

## 2015 Maryland FMP Report (September 2016)

### Section 19. Tautog (*Tautoga onitis*)

Tautog, also known as blackfish, are predominately a recreational species. They are frequently encountered in the Atlantic Ocean and the Coastal Bays and infrequently in Maryland's portion of the Chesapeake Bay. The International Game Fish Association (IGFA) World Record tautog was caught off Ocean City, Maryland in January 2015; this fish was 23 years old. Although the oldest tautog aged in Maryland has been 28 years old, they are known to reach 40 years old. Tautog prefer reef structure and typically do not migrate more than 20 miles. Spawning occurs in the Atlantic Ocean during May and June and juvenile fish can be found in the eel grass beds within Maryland's Coastal Bays. Tautog are managed by the Atlantic States Marine Fisheries Commission (ASMFC). The current coastwide management uses a single stock approach but will be changing to a regional management approach with the development of an amendment in 2017. While tautog are overfished on a coastwide basis, overfishing is not occurring in the Delmarva region.<sup>1</sup>

#### Fishery Management Plans (FMPs)

The Chesapeake Bay and Atlantic Coast Tautog Fishery Management Plan (CBT FMP) was adopted in 1998 by the Chesapeake Bay Program to perpetuate the stock and maintain existing fisheries. The CBT FMP adopts ASMFC guidelines and requirements. The CBT FMP was reviewed in 2011. The review evaluated the goals, objectives, strategies, and actions within the 1998 FMP and concluded that the current management framework is appropriate for managing the stock.

The ASMFC Fishery Management Plan for Tautog (1996) defined overfishing and established an interim fishing mortality rate (F) of 0.24, a final target  $F = 0.15$ , and a minimum size of 14". Addenda I (1997) and II (1999) successively extended the implementation timeframe for  $F_{\text{target}}$ . Addendum III (2002) revised the  $F_{\text{target}}$  reference point to 0.21 and a biological reference point of 40% spawning stock biomass (SSB, 0.29). Overfishing was defined as  $F_{\text{threshold}} = 0.29$ . Addendum IV (January 2007) established biological reference points to determine if tautog are overfished:  $SSB_{\text{target}} = 59$  million lbs. and  $SSB_{\text{threshold}} = 44$  million lbs. Tautog biomass was below average for 8 years and a rebuilding  $F_{\text{target}}$  of 0.20 was implemented. The addendum stipulated that only recreational regulations would be implemented to reduce F. Addendum V (April 2007) removed the provision that restricted regulations to the recreational fishery. Addendum VI (2011) required a reduction in  $F_{\text{target}}$  to 0.15: a 53% coast wide reduction in harvest. Following Technical Committee recommendations, the 53% coastwide harvest reduction was revised to 39% in early 2012.<sup>2</sup> Maryland implemented regulations in 2013 to achieve the required reduction. Maryland is required to submit an annual compliance report to ASMFC. As a result of the 2015 ASMFC stock assessment, the tautog Management Board began the development of draft Amendment 1 to consider a

regional approach to managing and to assessing the stock. The draft amendment is scheduled for completion in 2017.

#### Stock Status

Over the years, the ASMFC has conducted benchmark (full) stock assessments for tautog (1999, 2005, 2015) and one update in 2011 that was revised in 2012. The most recent stock assessment (2014/2015) utilized data through 2013. This assessment conducted analyses for the coastwide stock population and for multiple regions as discrete stock populations. Based on the coastwide stock, tautog continue to be overfished and overfishing is still occurring.<sup>1</sup> Tautog SSB has remained below the threshold value since 1989.<sup>1</sup> However, based on the regional assessment approach, the Southern New England (MA-CT) stock is overfished and overfishing is occurring; the NY-NJ stock is overfished, but overfishing is not occurring; and the Delmarva stock is overfished, but overfishing is not occurring.<sup>1</sup> The ASMFC Technical Committee recommended a stock assessment update in 2016 with the ability to modify the regions to include Long Island Sound as an additional region for analyses.

Tautog are sampled by Maryland's Coastal Bays Finfish Investigation (CBFI) program. The 2015 tautog relative abundance indices from the CBFI Trawl and Beach Seine Survey were not different from the grand means. Tautog were captured in three of 140 trawls (2%) and in four of 38 beach seines (11%). Tautog ranked 52nd out of 74 species in overall finfish abundance. The trawl and beach seine CPUEs were 0.2 fish/hectare and 0.1 fish/haul, respectively. The CBFI Submerged Aquatic Vegetation Habitat Survey results showed higher tautog mean abundance compared to the CBFI Trawl and Beach Seine Survey. There were 83.2 tautog/hectare in SAV beds with 50-75% SAV coverage and 29.1 tautog/hectare in SAV beds with  $\leq 25\%$  SAV coverage.

#### Current Management Measures

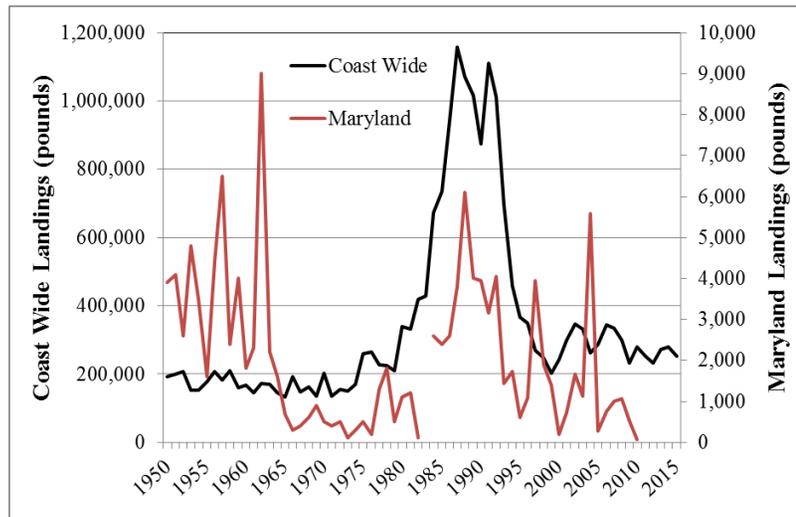
Maryland's tautog regulations have not changed since 2013. Both commercial and recreational fisheries have a minimum size limit of 16". Fisheries in tidal and coastal waters are limited to 4 fish per person per day during January 1 – May 15 and during November 1 – 26. Harvest is reduced to 2 fish per person per day from May 16 – October 31. Tautog harvest is prohibited from November 27 – December 31. Commercial harvesters are allowed to use hook and line, net, pot, trap, trot line, and seine. One panel on pots and traps must be attached with degradable fasteners to prevent ghost fishing if the pot is lost. Recreational anglers are restricted to hook and line.

## The Fisheries

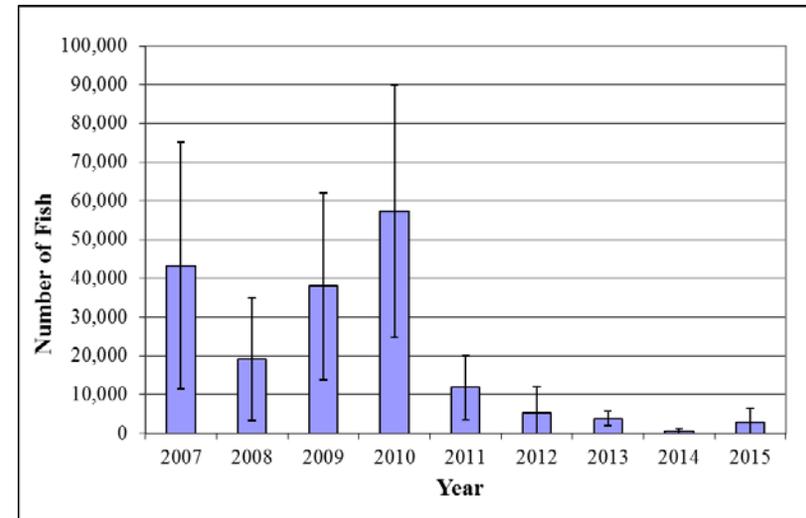
Maryland's commercial and recreational tautog harvests are minor components of the coastwide landings and comprise approximately 1% of the total. Commercial landings have remained at low levels since 2007 due to the limited possession allowance (Figure 1).<sup>5</sup>

The Marine Recreational Information Program (MRIP) estimate of recreational tautog harvest (A + B1) from Maryland during the 2015 fishing season was 2,988 fish (Figure 2).<sup>6</sup> Estimated harvest has decreased since 2010 with the lowest recreational landings occurring in 2014. The 2015 recreational harvest was comprised of three modes: fishing from shore (65%), charter boat (30%) and party boat (5%). Tautog are not well-sampled by the MRIP program, resulting in higher proportional standard errors (PSEs; approximately 20-25% in recent years at the regional level) and larger year-to-year fluctuations in catch estimates, often driven by small numbers of fish recorded during the intercept survey.<sup>1</sup>

**Figure 1. Maryland and coastwide commercial tautog landings 1950-2015. Data Source: Atlantic Coastal Cooperative Statistics Program (note different scales).**



**Figure 2. Maryland estimated recreational tautog harvest (A + B1; number of fish): 2007-2015(MRIP data).**



## Issues/Concerns

Adult tautog are dependent on hard bottom structure such as reefs, ship wrecks, stones or artificial structures. Juveniles require SAV beds and protected coastal embayments for development. While SAV has increased in the Chesapeake Bay, the Coastal Bays have experienced a decrease in SAV beds. These habitats are essential for a sustainable population. This species congregates around structures, is slow growing, has a late age at maturity and is long-lived; making it susceptible to overfishing. Tautog are considered a delicious meal, and illegal live markets are a concern to management and law enforcement. Regional management will likely benefit this species and anglers in the near future.

## References

- <sup>1</sup> Atlantic States Marine Fisheries Commission. 2015. Tautog Benchmark Stock Assessment and Peer Review Reports. Arlington, Virginia
- <sup>2</sup> Atlantic States Marine Fisheries Commission. 2015. Review of the Atlantic states marine fisheries commission fishery management plan for tautog (*Tautoga onitis*):

Fishing year 2013. Atlantic States Marine Fisheries Commission. Arlington, Virginia.

<sup>3</sup> Maryland Department of Natural Resources. 2016. Maryland's 2015 tautog (*Tautoga onitis*) compliance report to the Atlantic States Marine Fisheries Commission. Maryland Department of Natural Resources, Fisheries Service. Annapolis, Maryland.

<sup>4</sup> Doctor, S., Tyler, T., Weedon, C. and A. Willey. 2015. MDDNR-Fisheries Service, Investigation of Maryland's Coastal Bays and Atlantic Ocean Finfish Stocks, USFWS Federal Aid Project, F-50-R-24.

<sup>5</sup> The Atlantic Coastal Cooperative Statistics Program (ACCSP), 2016, Non-confidential data.

<sup>6</sup> Marine Recreational Information Program (MRIP), National Marine Fisheries Service, 2016, Fisheries Statistics Division.

1998 Chesapeake and Atlantic Coast Tautog Fishery Management Plan Implementation Table (updated 6/2016)			
Strategy	Action	Date	Comments
1) Implement minimum size and possession limits applicable to the commercial and recreational fisheries to prevent overexploitation. Monitor size composition of landings in the recreational fishery to prevent compression of age structure in the population. Use size composition of fish in the recreational fishery and total landings in the commercial fishery as triggers to implement further management of the fishery, should statistically significant compression of the age structure occur. This plan recommends that the Secretary of Commerce implement minimum size and possession regulations for tautog in the EEZ that are in accordance with state minimum size requirements contained in the plan. It is the intention under the Atlantic Coastal Fisheries Conservation and Management Act to have EEZ fisheries regulated consistent with state possession and landing laws, and that the more stringent of state or federal law will apply regardless of whether fish are caught in the EEZ or in state waters.	1.1) VA, MD and PRFC will implement a minimum size limit of 14" in the recreational and commercial tautog fisheries. Minimum size limits may be changed as more data becomes available on stock condition and biological reference points are re-evaluated.	1998 2003 2005 Continue	MD commercial and recreational fisheries have a 16" minimum size, 4 fish/person/day from January 1 – May 15, 2 fish/person/day from May 16 – October 31, 4 fish/person/day from November 1 – 26, and is closed from November 27 – December 31. VA has a 16" minimum size, 3 fish/person/day creel, and a recreational closure from May 1 – Sept 19. VA commercial fishery has a 15" minimum size, no catch limit, and seasonal closures from January 22 – last day of February and May 1 - October 31. PRFC has a 14" minimum size limit and no harvest restrictions for both commercial and recreational fisheries.
	1.2) VA, MD and PRFC will reduce fishing mortality to interim and target rates, as defined by ASMFC, through a combination of possession limits, gear, seasons, and/or other restrictions. Target rates may be changed and management measures adjusted as more data becomes available to manage the stock. Due to differences in F between MD and VA, different management strategies may be necessary to reach the target F set by ASFMFC. The jurisdictions will continue to work towards a unified, Baywide management strategy.	1998 2000 2003 2005 2011  2011 2012  2015-2017	A benchmark coastal stock assessment was completed in 2005 (using data from 1981-2004). Results indicate that F declined from 0.71 to 0.299. Overfishing was redefined as $F_{40\%SSB}=0.29$ . The most recent 3-year average ( $F=0.389$ ) exceed the ASMFC rebuilding target ( $F=0.2$ ), so tautog are being overfished. Tautog have a $SSB_{2009}$ of 23.5 million lbs, 20.8 million lbs below the $SSB_{threshold}$ meaning tautog are currently overfished.  ASMFC Addendum VI was implemented to reduce F to 0.15, a 53% reduction, and prohibit possession of tautog caught in federal waters. MD's 2012 harvest reduction was decreased from 48% to 39%.  <b>Based on the 2015 tautog benchmark stock assessment, the coastal stock is overfished and overfishing is occurring. <sup>1</sup> Besides assessing tautog as one unit stock along the coast, a regional stock assessment approach was evaluated. As a result, ASMFC has initiated the development of an amendment for a regional approach with region-specific reference points and is scheduled for completion in 2017.</b>
	1.3) VA and MD waters will continue to require degradable fasteners in tautog pots and traps utilizing either: <ul style="list-style-type: none"> <li>• Untreated hemp, jute, or cotton string of 3/16" (0.48 mm) or smaller</li> <li>• Magnesium alloy, timed float releases (pop-up devices) or similar magnesium alloy fasteners</li> </ul>	1997 Continue	A pot and trap shall have hinges on one panel/door made of untreated hemp or jute string 3/16" (4.8 mm) diameter or smaller, magnesium alloy fasteners or ungalvanized/uncoated iron wire of 0.094" (2.39 mm) diameter.

1998 Chesapeake and Atlantic Coast Tautog Fishery Management Plan Implementation Table (updated 6/2016)			
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	<ul style="list-style-type: none"> <li>Ungalvanized or uncoated iron wire of 0.09" (2.39 mm) or smaller.</li> </ul>		
<p>2.1) VA and MD will work with Virginia Institute of Marine Science, Old Dominion University, University of Maryland, Smithsonian Institute and National Marine Fisheries Service's Marine Recreational Fisheries Statistics Survey to conduct research into the size, age and sex composition of tautog in the Chesapeake Bay. The agencies' stock assessment departments will continue to collect information on size composition to monitor the status of tautog stocks. This stock assessment data will be used to determine a baseline of age and sex distribution for the local stock, significant deviation from which will be used as a trigger mechanism to determine the need for future management measures.</p>	<p>2.1) The management agencies will gather data on age, size and sex distribution to be used as a baseline measurement of a healthy population and will encourage research into the possibility of sex-reversal in the tautog population.</p>	<p>Continue 1989-1999 Continue</p> <p>2014</p>	<p>Annual fecundity estimates are much higher than previously thought. All states are required to collect data to support the coast wide stock assessment. Data are collected from cooperating head boat captains, trawl, and seine.</p> <p>A DNA analysis of tautog was conducted to determine if there is genetic separation in the coastal stock. Maryland is participating in this study, results pending publication.</p>
	<p>2.1 A) VA will continue the Baywide trawl survey of estuarine finfish species and crabs to measure size, age, sex, distribution, abundance and CPUE.</p>	<p>Continue</p>	<p>Data from the Baywide trawl survey is used in the ASMFC stock assessment. However, very little data is collected on tautog.</p>
	<p>2.1 B) VA implemented a mandatory reporting system for commercial licensees beginning January 1, 1993. Maryland's mandatory reporting system has been in effect since 1944 (excluding eel). Improved reporting of commercial landings, along with more detailed information on catch location and effort are some of the expected benefits of these programs.</p>	<p>Continue</p>	<p>Commercial reporting has been improved through more stringent penalties for late reporting and no reporting.</p> <p>MD commercial landings have been &lt;1% of the coastal harvest since 2007.</p>
	<p>2.1 C) VA will continue to supplement the Marine Recreational Fisheries Statistics Survey to obtain more detailed catch statistics at the state level. VA's new recreational saltwater fishing license may provide funding for more extensive surveys of the state's recreational fishery.</p>	<p>2009 Continue</p> <p>2011 Continue</p> <p>2011 On-going</p>	<p>MD contracted to have supplemental MRFSS recreational data collected.</p> <p>MD implemented a coastal recreational saltwater license requirement.</p> <p>The MRFSS survey is being improved through implementation of the MRIP program. NMFS requires all states to register recreational fishermen to create a more robust data base to estimate recreational harvest.</p> <p><b>The Marine Recreational Information Program (MRIP) estimated total recreational harvest (A + B1) of 2,988 tautog from Maryland during 2015.</b></p>
	<p>2.1 D) MD's Coastal Bays Fisheries Investigation will be expanded by conducting a creel survey from recreational headboats. The survey will collect biological data on tautog such as sex, length, age and information on recreational fishing effort.</p>	<p>1972 Continue</p> <p>1999 Continue</p>	<p>Juvenile tautog are sampled during the summer and fall coastal bays trawl and seine survey (not designed to target tautog).</p> <p>MD Coastal Bays Fisheries Investigation (CBFI) annually collects age, length, and sex data plus tissue samples for DNA analysis. Tautog are purchased from several commercial fishermen or collected by hook and</p>

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		2015	line. <b>From the CBFI, tautog were captured in three of 140 trawls (2%) and in four of 38 beach seines (11%). The trawl and beach seine CPUEs were 0.2 fish/hectare and 0.1 fish/haul, respectively. There were 83.2 tautog/hectare in SAV beds with 50-75% SAV coverage and 29.1 tautog/hectare in SAV beds with ≤ 25% SAV coverage.</b>
2.2) The jurisdictions will promote research to determine the extent of migration and mortality in localized tautog populations. As reliance of this species on structure for both food and shelter may limit populations in the Chesapeake Bay area, studies designed to determine the relationship between population size and available shelter and food sources should likewise be encourages.	2.2) Research on migration of tautog between areas is encouraged. Tagging experiments to provide data on tautog migration may be funded from sales of saltwater fishing licenses. The Virginia Game Fish Tagging Program will be continued.	Continue  2007 On-going  Continue	A study on the seasonal occurrence of tautog in the lower CB indicates that most fish tagged and released in inshore waters remain inshore for the winter rather than move offshore (Arendt, Lucy and Munroe, 2001).  VA initiated Marine Sportfish Collection Project to collect sex, length, and age data. Freezers were set up for recreational anglers to donate whole fish or carcasses.  VA initiated Saltwater Fisherman’s Journal where anglers log their fishing experiences and anecdotal information.
3.1.1) Restoration of aquatic reefs could lead to increased habitat for tautog. Jurisdictions will continue to expand and improve their current oyster restoration programs with periodic program evaluations to ensure maximum success.	3.1.1A) MD and VA will continue the implementation of the 1994 Oyster FMP which combines the recommendations of both the Virginia Holton Plan and the Maryland Roundtable Action Plan. Strategies in both VA & MD have taken a new focus as the programs intensify efforts to manage around the devastating oyster diseases, Dermo and MSX, currently infecting Chesapeake Bay oysters.	Continue 2003 2004   2008   2009 - 2010  2012 <b>Continue</b>	The 1994 Oyster FMP was revised and adopted in 2004. It incorporated concepts from the 1994 FMP and the Aquatic Reef Habitat Plan. Sanctuary and special management areas are protected from harvest and oyster habitat is being restored.  <i>Crassostrea virginica</i> (native oyster) and not <i>Crassostrea ariakensis</i> (Asian oyster) will be used for reef development following the Environmental Impact Statement for Oyster Restoration in Chesapeake Bay Including the Use of a Native and/or Nonnative Oyster.  MDNR has expanded the oyster sanctuary network from 9% to 25% (app. 9,000 acres) of the available oyster habitat. Both recreational and commercial fish species will benefit from improved/protected oyster bar habitat.  MD & VA operate through each state’s interagency team to implement restoration projects. Currently, MD has projects in Harris Creek, Little Choptank and Tred Avon. Oyster aquaculture is increasing. <b>6,062acres</b> of active

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			aquaculture have been permitted from 2011 to July 2016).
	3.1.1B) MD and VA will continue the implementation of the Aquatic Reef Habitat Plan. "The purpose of the Aquatic Reef Habitat Plan is to guide the development and implementation of a regional program to rebuild and restore reefs as habitat for oysters and other ecologically valuable aquatic species."	2007 Continue  Continue  2010 On-going	MD ARC, MARI, and Maryland's Artificial Reef Management Plan were created and several reefs have been built in the Bay.  Reefs are qualitatively monitored with underwater video. There is no set sampling schedule or protocol.  ARC and MARI have begun support for shallow water (<20 ft.) reef projects.
3.1.2) The creation of new artificial reefs and the expansion and improvement of preexisting reefs will provide additional habitat for the tautog population.	3.1.2A) Jurisdictions will continue to maintain, expand, and improve their artificial reef programs. Since 1995, VA has developed 3 new reef sites within the Bay and expanded several existing sites, deploying more than 6,000 designed structures (concrete tetrahedrons) and over 5,000 tons of concrete rubble. MD has designated 3 sites as oyster sanctuaries where harvest is not allowed: Plum Point, lower Severn River and Cambridge. MD will also be examining the efficacy of small hill sanctuaries at 3 sites: Tangier, Choptank and Strong Bay (Chester R.).	1996-2006  2007 On-going  Continue  2008  2011  On-going	MD terminated its program in 1996. Artificial reef development was administered in the Chesapeake Bay by MD Environmental Service and in the Atlantic Ocean by the Ocean City Reef Foundation (OCRF).  MD Artificial Reef Committee and the MD Artificial Reef Initiative (MARI) were established to develop reefs in cooperation with OCRF. Both MARI and OCRF accept private donations while MD contributes funds when available for reef development projects.  In VA, artificial reefs are being funded through Recreational Advisory Board. All artificial reefs are created with funds from recreational license revenues adhere to gear type prohibitions.  44 NY subway cars were deployed off Ocean City.  USN Destroyer <i>Radford</i> was reefed on August 10, 2011. The vessel has since broken into 3 pieces but remains upright.  MARI and OCRC continue to develop existing and new artificial reefs as funding and materials become available.  For the most up-to-date information on the MD artificial reef program go to <a href="http://www.dnr.maryland.gov/fisheries/reefs/">http://www.dnr.maryland.gov/fisheries/reefs/</a> and for the VA artificial reef program go to <a href="http://mrc.virginia.gov/vsrfdf/reef.shtm">http://mrc.virginia.gov/vsrfdf/reef.shtm</a>
	3.1.2B) VA has recently prohibited the use of all gear except recreational rod and reel, hand-line,	Continue	MD and VA both adopted legislation that prohibits hydraulic clamming (and crab dredging in VA) in or near

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	spear, or gig on four artificial reefs in state waters. The result of this regulation is similar to the MAFMC/ASMFC Special Management Zones that protect vital tautog habitat.		SAV beds. MD has a prohibition on hydraulic dredging in coastal bays. It is allowed in MD Chesapeake Bay waters, but not within a delineated SAV bed. There is no required setback from the bed.
3.2.1) Jurisdictions will continue efforts to: “achieve a net gain in SAV distribution, abundance, and species diversity in the Chesapeake Bay and its tributaries over current populations”.	3.2.1.1A) Protect existing SAV beds from further losses due to increased degradation of water quality, physical damage to the plants, or disruption to the local sedimentary environment as recommended by the Chesapeake Bay Submerged Aquatic Vegetation Policy Implementation Plan.	Continue	MD and VA prohibit hydraulic clamming and crab dredging (VA) in or near SAV beds. MD prohibits hydraulic dredging within delineated SAV beds, but there is no required setback.
	3.2.1.1B) The Guidance for Protecting Submerged Aquatic Vegetation in Chesapeake Bay from Physical Disruption was developed in response to the above action and should be used by agencies making decisions that influence SAV survival in Chesapeake Bay. The following recommendations from the guidance document should be strongly considered when making decisions that impact SAV, with special emphasis on SAV that falls within the salinity range of juvenile. 1. Protect SAV and potential SAV habitat from physical disruption. Implement a tiered approach to SAV protection, giving highest priority to protecting Tier I and Tier II areas but also protecting Tier III areas from physical disruption. 2. Avoid dredging, filling or construction activities that create turbidity sufficient to impact nearby SAV beds during SAV growing season. 3. Establish an appropriate undisturbed buffer around SAV beds to minimize the direct and indirect impacts on SAV from activities that significantly increase turbidity.	Continue	MD implemented a living shorelines program in 1970 to encourage vegetative shoreline stabilization.  Regulations are in place to prohibit dredging through SAV beds. Tiered designation and prioritization of SAV beds has not been implemented. Avoidance of dredging, filling and construction impacts to SAV is strictly enforced by MDE and USACE with input from DNR, USFWS, and NMFS. MD has not established undisturbed buffers. VA has established buffer criteria.
		2003	The revised SAV goal adopted by Chesapeake Bay Program was restoration of 185,000 acres of SAV by 2010 and planting 1,000 acres of SAV by 2008.
		2008	MD legislated that shoreline stabilization projects must use living shoreline techniques unless demonstrated to be infeasible.
		2012	The SAV planting goal was revised to be the planting of 20 acres per year.
		2014 Continue	A new Chesapeake Watershed Agreement was adopted in 2014. The Bay jurisdictions developed a SAV outcome (goal) and a management strategy as a framework for reaching the goal. Biennial work plans (2016-2017) were developed to reach the baywide goal of 130,000 acres by 2025. The jurisdictions have already met the interim goal of 91,000 acres by 2017.
	3.2.1.2) Set and achieve regional water and habitat quality objectives that will result in restoration of SAVs through natural revegetation as recommended	Continue	Water quality criteria have been adopted and there is a water quality outcome in the 2014 Chesapeake Watershed Agreement.

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	by the Chesapeake Bay SAV Policy Implementation Plan.		<a href="http://www.chesapeakebay.net/restoringwaterquality.aspx?menuitem=14728">http://www.chesapeakebay.net/restoringwaterquality.aspx?menuitem=14728</a> .
	3.2.1.3) Set regional SAV restoration goals in terms of acreage, abundance, and species diversity considering historical distribution records and estimates of potential habitat as recommended by the Chesapeake Bay SAV Policy Implementation Plan.	2003 Continue	Chesapeake Bay Program adopted a revised the SAV goal to plant 1,000 acres of SAV by 2008; 173 acres have been planted to date ( <a href="http://www.chesapeakebay.net/indicators/indicator/planting_bay_grasses">http://www.chesapeakebay.net/indicators/indicator/planting_bay_grasses</a> ). The SAV planting goal was revised in 2012 to the planting of 20 acres per year. One acre was planted during 2013. The restoration goal is 185,000 acres of SAV (see 3.2.1A). VIMS annually surveys SAV distribution in Chesapeake Bay. 2013 SAV acreage was 59.9 thousand and 2014 estimated acreage is 75,835. <b>In 2015, 91,621 acres of SAV were mapped in Chesapeake Bay and its tributaries. Notable changes in SAV distribution were measured between 2015 and 2014. SAV increased 21% from 75,438 ac to 91, 621 ac.</b>
3.2.2) The jurisdictions will use The Submerged Aquatic Vegetation Habitat Requirements and Restoration Targets: A Technical Synthesis as a guide to set quantitative levels of relevant water quality parameters necessary to support continued survival, propagation and restoration of SAV, as well as established the regional SAV restoration target goals defined earlier in this section.	3.2.2) When choices must be made in selecting SAV restoration projects, to fund and support under the Chesapeake Bay SAV Policy Implementation Plan, specific attention should be given to action items that lead to the protection and restoration of SAV found within the juvenile tautog habitat range.	Continue	More emphasis is being placed on multispecies benefits when considering restoration projects. Long-term survival of SAV plantings has been limited. STAC reviewed the SAV restoration projects and concluded they were operationally successful but functionally unsuccessful. SAV aerial surveys continue.
3.3)In 1998, the Chesapeake Executive Council adopted the Chesapeake Bay Wetlands Policy in recognition of the ecological and economic importance that wetlands play in the Chesapeake Bay. The Wetlands Policy establishes an immediate goal of no net loss with a long-term goal of a net resource gain for tidal and nontidal wetlands. It identifies specific actions necessary to achieve both the short term goal of the Policy, “no net loss” and the long term goal of “a net resource gain for tidal and nontidal wetlands.”	3.3) The jurisdictions should strive towards achieving the following, especially in the salinity range of tautog. a) define the resource through inventory and mapping activities b) protect existing wetlands c) rehabilitate, restore and create wetlands d) improve education e) further research.	Continue  2006 Continue  2009 Continue	Wonders of Wetlands (WOW) curriculum was developed  GIS mapping activities are underway to target protection and restoration of habitat resources. Habitats are not targeted to benefit a specific species.  MD is developed a Blue Infrastructure that includes mapping structural habitat and SAV.  Wetland mosquito ditches from the 1930s-1940s are being modified to reduce tidal flow and restore wetland hydrology and function.

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		2011 On-going	Between 2010 and 2011, 3,775 acres of wetlands were established or re-established and 107,239 acres were enhanced or rehabilitated.
		2013/2014 On-going	The new Chesapeake Bay Program Watershed Agreement has a wetlands outcome to create or reestablish 85,000 acres of wetlands and enhance the function of wetlands on an additional 150,000 acres.  Between 2010 and 2014, approximately 6,200 acres of wetlands were established or restored on agricultural lands in the Bay watershed.
3.4.1) Jurisdictions will continue efforts to improve Baywide water quality through the efforts of programs established under the 1987 Chesapeake Bay Agreement. In addition, the jurisdictions will implement new strategies, based on recent program reevaluations, to strengthen deficient areas.	3.4.1A) Based on 1992 baywide nutrient reduction plan reevaluation, the jurisdictions will: a) expand program efforts to include the tributaries b) intensify efforts to control nonpoint sources of pollution from agriculture and developed areas c) improve on current point and nonpoint source control technologies.	Continue	Maps that indicate regions of concern for living resources have been developed.
		2009	See Chesapeake Bay Program website for updates on nutrient reduction. <a href="http://www.chesapeakebay.net/status_reducingpollution.aspx?menuitem=19859">http://www.chesapeakebay.net/status_reducingpollution.aspx?menuitem=19859</a> .
		2009	President Barack Obama’s executive order recommitted federal agencies to Bay restoration and regulatory enforcement.
		2010	EPA established a Bay wide TMDL (aka: pollution diet). Each jurisdiction must establish 2 year milestones for progress towards meeting its TMDL.
		2012	Legislation has been passed for restrictions on new developments using septic systems.
		2013	Legislation for a stormwater fee based on impervious surface coverage was enacted.
		2014 Continue	2014 Chesapeake Watershed Agreement outcome is to achieve a 60% reduction of nutrient and sediment pollution.
	3.4.1B) Based on the 1994 Chesapeake Bay Program Toxics Reduction Strategy Reevaluation Report, the jurisdictions will emphasize the following 4 areas: a) pollution prevention: target “regions of concern” & “areas of emphasis”	Continue	See Chesapeake Bay Program website for updates on nutrient reduction. <a href="http://www.chesapeakebay.net/status_reducingpollution.aspx?menuitem=19859">http://www.chesapeakebay.net/status_reducingpollution.aspx?menuitem=19859</a>

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Strategy	Action	Date	Comments
	b) regulatory program implementation: insure that revised strategies are consistent with and supplement pre-existing regulatory mandates c) regional focus: identify and classify regions according to the level of contaminants d) directed toxics assessment: identify areas of low level contamination, improve tracking and control nonpoint sources.	2014 Continue	Chesapeake Bay Program is monitoring levels of mercury, PCBs, PAHs, organophosphate and organochloride pesticides.  There are two outcomes for toxic contaminants in the 2014 Chesapeake Watershed Agreement: develop a research agenda and best management practices pertaining to toxics and develop a policy to reduce and prevent toxic contaminants.
	3.4.1C) The jurisdictions will continue to develop, implement, and monitor their tributary strategies designed to improve bay water quality.	Continue April 2003	Ambient water quality criteria of DO, water clarity, and chlorophyll-a have been adopted for the Chesapeake Bay.
3.4.2 The Chesapeake Bay Program partners will “Plan for and manage the adverse environmental effects of human population growth and land development in the Chesapeake Bay watershed.” In 1996, the Chesapeake Bay Program accepted the Priorities for Action for Land, Growth and Stewardship in the Chesapeake Bay Region as a framework to address land use and development pressures in the Chesapeake Bay. This approach recognizes that communities are the basic unit for addressing growth, land-use and long-term stewardship of the natural environment. These priorities are voluntary actions which are expected to be accomplished through a variety of public and private partners, including but not limited to the Chesapeake Bay Program. Jurisdictions will forward the goals of the Priorities for Action, which encourage sustainable development patterns. Given the fact that tautog are particularly vulnerable to suspended solids which abrade epithelial tissues and to decreasing SAV and shellfish beds which serve as habitat and feeding areas, the goals of the Priorities for Action which are germane to nutrient and sediment load reduction will be promoted.	3.4.2) Encourage efficient development patterns which reduce nutrient and sediment loads to the Chesapeake Bay and promote responsible land management practices and decisions regarding present and future development by pursuing the following: 1) Revitalize existing communities. Revitalization efforts can assist existing communities and help reduce sprawl by encouraging the use of state-of-the-art storm water management and pollution prevention strategies. 2) Encourage efficient development patterns. Ecologically sound, efficient development patterns encourage higher population density; compact and contiguous development. Benefits to the Bay include reduced impervious surfaces; conservation of farms, forests, and wetlands. 3) Foster resource protection and land stewardship. Cooperation and linkages among local watershed protection planning efforts should be increased to foster a regional sense of stewardship toward the bay’s natural resources. The development of new policies that integrate natural and community infrastructure in public and private planning, development and protection efforts will further this goal.	Continue	See Chesapeake Bay Program website for updates on land stewardship. <a href="http://www.chesapeakebay.net/status_protectingwatersheds.aspx?menuitem=19876">http://www.chesapeakebay.net/status_protectingwatersheds.aspx?menuitem=19876</a>  MD developed curriculum “Where Do We Grow from Here?” about population growth and its impacts on the Bay.  The 2014 Chesapeake Watershed Agreement includes outcomes for stewardship, environmental literacy and land conservation.

## **Acronyms**

ARC - Artificial Reef Committee  
ASMFC – Atlantic States Marine Fisheries Commission  
CB – Chesapeake Bay  
CCA MD – Coastal Conservation Association of Maryland  
CPUE – Catch per Unit Effort  
DO – Dissolved Oxygen  
EEZ – Exclusive Economic Zone  
F – Fishing Mortality  
FMP – Fishery Management Plan  
GIS – Geographic Information System  
MAFMC – Mid-Atlantic Fishery Management Council  
MARI - Maryland Artificial Reef Initiative  
MD DNR – Maryland Department of Natural Resources  
NMFS – National Marine Fisheries Service  
OCRFB - Ocean City Reef Foundation  
PAH – Polycyclic Aromatic Hydrocarbon  
PCB – Polychlorinated Biphenyl  
PRFC –Potomac River Fishery Commission  
SAV – Submerged Aquatic Vegetation  
USACE – United States Army Corps of Engineer  
USFWS – United States Fish and Wildlife Service  
USN – United States Navy  
VIMS – Virginia Institute of Marine Science