2013 Maryland FMP Report (October 2014)
Section 17. Striped Bass (*Morone saxatilis)*

Chesapeake Bay FMP

Fishing mortality (F) and female spawning stock biomass (SSB) projections from the 2013 striped bass stock assessment require implementation of a harvest reduction mechanism for the 2015 season. Each metric is projected to violate its threshold level if current harvest levels continue. Harvest reduction options were presented with Draft Addendum IV and public comment was solicited during August and September 2014. The Atlantic States Marine Fisheries Commission (ASMFC) Management Board adopted Addendum IV at their October 2014 meeting.

The Fisheries Service Plan Review Team reviewed the 1989 Chesapeake Bay Striped Bass Management Plan (CBSB FMP) and Amendment #1 in May 2013. The review included an examination of the harvest allocations specified in the FMP. The FMP review findings were presented to both the Sport and Tidal Fisheries Advisory Commissions in 2014. The Plan Review Team recommended the development of an amendment that reflects the management changes adopted since the CBSB FMP and Amendment #1 were developed and the utilization of ecosystem-based management tools specific to the Chesapeake Bay, when feasible.

The ASMFC developed the Interstate Fisheries Management Plan for Striped Bass in 1981 (ASMFC FMP). In 1989 the Chesapeake Bay Program developed the CBSB FMP to coordinate management among jurisdictions and to comply with ASMFC FMP requirements. Several amendments and addenda to the ASMFC FMP have been adopted to make adjustments to management measures (http://www.asmfc.org/species/atlantic-striped-bass). Amendment 5 (1995) to the ASMFC FMP required an annual juvenile abundance survey in Maryland and Virginia to monitor for recruitment failure. Maryland's Juvenile Abundance Index (JAI) began in 1954 and Virginia's in 1955. Amendment #1 to the CBSB FMP formally adopted ASMFC's Amendment 5 management framework within the Chesapeake Bay. Amendment 6 (2003) 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, approved in 2012, standardized the use of commercial harvest tags coastwide to reduce illegal harvest. Draft Addendum IV was developed in 2014 to begin reduction of the fishing mortality (F) rate in 2015. Management options for 2015 include implementation of a 25% reduction of 2013 harvest levels in one year, a 17% reduction of 2013 harvest within three years, or a 7% sequential reduction in harvest for three consecutive years. For the most current status on Addendum IV, check the ASMFC website at http://www.asmfc.org/uploads/file/54539b9bpr43StripedBassAddIV_Approval.pdf

A NOAA Chesapeake Bay Fisheries Ecosystem Advisory Panel agreed to develop a Fisheries Ecosystem Plan (FEP) for CB in 2006. Maryland Sea Grant was contracted to facilitate FEP development for five keystone Chesapeake Bay species, which includes 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, projected SSB estimates indicate that SSB will most likely fall below the threshold under current conditions. Striped bass are managed with biological reference points (BRPs) for F and SSB. Target F for striped bass in coastal waters has been 0.30 and the $F_{threshold}$ has been 0.34. The Chesapeake Bay has had a slightly lower F_{target} (0.27) because of the smaller minimum size (18") used to manage a fishery of smaller, pre-migratory, resident fish. Levels of F during 2011 remained low in coastal waters (F=0.13) and in Chesapeake Bay (F=0.09).[1] Target SSB was 160 million pounds with a $SSB_{threshold}$ at 128 million pounds. The coastwide SSB in 2011 was 136 million pounds.[1] BRPs were updated in ASMFC's 2013 Stock Assessment Report for Atlantic Striped Bass. Current harvest levels are predicted to reduce SSB below $SSB_{threshold}$ by 2015 and raise F above $F_{threshold}$.[1]

MD DNR has conducted the Maryland Estuarine Juvenile Finfish Survey since 1954 to measure young of year (YOY) striped bass abundance and 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 striped bass JAI falls below a value of 1.60 for three consecutive years, it would trigger management action by the ASMFC.[3] The 2013 JAI rebounded to 3.42 after having reached a historic low of 0.49 in 2012 [4] (Figure 1). The Maryland JAI is one of six that are calculated for different regions of the Atlantic coast including Maine, New York, New Jersey, Virginia, and North Carolina. Recruitment failure for three consecutive years in any one of these six regions would trigger an ASMFC management action.[3]

Current Management Measures

Maryland's 2013 striped bass quota was 4.1 million lbs., a 14% decrease from 2012, and was distributed among two fishing sectors: commercial (42.5%) and recreational/charter (57.5%).[5] The Maryland Chesapeake Bay commercial quota was 1.69 million lbs for 2013 (Figure 2).[5] Two and a half percent of the quota was set aside to account for management uncertainty leaving 1.65 million lbs available for harvest. The 2013 commercial quota was allocated among three sectors: drift gill net (709,000

lbs), hook and line (397,000 lbs), and pound net/haul seine (541,000 lbs).[5] The 2013 quota for recreational (including charter) fisheries in Chesapeake Bay was 2.29 million lbs (excluding spring migratory fish; Figure 3).[5] The Maryland Atlantic Coast recreational harvest is managed under a coastwide F. 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 individual transferable quota (ITQ) management framework. The common pool fishery has a single quota assigned to all participants. An ITQ guarantees each participating waterman a portion of the commercial quota. Watermen will have the ability to temporarily transfer quota to other waterman with an ITQ. Quota allocation is based on a waterman's historical landings through February 29, 2012.

Commercial fisheries are managed using quotas and time restrictions for all four fishing sectors: pound net, haul seine, hook and line, and drift gill net. Maryland's 2014 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 Monday – Saturday and the haul seine fishery on 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 December 1 – February 28. 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 on Monday – Friday from January 1 – April 30 and November 1 – December 31.

Striped bass caught by the commercial fishery must be individually tagged and landed at a certified check station prior to sale.[3] 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 daily harvest numbers and submit a weekly report. Fishermen and check stations have the option to submit harvest data electronically. Check stations are randomly sampled by MD DNR to collect age and length data as well as validate reporting.

The recreational fishery is managed with minimum size limits, creel limits, tackle and bait restrictions, seasonal closures, and area closures.[3] Regulations to control catch and release effort during the pre-spawn period (March 1 - the third Friday in April) were implemented in 2010. 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.

Recreational angling is managed with a number of seasonal and spatial restrictions. No recreational harvest of striped bass was allowed in the Chesapeake Bay and Potomac River during the January 1 – February 28 catch and release fishery. The area of the catch and release fishery was restricted from March 1 – April 18. Fishing was 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 spring trophy season took place from April 19 – 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. Anglers were allowed to harvest one fish ≥28" per day. Allowable fishing locations were most 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 15. Harvest restrictions from May 16 – December 15 are two fish per person per day 18" – 28", or one fish per person per day 18" – 28" and one fish per person per day >28". The fishery transitions to catch and release only on December 16 and continues thru December 31. The use of eel as bait is prohibited from January 1 – May 15 to prevent deep hooking which increases mortality.

Recreational regulations differ somewhat for upper Chesapeake Bay waters including the Susquehanna Flats. The striped bass fishery is catch and release only from December 16 – May 3. The fishery is closed from May 4 – 15. The fishery re-opens with a one fish per person per day 18" – 26" from May 16 – 31. Regulations from June 1 – December 15 are two fish per person per day 18" – 28", or one fish per person per day 18" – 28" and one fish per person per day >28". Eel bait is prohibited from December 16 – May 31. The Atlantic Coast recreational fishery is year-round with a limit of two fish per person per day at ≥28". 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

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 Maryland commercial fishery in Chesapeake Bay harvested an estimated 1.66 million lbs; 748,000 lbs from gill net, 383,000 lbs from hook and line, and 532,000 lbs from pound net/haul seine (Figure 2).[5] Atlantic coast landings were estimated at 94,000 lbs.[5]

NOAA Marine Recreational Information Program (MRIP) estimated recreational harvest in Maryland to be 2.21 million lbs: 2.02 million lbs from Chesapeake Bay and 184,000 lbs from Atlantic Coast (Figures 3 and 4).[5] MD DNR's estimated total recreational harvest was 2.63 million lbs (Figure 4).[5]: 2.50 million lbs from Chesapeake Bay and 126,000 lbs from the Atlantic coast.[5] Of the Chesapeake Bay harvest, 48,600

spring migratory fish were harvested by the trophy fishery (Figure 3).[5] The estimated discard mortality for striped bass is 9%, equal to 536,000 lbs in 2013.[5]

Figure 1. Striped bass juvenile abundance index and geometric mean values: 1957 – 2013.[4] The red dashed line represents the recruitment failure definition (1.60) and the vertical dotted lines demarcate the 1985 – 1989 harvest moratorium.

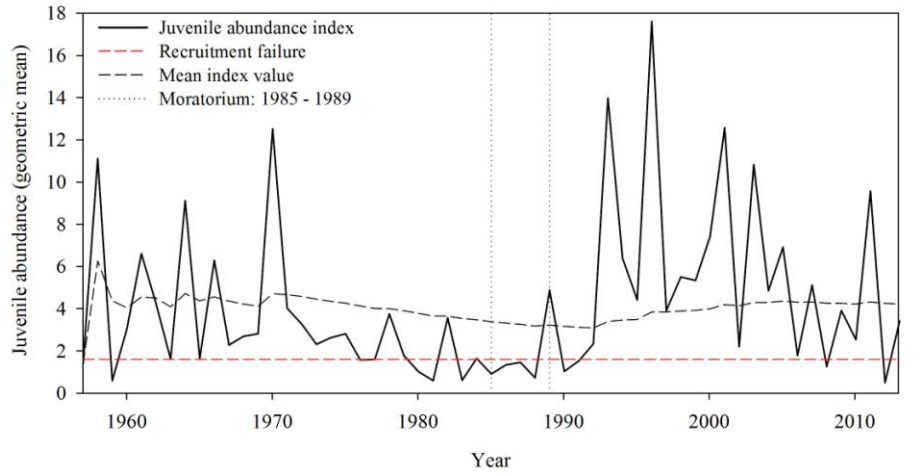


Figure 2. Total commercial striped bass landings (1950-2013) [6] and Chesapeake Bay landings (1982-2013) [5] in Maryland. Total and Chesapeake Bay quota are shown for 2000-2013 (http://www.asmfc.org/species/atlantic-striped-bass). The vertical dotted lines demarcate the 1984-1989 striped bass harvest moratorium.

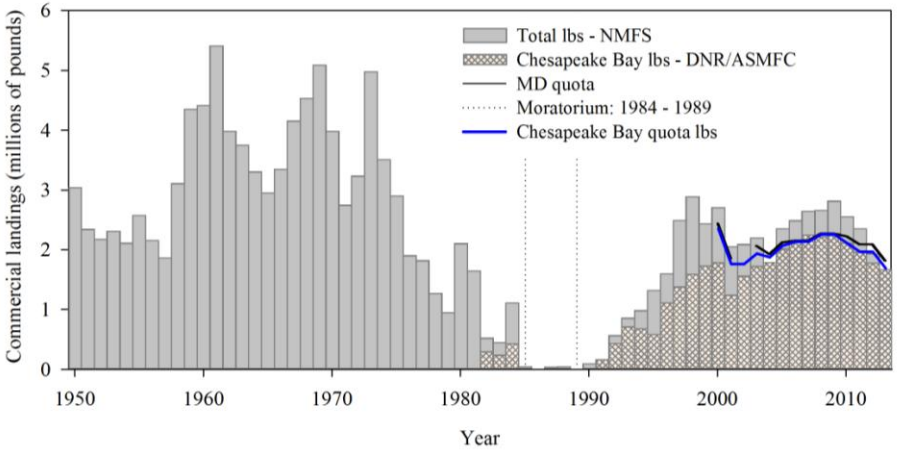


Figure 3. Maryland Chesapeake Bay resident (2006-2013) and trophy striped bass landings (2003-2013) [5] and quotas (1993-2013; http://www.asmfc.org/species/atlantic-striped-bass).

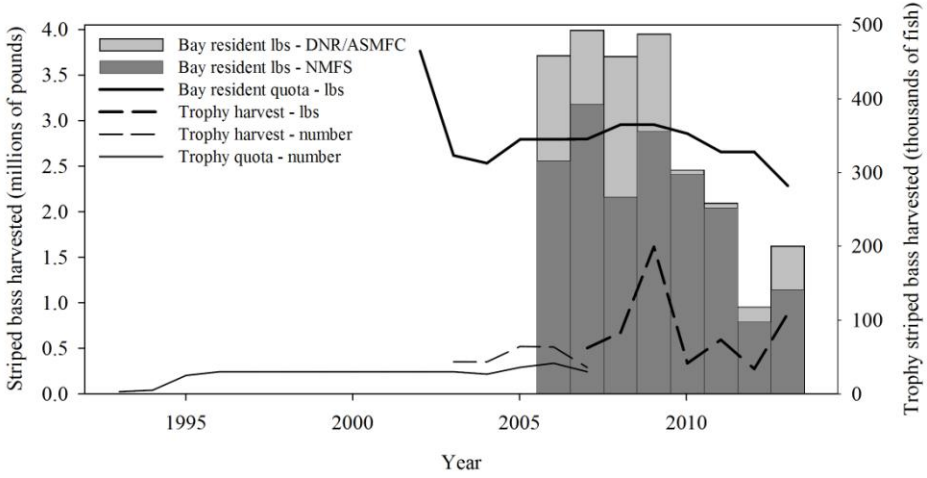
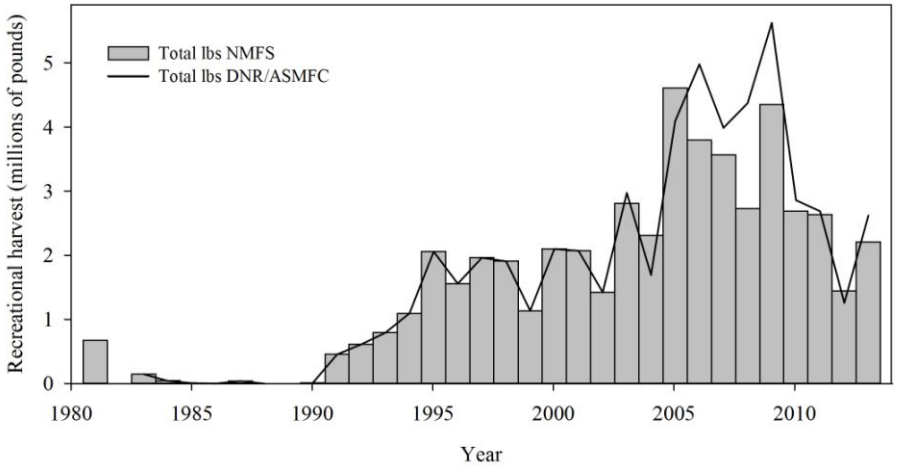


Figure 4. Maryland recreational (including charters) striped bass landings from 1981-2012.[5,6] Available landings data from Maryland compliance reports submitted to Atlantic States Marine Fisheries Commission began to deviate from National Marine Fisheries Service data beginning in 2003.



Issues/Concerns

The striped bass stock has been undergoing a decline in SSB and a rise in F. Projections from the 2013 stock assessment indicated that SSB will likely fall below its threshold and that F will likely increase above its threshold. Timely implementation of a management strategy will be critical.

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 [7] or other factors affecting health. Nutritional status of striped bass has been proposed as a possible health index. Nutrition-based reference points were recently proposed by Jacobs et al. (2013),[8] Further study of mycobacteriosis infections in striped bass and its relation to M is needed.

References

[1] Northeast Fisheries Science Center. 2013. 57th Northeast regional stock assessment workshop (57th SAW) assessment summary report. Northeast Fisheries Science Center Reference Document 13-14. U.S. Department Of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Fisheries Science Center. Woods Hole, MA. http://www.nefsc.noaa.gov/nefsc/publications/crd/crd1314/crd1314.pdf

[2] Atlantic States Marine Fisheries Commission. 2014, August. ASMFC Atlantic Striped Bass Board approves draft Addendum IV for public comment. Atlantic States Marine Fisheries Commission. Arlington, VA. http://www.asmfc.org/uploads/file/53e2a814pr26StripedBassDraftAddIV_PublicComment.pdf

[3] 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.

[4] Maryland Department of Natural Resources Fisheries Service. 2014. Striped bass seine survey juvenile index: striped bass (YOY) [Data file]. Retrieved from http://www.dnr.maryland.gov/fisheries/juvindex/index.asp

[5] Maryland Department of Natural Resources. 2014. Maryland Striped Bass (*Morone saxatilis*) Compliance Report to the Atlantic States Marine Fisheries Commission 2012. Maryland Department of Natural Resources, Annapolis, MD

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

[7] Striped Bass Stock Assessment Subcommittee and Striped Bass Tagging Subcommittee. 2011. Atlantic States Marine Fisheries Commission striped bass stock assessment update 2011. Atlantic States Marine Fisheries Commission. Alexandria, VA.

[8] 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 10/2014)			
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**	Target is 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, and 2011 year classes **Draft Addendum IV has been approved to implement management measures to reduce F in order to increase SSB.**
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 2013	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. See Strategy 1.2 comments for size limits and Strategy 2.4.1 comments for seasons and time restrictions. BRPs were updated in the 2013 ASMFC Coastal Stock Assessment.
	1.1.2 Maryland, the Potomac River Fisheries	1990	Implemented.

1989 Chesapeake Bay Striped Bass Management Plan Implementation Table (updated 10/2014)			
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	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.	1995	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	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".
	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 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.	On-going	DC, MD, PRFC, and VA recreational fisheries are managed with a combination of the 18" – 28" slot limit and a 28" minimum size limit: 2 fish 18" - 28", or 1 fish 18" - 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.

1989 Chesapeake Bay Striped Bass Management Plan Implementation Table (updated 10/2014)			
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	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 regarding the Susquehanna River.	Magothy - 1982 Patuxent - 1984 Pennsylvania – 1990	MD, PA, and USFWS discontinued stocking hybrid striped bass.
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 CBP FMP was reviewed including quota allocation in 2013 by a plan review team. The team recommended the development of a new amendment to adopt the current 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	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.

1989 Chesapeake Bay Striped Bass Management Plan Implementation Table (updated 10/2014)			
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	Bass Plan is reached, regardless of the time during that season.		
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. CB FMP includes provisions for how jurisdictions allocate among sectors. MD adopted an allocation policy in 2011.
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.
	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	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

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			without a license. The fine is up to $25,000 and imprisonment for up to one year.
		2011	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).
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. 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.	On-going Dates modified & subject to change Dates modified & subject to change	Fishing season dates are annually reviewed by ASMFC. **Pound net, haul seine, hook and line fisheries were 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 December 1 – February 28. 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:	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:

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	○ The commercial gill net season will be within the period November through March. ○ The commercial pound net/haul seine/hook and line seasons will be within the period June through December. ○ The recreational and charter season will be within the period June through December.		February 15 – March 25 (18" – 36") and June 1 – December 31 (≥ 18"). Gill net: November **12** – February 14 (≥18") and February 15 – March 25 (18" – 36"). Recreational seasons differ by size, possession, and bait limits. Spring season: April **20** – 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.
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: ○ Utilize daily trip tickets for commercial and charter fishermen.	1995 - 2003 On-going	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.

1989 Chesapeake Bay Striped Bass Management Plan Implementation Table (updated 10/2014)			
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	○ Conduct port sampling of commercial vessels. ○ Conduct onboard sampling of commercial catches. ○ Utilize check-in station sampling to characterize exploited stocks. ○ Require dealer logs ○ Maintain Natural Resource Police activity reports. ○ Utilize aerial overflights to estimate recreational effort. ○ Conduct port and onboard sampling of recreational vessels. ○ Conduct telephone surveys to estimate recreational participation. ○ Utilize mail surveys to estimate recreational catch and effort. ○ Utilize an enhanced National Marine Fisheries Service survey and/or Chesapeake Bay Stock Assessment Committee recreational monitoring data.	On-going 2007 2008 2011	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. 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	2.6.1 Maryland will propose legislation to authorize timely management actions and will develop guidelines for regulations. Virginia	1990 On-going	Jurisdictions are in compliance with ASMFC and are coordinating through the Chesapeake Bay Program.

1989 Chesapeake Bay Striped Bass Management Plan Implementation Table (updated 10/2014)			
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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.	will promulgate regulations for timely management and seek legislation to correct any deficiencies if noted.		
	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	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 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**	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.**
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	On-going	MD has a gill net survey to monitor the spring spawning stock.

1989 Chesapeake Bay Striped Bass Management Plan Implementation Table (updated 10/2014)			
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	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	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.
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 VRMC 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**
	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	1991 2001	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

1989 Chesapeake Bay Striped Bass Management Plan Implementation Table (updated 10/2014)			
Strategy	**Action**	**Date**	**Comments**
	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.	2007 Completed 1990 On-going	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 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.	1990 On-going	Chesapeake Bay Program develops, revises, and monitors goals and strategies for chemical contaminants. For more information: http://www.chesapeakebay.net/issues/issue/chemical_contaminants

1989 Chesapeake Bay Striped Bass Management Plan Implementation Table (updated 10/2014)			
Strategy	**Action**	**Date**	**Comments**
	c) Reduce levels of metals and organic compounds in urban and agricultural runoff. Reduce chlorine discharges to critical finfish areas.		
	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. 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.	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

Acronyms

ACCSP – Atlantic Coastal Cooperative Statistics Program
ASMFC – Atlantic States Marine Fisheries Commission
CB – Chesapeake Bay
CBP – Chesapeake Bay Program
COMAR – Code of Maryland Regulations
DCFM – District of Columbia Department of Consumer and Regulatory Affairs, Fisheries Management Section
EPA – Environmental Protection Agency
F – Fishing Mortality
FMP – Fishery Management Plan
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
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