2015 Maryland FMP Report (June 2016)
Section 17. Striped Bass (*Morone saxatilis)*

In 2015, the Maryland striped bass fishery was managed under the Atlantic States Marine Fisheries Commission (ASMFC) Addendum IV. New regulations were enacted for the spring trophy season and Atlantic coast to achieve a 25% harvest reduction relative to 2013. The remaining Chesapeake Bay seasons were managed to achieve a 20.5% harvest reduction relative to 2012. Data collected during 2015 are currently being reviewed to determine the effects of Addendum IV management changes at the coastwide level. The 2015 juvenile abundance index was more than twice the long-term average and similar to the above average 2011 year class. Addendum IV harvest restrictions will continue in 2016. The ASMFC Striped Bass Technical Committee will conduct an update to the stock assessment in 2016 with data through 2015.

Fishery Management Plans (FMPs)

In 1989 the Chesapeake Bay Program developed the Chesapeake Bay Striped Bass Fishery Management Plan (CBSB FMP) to coordinate management among Bay jurisdictions and to comply with ASMFC FMP requirements. The CBSB FMP was amended in 1998. Amendment 1 formally adopted ASMFC's Amendment 5 management framework for the Chesapeake Bay. Amendment 5 (1995) to the ASMFC FMP required an annual juvenile abundance survey in Maryland and Virginia to monitor for recruitment. Maryland's Juvenile Abundance Index (JAI) began in 1954 and Virginia's in 1955. The CBSB plan and amendment have been regularly updated and periodically reviewed. The most recent review was conducted in 2013/2014. The Maryland Plan Review Team (PRT) concluded that the use of coastal management indices [fishing mortality (F), spawning stock biomass (SSB) and juvenile abundance] are sufficient for decision-making in the Chesapeake Bay. The PRT recommended the development of a new amendment to incorporate the recent coastal management framework and recommended utilizing ecosystem-based management specific to the Chesapeake Bay when feasible.

The ASMFC developed the Interstate Fisheries Management Plan for Striped Bass in 1981 (ASMFC FMP). Several amendments and addenda to the ASMFC FMP have been adopted to make adjustments to management measures (1985-2001). Amendment 6 (2003) to the ASMFC FMP replaced all previous ASMFC management documents for striped bass. It includes provisions for target and threshold control rules to effectively manage mortality, spawning potential, and age diversity. Addendum I (2007) implemented additional data collection requirements to improve discard estimates. Addendum II (2010) revised the recruitment failure threshold from an annually variable value (1957 – present) to a set value (1957 – 2009) of 1.60. Addendum III (2012), standardized the use of commercial harvest tags coastwide to reduce illegal harvest. Addendum IV was developed and approved in 2014 to reduce the Atlantic coast fishing mortality (F) rate in 2015 to a level at or below the target. In Maryland, harvest reductions include a 25% reduction in the Atlantic and Chesapeake Bay trophy fisheries from 2013 harvest and a 20.5% reduction in the summer/fall and winter fisheries from 2012 harvest levels (http://www.asmfc.org/species/atlantic-striped-bass).

A NOAA Chesapeake Bay Fisheries Ecosystem Advisory Panel developed a Fisheries Ecosystem Plan (FEP) for CB in 2006. Maryland Sea Grant was contracted to facilitate FEP development for five keystone Chesapeake Bay species including striped bass. State, federal, and academic representatives completed a series of issue briefs in 2009 that identified current and future ecosystem stressors: habitat (warming, flow, eutrophication/ hypoxia, pollution/contamination, and watershed development), food web (forage and predation), stock assessment (recruitment variability, exploitation, disease, and connectivity), and socioeconomic (livelihoods, recreation, and consumption). The briefs were forwarded to a Quantitative Ecosystem Team (QET) tasked with development of measurable targets and reference points. No targets or reference points have been developed to date. For more information on the EBFM process, go to (www.mdsg.umd.edu/programs/policy/ebfm/).

Stock Status

Although the striped bass stock is not overfished and overfishing is not occurring, model projections indicate that SSB could fall below the threshold in the future. Striped bass are managed under biological reference points (BRPs) for F and SSB. BRPs were updated in the ASMFC's 2013 Benchmark Stock Assessment Report for Atlantic Striped Bass. The new target F for striped bass in coastal waters is 0.18 and the $F_{threshold}$ is 0.22. Separate BRPs for Chesapeake Bay were not developed in the 2013 Stock Assessment report but the Technical Committee will continue to work on developing Chesapeake Bay reference points.[2] In the meantime, the Chesapeake Bay stock will be assessed under the coastwide reference points.

Levels of F from the 2015 stock assessment update (F=0.205) exceeded the target level, but remained below the threshold level. The new target female SSB was 72,032 metric tons (159 million pounds) with the $SSB_{threshold}$ at 57,626 metric tons (127 million pounds). The coastwide SSB in the 2015 stock assessment update was 63,918 metric tons (140 million pounds) which is above the threshold but below the target.[1] Since continued harvest at existing levels was predicted to reduce SSB below $SSB_{threshold}$ by 2015 and raise F above the $F_{threshold}$, Addendum IV was approved to reduce harvest levels beginning in 2015. Addendum IV restrictions will continue even though SSB has increased from the 2013 stock assessment. A stock assessment update will be completed in 2016 with data through 2015. The most recent ASMFC Atlantic Striped Bass Stock Assessment Update (2015) can be found at: http://www.asmfc.org/uploads/file/564106f32015AtlStripedBassAssessmentUpdate_Nov2015.pdf

Maryland DNR has conducted the Estuarine Juvenile Finfish Survey since 1954 to measure young of year (YOY) striped bass abundance and to calculate a juvenile abundance index (JAI). The JAI is a predictor of year class strength and is used to monitor YOY recruitment success. If the MD striped bass JAI falls below a value of 1.60 for three consecutive years, it would trigger management action by the ASMFC.[4] The 2015 JAI was well above average at 10.67. The 2013 and 2014 JAI were ~~nearaverage~~near average at 3.42 and 4.06, respectively, after a historic low of 0.49 in

2012 [5] (Figure 1). The Maryland JAI is one of six indices that are calculated for different regions of the Atlantic coast including Maine, New York, New Jersey, Virginia, and North Carolina.[4]

Current Management Measures

Addendum IV established new management measures to achieve mandatory reductions in recreational and commercial removals for the 2015 season. The Chesapeake Bay is managed under a separate commercial quota that is allocated among the Bay jurisdictions. Maryland's 2015 Chesapeake Bay striped bass commercial quota was 1.47 million lbs., a 24% decrease from 2014 (Figure 2).[6] The 2015 commercial quota allocated to the common pool fisheries was 20,048 pounds for hook and line and 30,085 pounds for drift gill net. The remaining quota was allocated to the individual transferable quota (ITQ) fishery with no gear-specific restrictions.[6] The Maryland Atlantic commercial quota was 90,727 pounds and could be harvested with drift gill net or otter trawl. The recreational (including charter) fishery in Chesapeake Bay attained reductions in the trophy and summer/fall harvests through changes in size limits (Figure 3).[6] Striped bass regulations may be adjusted annually based on ASMFC requirements and stakeholder concerns.

Watermen and the Maryland Department of Natural Resources (MD DNR) began implementation of a catch shares management system with the 2014 commercial season. Each waterman had the option to remain in the traditional common pool management framework or switch to an ITQ management framework. The common pool fishery has a single quota shared among all participants. An ITQ guarantees each participating waterman a portion of the commercial quota. Quota allocation is based on a waterman's historical landings record through February 29, 2012. Watermen have the ability to temporarily transfer quota to other watermen with an ITQ.

Commercial fisheries are managed using quotas and seasonal restrictions by gear type: pound net, haul seine, hook and line, and drift gill net. In 2015, the quota was decreased by 20.5% for Chesapeake Bay and by 25% for Atlantic Ocean commercial fisheries to meet Addendum IV compliance requirements. Maryland's Chesapeake Bay commercial fisheries operated with an 18" – 36" total length slot limit. All fisheries, except gill net, were open from June 1 – November 30. The pound net fishery was open from Monday – Saturday and the haul seine fishery was open from Monday – Friday. The hook and line ITQ sector was open from Monday – Thursday while open days for the common pool sector varied during the fishing season. The drift gill net fishery was open from January 1 – February 28 and December 1-31. The ITQ sector operated from Monday – Friday while open days for the common pool sector varied during the fishing season. The Atlantic Ocean drift gill net and otter trawl fisheries had a 24" total length minimum size limit. Atlantic coast fisheries were open from Monday – Friday on January 1 – April 30 and October 1 – December 31.

Striped bass caught by the commercial fishery must be individually tagged and landed at a certified check station prior to sale.[4] Each fish is counted and weighed. Check stations verify each fisherman's daily harvest record on the fisherman's harvest permit. Fishermen submit monthly harvest reports to MD DNR. Check stations call in harvest numbers and submit a weekly report. Fishermen and check stations have the option to submit harvest data electronically through FACTS or SAFIS reporting systems. Check stations are randomly sampled by MD DNR biologists to collect age, length and weight data for federal compliance reporting.

Recreational harvest is managed with a number of seasonal and spatial restrictions. No recreational harvest of striped bass is allowed in the Chesapeake Bay and Potomac River during the January 1 – February 28 catch and release fishery. Regulations to control recreational catch and release effort during the pre-spawn period (March 1 - the third Friday in April) were implemented in 2010. During this time, anglers are prohibited from using stinger hooks, required to use barbless hooks when trolling, required to use circle hooks or J hooks with a gap < ½" when using bait, and allowed up to six lines per boat when trolling. Fishing is allowed in the mainstem Chesapeake Bay below Brewerton Channel (Patapsco River), Tangier and Pocomoke sounds, and tributaries except those identified as striped bass spawning rivers. The 2015 spring trophy season took place from April 18 – May 15, but harvest was restricted to the Chesapeake Bay mainstem south of Brewerton Channel (Baltimore) down to the MD/VA line, Pocomoke Sound, and Tangier Sound. The regulations changed for the 2015 trophy season due to implementation of Addendum IV. Anglers were allowed to keep one fish 28 to 36 inches or one fish over 40 inches (no harvest 36-40 inches).

Allowable fishing locations were less restrictive from May 16 – 31: Chesapeake Bay mainstem from Hart-Miller Island (Baltimore) to the MD/VA border; the lower five miles of the Chester, Choptank, and Patuxent rivers; Pocomoke Sound, and Tangier Sound. All Chesapeake Bay and tributary waters are open to striped bass fishing from June 1 – December 20. The 2015 creel and size limits from May 16 – December 20 were two fish per person per day 20-28 inches, or one fish per person per day 20-28 inches and one fish per person per day over 28 inches The fishery transitions to catch and release only on December 21 and continues thru December 31. The use of eel as bait is prohibited from December 21 – May 31 to prevent deep hooking which increases mortality.

Spring recreational regulations differ somewhat for upper Chesapeake Bay waters including the Susquehanna Flats. The striped bass fishery is catch and release only from December 21 – May 3. The fishery is closed from May 4 – 15. The 2015 fishery re-opened with a 1 fish per person per day creel at 20 – 26 inches from May 16 – 31.

The 2015 Atlantic coast recreational fishery regulations changed to a limit of 1 fish per person per day of 28 inches or greater. The US Secretary of Commerce enacted a moratorium on striped bass harvest in federal waters (Exclusive Economic Zone or EEZ) in 1990. The moratorium remains in effect.

The 2016 spring trophy season regulations were changed to 1 fish with a minimum size limit of 35 inches. The 2016 summer/fall recreational regulations will be the same as 2015. The 2016 Atlantic recreational fishery started with 1 fish per person per day of 28 inches or greater. A public notice was issued on May 24, 2016 to change the regulations

to 2 fish per person per day from 28 to 38 inches or greater than 44 inches effective June 1, 2016.

Maps of closed, catch and release, and harvest areas can be found at http://dnr2.maryland.gov/fisheries/Pages/striped-bass-maps.aspx. An overview of commercial regulations can be found at http://www.dnr.state.md.us/fisheries/regulations/table.asp?c=commercial and recreational regulations at http://www.eregulations.com/maryland/fishing/striped-bass/. The complete list of commercial and recreational harvest restrictions are printed in the Code of Maryland Regulations (COMAR).

The Fisheries

The 2015 Maryland commercial fishery in Chesapeake Bay harvested an estimated 1.47 million lbs.; 663,144 lbs. from the winter gill net fishery and 806,346 lbs. from the summer/fall fishery (Figure 2).[6] Atlantic coast landings were estimated at 43,677 lbs.[5]

The NOAA Marine Recreational Information Program (MRIP) estimated recreational harvest in Maryland for 2015 was 3.10 million lbs.: 3.08 million lbs. from Chesapeake Bay and 13,848 lbs. from Atlantic Coast (Figure 3).[6] Of the 2015 Chesapeake Bay harvest, 30,533 spring migratory fish (649,857 lbs.) were harvested by the trophy fishery (Figure 4).[6] The estimated discard mortality for striped bass is 9%, equal to 280,580 fish or 579,082 lbs. in 2015.[6]

Figure 1. Striped bass juvenile abundance index geometric mean values: 1957 – 2015.[5,6] The red line represents the recruitment failure definition (1.60) and the black line defines the target period average (1959-1972) of stable recruitment. The moratorium was in place from 1985 to 1989.

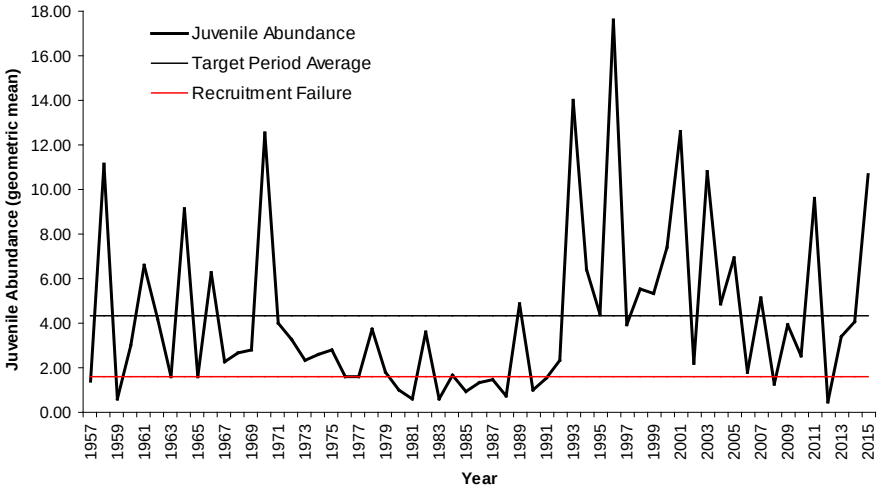


Figure 2. Total commercial striped bass landings (Atlantic and Chesapeake Bay) [6] **and Chesapeake Bay landings** [6] **in Maryland from 1982 to 2015.** Total and Chesapeake Bay quota are shown for 2003-2015. Striped bass harvest moratorium was in effect from 1985 to 1989. (http://www.asmfc.org/species/atlantic-striped-bass).

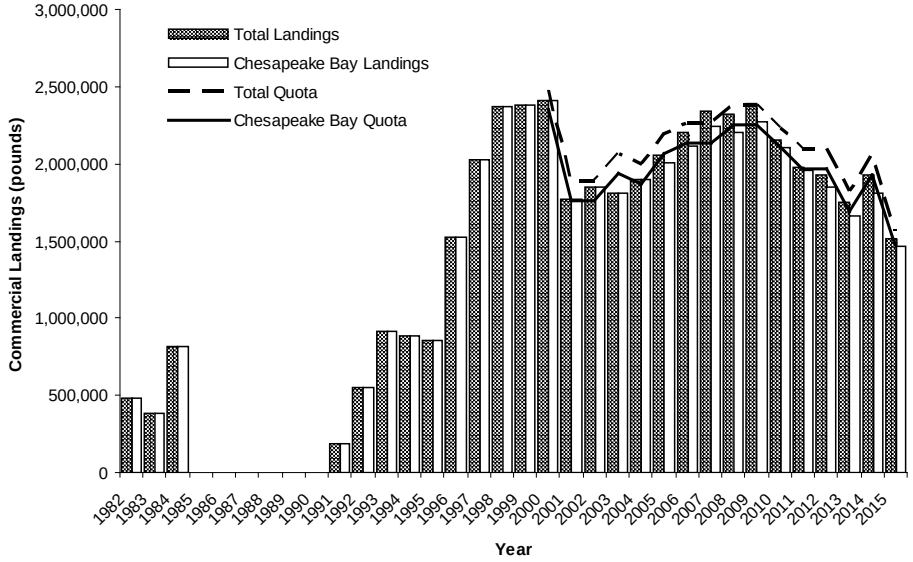


Figure 3. Maryland recreational (including charters) striped bass landings from 1981-2015.[6,7] Striped bass harvest moratorium was in effect from 1985 to 1989.

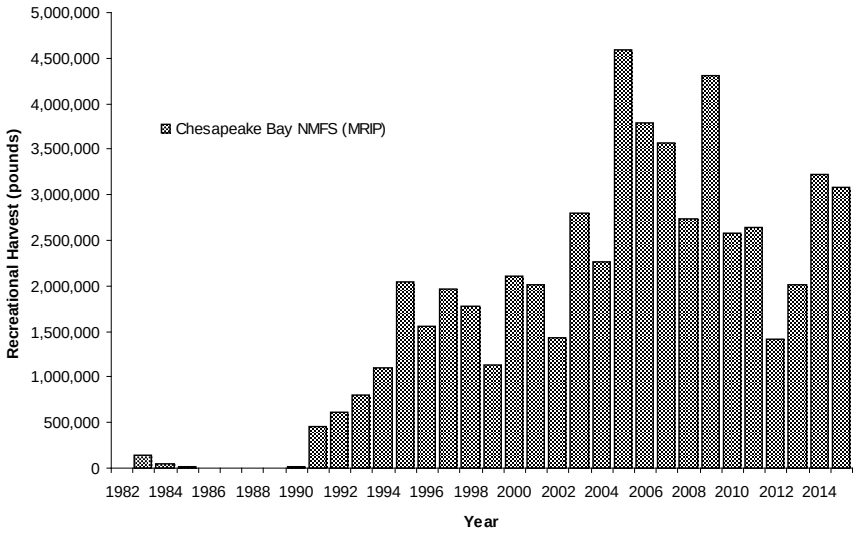
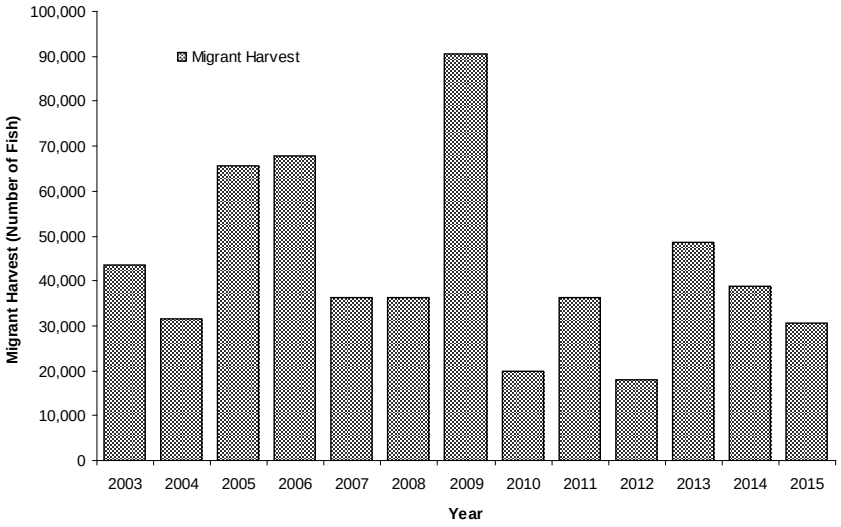


Figure 4. Maryland striped bass migrant harvest from 2003 to 2015.[6] Trophy migrant harvest data submitted as an appendix to the ASMFC annual compliance reporting.



Issues/Concerns

The striped bass stock has been undergoing a decline in SSB and an increase in F. Projections from the 2015 stock assessment update indicated that SSB could fall below its threshold and that F could increase above its threshold. Continued implementation of Addendum IV from the ASMFC will be critical in reducing harvest and preventing a further decline in SSB.

Tagging data indicate that natural mortality (M) has been increasing, particularly in Chesapeake Bay, and is above the assumed value. Increased M in Chesapeake Bay may be linked to the increased prevalence of mycobacteriosis [8] or other factors affecting health. Nutritional status of striped bass has been discussed as a possible health index. Nutrition-based reference points were recently proposed by Jacobs et al. (2013). [9] Further study of mycobacteriosis infections in striped bass and its relation to M is needed.

The ASMFC Striped Bass Technical Committee will continue to evaluate stock-specific reference points in producer areas, including the Chesapeake Bay, Delaware Bay and Hudson River.

The DNR Fish Ecosystem and Habitat Program is working to develop striped bass forage indicators using the data from striped bass health monitoring, relative abundance, natural mortality, fall diet studies and forage relative abundance. Striped bass from the upper Bay feed on a variety of prey including menhaden, bay anchovy, spot and blue crab. The model and indicators will be reviewed by the ASMFC Biological Ecological Reference Point Group and then determine the next steps.

As a natural prey item for striped bass, spot are important to the commercial hook and line fishery and the recreational fishery as live bait. Restrictions on spot harvest and/or size limits could significantly impact these fisheries.

References

[1] Atlantic States Marine Fisheries Commission. 2015. Atlantic Striped Bass Stock Assessment Update (October 2015). Prepared by Striped Bass Technical Committee, ASMFC.

[2]Atlantic States Marine Fisheries Commission. 2014. Addendum IV to Amendment 6 to the Atlantic Striped Bass Interstate Fishery Management Plan. Atlantic States Marine Fisheries Commission, Washington D.C.

[3] Atlantic States Marine Fisheries Commission. 2013. Update of the Striped Bass Stock Assessment using Final 2012 Data. Prepared by Dr. Gary Nelson, MA DMF, ASMFC Striped Bass Technical Committee.

[4] Atlantic States Marine Fisheries Commission. 2010. Addendum 2 to Amendment 6 to the Atlantic striped bass interstate fishery management plan. Atlantic States Marine Fisheries Commission. Washington DC.

[5] Maryland Department of Natural Resources Fisheries Service. 2015. Striped bass seine survey juvenile index: striped bass (YOY) [Data file]. Retrieved from http://www.dnr.maryland.gov/fisheries/juvindex/index.asp

[6] Maryland Department of Natural Resources. 2016. Maryland Striped Bass (*Morone saxatilis*) Compliance Report to the Atlantic States Marine Fisheries Commission 2015. Maryland Department of Natural Resources, Annapolis, MD

[7] Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division. http://www.st.nmfs.noaa.gov/index

[8] Striped Bass Stock Assessment Subcommittee and Striped Bass Tagging Subcommittee. 2013. Atlantic States Marine Fisheries Commission striped bass stock assessment update 2013. Atlantic States Marine Fisheries Commission. Alexandria, VA.

[9] Jacobs, J. M., R. M. Harrell, J. Uphoff, H. Townsend, and K. Hartman. 2013. Biological reference points for the nutritional status of Chesapeake Bay striped bass. North American Journal of Fisheries Management. 33: 468-481.

1989 Chesapeake Bay Striped Bass Management Plan Implementation Table (updated 6/2016)			
Strategy	**Action**	**Date**	**Comments**
1 - Overharvesting, Reduced Spawning Stock and Poor Recruitment: Controlling fishing mortality will be the primary method of maintaining adequate striped bass stocks. Optimum yield per fish will be more closely approached by establishing minimum sizes greater than historic limits. Long term fishery maintenance must be based on a management objective commensurate with reproductive success. The number of eggs per striped bass is directly related to fish size and age. Females will be protected so that more can reach their spawning potential. As reproductive potential is protected and spawning stock increases, more young striped bass should enter the fishery. Two types of fisheries have been defined by the ASMFC: 1) A conservative transitional fishery, which would go into effect after the Maryland striped bass juvenile index has reached a 3-year-average of 8.0; and (2) A more robust recovered fishery, to be considered when a certain percentage of the female spawning stock is composed of striped bass females equal to or greater than age VIII. The percentage will be determined by the ASMFC.		Completed 1995 1995 On-going 2003 2010 Continue 2014 2015 **2016**	Target was 1990 for a transition fishery. The stock was deemed restored in 1995. Juvenile abundance data is used by ASMFC to estimate coastal SSB and SCA of coastal stock. Amendment VI changed the JAI recruitment failure definition from 90% to 75% of the index for three consecutive years. Addendum 2 to Amendment 6 established a fixed recruitment failure value of 1.60. Strong recruitment of 1993, 1996, 2001, 2003, 2011, and 2015 year classes Addendum IV approved to implement management measures to reduce F in order to increase SSB. New regulations implemented as required by Addendum IV. **Trophy season regulations adjusted, but still implemented as required by Addendum IV.**
1.1 Fishing mortality will be controlled by several means to protect striped bass stocks. Harvest restrictions will be set to provide a fishing mortality rate of 0.25 (equivalent to about 18% of the legal sized fish being harvested) during a transition fishery and a rate of 0.5 (equivalent to about 32% of the legal sized fish being harvested) during a recovered fishery, in accordance with ASMFC guidelines (these percentages may change slightly as additional calculations are made by the ASMFC). Adult stock levels, stock composition, and the Maryland striped bass young-of-the-year index (or other juvenile indices as approved by ASMFC) will be used in determining needed restrictions.	1.1.1 The District of Columbia, Maryland, Virginia, and the Potomac River Fisheries Commission will utilize a combination of harvest restrictions to meet target fishing mortality rates. Controls may include seasonal quotas, daily bag limits, minimum size limits, seasons, time restrictions, gear restrictions, license requirements, and other actions. Maryland's annual quota will be presented as total sport and commercial landings.	2000 Continue February 2003 Continue 2009 On-going	All CB jurisdictions have implemented regulations to prevent exceeding F_{target}. CBP jurisdictions have the option to implement stricter regulations than required under ASMFC Amendment 6. The overfishing definition is F_{msy}=0.34. If coastwide estimated mortality rates exceed the target rate for 2 consecutive years, the ASMFC will develop management measures. Bay jurisdictions are in compliance with ASMFC guidelines. CB F remains below the target of 0.27.

1989 Chesapeake Bay Striped Bass Management Plan Implementation Table (updated 6/2016)			
Strategy	**Action**	**Date**	**Comments**
			See Strategy 1.2 comments for size limits and Strategy 2.4.1 comments for seasons and time restrictions.
		2013 Continue	**BRPs were changed in the update to the 2013 ASMFC Coastal Stock Assessment. New BRPs are a target F=0.18 and threshold F=0.22.**
	1.1.2 Maryland, the Potomac River Fisheries Commission and Virginia will cap commercial harvest during the transitional fishery with a quota not to exceed 20% of the average annual commercial harvest as reported for the period 1972-1979. No commercial fishing is permitted in the District of Columbia.	1990 1995	Implemented. The stock was deemed restored.
1.2 Size limits and fishing mortality rates will be set to allow sufficient recruitment to the spawning stock.	1.2.1 The District of Columbia, Maryland, Virginia and the Potomac River Fisheries Commission will establish a minimum size limit of 18 inches total length in the Chesapeake Bay and tributaries during the transition fishery. Maryland may establish a larger minimum legal size during a May trophy fishery beginning in 1991.	On-going 2015 **2016**	ASMFC requires that the recreational minimum size limit for striped bass in Chesapeake Bay is 18" except for the spring trophy season. The minimum size limit for striped bass during the spring trophy season in MD is 28". Addendum IV requires the recreational minimum size limit for striped bass in the Chesapeake Bay to be 20 inches except in the trophy season. The trophy season has a minimum size limit of 28 inches and a no take slot limit from 36 to 40 inches. **Addendum IV requires the recreational minimum size limit for striped bass to be 20 inches. The trophy season regulations are changed from a slot limit to a 35 inch minimum size limit.**
	1.2.2 Maryland, Virginia and the Potomac River Fisheries Commission will prohibit the keeping and sale of sublegal (fish smaller than the minimum size) striped bass by-catch.	On-going 2012	ASMFC prohibits the sale of sub-legal striped bass (<28"). All striped bass are individually weighed, measured, and tagged at certified check-in stations. Harvest tag criteria were standardized, coastwide, with Addendum III to Amendment 6.
	1.2.3 As a conservation measure, the District	On-going	DC, MD, PRFC, and VA recreational fisheries

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	of Columbia, Maryland, Virginia and the Potomac River Fisheries Commission will establish a consistent maximum legal size for striped bass in the Chesapeake Bay and its tributaries.		are managed with a combination of the 20" – 28" slot limit and a 28" minimum size limit: 2 fish 20" - 28", or 1 fish 20" - 28" and 1 fish ≥28". Spring trophy season size limits for MD and PRFC are 1 fish ≥28" and VA allows 1 fish ≥32". There is not a spring trophy season in DC. Commercial fishery size limits: MD is 18" – 36" for all gear and seasons; PRFC is 18" – 36" from February 15 – March25 and ≥ 18" from June 1 – December 15, and for gill net ≥ 18" from November 12 – February 14; VA minimum size is 18" all season with a 28" maximum from March 26 – June 15. Commercial fishing is prohibited in DC.
1.3 Fishing mortality rates will be set to ensure a viable female spawning stock of age VIII and older females, and stocks will continue to be enhanced with hatchery production.	1.3.1 During a transition fishery, mortality will be controlled to protect age VIII or older females until they comprise at least a certain percentage (as determined by the ASMFC) of the female spawning population.	2011	Female fish ages 8+ have increased in abundance. Minimum percent of age 8+ females has not been specified by ASMFC.
	1.3.2 A fishery on a recovered stock will be controlled so that females age VIII or older continue to comprise at least a certain percentage (as determined by the ASMFC) of the female spawning stock.	Discontinued Ongoing - Adjusted during stock assessment	ASMFC uses a VPA to estimate SSB. A statistical catch at age (SCA) model is used to estimate SSB. Since 2008, $SSB_{threshold}$ = 66.2 million lbs. and SSB_{target} = 82.7 million lbs. Minimum percent of age 8+ females has not been specified by ASMFC.
	1.3.3 Maryland and Virginia will continue hatchery production to enhance striped bass spawning stocks in areas that are still depleted. The District of Columbia will work with the Maryland and Virginia hatchery programs to enhance striped bass spawning stocks.	1993 VA 1995 MD	MD and VA discontinued stocking striped bass.
	1.3.4 Hybrid striped bass stocking and the introduction of non-native stocks will be restricted in the Chesapeake Bay and its tributaries in accordance with ASMFC guidelines. The Maryland Department of Natural Resources, the Pennsylvania Fish and Boat Commission and the U.S. Fish & Wildlife Service will discuss stocking issues	Magothy - 1982 Patuxent - 1984 Pennsylvania – 1990	MD, PA, and USFWS discontinued stocking hybrid striped bass.

1989 Chesapeake Bay Striped Bass Management Plan Implementation Table (updated 6/2016)			
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	regarding the Susquehanna River.		
2 - Regulatory and Enforcement Issues: In order to control fishing effort and fishing mortality rates, harvest and sale regulations will be developed and implemented. Guidelines will be set for monitoring the resource and harvest restrictions. The individual jurisdictions will comply with ASMFC goals and criteria for the striped bass fishery and, where possible, have compatible fishing regulations. Areas of harvest pressure and times when harvesting pressure will be heaviest will be defined in order to facilitate adequate enforcement.	2.1.1 The Maryland quota will be allocated as follows – 42.5% commercial; 42.5% recreational; 15% charter. Virginia and the Potomac River Fisheries Commission will use various restrictions in fishing seasons and bag limits to equitably allocate and restrict harvest among the commercial, recreational and charter boat fisheries.	On-going 2013 2014	Quota allocation is periodically reviewed. Recreational and charter allocations have since been combined to be 57.5%. The CBSB FMP was reviewed including quota allocation in 2013/2014 by a plan review team. The team recommended the development of a new amendment to adopt the current ASMFC coastal management framework.
2.1 The striped bass harvest will be equitably allocated among user groups on a yearly basis.	2.1.2 Maryland will terminate the fishing season for each of its three component fisheries when their individual quota is reached, regardless of time during the season. Virginia will terminate its commercial fishing component when its harvest quota is reached, regardless of time during the season. The Potomac River Fisheries Commission will terminate its fishing seasons when the allowable harvest under ASMFC's Striped Bass Plan is reached, regardless of the time during that season.	On-going	MD Department of Natural Resources, VA Marine Resources Commission, and PRFC have authority to close their fisheries when quotas are projected to be reached.
2.2 Maryland, Potomac River Fisheries Commission and Virginia will establish commercial gear restrictions to limit fishing effort and sublegal by-catch, and to facilitate enforcement.	2.2.1 Maryland, the Potomac River Fisheries Commission and Virginia will establish a minimum gill net mesh size designed to reduce sublegal by-catch mortality to negligible levels.	On-going	CB jurisdictions are in compliance.
	2.2.2 Maryland and Virginia will require that gill nets be marked, tended, and recovered (except for Virginia's stake nets) daily. The Potomac River Fisheries Commission will continue a fixed location for each gill net licensed in the Potomac.	On-going	CB jurisdictions are in compliance.
	2.2.4 Maryland and Virginia will establish annual quotas for their commercial fisheries.	On-going	State quotas are determined by ASMFC. CBSB FMP includes provisions for how jurisdictions allocate among sectors. MD adopted an allocation policy in 2012.
2.3 Selling and buying procedures and timely reporting requirements will be established to monitor and regulate harvest.	2.3.1 A) Maryland will establish check-in stations for the commercial sale of striped bass.	On-going	CB jurisdictions are in compliance.
	2.3.1 B) Virginia dealers and commercial watermen that harvest striped bass will be required to have a special permit to sell striped bass.	On-going	CB jurisdictions are in compliance.

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	2.3.1 C) The sale of striped bass caught by recreational or charter boat fishermen will be prohibited.	On-going	CB jurisdictions are in compliance.
	2.3.2 Maryland and Virginia will establish a weekly reporting system for licensed commercial fishermen and a daily reporting system for buyers during the commercial season. Maryland and Virginia will provide the Potomac River Fisheries Commission with information obtained through their mandatory buyer reporting provisions. The Potomac River Fisheries Commission will reduce the time period required for the finfish reporting system from monthly to weekly.	2006 2009 2010 2011 2011 2014 **Continue**	Electronic reporting was established for check stations and fishermen. Commercial Harvest Reports must be submitted to MDNR Fisheries Service within 10 days after the end of the month being reported. After 10 days the report is late. Watermen having late reports will be identified on the MDNR commercial webpage and in the Maryland Watermen's Gazette. Official violations are recorded for a license if a harvest report is not received within 50 days after the due date. Two or more reporting violations may result in license suspension. MD Senate Bill 655 and House Bill 1225 increased the penalty for commercial fishing with a suspended license, a revoked license, or without a license. The fine is up to $25,000 and imprisonment for up to one year. MD House Bill 1252, established a misdemeanor charge and up to two years imprisonment for the unlawful capture of >$20,000 worth of striped bass (based on sale proceeds). Maryland is conducting a SB Pilot Permit system for the commercial fishery. This e-reporting system should improve the accuracy of harvest reports. **Beginning in 2016, the e-reporting system was expanded to all finfish.**
2.4.1 Fishing seasons will be established for the recreational, charter boat and commercial fisheries. The length of the season may be adjusted as needed, including when quotas are reached (see Action 2.1.2), by opening and closing areas to fishing, or with other actions as appropriate. Seasons will be consistent among jurisdictions to the extent possible.	2.4.1 A) The District of Columbia will establish a recreational fishing season within the period June through December.	Completed	The season opens in May and concludes at the end of December.
	2.4.1 B) Maryland will establish fishing seasons within the following periods: o The commercial gill net season will be within the period November through March 15.	On-going Dates modified & subject to	Fishing season dates are annually reviewed by ASMFC. **Chesapeake Bay pound net was Jun –Dec.; haul seine and hook and line fisheries were**

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	o The commercial pound net/haul seine/fyke net/hook and line seasons will be within the period June through November. o The recreational and charter boat seasons will be within the period June through November. o There may be a May trophy fishery for recreational and charter boat fishing, effective May 1991, limited to a single trophy fish per boat per day.	change Dates modified & subject to change	**June 1 – November 30. Pound net sector was Monday – Saturday and haul seine was Monday – Friday. Hook and line: ITQ sector was Monday – Thursday, common pool sector's open days varied during the season. Drift gill net was open from Jan. – Mar 13 and December 1 – 31. ITQ sector was Monday – Friday, common pool sector's open days varied during the season.** Atlantic coast: Monday – Friday from January 1 – April 30 and November 1 – December 31. Upper Chesapeake Bay (Susquehanna Flats) catch and release: March 1 – May 3, and the catch and keep: May 16 – 31. Spring trophy: 3rd Saturday in April – May 15. Summer – fall recreational/charter boat: May 16 – 31 and June 1 – December 15.
	2.4.1 C) Virginia will establish fishing seasons within the following periods: o The commercial netting season will be within the period September through February. o The recreational and charter boat seasons will be within the period June through December.	Dates modified & subject to change Dates modified & subject to change	Commercial season is January 16 – December 31 (≥ 18") and March 26 – June 15 (≤ 28"). Recreational Chesapeake Bay spring trophy fishery: May 1 - June 15. Spring/summer fishery: May 16 - June 15. Fall fishery: October 4 - December 31
	2.4.1 D) The Potomac River Fisheries Commission will establish fishing seasons within the following periods: o The commercial gill net season will be within the period November through March. o The commercial pound net/haul seine/hook and line seasons will be within the period June through December. o The recreational and charter season will be within the period June through December.	Dates modified & subject to change	Pound net, Haul Seine, and miscellaneous gear: February 15 – March 25 (18" – 36") and June 1 – December 15 (≥ 18"). Hook and line: February 15 – March 25 (18" – 36") and June 1 – December 31 (≥ 18"). Gill net: November **10** – February 14 (≥18") and February 15 – March 25 (18" – 36"). Recreational seasons differ by size, possession, and bait limits. Spring season: April **16** – May 15. Fall season: May 16 – December 31.
	2.4.1 E) Maryland, the Potomac River Fisheries Commission and Virginia will annually review the need for a Bay spawning season fishery in relationship to the issue of parity with the coastal states.	Continue	Addressed by ASMFC.

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2.4.2 Establish time periods when fishing is allowed to aid law enforcement and monitoring.	2.4.2 Maryland will prohibit commercial fishing on weekends and at night during the transitional fishery.	Completed 2014	Weekend and evening/night fishing have been prohibited. Saturday fishing was allowed in the pound net sector.
2.4.3 Maryland, the Potomac River Fisheries Commission and Virginia will maintain appropriate striped bass fishing areas.	2.4.3 Maryland will continue to restrict fishing for striped bass in spawning areas and rivers, and spawning reaches as defined in COMAR 08.02.05.02. Virginia will continue to restrict fishing within the spawning reaches defined in VMRC Regulation 450-01-0034. The Potomac River Fisheries Commission will continue its prohibition on gill netting or striped bass fishing during April and May throughout the entire Potomac River during the transitional fishery.	Completed On-going	Area closures are regulated. Jurisdictions follow ASMFC harvest restrictions.
2.4.4 The District of Columbia, Maryland, the Potomac River Fisheries Commission and Virginia will establish recreational and charter boat creel limits consistent with ASMFC guidelines and dependent on length of season.	2.4.4.1 The District of Columbia, Maryland, the Potomac River Fisheries Commission and Virginia will establish creel limits for the recreational and charter boat fisheries of up to five (5) fish per person per day within the established season.	On-going	Jurisdictions are in compliance with ASMFC harvest restrictions. See Strategy 1.2 for creel limits.
	2.4.4.2 Maryland may allow one trophy fish per boat during a May trophy season.	On-going	Jurisdictions are in compliance with ASMFC harvest restrictions. See Strategy 1.2 for creel limits.
2.5 Maryland, Virginia and the Potomac River Fisheries Commission will establish monitoring programs to provide timely knowledge of harvest and effort data.	2.5.1 Maryland, the Potomac River Fisheries Commission and Virginia will monitor harvest for the striped bass fishery by one or a combination of the following: o Utilize daily trip tickets for commercial and charter fishermen. o Conduct port sampling of commercial vessels. o Conduct onboard sampling of commercial catches. o Utilize check-in station sampling to characterize exploited stocks. o Require dealer logs o Maintain Natural Resource Police activity reports. o Utilize aerial overflights to estimate recreational effort. o Conduct port and onboard sampling of recreational vessels. o Conduct telephone surveys to estimate recreational participation.	1995 - 2003 On-going On-going 2007	Amendment V of the ASMFC FMP requires MD and VA to conduct annual juvenile abundance (JAI) surveys. CB jurisdictions are required to compile and submit commercial and recreational fisheries data. Monitoring programs include the Maryland Estuarine Juvenile Finfish Survey; spring spawning stock survey; spring tagging; commercial pound net, haul seine, hook and line, and drift gill net; and recreational Susquehanna Flats catch and release, spring trophy, spring-early summer and summer-fall recreational/charter boat seasons. Monitoring requirements may be changed as necessary. Data collected from Federal waters is coordinated with NOAA Fisheries. Addendum I to Amendment 6 of the ASMFC FMP requires commercial and recreational catch, bycatch, discard, and mortality data.

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	o Utilize mail surveys to estimate recreational catch and effort. o Utilize an enhanced National Marine Fisheries Service survey and/or Chesapeake Bay Stock Assessment Committee recreational monitoring data.	2008 2011 Continue	Discard mortality data gaps will be identified. Coastal stock data was used in a VPA model, but is now used in an SCA model. Addendum 1 to Amendment 6 of ASMFC FMP requires states to address bycatch and angler education. States are required to collect commercial and recreational catch and bycatch data that is consistent with ACCSP standards, coordinate data collection from Federal waters with NOAA Fisheries, and review discard mortality studies for information gaps. States are to implement angler education about best practices for catch and release fishing. MD Senate Bill 414 and House Bill 396 authorize NRP officers to inspect licensed commercial vessels, vehicles, and premises where MD fishery resources may be stored. NRP officers are authorized to issue electronic citations. The law allows MDNR to suspend or revoke a license after providing the opportunity for a hearing.
	2.5.2 The District of Columbia will conduct an angler survey to determine striped bass fishing effort and harvest.	On-going	District Department of the Environment conducts monthly angler surveys.
2.6.1 The District of Columbia, Maryland and Virginia will establish regulatory procedures that allow for: 1) recognition of and incorporation of ASMFC requirements into state management, and 2) a periodic cycle of public review of management options. The Potomac River Fisheries Commission will promulgate regulations necessary to comply with the ASMFC and Chesapeake Bay Striped Bass Management Plans.	2.6.1 Maryland will propose legislation to authorize timely management actions and will develop guidelines for regulations. Virginia will promulgate regulations for timely management and seek legislation to correct any deficiencies if noted.	1990 On-going	Jurisdictions are in compliance with ASMFC and are coordinating through the Chesapeake Bay Program.
	2.6.2 The District of Columbia, Maryland, the Potomac River Fisheries Commission and Virginia will adopt consistent enforcement policies for the striped bass fishery throughout the Chesapeake Bay. Strategies to address enforcement needs will be developed.	On-going 2011 2011 Continue	ASMFC's Law Enforcement Committee develops minimum enforcement policies. Additional enforcement resources have been made available. Resources include additional officers, equipment, access to state of the art surveillance tools, legislation and regulation, increased penalty system, and a streamlined judicial framework. MD Senate Bill 635 and House Bill 1154, require the revocation of an individual's

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			commercial fishing license if found by an Administrative Law Judge to have knowingly committed an egregious violation or repeat violation against striped bass including: using illegal gear; harvesting during closed seasons; harvesting from a closed area; violating established harvest, catch or size limits; or violating tagging and reporting requirements.
3 - Stock Assessment and Research Needs: The Chesapeake Bay Stock Assessment Committee (CBSAC) will continue to improve the coordination of stock assessment pursuant to the Chesapeake Bay Stock Assessment Plan. Stock identification studies should be expanded, especially for the Chesapeake & Delaware Canal and along the coast, to provide information on stock mixing. The contribution of hybrids and hatchery produced fish to the wild population needs to be determined. A review of hooking mortality and other by-catch mortality rates would allow greater precision in establishing fishing mortality controls. Studies on larval survival and growth in relation to environmental variables would provide a better understanding of the factors affecting year class strength.		 On-going Completed 2009 2008 – 2011 2012-2013 2014 **2015** **2016**	MD and VA have instituted tagging programs to estimate migration and mortality rates. Gillnet survey is used to collect population data. Studies demonstrating the effectiveness of circle hooks for reduced gut hooking and release mortality have been completed. Research has linked striped bass recruitment with climate cycles. Wood & Austin, 2009, Synchronous multidecal fish recruitment patterns in Chesapeake Bay, USA. SARC determined stock is not overfished is not undergoing overfishing. A benchmark stock assessment was completed in 2013**.** An update to the benchmark stock assessment was completed and the stock was not overfished and overfishing was not occurring, but management triggers were met and lead to approval of Addendum IV **An update to the stock assessment was completed in October 2015 (using data through 2014) The stock was not overfished and overfishing was not occurring, however, SSB was projected to fall below the threshold level and harvest reductions were triggered.** **An update to the stock assessment will be completed to determine the stock status**

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3.1 The jurisdictions will continue to obtain stock information on striped bass in Chesapeake Bay.	3.1 The District of Columbia will continue monitoring aspects of striped bass population dynamics. Maryland will continue surveys of the spawning and premigratory striped bass stock in the Chesapeake Bay. Virginia will initiate surveys on its spawning stock of striped bass. Collection of tissue and scale samples to augment tagging information and stock identification will be considered.	On-going On-going	MD has a gill net survey to monitor the spring spawning stock. MD and VA tag fish for the USFWS Cooperative Coastal Striped Bass Tagging Program to monitor migratory and resident striped bass population dynamics. ASMFC does not require DC to tag fish.
3.2 Efforts will be made to improve our understanding of factors that affect reproduction and recruitment to the fishery.	3.2 The District of Columbia, Maryland and Virginia, in cooperation with federal agencies, will review and update existing data, and initiate new studies that target: striped bass reproduction and early life history, especially in relation to environmental parameters; natural mortality; and catch-release mortality induced by various fishing methods.	2007 Continue 2009 Continue On-going	Addendum I to Amendment 6 of the ASMFC FMP requires states to implement angler education about catch and release best practices**.** Tagging data indicates striped bass natural mortality (M) may be increasing unless CB emigration has increased. Increased M may reflect an increased incidence of mycobacteriosis, decreased prey availability, or poor water quality. Tagging study design and implementation requirements are coordinated with ASMFC. Tag return data provide information on migration rates and mortality. The data is then used to improve management measures.
4 – Declining Water Quality: Adequate spawning and nursery areas with good water quality are critical for striped bass survival. Although causes for the decline in reproduction may differ between years and between spawning areas, several water quality aspects are identified as reducing survival of young. State and Federal studies will continue to examine the effects of environmental contaminants on striped bass. 4.1 Identify those water quality factors, both natural and man-induced, which affect striped bass reproduction and survival, and focus on the control of those factors.	4.1 The first four action items are commitments under the 1987 Chesapeake Bay Agreement. The DCFM, MDNR, PRFC and VMRC are not the agencies responsible for carrying out the actual commitments, but are involved in setting the objectives of the programs to fulfill the commitments. The achievement of these commitments will lead to improved water quality and enhanced biological production that can only benefit striped bass populations. The DCFM, MDNR, PRFC and VMRC fully support these commitments.	1990 On-going 2010 2012 – 2013 2014	Water quality issues are also addressed in the Chesapeake 2000 Agreement and most recently in the 2009 Executive Order. US EPA established a Chesapeake Bay TMDL “pollution diet” mandating nutrient and sediment reductions for compliance with the Clean Water Act. Chesapeake Bay jurisdictions adopted a new Chesapeake Bay Watershed Agreement which outlines new goals and outcomes for protecting and restoring the Bay. The document is available at .http://www.chesapeakebay.net/chesapeakebaywatershedagreement/page The forage outcome and work plan is particularly important for striped bass.

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	1 - The first commitment adopted under the 1987 Chesapeake Bay Agreement was a report titled, "Habitat Requirements for Chesapeake Bay Living Resources". This document listed the habitat requirements for selected target species including striped bass. The report is being revised and updated by a workgroup of the Living Resources Subcommittee. When complete in May, 1990, the habitat requirements contained in the report will be used to aid managers in improving water quality: a) Assist in the revision of water quality standards and criteria as needed, b) Develop a Habitat Requirements Use Report which will detail resource needs by river segment, c) Assist in the 1991 Nutrient Re-evaluation by providing living resource habitat requirement for use in the 3-D Model (The model will compare existing water quality with the habitat requirements and project whether the requirements would be met under various nutrient removal scenarios), and d) Assist in the implementation of the nutrient, toxics and conventional pollutant control strategies by identifying critical habitat needs.	1991 2001 2007 Completed 1990 On-going	Document published. CB jurisdictions have implemented management strategies to protect striped bass habitat. MD spawning areas are protected from harvest March through May. An ecosystem-based fishery management process was facilitated by MD Sea Grant. Habitat issues/stressors were defined for striped bass. Chesapeake Bay Program develops, revises, and monitors goals and strategies for living resources (blue crab, menhaden, oyster, shad, and striped bass. For more information: http://www.chesapeakebay.net/issues/issue/blue_crabs http://www.chesapeakebay.net/issues/issue/menhaden http://www.chesapeakebay.net/issues/issue/oysters http://www.chesapeakebay.net/issues/issue/shad http://www.chesapeakebay.net/issues/issue/striped_bass
	4.1 2 –Development and adoption of a basinwide plan that will achieve a reduction of nutrients entering the Chesapeake Bay: a) Construct public and private sewage facilities. b) Reduce the discharge of untreated or inadequately treated sewage. c) Establish and enforce nutrient and conventional pollutant limitations in regulated discharges. d) Reduce levels of nutrients and other conventional pollutants in runoff from agricultural and forested lands. e) Reduce levels of nutrients and other conventional pollutants in urban runoff.	1990 On-going	Currently addressed through the Chesapeake Bay Program's 2 year milestones towards reaching the 2025 water quality goals. Chesapeake Bay Program develops, revises, and monitors goals and strategies for nutrient reduction. For more information: http://www.chesapeakebay.net/issues/issue/nutrients
	4.1 3 – Development and adoption of a basinwide plan for the reduction and control	1990 On-going	Chesapeake Bay Program develops, revises, and monitors goals and strategies for chemical

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	of toxic materials entering the Chesapeake Bay system from point and nonpoint sources and from bottom sediments: a) Reduce discharge of metals and organic compounds from sewage treatment plants receiving industrial wastewater. b) Reduce the discharge of metals and organic compounds from industrial sources. c) Reduce levels of metals and organic compounds in urban and agricultural runoff. Reduce chlorine discharges to critical finfish areas.		contaminants. For more information: http://www.chesapeakebay.net/issues/issue/chemical_contaminants
	4.1 4 – Development and adoption of a basinwide plan for the management of conventional pollutants entering the Chesapeake Bay from point and nonpoint sources: a) Manage sewage sludge, dredge spoil and hazardous wastes. b) Improve dissolved oxygen concentrations in the Chesapeake Bay through the reduction of nutrients from both point and nonpoint sources. c) Continue study of the impacts of acidic conditions on water quality. d) Manage groundwater to protect the water quality of the Chesapeake Bay. e) Continue research to refine strategies to reduce point and nonpoint sources of nutrient, toxic and conventional pollutants in the Chesapeake Bay.	1990 On-going	Chesapeake Bay Program develops, revises, and monitors goals and strategies for sediment, wastewater, stormwater runoff, and agriculture. For more information: http://www.chesapeakebay.net/issues/issue/sediment http://www.chesapeakebay.net/issues/issue/wastewater http://www.chesapeakebay.net/issues/issue/sediment http://www.chesapeakebay.net/issues/issue/stormwater_runoff
	4.1 5 – The development and adoption of a plan for continued research and monitoring of the impacts and causes of acidic atmospheric deposition into the Chesapeake Bay and its tributaries. This plan is complemented by Maryland's research and monitoring program on the sources, effects, and control of acid deposition as defined by Natural Resources Article Title 3, Subtitle 3A, (Acid Deposition: Sections 3-3A-01 through 3-3A-04): a) Determine the relative contributions to acid deposition from various sources of acid deposition precursor emissions and identify any regional variability.	1990 On-going	Chesapeake Bay Program develops, revises, and monitors goals and strategies for air pollution. For more information: http://www.chesapeakebay.net/issues/issue/air_pollution

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	b) Assess the consequences of the environmental impacts of acid deposition on water quality. c) Identify and evaluate the effectiveness and economic costs of technologies and mitigative techniques that are feasible to control acid deposition into the Chesapeake Bay.		

Acronyms

ACCSP – Atlantic Coastal Cooperative Statistics Program
ASMFC – Atlantic States Marine Fisheries Commission
BRP – Biological Reference Points
CB – Chesapeake Bay
CBP – Chesapeake Bay Program
CBSAC – Chesapeake Bay Stock Assessment Committee
COMAR – Code of Maryland Regulations
DCFM – District of Columbia Department of Consumer and Regulatory Affairs, Fisheries Management Section
EBFM – Ecosystem-based Fisheries Management
EPA – Environmental Protection Agency
F – Fishing Mortality
FACTS – Fishing Activity and Catch Tracking System
FMP – Fishery Management Plan
ITQ – Individual Transferable Quota
JAI – Juvenile Abundance Index
M – Natural Mortality
MDNR – Maryland Department of Natural Resources
MSY – Maximum Sustainable Yield
NOAA – National Oceanic and Atmospheric Administration
NRP – Maryland Natural Resources Police
PRFC – Potomac River Fisheries Commission
SAFIS – Standard Atlantic Fisheries Information System
SARC – Stock Assessment Review Committee
SCA – Statistical Catch at Age
SFAC – Sport Fish Advisor Commission
SSB – Spawning Stock Biomass (females)
TFAC – Tidal Fish Advisory Commission
TMDL – Total Maximum Daily Load
USFWS – U.S. Fish and Wildlife Service
VMRC – Virginia Marine Resources Commission
VPA – Virtual Population Assessment
YOY – Young of Year