2014 Maryland FMP Report (July 2015)
Section 20. Weakfish (*Cynoscion regalis*)

The 2009 weakfish coastwide stock assessment determined the stock is depleted and overfishing is not occurring.[1] Using the term "depleted" rather than "overfished" is a signal that low stock size is not the direct effect of fishing. The stock assessment results indicated that fishing mortality has declined but natural mortality has increased leading to high total mortality. A benchmark assessment was initiated by ASMFC in 2014 and will be peer reviewed and evaluated for management use in late 2015 or early 2016.

Fishery Management Plans (FMPs)

The Chesapeake Bay Weakfish and Spotted Seatrout Fishery Management Plan (CBFMP) was adopted in 1990 to enhance and perpetuate the Chesapeake Bay's weakfish and spotted seatrout stocks. Since then, the plan was revised in 2003 and addresses only weakfish and not spotted seatrout. The revised plan was developed in response to the improvement in the status of the weakfish stock from overfished (below a threshold) to fully exploited (fished at MSY) and included new biological data pertinent to the Chesapeake Bay. The CBFMP follows the compliance requirements set forth in the ASMFC Amendment 4 to the Interstate Weakfish Management Plan (2002) and several addenda (2003-2009). Maryland is required to submit annual compliance reports to ASMFC for both weakfish and spotted seatrout.

The CBP plan was reviewed by the Maryland DNR Fisheries Service (FS) weakfish and spotted seatrout plan review team (PRT) in 2012/2013. A report was presented to the Tidal Fisheries Advisory Committee and Sport Fisheries Advisory Committee as part of the plan review process. The PRT recommended no changes to spotted seatrout or weakfish allocation, but noted a need for additional socioeconomic data.

Stock Status

Since 2009, the Atlantic coastwide weakfish stock has been considered depleted rather than overfished and overfishing has not been occurring. The term "depleted" is used when factors other than fishing mortality have resulted in a biomass decline. The last peer-reviewed stock assessment was completed for the Atlantic coastal stock in 2009. The stock spawning potential was estimated at 3%-4% of an unfished stock. Since 1995, the decline in biomass has been due to a sustained increase in natural mortality and not from an increase in fishing mortality (overfishing). The increased natural mortality was exacerbated by continued removals by commercial and recreational fisheries. Maryland's fishery dependent and independent monitoring has shown both a decrease in mean adult age and low juvenile abundance. The ASMFC Weakfish Management Board adopted new percentage-based spawning stock biomass biological reference points (BRPs) in November 2009. The spawning potential threshold was set at 20% and the spawning potential target was set at 30%. Despite more restrictive management measures, the depleted weakfish stock is unlikely to recover quickly.[1] The increase in natural mortality is attributed to predation, competition and changes in climate. A benchmark stock assessment was initiated in 2014. The data workshop was be held in October 2014, the assessment workshop will be held in August 2015 and the peer review workshop will be held in late 2015 or early 2016.

Current Management Measures

Management measures implemented by ASMFC's Addendum IV required states to implement a 1 fish recreational creel limit and a 100 pound commercial trip bycatch limit, which translates to a 60% reduction in commercial and recreational exploitation. The Chesapeake Bay jurisdictions implemented new restrictions in 2010 to meet or exceed the ASMFC requirements on harvest and bycatch. In Maryland, the recreational creel limit was decreased to one fish and commercial bycatch limits were implemented. These restrictions continued through 2014.

Maryland DNR conducts fishery dependent and fishery independent monitoring for important recreational and commercial fish species. Adult weakfish are sampled from pound nets. Maryland is required to provide biological data to ASMFC from the commercial catch based on per metric ton of commercial landings. Maryland was required to provide 6 lengths and 6 age samples for 2014 (and met the requirement). Juvenile fish are sampled from Maryland's Chesapeake Bay and Coastal Bays. Juvenile weakfish mean catch per hectare was higher in the 1990s and reached lows in 2008 and 2012. There has been an increase in juvenile weakfish production in both the Bay and Coastal Bays in 2013 and 2014 but the catch remains below the long-term mean.

Fisheries

Both estimated recreational harvest and commercial landings of weakfish decreased in the early 2000s to very low values (Figures 1 & 2). Harvest estimates and landings values have remained at historically low levels. The recreational harvest estimates in 2014 were 1,062 fish in Maryland and 9,084 fish in Virginia.[3] Many of the recent year values for both state have had high proportional standard error (PSE), indicating these estimates are imprecise. The declining commercial landings trend began in 1999. Maryland's 2014 commercial landings were 2,130 lbs. Landings values for the past six years are the lowest on record for both states for the entire NMFS time series (1950-2013)[4]

Issues/Concerns

Factors such as predation, competition, and environmental changes, have increased natural mortality and appear to have a stronger influence on weakfish stock dynamics then harvest. Production of weakfish juveniles has not lead to increased adult biomass.[1]

The ASMFC weakfish plan review team has reported its recommendations for management, biological research, social and economic research, and habitat studies.[2] Biological research recommendations were listed under high, medium, and low priorities. High priority recommendations include increased observer coverage to quantify discards, quantify trawl bycatch, stock identification and movements, evaluation of predation with a multispecies model, analysis of the spawner-recruit relationship and monitor weakfish diet over abroad regional scale.

Figure 1. Maryland and Virginia estimated recreational weakfish harvest in numbers, 1982-2014.[3]

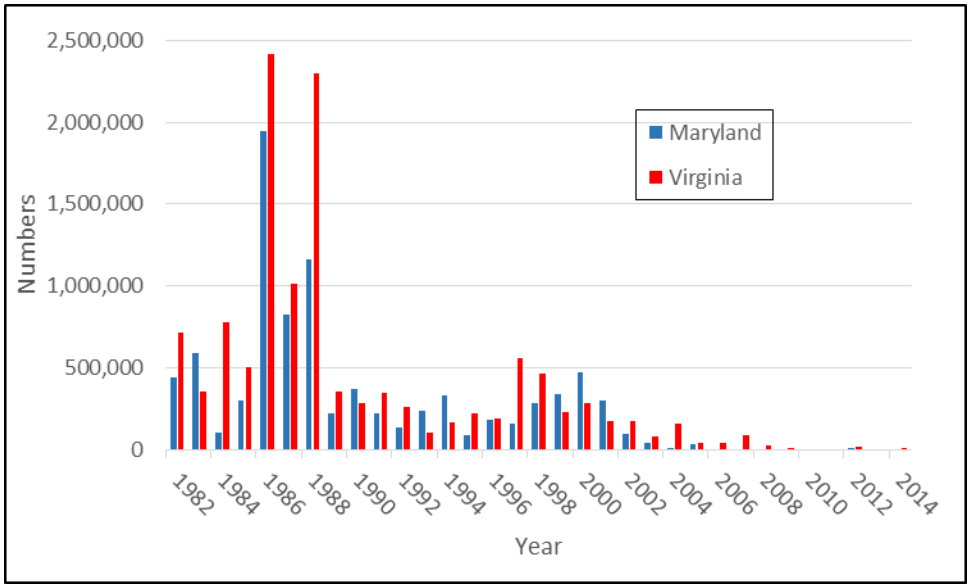

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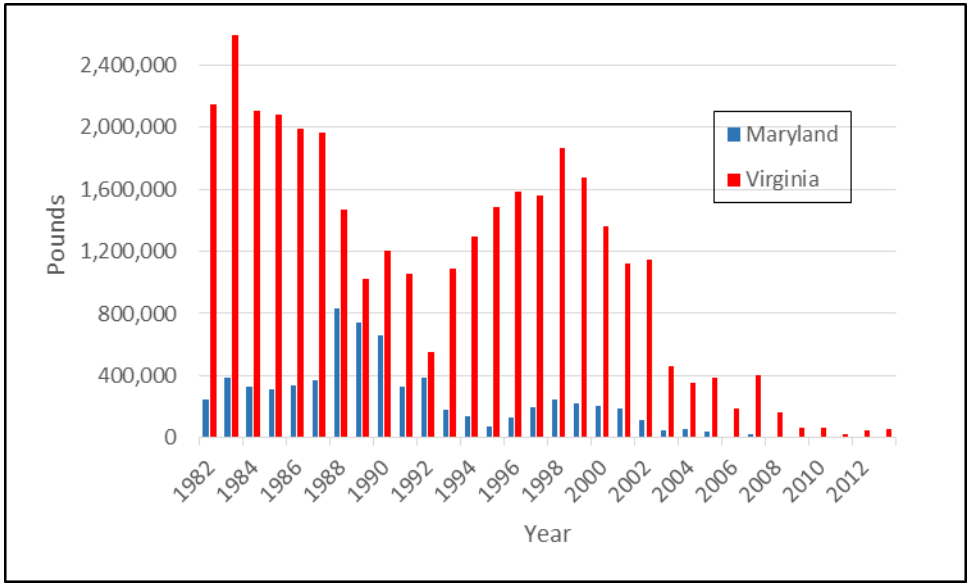
Figure 2. Maryland and Virginia commercial weakfish landings, 1981-2013.[4]



References

[1] NFSC. 48th Northeast Regional Stock Assessment Workshop (48th SAW) Assessment Summary Report. 2009. Reference Document 09-10, U.S. Department of commerce. Woods Hole, MA

[2] ASMFC. 2013. 2012 Review of the Atlantic States Marine Fisheries Commission Fishery Management Plan for Weakfish (*Cynoscion regalis*) 2012 Fishing Year. ASMFC Board Approved October 23, 2012. 25p

[3] Personal communication from the National Marine Fisheries Service, Marine Recreational Information Program, Fisheries Statistics Division July 20, 2014.

[4] Personal communication from the National Marine Fisheries Service, Commercial Fisheries Statistics, Fisheries Statistics Division July 20, 2014.

2003 Chesapeake Bay Program Weakfish Fishery Management Plan Implementation (updated 7/15)			
Section	**Action**	**Implementation**	**Comments**
Stock Status Management Strategy: CBP jurisdictions will adopt biological reference points (BRPs) that reflect the most current status of the weakfish stock. As data becomes available on multi-species interactions and ecological considerations such as species interactions, food webs, bycatch, biodiversity and habitat, the BRPs should be modified accordingly.	Action 1.1 MD, PRFC (Potomac River Fisheries Commission) and VA will adopt the Atlantic States Marine Fisheries Commission's (ASMFC) recommendations for the coast wide management of weakfish	Annually reviewed and adjusted if necessary	The 2009 assessment results indicated that the weakfish stock is depleted, with SSB estimated at 3%-4% of an unfished stock well below the BRPs adopted in Addendum IV. The biomass decline is the result of increasing natural mortality while F remains low. Size and age structure of the stock has decreased. The ASMFC review team (2010) recommended the development of additional methods to analyze the stock in the next assessment **The ASMFC initiated a benchmark stock assessment in October 2014 to update stock status and better inform management decisions.**
	Action 1.2 In order to achieve the fishing target rates defined by the adopted BRPs, CBP jurisdictions will utilize a combination of size limits and possession limits, and/or seasons or areas to manage the commercial and recreational fishery in state waters.	Annually	ASMFC Addendum IV to Amendment 4 of the weakfish FMP requires that the recreational creel does not exceed 1 fish/person/day in the CBP jurisdictions. Commercial landings must be limited to 100 pounds per vessel, day or trip, whichever is the longer period of time for directed fisheries and bycatch must be limited to 100 pounds per vessel, per day or trip for all non-directed fisheries. The finfish trawl fishery allowance for undersized fish must be reduced to 100 fish. The CBP jurisdictions are in compliance; All met the recreational harvest restrictions and met or exceeded the commercial harvest restrictions. The requirements have remained in effect since 2010.
The Fishery Management Strategy: The CBP jurisdictions will regulate the commercial and recreational fishery based on the most recent status of the stock and the established fishing targets.	Action 2.1 The CBP jurisdictions will consider regional differences when determining state allocation issues and regulations.	As necessary	The Maryland Sport Fish Advisory Commission recommended a weakfish moratorium but no action was taken. Fishing mortality has been decreased over the years but there remains a significant amount of non-fishing mortality,
	Action 2.2 The CBP jurisdictions will consider the economic impacts of management measures on the fishery and promote the utilization of economic data in the management decision process.	Dependent on the availability of economic data	Collection of economic data for the commercial fishery should include dockside values, the number of commercial vessels, the number of commercial fishermen, and the economic returns from the commercial fishery. Data collection for the recreational fishery should include the number of anglers, the number of directed trips, and angler expenditures. Detailed data collection will enable the development of bio-economic models that can estimate costs or benefits to consumers resulting from fishery regulations.
	Action 2.3 The CBP jurisdictions continue to	Annually	ASMFC Addendum III to Amendment 4 of the weakfish FMP aligns BRD certification requirements between state and federal waters

2003 Chesapeake Bay Program Weakfish Fishery Management Plan Implementation (updated 7/15)			
Section	**Action**	**Implementation**	**Comments**
	support the use of BRDs in non-directed fisheries and the appropriate mesh sizes in directed fisheries, to reduce the fishing mortality on small weakfish.		along with the SAFMC shrimp bycatch reduction device requirements.
The Fishery Research and Monitoring: The CBP jurisdictions will continue to monitor the biological characteristics of the weakfish stock in the Chesapeake Bay and coordinate monitoring activities within the Bay and the Atlantic coast.	Action 3.1 The CBP jurisdictions will continue fishery dependent sampling and improve catch data. Economic information from the recreational and commercial fisheries will also be reviewed.	Continue	Monitoring data provides information on abundance, age structure, and growth parameters. Addendum I to Amendment 4 to ASMFC's Weakfish FMP stipulates that states must collect otolith ages and fish lengths based on each states landing values, to provide data for coast wide stock assessments**. In 2014, otoliths were removed from six weakfish encountered during MD pound net sampling in Chesapeake Bay. Ages ranged from one to three years old.**
	Action 3.2 The CBP jurisdictions will conduct fishery independent sampling and collect data on abundance, age structure and recruitment.	Continue	Weakfish juvenile abundance, from the Maryland Blue Crab Trawl Survey in Pocomoke and Tangier sounds, generally increased from 1989 to 1996, remaining at a relatively high level through 2001, but generally decreased from 2003 to 2008, with moderate to low values since. **The Chesapeake Bay juvenile geometric mean in 2014 increased compared to 2013, and was the 12th highest value in the 26 year time series.** A second JI index s generated from the Coastal Bay Trawl survey. **The geometric mean from this survey increased in 2014 but was ranked 20th among the 26 years surveyed.**
	Action 3.3 CBP jurisdictions will continue to coordinate state activities with the Atlantic Coast Cooperative Statistics Program (ACCSP).	Continue	The ACCSP Coordinating Council approved the Atlantic States Fisheries Data Collection Standards document in May, 2012. This document will be used to direct partner data collection.
	Action 3.4 The CBP jurisdictions will begin to collect and examine stomach contents data and examine the effects of environmental variables upon weakfish growth rates.	On-going	Data from the ChesMMAP Survey, CHESFIMS project may be used to evaluate species interactions and relationships. Results and trends can then be incorporated into CBP fishery management plans. ASMFC weakfish stock assessment (2006) incorporated a striped bass predator function allowing weakfish stock decline to be modeled.

2003 Chesapeake Bay Program Weakfish Fishery Management Plan Implementation (updated 7/15)			
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Habitat Management Strategy: CBP jurisdictions will monitor and regulate activities which may be harmful to weakfish habitat.	Activities, which contribute to the degradation and or loss of habitat types that weakfish utilize throughout their life history stages will be monitored and regulated by CBP jurisdictions.	On-going 2014	CBP jurisdictions support the commitments of the Chesapeake Bay 2000 Agreement. These activities include reducing the discharge of toxic pollutants or excessive nutrients into the Chesapeake Bay and its tributaries, interruption or changes in water discharge patterns, deposition of solid waste, sewage sludge or industrial waste into Bay (which may lead to anoxic conditions), rapid coastal development, unregulated agricultural practices, net coastal wetland loss, or the dredging of contaminated sub-aqueous soils. **The CBP developed a new Watershed Agreement (2014) with new and updated habitat outcomes.** For more information see: **http://www.chesapeakebay.net/documents/FINAL_Ches_Bay_Watershed_Agreement.withsignatures-HIres.pdf**
	Action 4.1 The CBP jurisdictions will monitor and regulate land-based activities and water-based activities that may negatively impact Chesapeake Bay water quality and weakfish spawning, rearing and foraging areas.	Continue	The MD DNR water quality protection database focuses on watershed lands that are most important for improving water quality.
	Action 4.2 The CBP jurisdictions will monitor important weakfish forage species to insure that activities, such as directed fisheries or incidental bycatch in non-directed fisheries, do not adversely affect abundance. These managed species, which serve as forage for weakfish include Atlantic croaker, spot, Atlantic menhaden, and blue crab. If fishing activities are contributing to higher F's on forage species, additional management measures may be necessary.	Continue 2014	Data from the ChesMMAP, CHESFIMS, and the MD Winter Trawl Survey will provide data on important forage species for weakfish. The CHESFIMS survey was discontinued after 2005 due to lack of funding. The CBP developed a Watershed Agreement (2104) with new forage species outcome. For more information see: **http://www.chesapeakebay.net/documents/FINAL_Ches_Bay_Watershed_Agreement.withsignatures-HIres.pdf**
	Action 4.3 The CBP jurisdictions will monitor the	Continue	The MD Estuarine Juvenile Finfish Survey and VIMS Juvenile Abundance Monitoring Surveys (formerly known as the VIMS

2003 Chesapeake Bay Program Weakfish Fishery Management Plan Implementation (updated 7/15)			
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	abundance of weakfish forage species that are not managed under CBP FMPs, such as bay anchovies, and Atlantic silversides, using on-going monitoring and surveys.		Trawl Survey and the VIMS Juvenile Seine Survey) will continue to monitor the abundance of important, non-managed forage species in the Chesapeake Bay.
Ecosystem Interactions Management Strategy:	Action 4.4 The CBP jurisdictions will continue to identify predator/prey interactions, both inter- and intraspecies competition and other interactions that might affect the management of weakfish. As multispecies interactions are evaluated and quantified, biological reference points and management strategies may be adjusted.	On-going 2014 Continue	Data from the ChesMMAP, CHESFIMS, and the MD Winter Trawl Survey will be collected and analyzed by CBP jurisdictions to identify possible inter-and intra-species relationships. ASMFC weakfish TC incorporated a striped bass predator function into the 2006 weakfish stock assessment to model the weakfish stock decline since 1998. No new recommendations have been developed. The CB Watershed Agreement (2014) has a forage species outcome that will evaluate predator/prey interactions. A forage management strategy was developed in 2014/2015 and a biennial work plan is under development for 2016. The work plan will include actions to identify important forage species and how to manage for key predators.

Acronyms:

ACCSP =
ASMFC = Atlantic States Marine Fisheries Commission
BRD = bycatch reduction device
BRPs = biological reference points
CHESFIMS = Chesapeake Bay Fishery Independent Multispecies Fisheries Survey
ChesMMAP = Chesapeake Bay Multispecies Monitoring and Assessment Program
CBP = Chesapeake Bay Program
F = mortality due to fishing
FMP = fishery management plan
PRFC = Potomac River Fisheries Commission
PSE = Proportional Standard Error
SAFMC = South Atlantic Fishery Management Council
SSB = spawning stock biomass
TC = technical committee
VIMS = Virginia Institute of Marine Science
YOY = young of the year fish

Spotted Seatrout Notes:

The Atlantic States Marine Fisheries Commission (ASMFC) adopted the Fishery Management Plan (FMP) for Spotted Seatrout in 1984 for states from Maryland to Florida. An Omnibus Amendment (2011) was developed to bring spotted seatrout under the authority of the Atlantic Coastal Fisheries Cooperative Management Act (1993) and the ASMFC charter (1995). A corrected version of the omnibus amendment with Technical Addendum 1a was adopted on February 9, 2012.[1] The omnibus amendment includes recommended measures to protect the spotted seatrout spawning stock and requires a coastal minimum length limit.

The spotted seatrout was included in the 1990 Bay Program Chesapeake Bay *Weakfish and Spotted Seatrout Fishery Management Plan*. The management plan was revised in 2003 to include only weakfish. Since 1990, there has been no new management plan for spotted seatrout but updates have been completed on a regular basis. The 1990 FMP was reviewed by the Maryland DNR Fisheries Service (FS) Weakfish and Spotted Seatrout FMP Plan Review Team (PRT) in 2012/2013. A report was presented to the Sportfisheries and Tidal Fisheries Advisory Commissions. The Tidal Fisheries Advisory Commission recommended no action but the Sport Fisheries Advisory Commission recommended that the Maryland DNR FS consider raising the minimum size limit and decreasing the creel limit. Maryland increased the commercial size limits, decreased the recreation creel limit and instituted a daily commercial catch limit in 2013.

Stock Status

A coast-wide stock assessment of spotted seatrout has not been completed because this species is considered to be largely non-migratory. State assessments have been completed on local stocks (NC, SC, GA, FL) with state-by-state variability and no regional trend. ASMFC has not recommended a coastal stock assessment because of lack of biological and fisheries data. The lack of a stock assessment makes it difficult to implement an effective management framework. .

Fisheries

The Marine Recreational Information Program (MRIP) estimated that Maryland recreational harvest has ranged from zero to 7,933 fish from 2005 to 2014, with higher catches occurring in the late 1980s and mid 1990s (Figure 3). Most estimates have a high percent standard error (PSE) value which indicates the estimates are highly uncertain in most years. Catch-and-release estimates in the past 10 years have ranged from 2,331 to 107,017 fish per year, but have been highly variable with no trend and very high PSE values. The Virginia recreational harvest estimates have been consistently higher than Maryland's with a range of 17,417 to 247,736 fish per year from 2005 to 2014 and lower PSE values. Release estimates for Virginia over the same time period have ranged from 82,935 to 1,214,620 fish per year. Maryland commercial landings since 1982 have been less than 2,000 pounds most years, except for a peak in landings from 1996 to 2002, when landings averaged 20,515 pounds per year (Figure 4). Virginia's commercial landings have averaged 23,094 pounds per year since 1982, but experienced an unusually large peak in 2012 with 116,768 pounds reported.

Management Objectives and Measures:

The ASFMC FMP a size limit of 12" minimum total length is required. All states have complied with this minimum. Net mesh sizes corresponding to this size limit for directed fisheries, data collection, and state stock assessments were also recommended. Maryland, Virginia and PRFC have 14" recreational size limits with a 4 fish creel limit in Maryland, a 5 fish creel limit in in Virginia, and a 10 fish creel limit is imposed by PRFC. In Virginia there is a limit of only 1 fish over 24 inches, and Virginia closed its recreational fishery from March 1 through July 31, 2014 to protect the spawning stock following a winter kill. The Maryland commercial size limit is 14" with minimum 3-3/8 inches trawl and 3 inch stretched gill net meshes (the same mesh size restrictions apply to weakfish) and a 150 pound per trip harvest limit for all gear. The Virginia commercial hook & line fishery must adhere to the same size and bag limits as the Virginia recreational fishery. Virginia also has an annual commercial quota of 51,104 pounds and a size limit of 14 inches for all gears combined. PRFC has a 14 inch commercial size limit.

Figure 3. Estimated recreational harvest for spotted seatrout from Maryland and Virginia, 1986-2014.[3] (MRIP data)

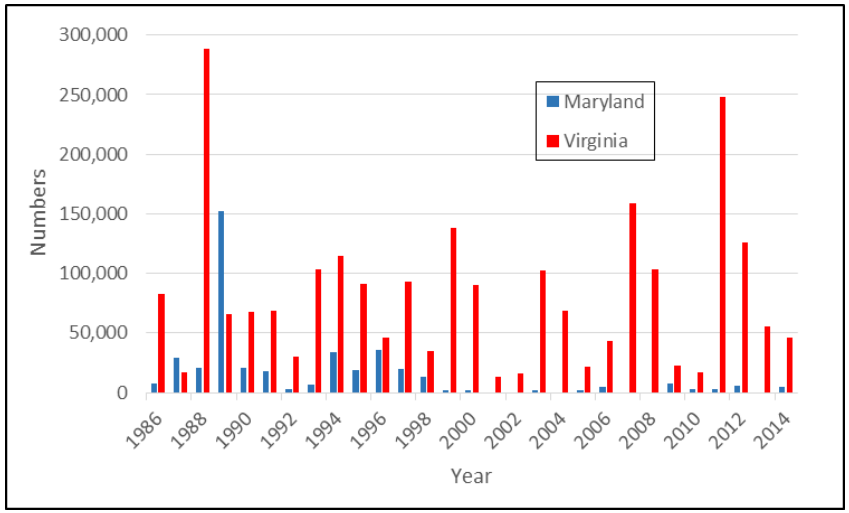
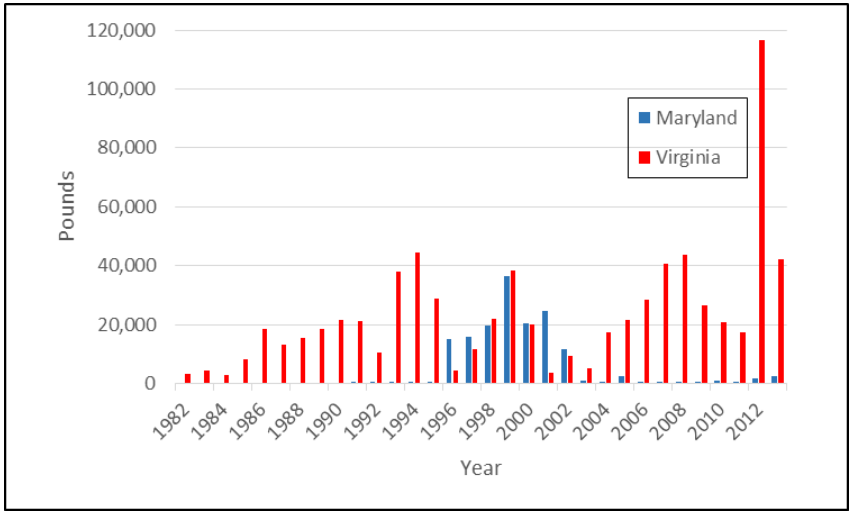


Figure 4. Commercial spotted seatrout landings from Maryland and Virginia, 1982-2013.[2] (NMFS data)



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[1] ASMFC. 2012. Fishery Management Report of the Atlantic States Marine Fisheries Commission. Omnibus Amendment to the Interstate Fishery Management Plans for Spanish Mackerel, Spot, and Spotted Seatrout. Approved February 9, 2012. 161 p.

[2] Personal communication from the National Marine Fisheries Service, Commercial Fisheries Statistics, Fisheries Statistics Division July 20, 2014.

[3] Personal communication from the National Marine Fisheries Service, Marine Recreational Information Program, Fisheries Statistics Division July 20, 2014.