	567,892	8,657,473	1,356,245	1,682,372	1,578,167	2,101,816	245,682	3,895,798	1,689,642	37,713	25,875,379	2,328,784
2007	1,105,347	288,985	5,772,100	740,941	1,831,899	1,456,055	1,494,572	251,074	2,998,085	913,849	16,195	16,869,102	1,518,219
2008	470,237	83,533	3,641,258	435,629	2,372,205	1,277,102	1,452,248	260,733	1,405,613	442,048	14,002	11,854,608	1,066,915

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

Table 8. Coastal Commercial Quotas and Harvests (pounds)

	Am 6 Allocation	2003 Quota [^]	2003 Harvest	2003 Difference	2004 Quota	2004 Harvest	2004 Difference	2005 Quota	2005 Harvest	2005 Difference
MA	1,159,750	1,036,880	1,055,439	18,559	1,141,191	1,206,305	65,114	1,094,636	1,104,737	10,101
RI	243,625	242,159	246,312	4,153	243,625	245,204	1,579	242,046	242,303	257
NY	1,061,060	828,293	753,261	-75,032	828,293	741,668	-86,625	828,293	689,821	-138,472
NJ+	321,750	321,750	121,410	-200,340	321,750	81,870	-239,880	321,750	29,866	-291,884
DE	193,447	193,447	188,419	-5,028	193,447	181,974	-11,473	193,447	173,815	-19,632
MD	131,560	126,936	98,149	-28,787	126,936	115,453	-11,483	126,936	46,871	-80,065
VA	184,853	184,853	159,786	-25,067	184,853	160,301	-24,552	184,853	184,734	-119
NC~	480,480	480,480	434,369	-46,111	526,591	421,645	-104,946	480,480	454,521	-25,959

	2006 Quota	2006 Harvest	2006 Difference	2007 Quota*	2007 Harvest	2007 Difference	2008 Quota	2008 Harvest	2008 Difference	2009 Quota
MA	1,149,649	1,312,168	162,519	997,231	1,040,328	43,097	1,116,653	1,160,122	43,469	1,116,281
RI	243,368	238,797	-4,571	239,963	240,627	664	239,299	245,988	6,689	233,274
NY	828,293	688,446	-139,847	828,293	729,743	-98,550	828,293	653,100	-175,193	828,293
NJ+	321,750	23,656	-298,094	321,750	13,615	-308,135	321,750	7,345	-314,405	321,750
DE	193,447	185,987	-7,460	193,447	188,668	-4,779	193,447	188,719	-4,728	193,447
MD	126,396	91,093	-35,303	126,396	96,301	-30,095	126,396	118,005	-8,391	126,396
VA	184,853	194,934	10,081	174,772	165,587	-9,185	184,853	164,400	-20,453	184,853
NC~	480,480	352,036	-128,444	480,480	424,723	-55,757	480,480	299,162	-181,318	480,480

[^] Beginning in 2003, NY and MD quotas reduced due to conservation equivalency; MA and RI quotas reduced in 2003 due to quota overages in previous year.

* Beginning in 2007, RI quota reduced due to conservation equivalency.

+ NJ quota applied to recreational bonus fish program

~ NC harvests and quotas are for the December 1 to November 30 fishing year

Table 9. Chesapeake Bay Quotas and Harvests (pounds), 2008

Year: 2008	Jurisdiction	Quota	Harvest
<i>Commercial Fisheries</i>	Maryland	2,254,831	2,208,018
	PRFC	835,960	611,789
	Virginia	1,642,242	1,550,164
	Subtotal	4,733,033	4,369,971
<i>Recreational Fisheries</i>	Maryland	2,956,463	2,163,691
	PRFC	683,967	*
	Virginia	1,642,242	1,106,345
	Subtotal	5,282,672	3,270,036
Chesapeake Bay Total		10,015,705	7,640,007

* Recreational harvest in the Potomac River is included in Maryland and Virginia harvest estimates.

Notes: Recreational harvests based on MRFSS estimates of Bay harvest (minus migratory fish harvest estimate for Maryland); PRFC recreational quota includes the charter boat quota of 75,996 pounds.

Table 10. Chesapeake Bay Spring Trophy Fishery Quotas and Harvests (numbers of fish)

	2003	2004	2005	2006	2007	2008	2009
Base quota	30,000	40,624	40,624 [^]	55,208	50,030	No Quota [†]	No Quota
Previous overage	0	13,900	4,680	13,720*	26,283	NA	NA
Adjusted quota	30,000	26,724	35,944	41,488	30,000 [∇]	NA	NA
Harvest	43,900	31,404	65,664	67,771	36,328	36,166	
Overage	13,900	4,680	29,720	26,283	6,328	NA	

[^] The Board approved the same base quota for 2005 as used in 2004.

* The 2005 overage of 29,720 fish was adjusted to a direct payback of 13,720 fish under an increased minimum size limit and future additional Maryland effort controls.

[∇] The Board approved a target for the 2007 season of the VPA calculated quota minus the 2006 overage, to be no less than 30,000 fish.

[†]The Board approved non-quota management for the 2008 fishery, and later approved continuing non-quota management until stock assessment indicates that corrective action is necessary.

Table 11. Status of compliance with monitoring and reporting requirements, 2008

(JAI = juvenile abundance index survey, SSB = spawning stock biomass survey, tag = participation in coastwide tagging program, Y = compliance standards met, N = compliance standards not met, na = not applicable)

Jurisdiction	Fishery-independent monitoring		Fishery-dependent monitoring		Annual reporting
	Requirement(s)	Status	Requirement(s)	Status	Status
ME	JAI	Y	x	na	Y
NH	x	na	x	na	Y
MA	tag	Y	composition, catch & effort (C&R)	Y	Y
RI	x	na	composition (C&R), catch & effort (R)	Y	Y* ^o
CT	x	na	composition, catch & effort (R)	Y	Y
NY	JAI, SSB, tag	Y [†]	composition, catch & effort (C&R)	Y	Y*
NJ	JAI, tag	Y	composition, catch & effort (R)	Y	Y
PA	SSB	Y	x	na	Y
DE	SSB, tag	Y	composition, catch & effort (C)	Y	N*
MD	JAI, SSB, tag	Y	composition, catch & effort (C&R)	Y [^]	Y
PRFC	x	na	composition, catch & effort (C&R)	Y	Y
DC	x	na	x	na	Y
VA	JAI, SSB, tag	Y	composition, catch & effort (C&R)	Y	Y
NC	JAI, SSB, tag	Y	composition (C)	Y	Y

* Reports from Rhode Island, New York, and Delaware were submitted late. The due date for striped bass compliance report submission is June 15.

[^] Changes are currently being made to the commercial harvest monitoring and reporting procedures, including individual transferable quotas, in Maryland.

[†] While not Amendment 6 requirements, the Western Long Island sub-adult survey and the coastal ocean trawl survey did not receive funds in New York's 2009-2010 budget, the former due to a lack of funding through the Anadromous Fish Conservation Act.

^o Rhode Island has not aged some or all of the commercial scale samples collected in 2006-2008.