Annual Report 2015

Atlantic States Marine Fisheries Commission

Sustainably Managing Atlantic Coastal Fisheries

2015 Annual Report

of the

Atlantic States Marine Fisheries Commission

To the Congress of the United States and to the Governors and Legislators of the Fifteen Compacting States

Presented in compliance with the terms of the Compact and the state-enabling acts creating such Commission and Public Law 539 - 77th Congress assenting thereto (Chapter 283, Second Session, 77th Congress; 56 Stat. 267) approved May 4, 1942, as amended by Public Law 721, 81st Congress, approved August 19, 1950

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Executive Director

February 2016

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Editor

Commonly Used Acronyms

AAE	Annual Awards of Excellence
ACCSP	Atlantic Coastal Cooperative Statistics Program
ACFHP	Atlantic Coastal Fish Habitat Partnership
ACFCMA	Atlantic Coastal Fisheries Cooperative Management Act
ACLs	Annual catch limits
ARM	Adaptive Resource Management
ASMFC	Atlantic States Marine Fisheries Commission (also referred to as the Commission)
BRDs	Bycatch reduction devices
CPUE	Catch-per-unit-effort
DPS	Distinct population segments
DW	Dressed weight
ERPs	Ecological-based reference points
ESA	Endangered Species Act
F	Fishing mortality
FMP	Fishery Management Plan
GBK	Georges Bank
GOM	Gulf of Maine
GOM/GBK	Gulf of Maine/Georges Bank
HMS	Highly Migratory Species
ISFMP	Interstate Fisheries Management Program
IFA	Interjurisdictional Fisheries Act
ITC	Interstate Tagging Committee
IUCN	International Union for the Conservation of Nature
LCS	Large coastal shark complex
MAFMC	Mid-Atlantic Fishery Management Council
MSP	Maximum spawning potential
MSTC	Multispecies Technical Committee
MSVPA-X	Extended Multispecies Virtual Population Analysis
MSY	Maximum sustainable yield
MT	Metric tons
NEAMAP	Northeast Area Monitoring and Assessment Program
NEFMC	New England Fishery Management Council
NEFSC	Northeast Fisheries Science Center
NFHAP	National Fish Habitat Action Plan
NFWF	National Fish and Wildlife Foundation
NMFS	National Marine Fisheries Service; also known as NOAA Fisheries
NOAA	National Oceanic and Atmospheric Administration
PDT	Plan Development Team
PRT	Plan Review Team
RHL	Recreational harvest limit
RSA	Research Set-Aside Program
SAFMC	South Atlantic Fishery Management Council
SAS	Stock Assessment Subcommittee
SAW/SARC	Northeast Regional Stock Assessment Workshop and Stock Assessment Review Committee, respectively
SCA	Statistical catch-at-age
SCS	Small coastal shark complex
SEAMAP	Southeast Area Monitoring and Assessment Program
SEDAR	SouthEast Data, Assessment, and Review Process
SFMPs	Sustainable fishery management plans
SNE	Southern New England
SNE/MA	Southern New England/Mid-Atlantic
SPR	Spawning potential ratio
SSB	Spawning stock biomass
SSC	Scientific and Statistical Committee
TAC	Total allowable catch
TAL	Total allowable landings
TLA	Traffic Light Analysis
USFWS	U.S. Fish and Wildlife Service
TEWG	Technical Expert Working Group

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Guiding Principles

Mission

To promote cooperative management of fisheries – marine, shell, and diadromous – of the Atlantic coast of the United States by the protection and enhancement of such fisheries, and by the avoidance of physical waste of the fisheries from any cause

Vision

Sustainably Managing Atlantic Coastal Fisheries

Goals

- Rebuild, maintain, fairly allocate, and promote Atlantic coastal fisheries
- Provide the scientific foundation for, and conduct stock assessments to support, informed management actions
- Promote compliance with fishery management plans to ensure sustainable use of Atlantic coast fisheries
- Protect and enhance fish habitat and ecosystem health through partnerships and education
- Strengthen stakeholder and public support for the Commission
- Advance Commission and member states' priorities through a proactive legislative policy agenda
- Ensure the fiscal stability and efficient administration of the Commission

Commissioner Values

- Effective stewardship of marine resources through strong partnerships
- Decisions based on sound science
- Long-term ecological sustainability
- Transparency and accountability in all actions
- Timely response to new information through adaptive management
- Balancing resource conservation with the economic success of coastal communities
- Efficient use of time and fiscal resources
- Work cooperatively with honesty, integrity, and fairness

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Stephen R. Train

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Sen. David H. Watters
G. Ritchie White

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Preface

The Commission was formed 73 years ago by the 15 Atlantic coastal states to assist in managing and conserving their shared coastal fishery resources.

With the recognition that fish do not adhere to political boundaries, the states formed an Interstate Compact, which was approved by the U.S. Congress in 1942. The states have found that their mutual interest in sustaining healthy coastal fishery resources is best promoted by working cooperatively, in collaboration with the federal government. With this approach, the states uphold their collective fisheries management responsibilities in a cost-effective, timely, transparent, and responsive fashion.

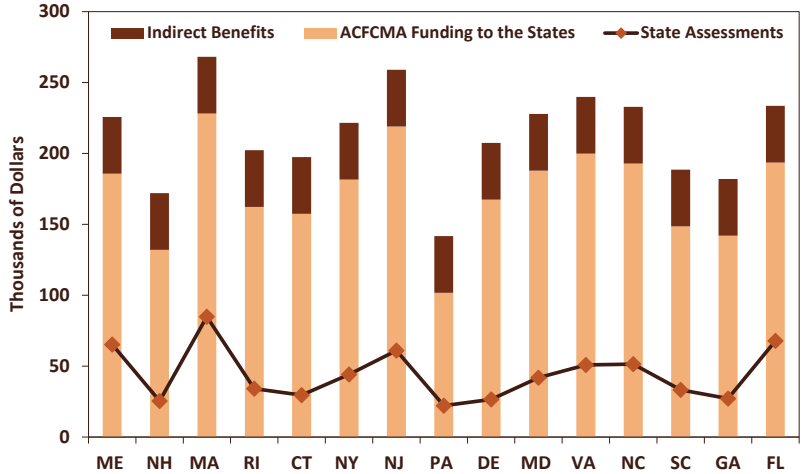
The Commission's current budget is $7.3 million. The base funding ($665,255) comes from the member states' appropriations, which are determined by the value of commercial fishing landings and saltwater recreational trips within each state. The bulk of the Commission's funding comes from a combination of state and federal grants, the largest being a line-item in the NOAA Fisheries budget appropriated to implement the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA). The Commission also receives funds from NOAA Fisheries to carry out the provisions of the Interjurisdictional Fisheries Act (IFA) (P.L. 99-659). The accompanying graph illustrates the benefits states receive from ACFCMA and IFA.

The U.S. Fish and Wildlife Service (USFWS) also provides grant funding to the Commission through its Federal Aid in Sport Fish Restoration Program (Wallop/Breaux). Also, since 1999 the Commission has overseen the administration of the Atlantic Coastal Cooperative Statistics Program (ACCSP), a state and federal partnership for Atlantic coastal fisheries data collection and management. Funding for this program is provided by ACFCMA and Fisheries Information Network line in the NOAA Fisheries budget.

The Commission serves as a deliberative body of the Atlantic coastal states, coordinating the conservation and management of nearshore fishery resources, including marine, shell, and diadromous species. The 15 member states of the Commission are (from north to south): Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, and Florida. Each state is represented on the Commission by three Commissioners: the director of the state's marine fisheries management agency, a state legislator, and an individual appointed by the state's governor to represent fishery interests. These Commissioners participate in deliberations in the Commission's main policy arenas: interstate fisheries management, fisheries science, habitat conservation, and law enforcement. Through these activities, the states collectively ensure the sound conservation and management of Atlantic coastal fishery resources and the resulting benefits that accrue to their fishing and non-fishing public.

2016 Return on State Assessments to the Commission

Source: FY16 ASMFC Assessments and FY15 ACFCMA & IFA Allocations



*Indirect Benefits include travel and per diem for 6 people from each state to participate in Commission meetings. Please note that this figure does not include the collective benefits derived from the work of the FMP Coordinators and Science Staff.

On behalf of the Atlantic States Marine Fisheries Commission (Commission), I am pleased to present our 2015 Annual Report. The report fulfills our obligation to inform Congress on the use of public funds provided to the Commission and provides our stakeholders with a summary of activities and progress in carrying out our cooperative stewardship responsibilities. In addition to detailing our 2015 activities, this report includes figures displaying the historical trends in stock status or catch for each managed species. These figures reflect our Commissioners' commitment to accountability and transparency in all they do to manage and rebuild fisheries under their care.

We remain grateful to the Administration, Members of Congress, our governors, and state legislators for their continued support. Many of the Commission's most important accomplishments would not have been possible without their trust and confidence.

ROBERT E. BEAL, EXECUTIVE DIRECTOR

We remain grateful to the Administration, Members of Congress, our governors, and state legislators for their continued support. Many of the Commission's most important accomplishments would not have been possible without their trust and confidence. In addition, the fiscal, staff, and technical support provided by NOAA Fisheries and USFWS to the Commission and states is an important part of our interstate fisheries management program and science activities.

2015 was one of the busiest years on record at the Commission with a whopping six benchmark stock assessments approved for management use – American lobster, Atlantic menhaden, black drum, bluefish, scup and tautog. Atlantic menhaden, in particular, spent much of the year in the public spotlight. In May, the Atlantic Menhaden Board began to look at ecological-based reference points that reflect menhaden's role as a forage species. Moving forward, the Commission has begun an unprecedented socioeconomic analysis of the bait and reduction fisheries to help describe the tradeoffs of various allocation strategies.

2015 was also the first year under new Addendum IV fishing mortality reference points approved by the Atlantic Striped Bass Board. Coastal states implemented a 25% harvest reduction from 2013 levels, while Chesapeake Bay states/jurisdictions implemented a 20.5% harvest reduction from 2012 levels. These reductions are in response to a number of below average year classes that occurred in the 2000s. Under reduced fishing pressure, the stocks are projected to rebuild to target levels.

American lobster, which is featured on the cover of this Report, will face a complicated year on the management front. While stocks in the Gulf of Maine are booming, the once productive Southern New England grounds are at the lowest levels on record. In 2016, we will begin development of an addendum for Southern New England to respond to the results of the 2015 benchmark stock assessment and address just one of our fisheries that is being impacted by warming ocean waters.

The Commission has continued to work closely with its sister Commissions in the Gulf of Mexico and Pacific. The three Commission alliance has shown to be an effective approach to unify the messages of 24 U.S. coastal states through one strong voice on national fisheries issues. This year our Annual Meeting was held in conjunction with the Gulf Commission where new relationships were forged and many policies, especially law enforcement, are now stronger thanks to the collaboration

Over the past 12 months, the three Commission alliance continued to work with our state and federal partners to reinforce the social and economic returns that come from investing in marine fisheries management and science. The overall investment is relatively modest; however, the returns are impressive. Commission-managed marine resources generate billions of dollars in economic activity annually and provide tens of thousands of jobs within our coastal communities. Our previous management successes have demonstrated the economic returns and jobs that can result from abundant and healthy coastal fisheries. This lesson reinforces the relevance and importance of the Commission's Vision today and in the years to come.

I continue to be amazed by the staff's commitment to healthy marine fisheries, and appreciate the devotion of Commissioners to our Vision, *Sustainably Managing Atlantic Coastal Fisheries.* It is always worth remembering the Legislative Commissioners and Governors' Appointees provide their time and expertise to the Commission without compensation. The Commission also elected new leadership at our Annual Meeting in St. Augustine, Florida. Doug Grout of New Hampshire will serve as Chair and James Gilmore of New York will serve as Vice Chair. We are grateful to outgoing Chair Dr. Louis Daniel of North Carolina for his many contributions.

Thank you all for your commitment to the Commission and the successful management of marine resources along the Atlantic coast.

Report from the Chair

DR. LOUIS B. DANIEL, III

As my last report as Chair of the Commission, I want to thank my fellow Commissioners for the support they have given me and Doug Grout over the past two years in carrying out our collective goals of ending overfishing and rebuilding depleted fishery resources, seeking outcomes that support the economic success of coastal communities, working toward long-term ecological sustainability, and being transparent and accountable in all our actions. Over the past year alone, we have made significant strides in furthering these goals.

2015 was a banner year in advancing the science behind our management decisions. We successfully completed benchmark stock assessments for Atlantic menhaden, black drum, tautog, American lobster, scup and bluefish, with the last two assessments being conducted in close coordination with our federal partners from NOAA Fisheries and the Mid-Atlantic Fishery Management Council. We continued to make progress on benchmark stock assessments for red drum, weakfish, spot and Atlantic croaker – all of which will have been peer-reviewed by the end of 2016. We have continued to invest in long-term fisheries-independent data collection activities through our support of the Northeast Area Monitoring and Assessment Program (NEAMAP) and the South Atlantic component of Southeast Area Monitoring and Assessment program (SEAMAP). We were able to secure funding to conduct the Virginia Tech Horseshoe Crab Trawl Survey, a critical input to our specifications setting process for horseshoe crab. This important long-term survey has been unfunded for the last two years, however, we are hopeful that long-term funding will be secured to allow this survey to be conducted for many years to come.

On the recreational data collection front, the Commission and ACCSP have worked hard this year to prepare for a significant change in the way recreational catch data will be collected along the Atlantic coast. Beginning in 2016, all coastal states from Maine through Georgia will transition to conducting the catch estimate portion of Marine Recreational Information Program, also known as APAIS. To prepare for this transition, new staff have been hired by the states and ACCSP, the Commission offices were reconfigured to accommodate the new hires, and the Commission readied itself to address the administrative and human resource challenges of an increased workforce. While NOAA Fisheries will retain primary accountability for APAIS and will be responsible for survey design, catch and effort estimation, and public dissemination, the Commission and ACCSP will act as the central coordinators of the state-conducted APAIS and will be responsible for data entry, compilation, quality control/quality assurance, as well as formatting and delivering intercept data to NOAA Fisheries. States will oversee and manage field collection, which will be conducted by state or Commission employees in accordance with APAIS standard data collection protocols.

From a fisheries management perspective, Commissioners adopted a new Interstate Fishery Management Plan (FMP) for Jonah Crab to manage growth in this expanding fishery with the intent of ensuring the sustainability of the resource. Given the linkages between the Jonah crab and American lobster fisheries and the predominance of the Jonah crab fishery in federal waters, we will continue to work closely with the New England Fishery Management Council and NOAA Fisheries on managing this shared resource. Based on the findings of the benchmark stock assessments for American lobster, tautog, and Atlantic menhaden, Commissioners have begun to discuss possible changes to management programs for these species. For American lobster, Commissioners will wrestle with what is the best approach to manage the severely depleted Southern New England stock unit given the environmental constraints placed on this resource that limit rebuilding efforts.

Responding to the positive findings of the Atlantic menhaden assessment, Commissioners have begun to move forward with the next stage on menhaden management. This new management regime will not only seek to fairly allocate the resource among the states and between fishery sectors but to also establish ecological based reference points that reflect Atlantic menhaden's role as a forage species. While working groups of Commissioners, scientists, and stakeholders have met throughout this year to lay the groundwork for future Board discussions, substantial work is still ahead of us. Luckily, we are not alone as we navigate the complex terrain of ecosystem management as our counterparts with the New England and Mid-Atlantic Fishery Management Councils explore ecosystem and forage species management as well.

2015 was the first year we implemented new management measures to reduce the coastwide harvest of Atlantic striped bass in order to assure a more rapid increase in the abundance of spawning fish which has been declining in recent years. Based on recent projections, the implemented management measures appear to meet, if not exceed, the required harvest reductions, with the resource not overfished and overfishing not occurring. This, coupled with the news of Maryland's above average juvenile index and Virginia's average juvenile index, offer promising news for the future of the striped bass resource.

USFWS's recent decision to not list American eel under the Endangered Species Act is also welcome news. The decision affirms the significant work and resources invested by the Commission, its member states, and federal partners over the past several years to conduct the first coastwide benchmark stock assessment for American eel and implement a management program in response to the assessment findings. However, given the current depleted status of the resource, there is still considerable

work to be done to rebuild American eel. The Commission will continue to closely monitor American eel fisheries and the status of the resource, and make adjustments to the management program as necessary, to ensure stock rebuilding.

The Commissioners and staff continue to work to secure the necessary resources to support important scientific, management, and enforcement activities. A critical component of this work is strengthening our partnerships with NOAA Fisheries and USFWS. The three interstate commissions continue to meet jointly with NOAA Fisheries leadership to communicate the states' budget priorities. This effort was successful in getting nearly one million dollars to support unfunded data collection programs. As the 2016 budget is finalized by Congress, staff and our government relations firm will continue to communicate the importance of supporting the interstate fishery management process.

In closing, I want to thank my fellow Commissioners for the trust they have placed in Doug Grout and me to serve as your Vice-Chair and Chair. We are grateful for their support and sustained commitment to the Commission and its programs. I am also deeply appreciative of the support and dedication of the Commission's talented staff. We have seen a lot of staff transitions over the past two years, with some well-respected veteran staff leaving some big shoes to fill. I am pleased to say that our new hires, who include three FMP Coordinators, one stock assessment scientist, and an accounting manager and HR manager, have admirably stepped into their new positions without missing a beat. This seamless transition is in large part due to the outstanding leadership of the senior staff and the remarkable teamwork exhibited by the remaining staff who have stepped in to mentor and contribute to the increased workload. It has been an honor to serve as your Chair. I look forward to continuing to work with you all over the coming years to sustainably manage Atlantic coastal fisheries. ✦

Stock Status Overview

In 2015, the Commission maintained sustainable fisheries for a number of rebuilt species such as Gulf of Maine/Georges Bank American lobster, Atlantic herring, Atlantic menhaden, bluefish, scup, and spiny dogfish. The Commission approved a new Jonah Crab FMP, updated management programs for two species (via addenda), and initiated four plan amendments in response to stock assessment information and changes in the fisheries. Two of the plan amendments will seek to improve resource sustainability for northern shrimp and tautog, while the other two amendments will seek to improve management of Atlantic herring and Atlantic menhaden fisheries. The Commission and Mid-Atlantic Fishery Management Council also initiated the development of new plan amendments for summer flounder and black sea bass. While these are positive steps forward, there is still substantial work ahead to rebuild valuable Atlantic coastal fishery resources such as American shad, river herring, Southern New England American lobster, winter flounder, and weakfish.

The Commission maintains its role as the deliberative forum for the Atlantic coastal states to come together to discuss the biological, socioeconomic, and environmental issues central to developing management programs for each species. The task of managing finite marine resources continues to grow more complex with the consideration of climate change, predator/prey interactions, habitat, and competing ocean uses, in addition to the more traditional considerations of stock maintenance, rebuilding, and the allocation of fisheries resources.

The following section provides a summary of the status of species managed by the Commission and highlights management activities that occurred throughout 2015. For this summary, **overfishing** occurs when fish are removed from a population at a rate that exceeds the threshold established in the FMP, which over the long-term will lead to declines in the population. A stock that is experiencing overfishing has fish removed at a rate faster than the population can sustain in the long run. Over the long-term, this will lead to declines in the population. An **overfished** determination occurs when stock biomass falls below the threshold established by the FMP, significantly reducing the stock's reproductive capacity to replace fish removed through harvest. The term **depleted** reflects low levels of abundance though it is unclear whether fishing mortality is the primary cause for reduced stock size. **Recovering/rebuilding** occurs when stocks exhibit stable or increasing trends, and stock biomass is between the threshold and the target level established by the FMP. A **rebuilt/sustainable** stock is one whose biomass is equal to or above the biomass level established by the FMP to ensure population sustainability. When between benchmark assessments a stock can still be considered rebuilt/sustainable if it drops below the target but remains above the threshold. **Concern** is when a stock develops emerging issues, e.g., increased effort, declining landings, or impacts due to environmental conditions. **Unknown** stock status occurs when there is no accepted stock assessment to estimate the stock condition.

Some other terms used throughout this report are benchmark stock assessment, peer-reviewed stock assessment, and stock assessment update. A **benchmark stock assessment** is a full analysis and review of the stock condition, focusing on the consideration of new data sources and newer or improved assessment models. This assessment is generally conducted every three to five years and undergoes a formal peer review by a panel of independent fisheries scientists who evaluate whether the data and methods used to produce the assessment are scientifically sound and appropriate for management use (**peer-reviewed stock assessment**). A **stock assessment update** incorporates data from the most recent years into the peer-reviewed assessment model to determine current stock status (abundance and overfishing level).

Quick Guide to Stock Status

STATUS/ TRENDS	SPECIES		OVERFISHED	OVERFISHING	REBUILDING STATUS & SCHEDULE
⬇		American Eel	Depleted	Unknown	Harvest restrictions adopted for glass, yellow, and silver eel fisheries in response to 2012 benchmark assessment
✓	American Lobster 	Gulf of Maine (GOM)/ Georges Bank (GBK)	Not Depleted	N	GOM and GBK stocks rebuilt Board approved 10% reduction in exploitation on SNE stock in 2012 as 1st phase in rebuilding program, as well as trap reductions in Areas 2 & 3. Board considering additional restrictions for SNE in response to 2015 benchmark assessment.
⬇		Southern New England (SNE)	Depleted	N	
⬇		American Shad	Depleted	Unknown	Amendment 3 establishes 2013 moratorium unless sustainability can be documented
?		Atlantic Croaker	Unknown	N	Overfished status unknown; however, biomass has been increasing & age structure has been expanding since late 1980s; benchmark assessment scheduled for 2016
✓		Atlantic Herring	N	N	Rebuilt; 2015 stock assessment update indicated SSB is above the target and F is below the threshold
✓		Atlantic Menhaden	N	N	Board set a TAC for the 2015 and 2016 fishing seasons at 187,880 mt per year, a 10% increase from the 2014 TAC
✸		Atlantic Striped Bass	N	N	Rebuilt since 1995, although female SSB has continued to decline since 2004; Board adopted harvest reductions for implementation in 2015 in response to 2013 benchmark assessment
?		Atlantic Sturgeon	Y	N	40+ year moratorium; to be rebuilt by ~2038; listed in 2012 under the ESA; benchmark assessment scheduled for 2017
✓		Black Drum	N	N	FMP approved in 2013; status based on 2015 benchmark assessment which found 2012 median biomass well above median biomass that produces MSY
✸		Black Sea Bass	N	N	Benchmark assessment scheduled for 2016; may change stock status
✓		Bluefish	N	N	Biomass above threshold but below target
✸		Coastal Sharks	Varies by species and species complex		
✸		Horseshoe Crab	Unknown	Unknown	2013 assessment update found New England & NY stocks to have declined, while DE Bay & Southeast stocks have increased over time series; since 2013, ARM Framework has been used to set harvest levels for horseshoe crabs of DE Bay origin
?		Jonah Crab	Unknown	Unknown	No range-wide assessment; Interstate FMP adopted in August 2015
⬇		Northern Shrimp	Depleted	N	Abundance & biomass indices lowest on record; recruitment indices also very low; fishery moratorium in place for 2014-2016 fishing seasons to protect remaining spawning population

✓ = Rebuilt /Sustainable ⇔ = Recovering/Rebuilding ⬇ = Depleted ? = Unknown ✸ = Concern

STATUS/ TRENDS	SPECIES		OVERFISHED	OVERFISHING	REBUILDING STATUS & SCHEDULE
⇔	Red Drum 	Northern Region	Unknown	N	SPR above target and threshold SPRs; benchmark assessment scheduled for completion in 2016
		Southern Region	Unknown	N	SPR above threshold SPR; benchmark assessment scheduled for completion in 2016
🡻		River Herring	Depleted	Unknown	Depleted on coastwide basis; Amendment 2 established 2012 moratorium unless river-specific sustainability can be documented
✓		Scup	N	N	Rebuilt
✓		Spanish Mackerel	N	N	Rebuilt
✓		Spiny Dogfish	N	N	Rebuilt
?		Spot	Unknown	Unknown	Traffic light approach adopted to assess stock trends & initiate management response if necessary; benchmark assessment scheduled for 2016
?		Spotted Seatrout	Unknown	Unknown	Omnibus Amendment includes measures to protect spawning stock & establishes 12" minimum size limit
✸		Summer Flounder	N	Y	2015 assessment update indicates biomass trending downward since 2010; 2014 F is 16% above threshold
✸		Tautog	Y	Varies by region	Overfished on coastwide basis; 2015 benchmark assessment presented stock status based on 3 regions; Board has initiated amendment to address regional stock units and reference points
🡻		Weakfish	Depleted	N	6-year rebuilding period if spawning stock biomass < threshold level; Board approved further harvest restrictions in 2009; benchmark assessment scheduled for 2016
✸	Winter Flounder 	Gulf of Maine	Unknown	N	Stock biomass is unknown; assessment not accepted due to concerns with large retrospective pattern; unknown why stock is not responding to low catches and low exploitation rates
🡻		South New England/ Mid-Atlantic	Y	N	Current biomass at 23% of SSB target; recruitment continues to decline

✓ = Rebuilt /Sustainable ⇔ = Recovering/Rebuilding 🡻 = Depleted ? = Unknown ✸ = Concern

American Eel

2015 marks the first year of the implementation of Addendum IV to the American Eel FMP. Addendum IV establishes a 907,671 pound coastwide quota for yellow eel commercial fisheries, sets Maine's glass eel quota at 9,688 pounds, and allows for the continuation of New York's silver eel weir fishery in the Delaware River. In concert with Addendum III, Addendum IV seeks to reduce mortality and increase conservation of American eel stocks across all life stages.

For yellow eel commercial fisheries, the coastwide quota was implemented in the 2015 fishing year, but will not initially include state-specific allocations. Instead, Addendum IV establishes two management triggers: (1) exceeding the coastwide quota by more than 10% in a given year, or (2) exceeding the coastwide quota for two consecutive years, regardless of the overage amount. If either trigger is met, then states would implement state-specific allocation. The Commission prepared for the potential implementation of state-specific allocation through the approval of state implementation plans in 2015. A major theme of those plans was improved catch monitoring in order to timely track harvest relative to an imposed quota (if triggered).

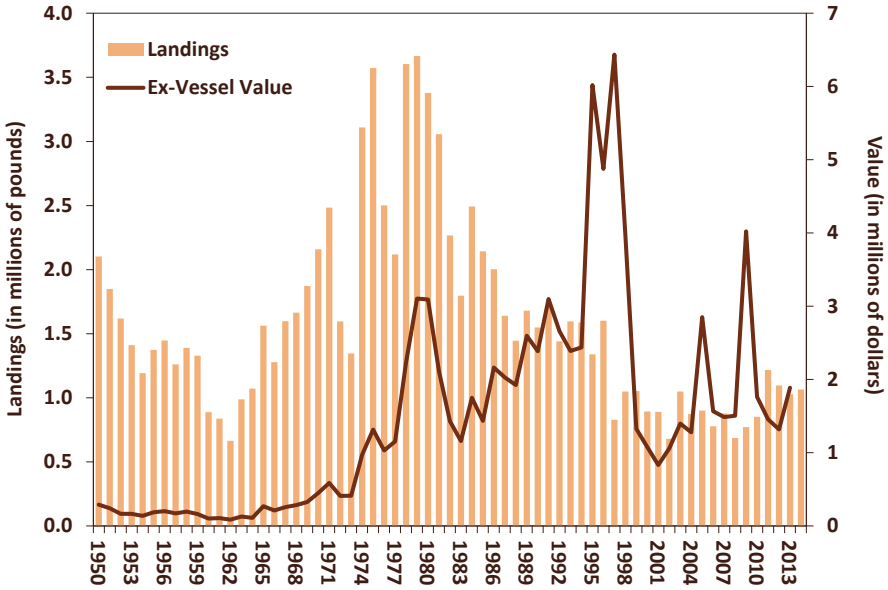
For the glass eel fishery, Maine vastly improved its catch monitoring program through the implementation of a dealer and harvester swipe card system. The swipe card program serves two purposes: (1) it is an effective fish management tool used to track individual fishing quotas, and (2) it is used as a daily quota monitoring tool. The results of the swipe card system were significant, reducing the number of fishery related infractions reported by the Maine Marine Patrol from 200 in 2013 to under 20 in 2014 and 2015. Maine will continue to use the swipe card program and require a pound-for-pound payback in the event of quota overages in its glass eel fishery. Additionally, the state plans to implement a Technical Committee and Board approved fishery-independent life cycle survey covering glass, yellow, and silver eels within the Cobboseecontee River system. The Addendum requires implementation of daily reporting and a life cycle survey for any jurisdiction with a commercial glass eel fishery harvesting more than 750 pounds.

From the 1970s to the mid-1980s, American eel supported significant commercial fisheries, with landings ranging from 2.5 -3.6 million pounds. Landings dropped to 1.6 million pounds in 1987 and have remained at low levels since then, ranging from 1.5 million to 700,000 pounds. State reported landings of yellow and silver eels in 2014 totaled just over one million pounds, 4% higher than 2013. Since 2010, increased demand for glass eels by foreign markets has led to a dramatic increase in the value of glass eels and record high prices of $2,000 per pound. In 2014, glass eel harvest from Maine and South Carolina totaled 12,515 pounds, a decrease from 2013 due to the new quota in Maine. In 2014, total eel landings (glass, yellow, and silver eel combined) were valued at approximately $9.8 million.

In 2011, USFWS initiated a status review of American eel under the Endangered Species Act (ESA) to assess the health of the population and the magnitude of threats facing the species. On October 7, 2015,

American Eel Total Commercial Landings and Value

Source: ASMFC 2012 American Eel Benchmark Stock Assessment Report (2012), ASMFC State Compliance Reports, and NMFS Fisheries Statistics Division, 2015



Timeline of Management Actions: FMP ('99); Addendum I ('06); Addendum II ('08), Addendum III ('13); Addendum IV (2014)

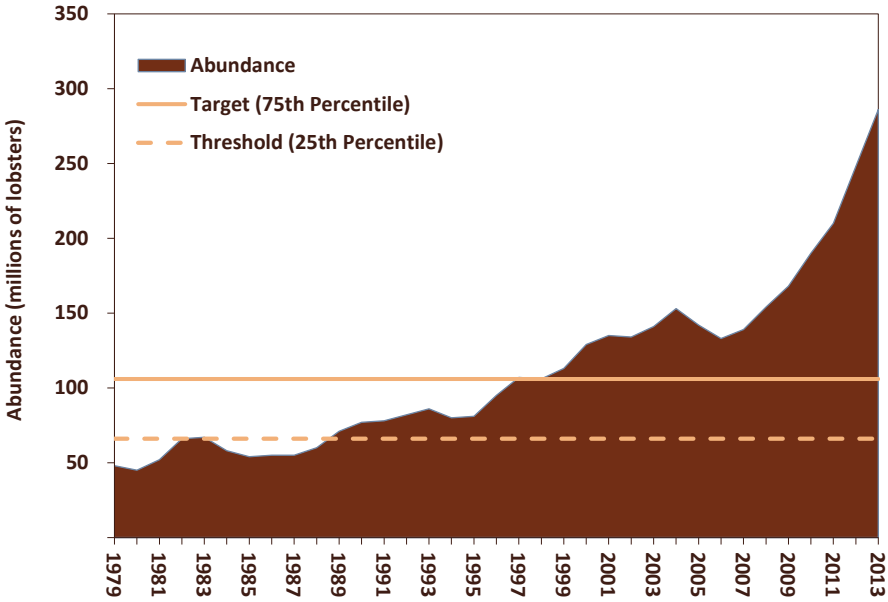
USFWS announced American eel is stable and does not need protection under the ESA. Nonetheless, for the species' long-term stability, the agency recommended continuing efforts to maintain healthy habitats, monitor harvest levels, and improve river passage for migrating eels. In 2014, the International Union for the Conservation of Nature (IUCN) listed American eel as "Endangered" on the Red List. The IUCN assesses flora and fauna globally to determine their conservation status. While the IUCN list has no legal implications, it is an important metric that accounts for a variety of factors including habitat, threats, potential stresses, and research status. Given these findings and recent actions taken by the Commission and its member states, the Commission remains committed to closely monitoring American eel fisheries and the status of the resource, and making adjustments to the management program as necessary to ensure stock rebuilding.

American Lobster

With roughly 148 million pounds of lobster landed in 2014 at an estimated value of $567 million, American lobster continues to be one of the most valuable species harvested throughout New England. While the fishery has experienced significant growth over the past 40 years, the results of the 2015 benchmark stock assessment showed a mixed picture of stock status. In the Gulf of Maine/Georges Bank (GOM/GBK), the stock is experiencing record high abundance and recruitment. In contrast, the Southern New England (SNE) stock is at record low abundance and is experiencing recruitment failure. The stock assessment found while the GOM/GBK stock is not overfished and not experiencing overfishing, the SNE stock is severely depleted with poor prospects of recovery. Declines in the SNE population abundance are most pronounced in the inshore portion where environmental conditions have remained unfavorable to lobster since the late 1990s. The Peer Review Panel recommended close monitoring of the SNE stock along with implementing measures to protect the remaining lobster resource. Approval of the stock assessment combined the GOM and GBK stocks into a single biological unit given extensive data that lobsters migrate between the two areas.

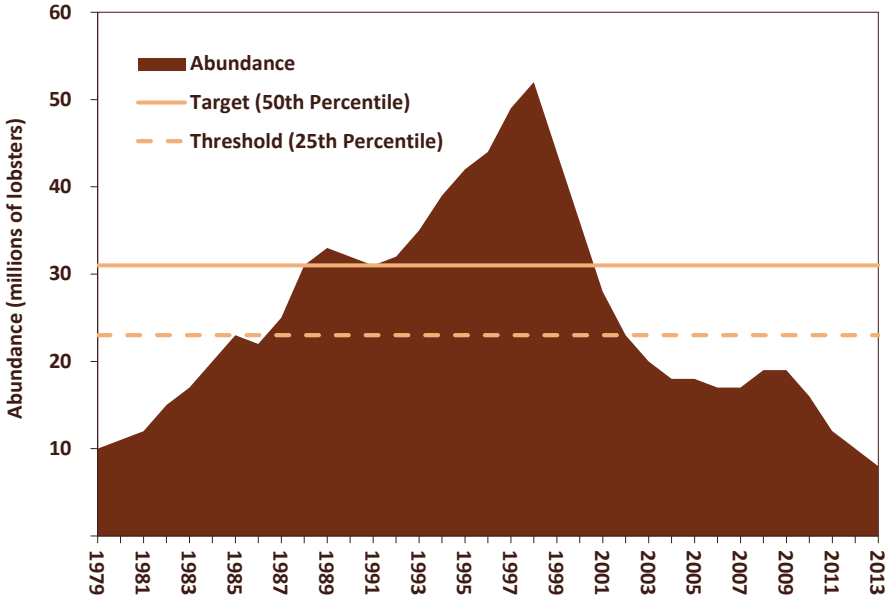
In response to the stock assessment findings, the American Lobster Management Board is evaluating potential management measures to respond to the poor condition of the SNE stock. As a first step, the Board convened a SNE

American Lobster Gulf of Maine/Georges Bank Abundance
Source: ASMFC American Lobster Benchmark Stock Assessment Report, 2015



Timeline of Management Actions: Amendment 3 ('97); Addendum I ('99); Addendum II ('01); Addendum III ('02); Addenda IV & V ('04); Addenda VI & VII ('05); Addenda X & XI ('07); Addendum XIII ('08); Addendum XIV ('09); Addendum XV ('09); Addendum XVI ('10); Addendum XVII ('11); Addendum XVIII ('12); Addenda XIX – XXII ('13); Addendum XXIII ('14); Addendum XXIV ('15)

American Lobster Southern New England Abundance
Source: ASMFC American Lobster Benchmark Stock Assessment Report, 2015



Working Group, comprised of a subset of industry representatives, Technical Committee members, Commissioners, and federal representatives. The Working Group discussed a suite of management objectives for the stock ranging from stabilizing the stock through reductions in fishing mortality to preserving fishery infrastructure at the expense of stock rebuilding. Preliminary projections of the SNE stock presented to the Working Group showed large reductions in fishing mortality would be needed to stabilize the stock. Furthermore, these projections suggested that, under current conditions, it may not be possible to rebuild the stock to its current reference point.

In November 2015, the Board reviewed the objectives of the Working Group and charged the Technical Committee with completing several tasks, including a review of preliminary stock projections and a recalculation of reference points. The goal of these tasks is to gain more information on the SNE stock and management options moving forward.

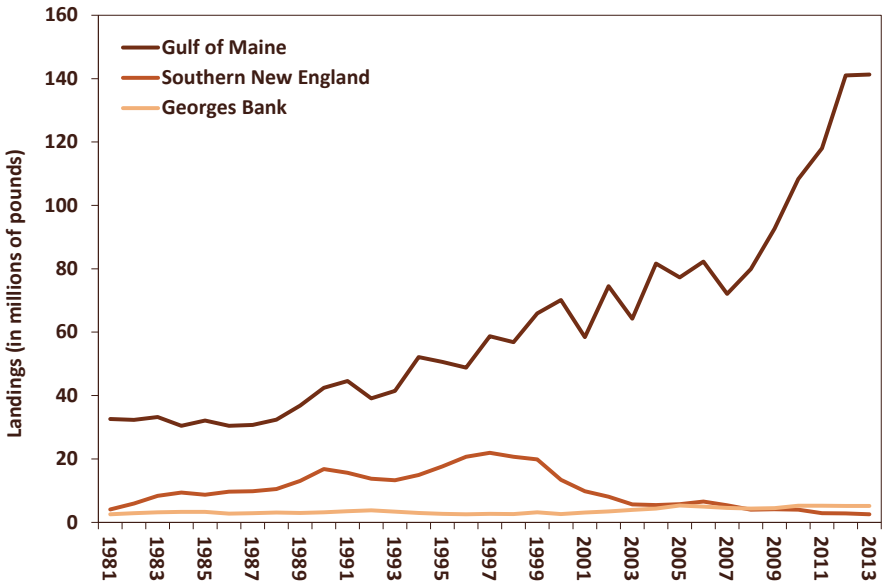
In 2015, the Board also approved Addendum XXIV, which aligns state and federal measures for trap transfer programs in Lobster Conservation Management Areas 2, 3, and Outer Cape Cod. The Addendum removes the 10% conservation tax on full business transfers and specifies that traps shall be transferred in 10 trap increments in all areas that currently have a trap transferability program, unless otherwise specified. Addendum XXIV also allows dual permit holders to transfer allocation with dual permit holders from other states. If a dual permit holder chooses to purchase a federal trap allocation from a dual permit holder from another state, only the federal allocation will transfer.

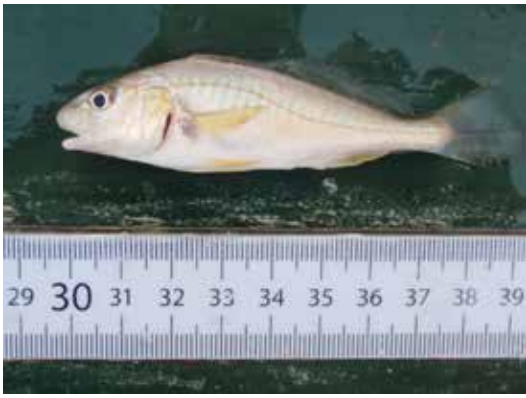
Atlantic Croaker

Atlantic croaker are a popular bottom-dwelling species, which gets its name from the croaking noises it makes during mating rituals. The species is most abundant from the Chesapeake Bay to northern Florida and is sought by recreational anglers and commercial fishermen. An estimated 10.1 million pounds of croaker were landed in 2014, with approximately 70% landed by the commercial sector and 30% harvested by recreational anglers.

American Lobster Landings by Area

Source: ASMFC American Lobster Benchmark Stock Assessment Report, 2015





The majority of these landings occurred in the Mid-Atlantic region.

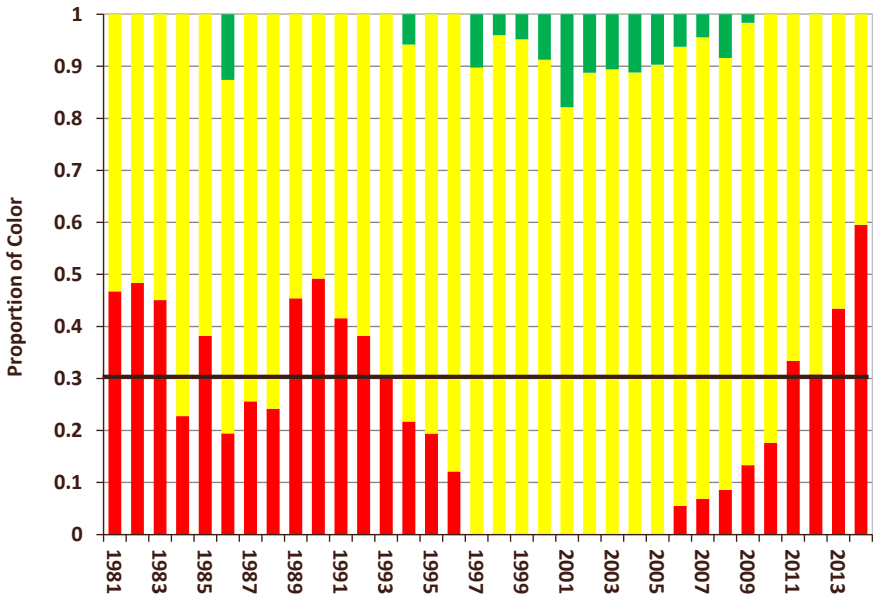
In 2015, the South Atlantic State/Federal Fisheries Management Board reviewed the Traffic Light Analysis (TLA) for Atlantic croaker. The TLA evaluates fishery trends and develops state-specific management actions (e.g. bag limits, size restrictions, time & area closures, and gear restrictions) when harvest and abundance thresholds are exceeded for three consecutive years. The name comes from assigning a color (red, yellow, or green) to categorize relative levels of indicators which reflect the condition of the fish population (abundance metric) or fishery (harvest metric). For example, as harvest or abundance increase relative to their long-term mean, the proportion of green in a given year increases and as harvest or abundance decrease, the amount of red in that year becomes more

predominant. The TLA improves the management approach as it illustrates long-term trends in the stock and includes specific management recommendations in response to declines in the stock or fishery.

The TLA showed a significant decrease in Atlantic croaker harvest in both the commercial and recreational sectors. Data from fishery-independent surveys also showed a slight decrease in the abundance of Atlantic croaker Management measures were not triggered in 2014 since the abundance index did not exceed the management threshold; however, the TLA does show a declining trend in the fishery which warrants monitoring in the future.

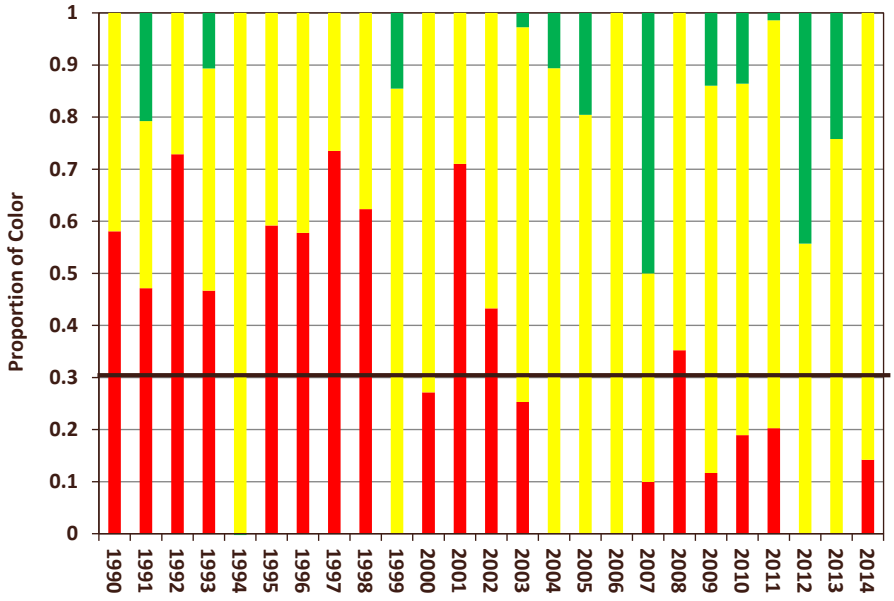
Traffic Light Analysis of Atlantic Croaker (Harvest Metric)

Solid line represents 30% threshold



Traffic Light Analysis of Atlantic Croaker (Abundance Metric)

Solid line represents 30% threshold



Management response is triggered when proportion of red exceeds the 30% threshold level for three consecutive years in both fishery characteristics (harvest and abundance metrics).

Timeline of Management Actions: FMP ('87); Amendment 1 ('05); Addendum I ('11); Addendum II ('14)

In 2015, the South Atlantic Board also initiated a benchmark stock assessment for Atlantic croaker. The previous stock assessment was completed in 2010 and found Atlantic croaker was not experiencing overfishing. Although model estimates of spawning stock biomass (SSB) were too uncertain to be used to determine an overfished stock status, biomass was increasing and the age structure of the population was expanding. The new assessment hopes to address a major source of uncertainty in previous assessments – the magnitude of croaker bycatch in the South Atlantic shrimp trawls. A data workshop was held in September 2015, and the stock assessment and peer review are scheduled for completion in late 2016.

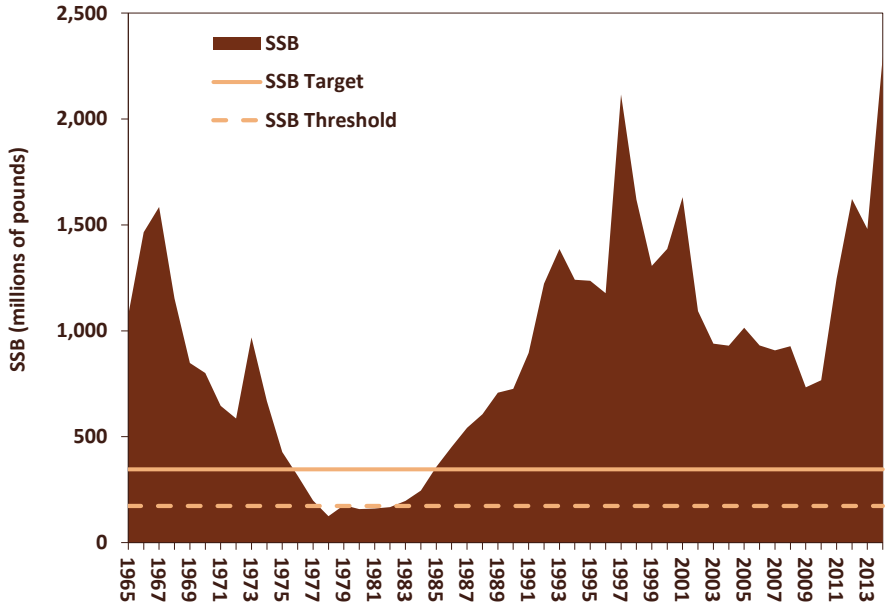
Atlantic Herring

The Atlantic herring fishery is managed cooperatively by the Commission through its Atlantic Herring Section and the New England Fishery Management Council (NEFMC). Commission management extends from the shore out to 3 miles, while NEFMC oversees management in federal waters (3-200 miles from shore).

Commercially, Atlantic herring are used as both bait and food. Currently, the herring fishery is thriving, with total domestic harvest (203 million pounds) valued at $28.8 million in 2014. These values are the third highest since the 1950s. As a baitfish, herring supports the American lobster fishery and tuna fishery. The majority of landings are taken from GOM, but fisheries also occur in GBK and areas south and west of Cape Cod.

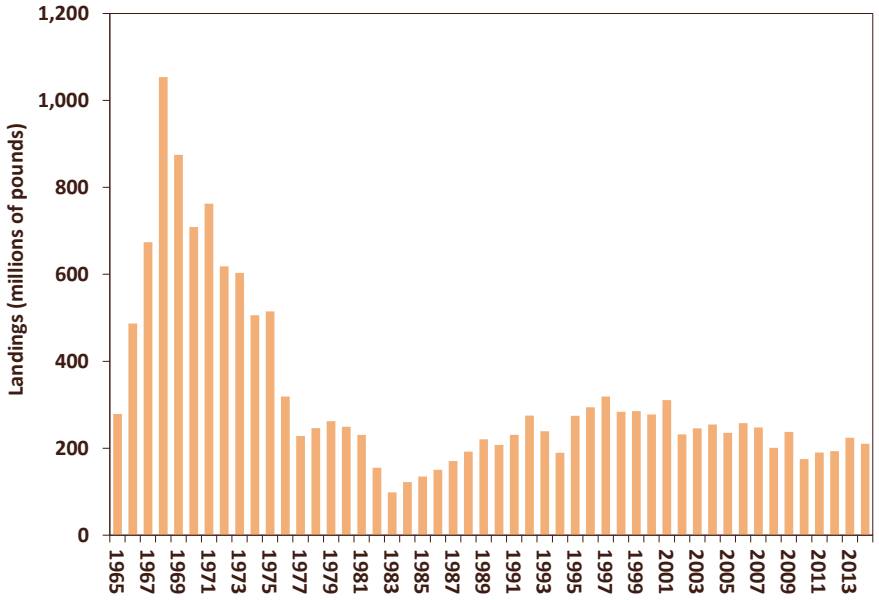
The 2015 stock assessment indicates Atlantic herring are not overfished and overfishing is not occurring. Spawning stock biomass in 2014 is estimated at 1.3 billion pounds, well above the spawning stock biomass

Atlantic Herring Spawning Stock Biomass (SSB)
Source: Northeast Regional Stock Assessment Update, 2015



Timeline of Management Actions: FMP ('93); Amendment 1 ('99); Amendment 2 ('06); Addendum I ('09); Addendum II ('10); Addendum V; ('12); Addendum VI ('13)

Atlantic Herring Commercial Landings
Source: ACCSP Data Warehouse, 2015



(SSB) threshold and target of 343 million pounds and 686 million pounds, respectively. Current fishing mortality is estimated at 0.16, below the fishing mortality threshold of 0.24.

Although the Atlantic herring stock complex is assessed as a whole, catch limits are allocated among four management areas based on estimates of stock composition and relative biomass. The Section set the 2016-2018 annual catch limit (ACL) at 231 million pounds per year. The ACL was further subdivided by Atlantic herring management areas as follows: Area 1A (inshore GOM) = 66.79 million pounds, Area 1B = 9.9 million pounds, Area 2 = 64.1 million pounds, and Area 3 = 90.16 million pounds. For the 2016 fishing season, as in previous years, Area 1A's sub-ACL will be distributed seasonally with 72.8% available from June 1-September 30 (Trimester 2) and 27.2% available from October 1-December 31 (Trimester 3). Directed fisheries within a management area will close when 92% of the sub-ACL has been harvested, and the stock-wide fishery will close when 95% of the ACL is projected to be reached.

During the 2015 fishing year, Maine, New Hampshire, and Massachusetts continued to modify days-out of the Area 1A fishery during the season, setting seven landing days for Trimester 2 (June 1 – September 30), which was subsequently lowered to zero landing days in mid-August due to an accelerated rate of landings. Landing days were increased to three days at the start of Trimester 3 (October 1 – December 31). On November 2, 2015, the Area 1A fishery was closed, having reached 92% of the management area's ACL.

Throughout 2015, the Atlantic Herring Section worked on the development of Draft Amendment 3 to the Atlantic Herring FMP. The Draft Amendment proposes changes to the spawning regulations and the fixed gear set-aside rollover provision, and considers a requirement for vessel holds to be empty of fish prior to departing on a trip. Based on over a decade of sampling data and literature review, the Draft Amendment proposes adjusting the method that informs the closure of spawning areas. The proposed method would forecast the expected onset of spawning and give advance notice when a spawning closure is likely to occur, allowing industry to plan their activities accordingly. The Draft Amendment was released for public comment in early December, with state hearings scheduled for early January 2016. The Section will consider final action on the amendment in early 2016.

Atlantic Menhaden

In 2015, the Atlantic Menhaden Management Board approved a total allowable catch (TAC) for

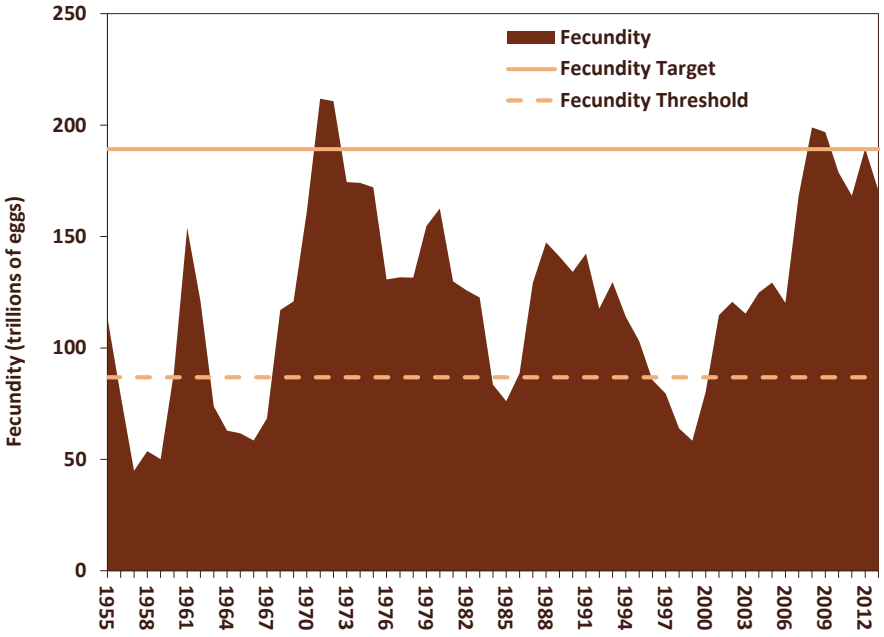
the 2015 and 2016 fishing seasons at 187,880 metric tons (mt) per year, a 10% increase from the 2014 TAC. The increase responds to the positive findings of the 2015 Atlantic menhaden benchmark assessment, which indicates the resource is not overfished nor experiencing overfishing relative to the biological reference points that were used in the 2015 stock assessment and accepted for management use. Population fecundity, a measure of reproductive capacity, is estimated to be 10% below the revised target value (189 trillion eggs) and fishing mortality is estimated to be 0.22, below both the revised fishing mortality threshold (1.26) and target (0.38). The 2015 stock assessment results were markedly different from those of the 2012 assessment due to improvements in both the datasets used and modeling approaches that split the resource by fishery and area.

The preliminary estimate of 2014 coastwide harvest, which includes the reduction and bait fisheries, and episodic event set asides is 168,607 mt, representing a 1.3% underage from the coastwide TAC of 170,800 mt. Additional bycatch landings of 3,101 mt accounted for approximately 1.8% of the coastwide harvest, but do not count towards the TAC. These bycatch landings were harvested under the 6,000 pound bycatch allowance. Combining total landings (including bycatch) is estimated at 171,709 mt.

In 2015, the Board committed to moving forward with the development of Amendment 3 to the Atlantic Menhaden FMP. Amendment 3 will consider both ecosystem reference points (ERPs) and allocation. Throughout 2015, the Board made progress on both topics through the establishment of two working groups. The first group was tasked with developing a complete list of potential allocation options for the menhaden fishery,

Atlantic Menhaden Fecundity

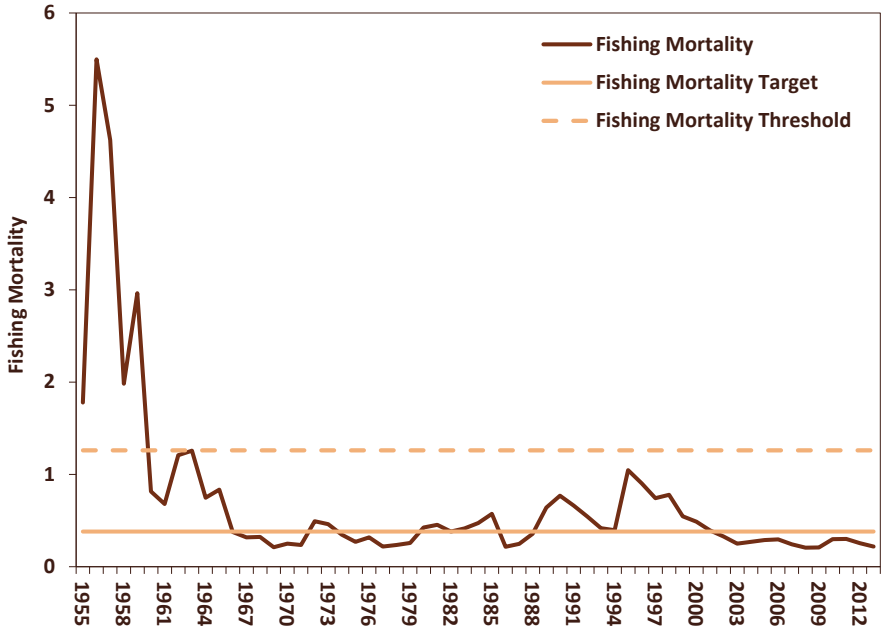
Source: SEDAR Atlantic Menhaden Stock Assessment, 2015



Timeline of Management Actions: FMP ('81); FMP revision ('91); Amendment 1 ('01); Addendum I ('04); Addendum II ('05); Addendum III ('06); Addendum IV ('09); Addendum V ('11); Amendment 2 ('12); Addendum I ('13)

Atlantic Menhaden Fishing Mortality (Ages 2-4)

Source: SEDAR Atlantic Menhaden Stock Assessment, 2015



while the second group identified potential ecosystem goals and objectives that will be used to advance ERP development by the Biological Ecological Reference Point Working Group. The next step of the amendment process will be development of a public information document to scope both allocation options and available ERPs in late 2016/early 2017, followed by a Draft Amendment document in mid-2017 for potential implementation of final measures in 2018.

The above timeframe will allow for the completion of a socioeconomic analysis to further characterize the Atlantic menhaden fishery. This analysis will provide much needed information on the importance of menhaden to its stakeholders to help inform allocation discussions. The analysis will be conducted throughout 2016, and will rely on stakeholder engagement to obtain socioeconomic data to conduct the analysis. The results are expected to assist fishery managers, industry, and stakeholders as they contemplate difficult allocation decisions through Amendment 3.

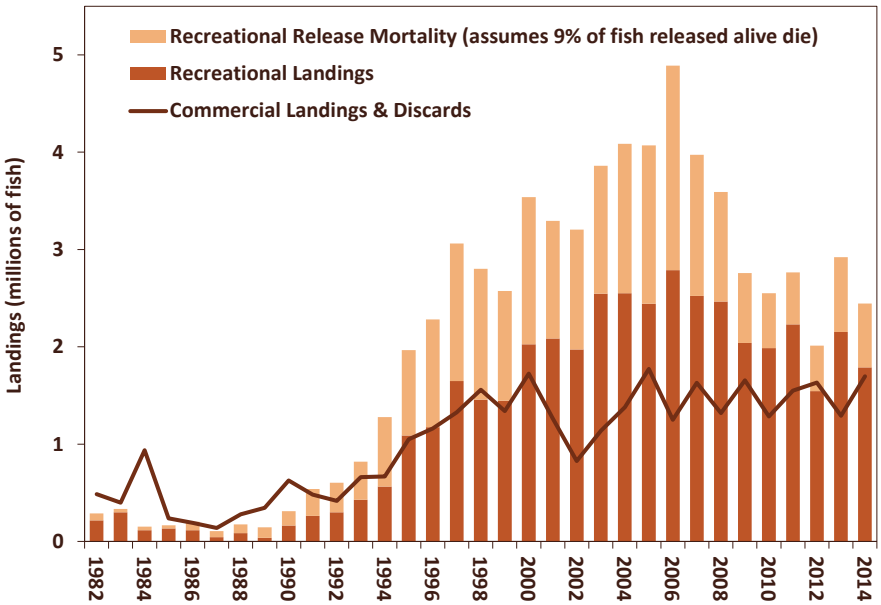
Atlantic Striped Bass

In 2015, the states and jurisdictions involved in the management of Atlantic striped bass (i.e., Maine through North Carolina, including Pennsylvania, the District of Columbia and the Potomac River Fisheries Commission) implemented the required harvest reductions of Addendum IV to Amendment 6 to the Atlantic Striped Bass FMP. Specifically, commercial state quotas were reduced by 25% from 2013 levels for coastal fisheries, and by 20.5% from 2012 levels for Chesapeake Bay commercial fisheries. To reduce recreational harvest, states implemented a one fish bag limit while keeping a 28" minimum size limit. Eight states and jurisdictions submitted conservation equivalency proposals (e.g., alternative measures that achieve the same reduction but are designed to meet the state's fishery needs) for at least one of their fisheries . These proposals were approved by both the Technical Committee and Atlantic Striped Bass Management Board. The projected harvest estimate based on previous years' fishing indicates that the combined measures implemented by the states and jurisdictions should reduce the 2015 coastwide harvest by 25.6%. The 2016 stock assessment update is expected to provide more accurate information regarding the performance of Addendum IV regulatory changes.

Addendum IV responds to the 2013 benchmark assessment which indicated fishing mortality was above the new target (0.18) and female SSB has been steadily declining below the target of 158.8 million pounds since 2006. While the stock

Atlantic Striped Bass Commercial Landings and Discards and Recreational Landings and Release Mortality

Source: ASMFC Atlantic Striped Bass Stock Assessment Update, 2015



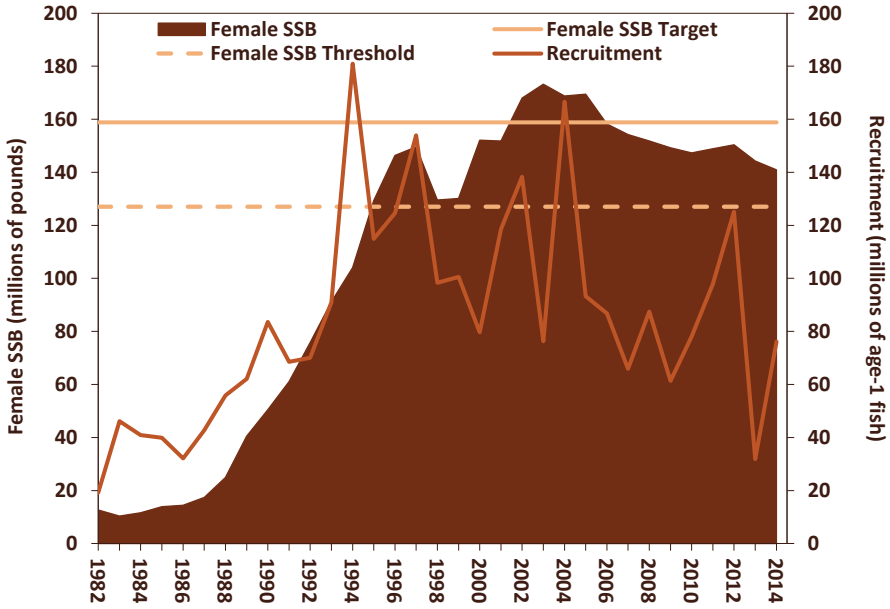
Timeline of Management Actions: Amendment 1 & 2 ('84); Amendment 3 ('85); Amendment 4 ('90); Amendment 5 ('95); Amendment 6 ('03); Addendum I ('07); Addendum II ('10); Addendum III ('12); Addendum IV ('14)

was not overfished and overfishing was not occurring, the Addendum established new fishing mortality reference points and required coastwide harvest reductions in order to reduce fishing mortality to a level at or below the new target . The 2015 stock assessment update results similarly indicated that the Atlantic striped bass stock was not overfished nor experiencing overfishing. Additionally, given the Albemarle Sound/Roanoke River (A/R) stock of striped bass contributes minimally to the coastwide complex when compared to the Chesapeake Bay, Delaware, and Hudson stocks, Addendum IV defers management of this stock to the State of North Carolina using stock-specific biological reference points. These stock-specific reference points, which have been approved by the Board, will result in a separate quota that is set to maintain fishing mortality for the A/R stock at its target level. The quota for the A/R stock in 2014 was 305,762 pounds.

From 2005 to 2014, total recreational harvest has ranged from a high of 31 million pounds (2.79 million fish) in 2006 to a low of 19.2 million pounds (1.55 million fish) in 2012, with an average of 26.2 million pounds. Landings from New York (29%), Massachusetts (19%), New Jersey (18%), and Maryland (12%) have comprised approximately 78% of annual recreational landings since 2005. Recreational harvest in 2014 is estimated at 24.1 million pounds. The number of fish released alive increased annually after the passage of Amendment 6 (2003) to a high of 23.3 million fish in 2006. Since then, the number of fish released alive has decreased by 77% to a low of 5.2 million fish in 2012. Reasons for the decline may be attributed to a reduction in stock size from the peak in 2003, a decreased availability of fish staying in nearshore areas, and changes in angler behavior in response to socioeconomic factors. The number of fish released alive in the recreational sector for 2014 is estimated to be 7.3 million fish.

Atlantic Striped Bass Female Spawning Stock Biomass (SSB) and Recruitment (Age-1)

Source: ASMFC Atlantic Striped Bass Stock Assessment Update, 2015



Total commercial harvest from 2005 to 2014 ranged between 5.8 and 7.2 million pounds (765,101 and 1.1 million fish, respectively), and averaged 6.7 million pounds. The Chesapeake Bay jurisdictions accounted for approximately 59% of total commercial harvest over the same time period, ranging between 3.3-4.4 million pounds and averaging 4.1 million pounds. Other primary contributors to coastwide commercial landings include Massachusetts (17%) and New York (11%). Commercial landings in 2014 were estimated at 5.9 million pounds.

Within the A/R management area, total harvest in 2014 was estimated at 121,956 pounds with 71,372 pounds coming from the Albemarle Sound commercial fishery, and 61,642 pounds from the A/R recreational fisheries.

Atlantic Sturgeon

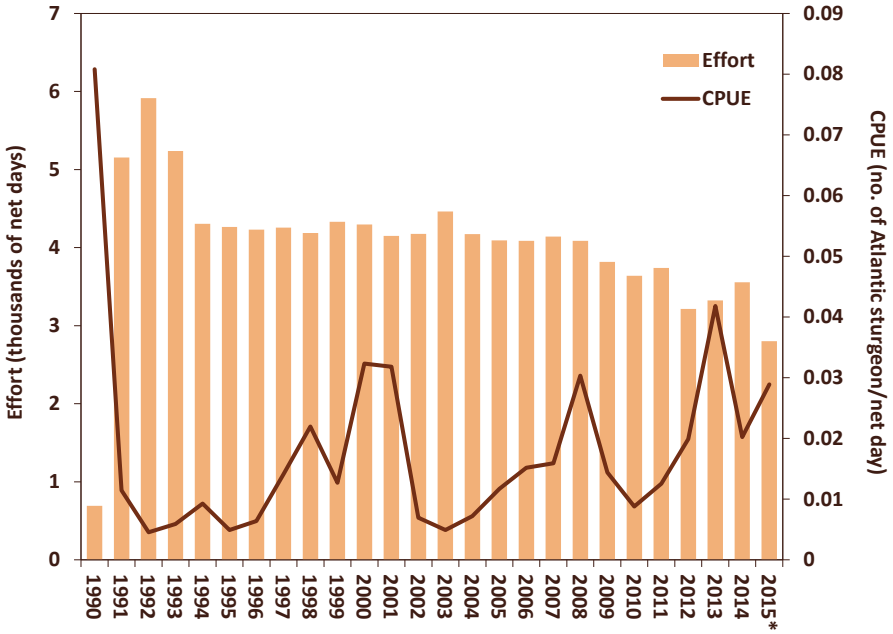
Atlantic sturgeon are one of the oldest fish species in the world, dating back to the Cretaceous period over 120 million years ago, and can be found along the entire Atlantic coast from Florida to Labrador, Canada. Atlantic sturgeon may live up to 70 years and utilize a wide range of habitats throughout their lifetime. They are an anadromous species that undergo extensive coastal migrations which take them from the ocean into coastal estuaries and rivers to spawn every two to five years. Females typically reach sexual maturity between the ages of seven to 30, and males between the ages of five to 24. These life history characteristics, coupled with excessive overfishing from the late 1800s to the mid-1900s and impediments to fish passage, have challenged species' rebuilding efforts. The Commission implemented a 40-year coastwide moratorium on harvest in 1998 to protect and rebuild this ancient species. Additionally, states have invested considerable resources to increase understanding of sturgeon biology and life history through research and fishery-independent surveys.

Very little is known about Atlantic sturgeon's stock status. Reliable data are difficult to obtain because many river systems have few fish, and rivers

with more fish are often not easily sampled. The last benchmark stock assessment, conducted in 1998, found the resource to be overfished coastwide. Several states have been conducting long-term monitoring of Atlantic sturgeon. Data from two of these efforts are provided in the accompanying graphs, which depict catch and effort data for fishery-independent surveys conducted by North Carolina and New Jersey. North Carolina has surveyed for juvenile Atlantic sturgeon in the Albemarle Sound since 1990. Although catch rates have fluctuated considerably over the time series, catch per unit effort (CPUE) in 2013 was the highest observed value since 1990. New Jersey has conducted trawl surveys in their coastal waters since 1989. Although Atlantic sturgeon catch has been below average in recent years, the survey has seen a steady increase over the years following the 1998 coastwide moratorium. Additionally, catch in 2015 looks promising for Atlantic sturgeon considering the data is preliminary and catch is already the third highest on record.

Fishery-independent Catch Rates of Juvenile Atlantic Sturgeon in Albermarle Sound

Source: NC Division of Marine Fisheries, 2015



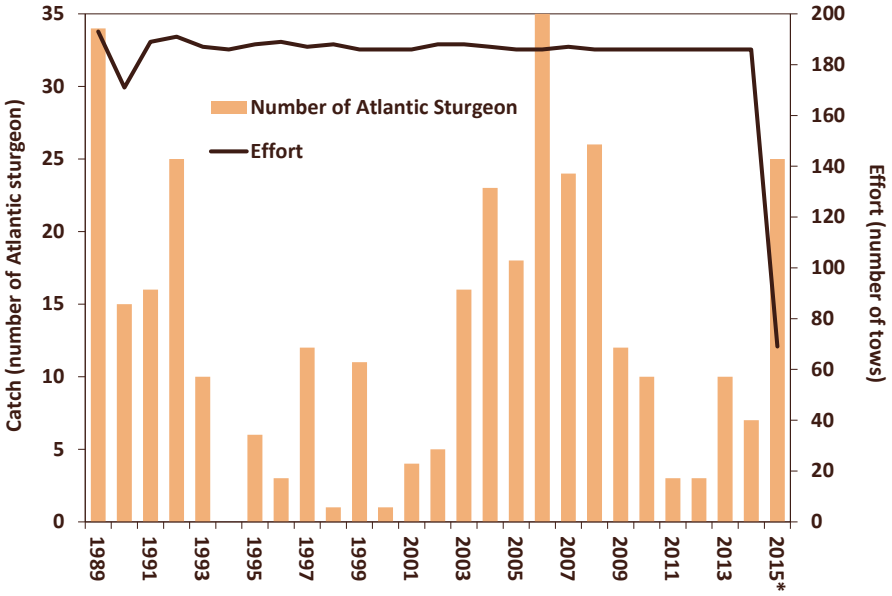
*2015 data are preliminary

NOAA Fisheries investigated the status of Atlantic sturgeon with regard to its listing under the ESA three times since the Commission's implementation of Amendment 1 in 1998. The 1998 and 2005 reviews concluded listing was not warranted. In 2012, NOAA Fisheries published a final rule declaring the Gulf of Maine distinct population segment (DPS) as threatened and the remaining four DPSs (New York Bight, Chesapeake Bay, Carolina and South Atlantic) as endangered (effective April 2012). The status review determined the most significant threats to all of the DPSs are bycatch mortality, poor water quality, lack of adequate state and federal regulatory mechanisms, and dredging activities. Additional stressors include habitat impediments and ship strikes. In 2013, NOAA Fisheries published an Interim Final Rule for the threatened Gulf of Maine DPS which essentially provides the same protection as an endangered listing.

In response to the ESA listing, the Atlantic Sturgeon Management Board initiated the development of a coastwide benchmark stock assessment for Atlantic sturgeon to evaluate stock status, stock delineation, and bycatch. In order to allow for the most comprehensive

Effort and Number of Atlantic Sturgeon Caught in New Jersey's Coastal Waters

Source: NJ Division of Fish and Wildlife Ocean Trawl Survey, 2015



*2015 data are preliminary

Timeline of Management Actions: FMP ('90); Amendment 1 ('98); Addendum I ('01); Addendum II ('05); Addendum III ('06)

assessment, the Board set a 2017 completion date so the most recent data from studies currently underway can be incorporated. For example, several assessment approaches at the DPS or stock-level would become possible from the analysis of genetic samples currently underway at the U.S. Geological Survey's Leetown Science Center in West Virginia. In May 2015, the Stock Assessment Subcommittee (SAS) identified each task of the assessment from data needs to modeling approaches, and the time it will take to complete each task to ensure the benchmark assessment is completed on schedule. Currently, the Bycatch and Tagging Working Groups are developing methodologies for their respective parts of the assessment, while each state actively updates its data through the terminal year of the assessment.

Black Drum

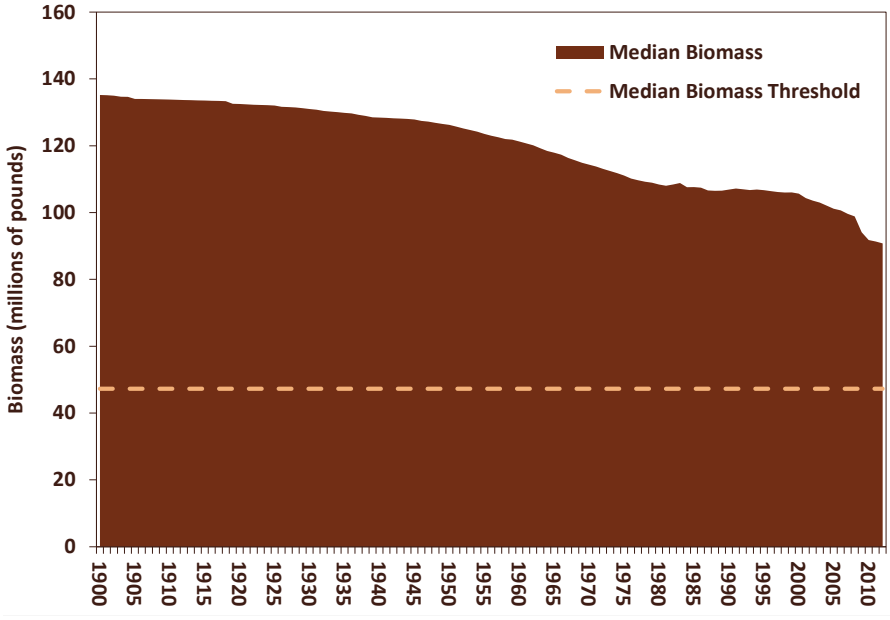
In 2015, the South Atlantic Board approved the Black Drum Benchmark Stock Assessment and Peer Review Report for management use. The assessment, which is the first coastwide assessment of this species, determined black drum are not overfished and not experiencing overfishing. Median biomass was estimated to have declined slowly and steadily from 135.2 million pounds in 1900 to 90.78 million pounds in 2012; however, the median biomass estimate in 2012 is still well above the median biomass that produces maximum sustainable yield (B_{MSY}; 47.26 million pounds). Given the assessment findings, the Board choose to not make any additional changes to the management program at this time.

The Black Drum FMP was adopted in 2013 to address a number of concerns, including increased harvest on juvenile fish and a lack of consistent coastwide regulations for the stock. In 2014, all the states within the management unit (New Jersey to Florida) implemented a minimum size limit of at least 12" and a maximum possession limit which varies by state. The FMP requires all states to further increase the minimum size limit to at least 14" by January 1, 2016.

The black drum fishery is predominantly recreational, with anglers landing about three times the fish (by weight) than the commercial fishery. From 2000-2008, recreational harvest trended upward with harvest peaking at 5.4 million pounds in 2008. Harvest has been on the decline since then with an estimated 1.15 million pounds harvested in 2014. Florida and South Carolina fisheries comprised the majority of recreational harvest in 2014.

Black Drum Biomass

Source: ASMFC Black Drum Benchmark Stock Assessment, 2015



Timeline of Management Actions: FMP ('13)

Historically, commercial landings averaged approximately 368,000 pounds in the 1950s and 1960s and then declined to an average of approximately 211,000 pounds in the 1970s and 1980s. The commercial fishery landed about 262,000 pounds in 2014. Since 2000, the majority of commercial landings have occurred in Virginia, North Carolina, and Florida, while a smaller portion is landed in New Jersey, Maryland, and Delaware.

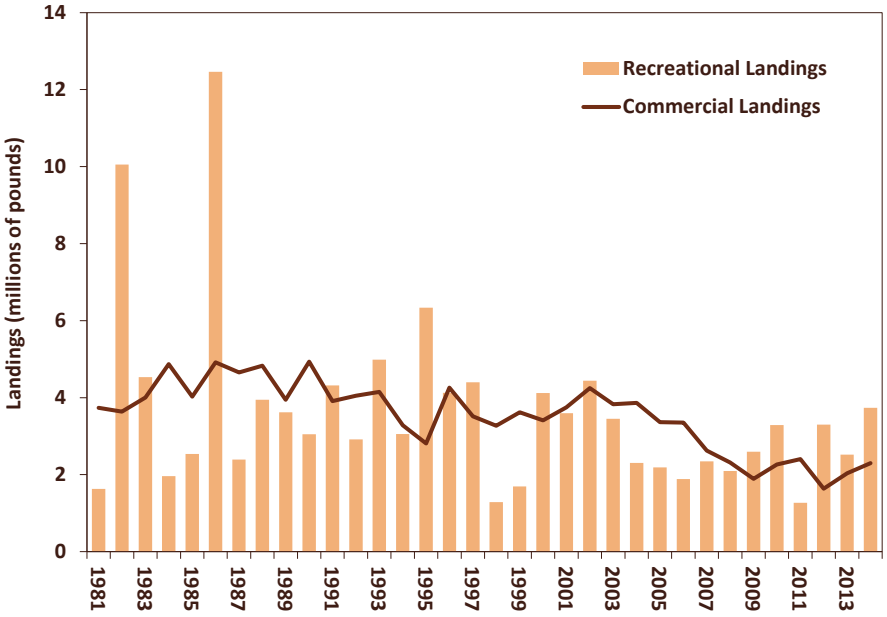
Black Sea Bass

For nearly two decades, the Commission and the Mid-Atlantic Fishery Management Council (MAFMC) have jointly managed the black sea bass stock north of Cape Hatteras, NC. The latest stock assessment update, completed in 2012, indicates black sea bass are not overfished and not experiencing overfishing, with biomass estimated to be 102% of the biomass target. Although the black sea bass resource was declared rebuilt in 2009, the unique life history characteristics of the species (e.g., it is a protogynous hermaphrodite, which means it changes sex from female to male) contributes to some level of uncertainty about the size of the stock. The response of this species, as well as other hermaphroditic species, to exploitation is not fully understood; therefore, management of the fishery has been conservative.

In the absence of a new benchmark stock assessment to address life history uncertainties, data limited methods were used to determine a new fishing level for the 2016 fishing season. Based on analysis undertaken in 2015, there is evidence that an increase in the quota could be done without jeopardizing conservation of the stock. As a result, the acceptable biological catch (ABC) for 2016 was increased to 6.67 million pounds, a 21% increase from 2015.

Black Sea Commercial and Recreational Landings

Source: NMFS Fisheries Statistics Division, 2015



Timeline of Management Actions: FMP ('96); Amendment 10 ('97); Amendment 11 ('98); Amendment 12 ('99); Amendment 13 ('03); Addenda II & III ('04); Addendum XVI ('05); Addendum XIX ('07); Addendum XX ('09); Addendum XXI ('11); Addendum XXIII ('13); Addendum XXV ('14)

This ABC was further divided into a 2.71 million pound commercial quota and a 2.88 million pound recreational harvest limit (RHL). Management measures include quotas to restrict the commercial fishery and possession limits, seasons, and minimum sizes to control recreational landings.

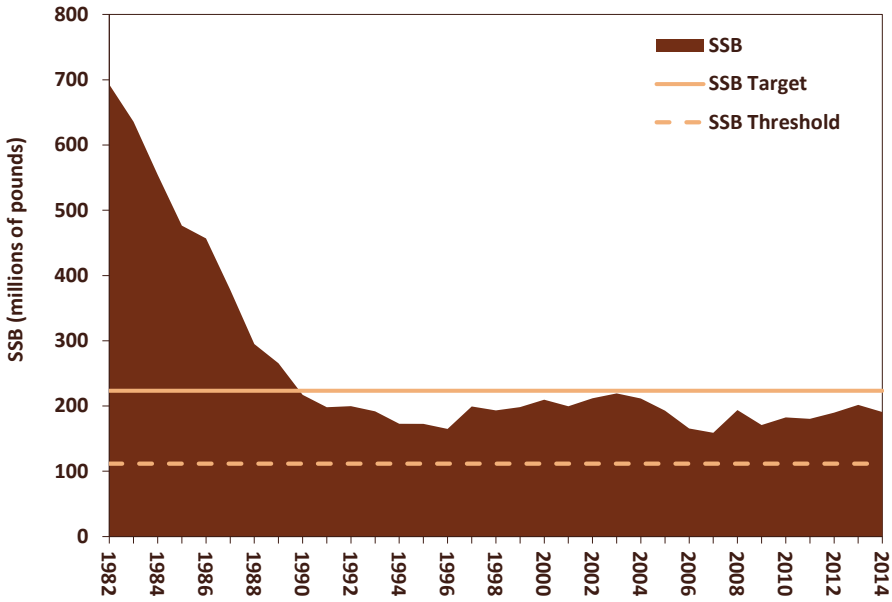
The 2015 black sea bass recreational fishery continued to be managed under regional and state-by-state approaches in order to mitigate potential disproportionate impacts to individual states that coastwide measures may cause. Since the 2014 regulations resulted in a harvest of 3.61 million pounds, approximately 1.35 million pounds over the 2014 RHL, 2015 regulations were modified to reduce harvest by 33% to achieve the 2015 RHL. The Board approved Draft Addendum XXVII for public comment to consider extending the current ad hoc regional management for recreational fisheries into 2016. Board action on final management measures is expected to occur in early 2016.

Recreational harvest peaked in 1985 at 12.35 million pounds, and then averaged 3.75 million pounds annually from 1988 to 1997. Since the implementation of recreational harvest limits in 1998, harvest has ranged from 1.1 to 4.4 million pounds from 1998-2012.

After peaking at 22 million pounds in 1952, commercial landings markedly decreased in the 1960s and have since ranged from 1.3 to 4.4 million pounds. In 1998, a quota system was incorporated into the management program and state-by-state commercial shares were introduced in 2003. Since 1998, landings have ranged from 2.86 to 3.53 million pounds, with 2014 landings estimated at 3.73 million pounds. The principal gears used in the fishery are pots, otter trawl, and handline.

The Board and MAFMC also initiated an amendment to address management strategies for commercial and recreational fisheries. Scoping for this amendment will occur in 2016. A benchmark stock assessment is underway for completion in December 2016.

Bluefish Spawning Stock Biomass (SSB)
Source: Northeast Regional Stock Assessment Workshop, 2015



Timeline of Management Actions: FMP ('80); Amendment 1 ('98); Addendum I ('12)

Bluefish

Jointly managed by the Commission and MAFMC since 1998 through state-specific quotas for the commercial fishery and a maximum possession limit to constrain the recreational fishery, bluefish were declared rebuilt in 2009. The 2015 benchmark stock assessment finds the resource to be in good condition; it is neither overfished nor experiencing overfishing relative to the biological reference points defined in the 2015 assessment. SSB is estimated at 191 million pounds, approximately 85% of its target. Fishing mortality is estimated to be 0.157, below the fishing mortality threshold (0.19). The Commission and MAFMC approved an ABC of 19.45 million pounds for the 2016 fishing season, an approximate 10% decrease from 2015 levels due to the updated SSB estimate and SSB target defined in the 2015 assessment. These changes in the SSB estimate and target are due to improvements in the assessment model. The 2016 commercial quota and recreational harvest limit will be set once final recreational harvest estimates for 2015 have been released in 2016.

Since reaching a low of 8.2 million pounds in 1999, recreational harvest has averaged approximately 15.9 million pounds annually. In 2014, anglers harvested a total of 10.5 million pounds of bluefish, a 32% decrease from 2013. Landings from the commercial fishery have been consistently lower than the recreational harvest. Commercial landings decreased from 16.5 million pounds in 1981 to 7.3 million pounds in 1999. The commercial fishery has been regulated by a quota (allocated to the States through the state shares) since implementation of Amendment 1 in 2000, and has since averaged around 6.7 million pounds annually. In 2014, landings were 4.8 million pounds, three-quarters of which were harvested in New York, New Jersey, and North Carolina.

Coastal Sharks

Sharks are a vital part of the ocean ecosystem. As apex predators, sharks reside at the top of the food chain and keep food webs in balance. Not only do they target healthy fish, but also old, sick, or slower fish in a population.

Relative to other marine fish, sharks have very low reproductive potential. The low reproductive rate is due to sharks' slow growth, late sexual maturity, one to two-year reproductive cycles, a small number of young per brood, and selective nursery areas. Frequently, the nursery areas are in highly productive coastal or estuarine waters where abundant small fish and crustaceans provide food for the growing pups. These shallow areas have fewer large predators than deeper waters, thus enhancing the chances of survival of the young sharks.

Forty species of Atlantic coastal sharks are managed cooperatively throughout their range by the Commission's Interstate Atlantic Coastal Sharks FMP and NOAA Fisheries' 2006 Consolidated Highly Migratory Species (HMS) FMP for Coastal Sharks. The Interstate FMP establishes management measures for recreational and commercial shark fisheries in state waters. The FMP, approved in 2008 and fully implemented by the states in 2010, was developed to complement federal shark management and ensure consistency between state and federal management measures.

In 2015, the Board approved a fishery opening date of January 1, 2016 and a variable possession limit, which will start at 36 fish per vessel per trip for those species within the aggregated large coastal sharks (LCS) species group (silky, tiger, blacktip, spinner, bull, lemon, nurse) and the hammerhead species group (scalloped hammerhead, great hammerhead, and smooth hammerhead sharks) for 2016. The Commission will follow NOAA Fisheries for in-season changes in the possession limit.

Stock status is assessed by species complex or by species group for species without enough data for an individual assessment. In summary, 14 species have been assessed domestically, three species have been assessed internationally, and 28 species have not yet been assessed. Most of the species that have been assessed and all of those that have not been assessed require a 'benchmark' stock assessment due to new data, changing information on stocks, and improved assessment methodologies. The accompanying table outlines the stock status of each species or species group. In 2015,

Stock Status Information by Species and Species Group

Species or Complex Name	Stock Status		References/Comments
	Overfished	Overfishing is Occurring	
Pelagic			
Porbeagle	Yes	No	Porbeagle Stock Assessment, ICCAT Standing Committee on Research and Statistics Report ('09); Rebuilding ends in 2108 (HMS Am. 2)
Blue	No	No	ICCAT Standing Committee on Research and Statistics Report ('08)
Shortfin mako	No	No	ICCAT Standing Committee on Research and Statistics Report ('12)
All other pelagic sharks	Unknown	Unknown	
Large Coastal Sharks (LCS)			
Blacktip	Unknown	Unknown	SEDAR 11 ('06)
Aggregated Large Coastal Sharks - Atlantic Region	Unknown	Unknown	SEDAR 11 ('06); difficult to assess as a species complex due to various life history characteristics/ lack of available data
Non-Blacknose Small Coastal Sharks (SCS)			
Atlantic Sharpnose	No	No	SEDAR 34 ('13)
Bonnethead	Unknown	Unknown	SEDAR 34 ('13)
Finetooth	No	No	SEDAR 13 ('07)
Hammerhead			
Scalloped	Yes	Yes	SEFSC Scientific Review ('09): Rebuilding ends in 2023 (HMS Am. 5a)
Blacknose			
Blacknose	Yes	Yes	SEDAR 21 ('10); Rebuilding ends in 2043 (HMS Am. 5a)
Smoothhound			
Smooth Dogfish	No	No	SEDAR 39 ('15)
Research			
Sandbar	Yes	No	SEDAR 21 ('10)
Prohibited			
Dusky	Yes	Yes	SEDAR 21 ('10); Rebuilding ends in 2108 (HMS Am. 2)
All other prohibited sharks	Unknown	Unknown	

the smoothhound shark complex was assessed, results indicate the two distinct stocks within the complex (smooth dogfish and Florida smoothhound) are not overfished and overfishing is not occurring.

In December 2015, the final rule for Amendment 9 to the 2006 Consolidated HMS FMP, which is specific to smoothhound sharks, was released. The Amendment brings smoothhound sharks (which in the Atlantic means smooth dogfish) under federal management effective March 15, 2016. Since this action initiates a commercial quota, the Commission will implement the allocation of smooth dogfish state shares as described in Addendum II of the FMP.

Commercial LCS landings in 2014 were approximately 503,594 pounds dressed weight (dw), a 14% increase from 2013, while landings of SCS species in 2014 were approximately 269,252 pounds dw, a 3% increase from 2013. Total U.S. landings of Atlantic pelagic species of sharks were 358,549 pounds dw in 2014, a 49% increase from 2013, which is largely attributed to increased thresher shark landings as well as blue, porbeagle and shortfin mako.

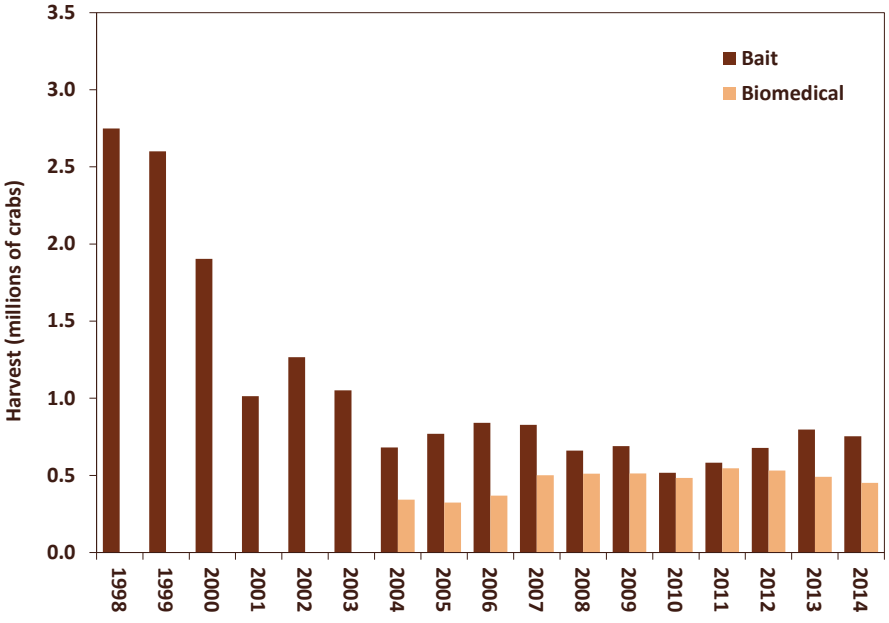
Approximately 102,000 sharks were harvested during the 2014 recreational fishing season in the Atlantic region, compared to 70,000 and 44,007 sharks in the 2013 and 2014 season. The SCS complex largely dominates the recreational fishery for sharks. In 2014, approximately 91,627 fish from the SCS complex were recreationally harvested, which represents the largest harvest over a six-year timeframe (2009-2014). Sharpnose sharks represents 61 percent of the 2014 SCS harvest. The LCS complex, including hammerheads, had 10,785 fish harvested in 2014.

Horseshoe Crab

With its eggs playing an important ecological role in the food web of migrating shorebirds, horseshoe crab is the first Commission managed species to incorporate ecosystem principles into its management program. The Delaware Bay not only supports the largest spawning population in the world, it is also the largest staging area for shorebirds in the Atlantic Flyway, with an estimated 425,000 to one million migratory shorebirds converging on the Delaware Bay to feed and rebuild energy reserves prior to completing their northward migration.

To address this food web dynamic, the species is managed under the Adaptive Resource Management (ARM) Framework, which incorporates both shorebird and horseshoe abundance levels into the horseshoe crab specifications for

Horseshoe Crab Bait Landings and Biomedical Harvest
Source: ASMFC State Reports, 2015



Note: 2014 harvest numbers for both bait and biomedical are preliminary

Please note the following details regarding biomedical harvest numbers:

- Harvest numbers include all horseshoe crabs brought to bleeding facilities, including those that were harvested as bait and counted against state quotas.
- Most of the biomedical crabs harvested are returned to the water after bleeding; a 15% mortality rate is estimated for all bled crabs.

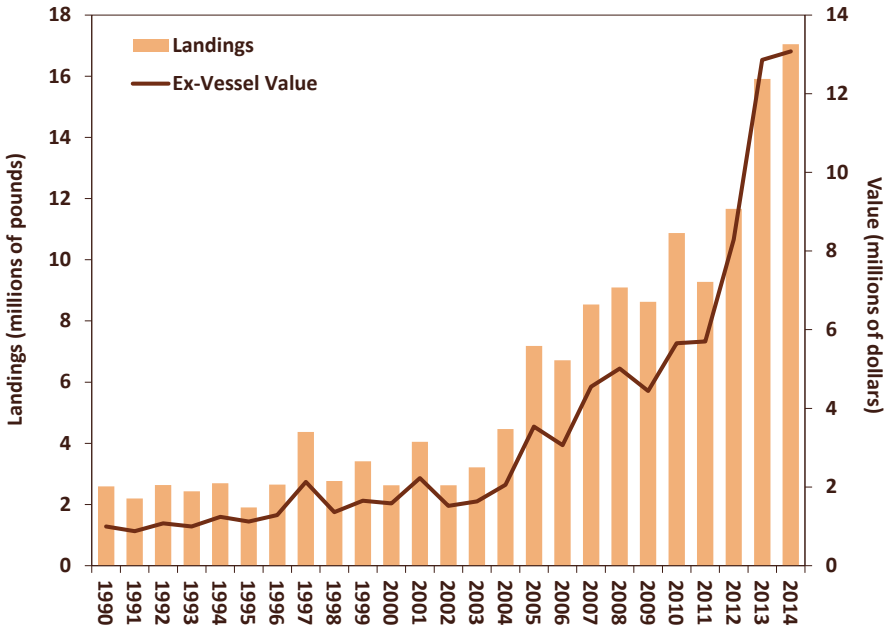
Timeline of Management Actions: FMP ('99); Addendum I ('00); Addendum II ('01); Addendum III ('04); Addendum IV ('06); Addendum V ('08); Addendum VI ('10); Addendum VII ('12)

the Delaware Bay states. Red knots, the shorebird that most relies on horseshoe crab eggs for food, was listed as threatened under the ESA in 2014. The ARM Framework was cited as one of the main reasons the species was not listed as endangered (due to adequate management in place). Funding for surveys that contribute abundance data on horseshoe crabs for us in the ARM Framework has been inconsistent in recent years. The Commission has secured funding for 2016 and will continue working with state and federal partners to secure long-term funding for this important survey.

For the 2015 and 2016 fishing seasons, harvest in the Delaware Bay area was limited to 500,000 male horseshoe crab. The ARM Framework will be evaluated in 2016 with particular attention paid to the recent change to red knots' status as threatened under the ESA, current monitoring programs, and model configuration based on the recommendation of the ARM Subcommittee and Horseshoe Crab Technical Committee. Horseshoe crab are also valuable to the conch and American eel fisheries and the pharmaceutical industry. A chemical in the horseshoe crab tissue makes it an ideal bait to catch conch and eel. Horseshoe crab blood is used by the biomedical industry to produce Limulus Amoebocyte Lysate, an important tool in the detection of contaminants in patients, drugs, and medical supplies.

Reported coastwide bait landings in 2014 remained well below the coastwide quota at 729,869 crabs. Biomedical harvest in 2014 was estimated at 452,014 crabs, with 15% of those harvested assumed to die as part of the harvesting and post-bleeding release process. As required by the FMP, bled crabs are returned to the water from where they were harvested except in some states where bled crabs are sold to the bait industry to minimize the impact on the population.

Jonah Crab Landings and Value
Source: NMFS Fisheries Statistics Division, 2015



Jonah Crab

In August 2015, the Commission approved the Interstate FMP for Jonah Crab. The FMP seeks to cap effort and protect spawning stock biomass in the absence of a range-wide stock assessment. The Plan was initiated in response to concern about increasing targeted fishing pressure for Jonah crab, which has long been considered a bycatch in the American lobster fishery. Since the early 2000s, landings of Jonah crab have increased 650% creating a mixed crustacean fishery that can target lobster or crab at different times of the year based on slight legal modifications to the gear and small shifts in the areas in which traps are fished. This rapid and recent increase in demand can be attributed to an increase in the price of other crabs (such as Dungeness), creating a substitute market for Jonah crab, as well as a decrease in the abundance of lobster in Southern New England, causing fishermen to supplement their income with Jonah crab. In response to this growing demand, the Commission approved an FMP for Jonah crab to support the implementation of a unified coastal management program which promotes the conservation and full

utilization of the Jonah crab resource. The FMP establishes commercial, recreational, and fishery-dependent monitoring measures for the Jonah crab fishery. The Plan limits participation in the trap fishery to only those vessels and permit holders that already hold an American lobster permit or can prove prior participation in the crab fishery. All other harvesters using nontrap gear must obtain an incidental permit. It also establishes a 4.75" coastwide minimum size and requires the landing of whole crab, except individuals from New Jersey, Delaware, Maryland, and Virginia who can prove a history of claw landings before June 2, 2015. The Plan also establishes a nontrap incidental bycatch limit of 200 crab per calendar day, 500 crab per trip for trips three days or longer, and prohibits the retention of egg-bearing females. For fishery-dependent sampling, the plan requires 100% harvester reporting and 100% dealer reporting with port and sea sampling. Jurisdictions that currently require less than 100% harvester reporter are required to, at a minimum, maintain their current programs and extend them to Jonah crab. In the recreational sector, the FMP establishes a possession limit of 50 whole crabs per person per day. Finally, the FMP specifies that states whose commercial landings are less than 1% of the three-year coastwide average may qualify for *de minimis* status. *De minimis* states are not required to implement fishery-independent or port/sea sampling.

In November 2015, the American Lobster Management Board discussed three aspects of the Jonah Crab FMP: effort control measures for Jonah crab only trap fishermen; claw exemptions; and the incidental bycatch limit for non-trap gear. In order to understand the scale of the Jonah crab only trap fishery, the Board tasked the Plan Development Team (PDT) to examine catch and landings records to characterize participants in this segment of the fishery. Similarly, the PDT was asked to review Jonah crab claw landings given the number of claw fishermen is greater than expected and the current claw exemption may no longer be appropriate.

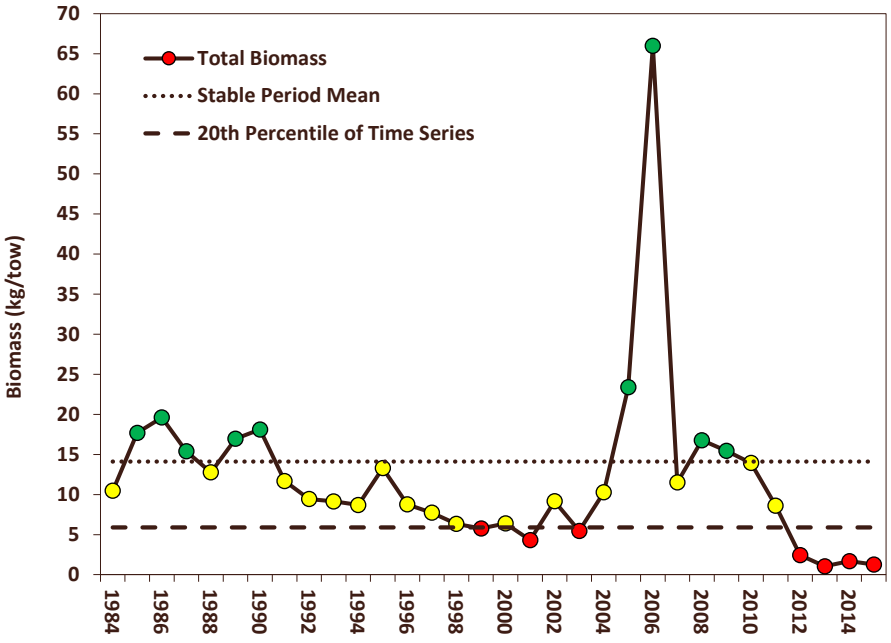
Finally, in response to concerns that the incidental bycatch limit does not capture all current participants in the fishery, the Board initiated Draft Addendum I to consider changes to the incidental bycatch limit for non-trap gear. Data submitted by the NEFMC and NOAA Fisheries illustrated that while 97-99% of trips from 2010 through 2014 were within the current limit, there were a number of trips above the limit. Given a goal of the Jonah Crab FMP is to prevent expansion of the fishery while including all current participants, the Board initiated an addendum to consider altering the incidental bycatch limit with options to increase the limit to 1,000 crab per trip or eliminate the bycatch limit for non-trap gear. Draft Addendum I will be presented to the Board in February 2016. If approved, the Board will release the Draft Addendum for public comment and consider its final approval in May 2016.

Northern Shrimp

In response to the depleted condition of the northern shrimp resource, the Northern Shrimp Section extended the moratorium on commercial fishing for the 2016 fishing season, continuing the closure of the fishery which began in 2014. The 2015 Stock Status Report for GOM Northern Shrimp indicates abundance and biomass indices for 2012 to 2015 were the lowest on record of the 32-year time series. Recruitment indices for the 2010 to 2014 year classes were also well below average, and included the three smallest year classes on record. As a result, the

Total Biomass of Northern Shrimp from the Gulf of Maine Northern Shrimp Trawl Survey

Source: Stock Status Report for Gulf of Maine Northern Shrimp, 2015



The graph represents the annual biomass index relative to the reference period (dotted line) and to the 20th percentile of the time series (dashed line). The reference period (1985-1994) is the time period during which the fishery experienced stable landings and value. Green dots are values that are equal to or above the stable period mean (SPM); red dots are values that are equal to or below the 20th percentile of the time series; yellow dots are values between the SPM and the 20th percentile.

Timeline of Management Actions: FMP ('86); Amendment 1 ('04); Amendment 2 ('11); Addendum I ('12)

index of current fishable biomass is the lowest on record. The recruitment index increased slightly in the 2014 survey, however in 2015, the index dropped to the lowest in the time series. Recruits from the 2013 and 2014 year classes are not expected to reach exploitable size until 2017 and 2018, respectively. Despite the marginal increase in the recruitment index in 2014, the population continues to meet the criteria defining a collapsed stock.

In an effort to maintain the time series of data collected from northern shrimp commercial fishery catches in the absence of an open season, a cooperative winter sampling program was implemented beginning in 2015 and for continuation in 2016. The goal of the program is to continue the winter time series of biological data (e.g. size composition, egg hatch timing) collected from GOM northern shrimp fishery catches when a moratorium is in place. For 2016, the Section approved a 22mt research set aside quota for the program. Four trawl vessels will be contracted to fish four regions with a maximum trip limit of 1,800 pounds, and two trappers with a weekly trap limit of 40 traps and a 600 pound per week limit. Participating trawlers and trappers will be able to sell their catch. Trawlers will also be compensated $500/trip. The states have issued a solicitation for participants. Participants will be selected by early January to allow for sampling to begin in mid-January.

Recruitment of northern shrimp is related to both spawning biomass and ocean temperatures, with higher spawning biomass and colder temperatures producing stronger recruitment. Ocean temperatures in western Gulf of Maine shrimp habitat have increased over the past decade and reached unprecedented highs in the past several years. While 2014 and 2015 temperatures were cooler, temperatures are predicted to continue rising as a result of climate change. This suggests an increasingly inhospitable environment for northern shrimp and the need for strong conservation efforts to help restore the stock.

Since the implementation of Amendment 2, the GOM northern shrimp fishery and population has experienced significant changes. Also, there have been substantial changes in other Northeast fisheries resulting in increased effort in the northern shrimp fishery. This increased fishing pressure, paired with failed recruitment, the lowest abundance indices on record, and unfavorable environmental conditions, has resulted in uncertainties in the future of the resource. To address these uncertainties, the Section initiated development of Draft Amendment 3 which considers management measures to control effort and stabilize the fishery. The Public Information Document for Draft Amendment 3 sought public comment on the direction of the northern shrimp fishery in 2015. Based on public comment and the Advisory Panel's recommendations, the Section directed the PDT to develop limited entry and state-by-state allocation programs for consideration in Draft Amendment 3. However, given the collapsed status of the stock and the fact that the fishery is under a moratorium, the Section postponed further action on Draft Amendment 3 to allow for the continued development of options to address over-capacity in the fishery.

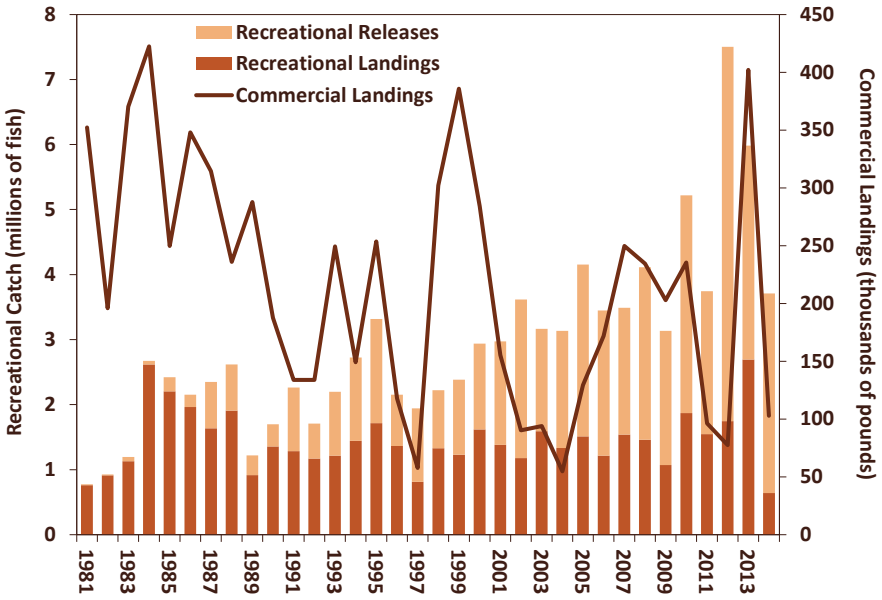
Red Drum

Red drum are one of the most recreationally sought-after fish throughout the South Atlantic. Juveniles are most abundant in estuarine waters and inlets, while fish older than age four inhabit deeper waters. As a result, the fishery is primarily nearshore with small red drum targeted in shallow waters and large trophy fish targeted along the Mid- and South Atlantic barrier islands. The 2014 recreational landings of 2.34 million pounds was well above the ten year average of 1.7 million pounds. Florida anglers landed the largest share of recreational harvest in numbers (43%) followed by North Carolina (18%).

The commercial fishery is largely dominated by North Carolina, which was responsible for 88% of commercial harvest in 2014. Commercial landings have declined since the 1980s. In 2014, coastwide

Red Drum Commercial Landings and Recreational Catch

Source: NMFS Fisheries Statistics Division, 2015



Timeline of Management Actions: FMP ('84); Amendment 1 ('91); and Amendment 2 ('02); Addendum I ('13)

commercial landings were roughly 103,000 pounds, a nearly 300,000 pound decrease from 2013.

Throughout 2015, the Red Drum Stock Assessment Subcommittee (SAS) worked on a new benchmark stock assessment for red drum. A primary goal of the assessment was to provide greater clarity as to the status of the stock's northern and southern components. While the previous assessment was able to determine that overfishing was not occurring, it was not able to determine whether either stock component was overfished. To this end, SAS decided to develop a new stock synthesis model (SS3) for red drum. SS3 was chosen because it allows for the incorporation of additional data which can provide a reliable estimate of fishing mortality and biomass for both the northern and southern stocks.

During the transition to SS3, the SAS encountered several challenges in developing a model to estimate plausible stock conditions and dynamics. A specific concern was the lack of stability in both the northern and southern models. Given that these issues persisted after the assessment workshop in June, the SAS determined the most beneficial function of the Review Workshop was to draw from the Peer Review Panel's experience to make model improvements during and following the workshop.

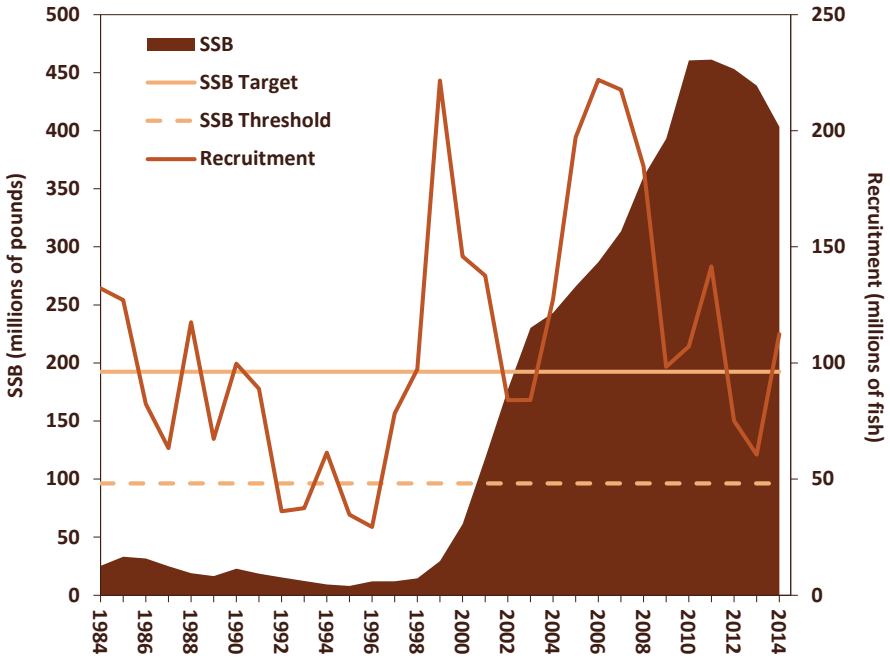
The SEDAR 44 workshop was a collaborative effort focusing on model development, where panelists reviewed the assessment work to date and provided constructive comments on modifications to SS3 for both the southern and northern stock models. SAS continued work on the stock assessment following the Review Workshop and was able to make significant improvements to the model. Work by the SAS will be completed and reviewed in 2016.

Red drum are managed through Amendment 2 to the Interstate FMP. The Amendment requires states to implement recreational creel and size limits to achieve the fishing mortality target, including a maximum size limit of 27". It also requires states to maintain their existing commercial regulations. A harvest moratorium and Presidential Executive Order enacted in 2007 prevents any harvest or sale of red drum from federal waters.

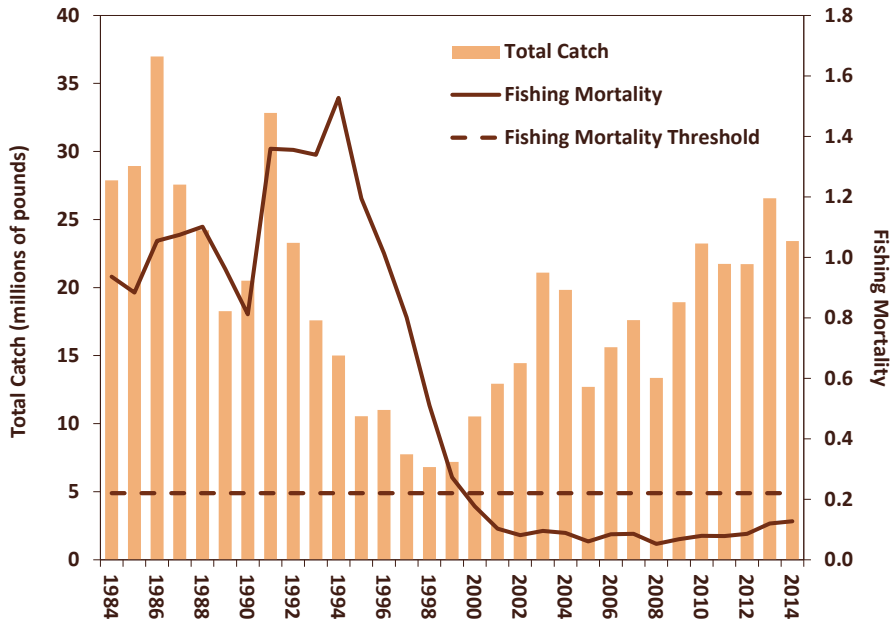
Scup

Scup are one of four species jointly managed by the Commission and MAFMC. Scup are considered rebuilt and not experiencing overfishing. The 2015 scup benchmark stock assessment estimates SSB at 403 million pounds, about two times the SSB target of 192 million pounds. Fishing mortality on age 3 fish and older in 2014 was estimated at 0.127, below the new fishing mortality

Scup Spawning Stock Biomass & Recruitment
Source: Northeast Regional Stock Assessment Workshop, 2015



Scup Total Catch and Fishing Mortality
Source: Northeast Regional Stock Assessment Workshop, 2015



Timeline of Management Actions: FMP ('96); Amendment 13 ('02); Addendum IX ('03); Addenda XI & XIII ('04); Addendum XVI ('05); Amendment 14 ('07); Addendum XX ('09)

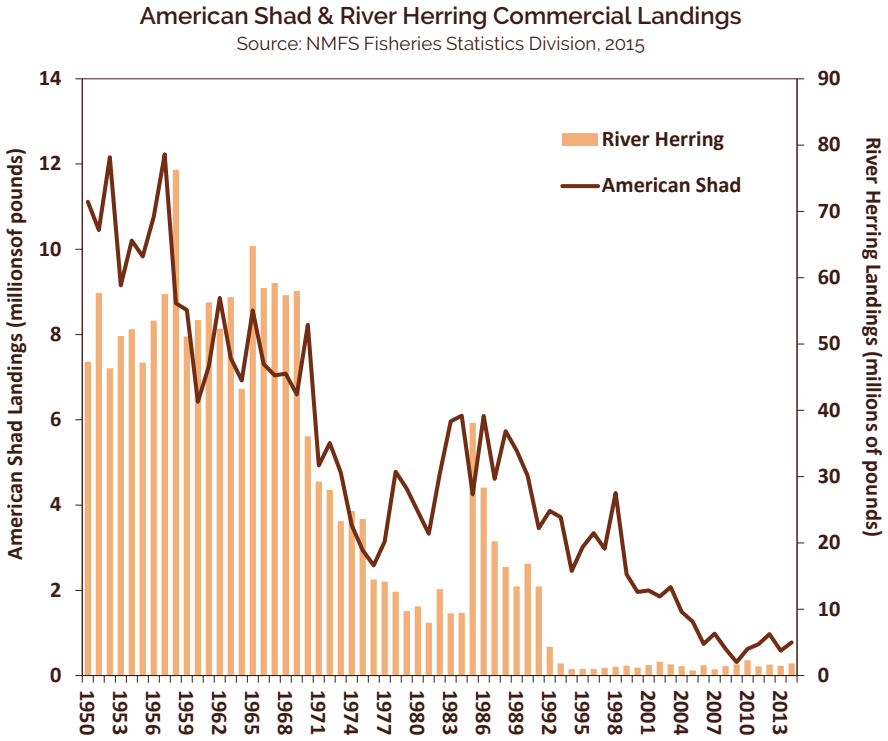
threshold of 0.22. Following two years of below average recruitment in 2012 and 2013, the 2014 year class is estimated to be above average at 112 million age 0 fish. Using these findings and 2014 landings, both the Commission and MAFMC set the commercial quota at 20.47 million pounds and the RHL at 6.09 million pounds for the 2016 fishery. This represents a decrease from 2015 levels due to a slight decrease in the SSB.

For decades, scup have been eagerly pursued by commercial, recreational, and subsistence fishermen throughout SNE and the Mid-Atlantic, largely due to their fine flavor and avid pursuit of baited hooks. A migratory schooling species found on the continental shelf of the Northwest Atlantic, scup commonly inhabit waters from Cape Cod, Massachusetts to Cape Hatteras, North Carolina, with area-specific abundance largely influenced by water temperature.

The scup resource is currently allocated 78%/22% to the commercial and recreational fisheries, respectively. Commercial landings peaked in 1960 at 48.5 million pounds. In recent years, landings have fluctuated from 15.6 million pounds in 1991 to a time series low of 2.7 million pounds in 2000. The commercial fishery landed 15.8 million pounds in 2014. For the past several years, Rhode Island and New Jersey have harvested the largest share of the commercial landings. Scup are primarily caught in otter trawls but are also caught using floating fish traps and hand lines. Recreational landings declined steadily from 11.6 million pounds in 1986 to 0.9 million pounds in 1998, the lowest value in the time series. In 2014, recreational anglers harvested 4.4 million pounds, with the majority of harvest occurring in Massachusetts, New York, Rhode Island, and Connecticut.

Shad & River Herring

With the passage and implementation of Amendments 2 and 3 to the Shad and River Herring FMP, the Commission and its member states affirmed their commitment to the rebuilding of American shad and river herring populations along the coast. Both Amendments require states and jurisdictions to close their shad and river herring fisheries unless they develop and implement sustainable fishery management plans (SFMPs). Plans must clearly demonstrate that the state's or jurisdiction's shad and river herring fisheries will not diminish the potential future stock reproduction and recruitment



Timeline of Management Actions: FMP ('85); Amendment 1 ('95); Amendment 2 – River Herring ('09); Amendment 3 – American Shad ('10)

through the development of sustainability targets which must be monitored, achieved, and maintained.

The Commission also continues to collaborate with NEFMC and MAFMC to address the bycatch of these species in federal fisheries. In 2015, NEFMC increased the catch cap for shad and river herring in the Atlantic herring fishery from 687,960 pounds to 796,005 pounds. In 2015, the MAFMC lowered the bycatch cap from 520,380 pounds to 196,245 pounds in the Atlantic mackerel fishery. For 2016, the bycatch cap will be lowered from 196,245 pounds to 180,810 pounds.

Benchmark assessments or assessment updates for American shad and river herring will be conducted by 2018.

American Shad

American shad stocks are currently at all-time lows and do not appear to be recovering. The primary causes for the continued stock declines are a combination of excessive total mortality, habitat loss and degradation, and migration and habitat access impediments. Although improvement has been seen in a few stocks, many remain severely depressed compared to historic levels. Coastwide landings for American shad were 776,586 pounds in 2014, up from 583,076 pounds in 2013.

The following states/jurisdictions are operating under approved SFMPs for American shad: Connecticut, the Delaware River Basin Fish and Wildlife Management Cooperative (representing New York, New Jersey, Delaware, and Pennsylvania), the Potomac River Fisheries Commission, North Carolina, South Carolina, Georgia, and Florida. The remaining states with no SFMPs maintained closures of their shad fisheries in 2015.

River Herring

In 2015, the River Herring Technical Expert Working Group (TEWG), a group of scientists, industry representatives, conservation groups, tribal leaders, and government officials with expertise in river herring conservation, convened to provide input and information on the River Herring Conservation Plan. The Plan, which was released by the Commission and NOAA Fisheries in May 2015, seeks to increase public awareness about river herring, alewife (*Alosa pseudoharengus*) and blueback herring (*A. aestivalis*), and foster cooperative research and conservation efforts to restore river herring along the Atlantic coast. The Plan is meant to be dynamic and will be refined over time with public input. It builds upon past and current river herring conservation projects, and coordinates ongoing activities.

The Plan pursues the following goals:

- Increase coordination of river herring data collection, research, and conservation

- Identify and undertake key research projects related to assessment and conservation
- Identify any further conservation actions to address threats
- Cultivate and engage research groups to address key topics in protecting or restoring herring populations
- Identify funding sources and secure funds for river herring research and conservation
- Improve information to be used in conservation efforts and incorporated into the next assessment
- Increase public outreach about river herring and the need for addressing impacts to these resources

The Plan can be found online at *www.greateratlantic.fisheries.noaa.gov/protected/riverherring/conserv/index.html.*

As part of their joint conservation efforts, the Commission and NOAA Fisheries also awarded funding for two research projects to provide insights into what is happening to river herring when they are at sea and in their riverine nursery and spawning areas. The projects will also help to fill in critical gaps in our understanding of the status of river herring populations.

The 2012 benchmark stock assessment found of the 52 stocks of alewife and blueback herring for which data were available for use in the assessment, 23 were depleted relative to historic levels, one stock was increasing, and the status of 28 stocks could not be determined because the time-series of available data was too short. Estimates of abundance and fishing mortality could not be developed because of the lack of adequate data. The depleted determination was used instead of overfished because of the many factors that have contributed to the declining abundance of river herring, which include not just directed and incidental fishing, but also habitat loss, barriers to migration, predation, and climate change.

In order to improve future stock assessments, the benchmark assessment placed as a high priority the standardization of river herring data collection methods and datasets. To begin to address this need, the Commission conducted a River Herring Data Collection Standardization Workshop in 2015. The Workshop brought together researchers from state and federal marine fishery agencies, Tribal Nations, and Canada Department of Fisheries and Oceans to evaluate current fishery-independent surveys for river herring and develop recommendations to standardize survey methodologies, as well as data collected by these surveys for use in future stock assessments. Workshop participants also considered some fishery-dependent sampling that collect river herring along the Atlantic coast. The report of recommendations regarding survey design, data collection, and considerations will be made available on the Commission and NOAA TEWG websites in early 2016.

Approved River Herring SFMPs remained in effect for the states of Maine, New Hampshire, New York, North Carolina, and South Carolina. The remaining states and jurisdictions closed their commercial and recreational fisheries starting in 2012. In 2014, 1.8 million pounds of river herring were landed in states with SFMPs.

Status of Select Alewife and Blueback Herring Stocks along the Atlantic Coast

Source: ASMFC River Herring Benchmark Assessment, 2012

State	River	Status Relative to Historic Levels/Recent Trends
ME	Damariscotta	Depleted[A], Stable[A]
	Union	Increasing[A], Stable[A]
NH	Cocheco	Unknown[A,B], Stable[A,B]
	Exeter	Depleted[A], Increasing[A]
	Lamprey	Depleted[A], Increasing[A]
	Oyster	Depleted[B], Decreasing[B]
	Taylor	Depleted[B], Decreasing[B]
	Winnicut	Depleted[A,B], Unknown[A,B]
MA	Mattapoisett	Depleted[A], Unknown[A]
	Monument	Depleted[A], Unknown[A]
	Parker	Depleted[A], Unknown[A]
	Stony Brook	Depleted[A], Unknown[A]
RI	Buckeye	Depleted[A], Unknown[A]
	Gilbert	Depleted[A], Decreasing[A]
	Nonquit	Depleted[A], Decreasing[A]
CT	Connecticut	Depleted[B], Decreasing[B]
NY	Hudson	Depleted[A,B], Stable[A,B]
MD, DE	Nanticoke	Depleted[A,B], Decreasing[A,B]
VA, MD, DC	Potomac	Depleted[A,B], Unknown[A,B]
NC	Chowan	Depleted[A,B], Stable[A,B]
SC	Santee-Cooper	Depleted[B], Increasing[B]

Status relative to historic levels is pre-1970. Recent trends reflect the last ten years of data. A= alewife only; B = blueback herring only; A,B = alewife and blueback herring by species

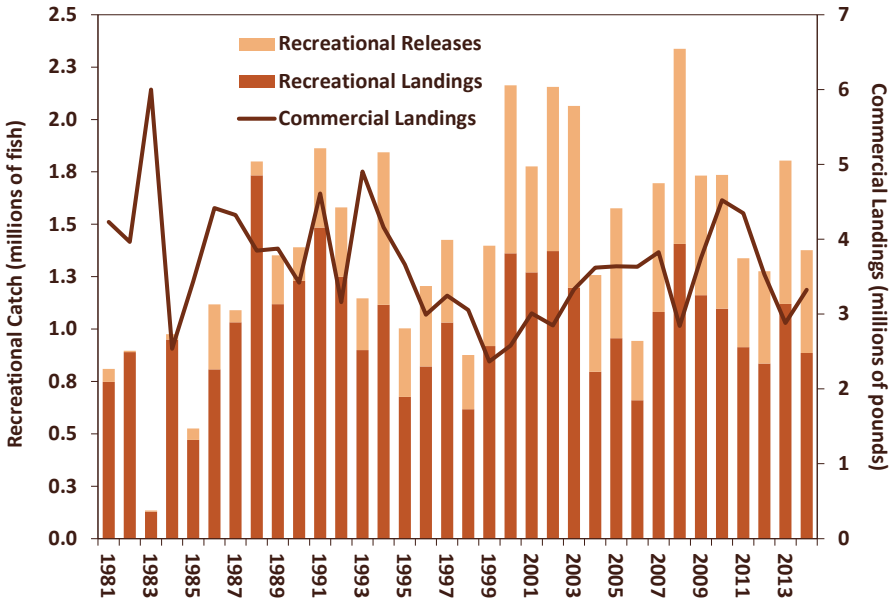
Spanish Mackerel

Spanish mackerel are an important recreational and commercial fishery in South Atlantic waters. Cooperative management by the Commission and the South Atlantic Fishery Management Council (SAFMC) has successfully rebuilt Spanish mackerel stocks after years of overfishing. The latest benchmark stock assessment, conducted in 2012, indicates Spanish mackerel are not overfished and not experiencing overfishing.

Total 2014 landings were 4.4 million pounds, with commercial and recreational fisheries harvesting approximately 70% and 30% of the resource, respectively.

Spanish Mackerel Commercial Landings and Recreational Catch (Landings and Releases)

Source: ACCSP Data Warehouse and NMFS Fisheries Statistics Division, 2015



Timeline of Management Actions: FMP ('90); Omnibus Amendment ('11); Addendum I ('13)

Coastwide commercial landings have been consistently below four million pounds since 1995, with the exception of 2010 and 2011 when commercial landings increased to over 4.3 million pounds. 2014 commercial landings are estimated at 3.72 million pounds. Over two-thirds of the landings occur in Florida, with the remaining amount harvested in North Carolina.

Recreational anglers harvested approximately 886,000 Spanish mackerel (1.14 million pounds) in 2014. The number of recreationally-harvested fish appears to show a cyclical trend, with low harvests in the early to mid-1980s and mid- to late 1990s, interspersed with higher harvests. Florida (43%) and North Carolina (45%) continue to account for the majority of recreational landings. The number of recreational releases has generally increased over time with 490,000 fish released in 2014.

In 2015, the South Atlantic Board extended the provisions of Addendum I for the 2015 and 2016 fishing years. This Addendum allows states to use a reduced minimum size of 11.5" in the commercial pound net fishery for the months of July through September. The measure is intended to reduce waste of these shorter fish, which are discarded dead in the summer months, by converting them to landed fish that will be counted against the quota. North Carolina, the only state to implement the Addendum thus far, will provide annual reports to the Board on Spanish mackerel catch in the pound net fishery.

Spiny Dogfish

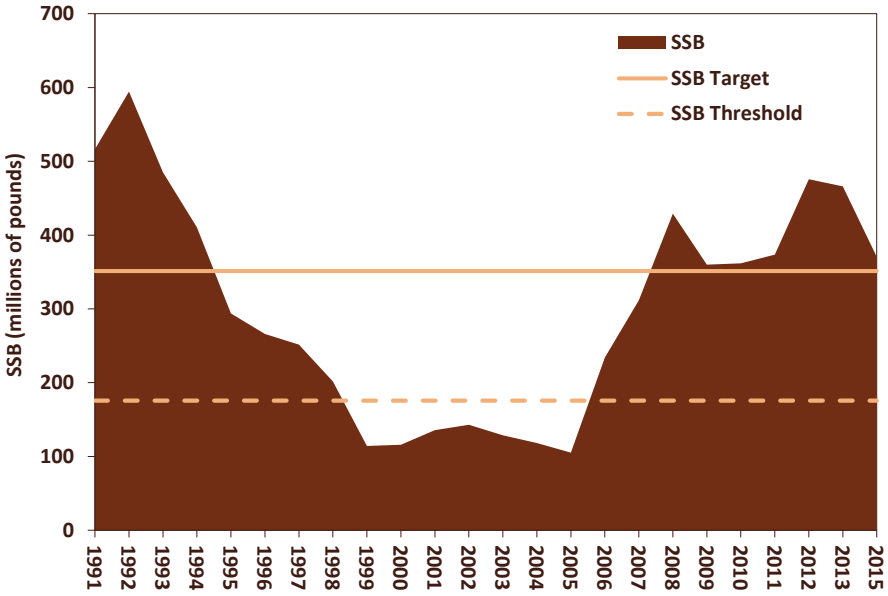
Spiny dogfish is a coastal shark with populations on the continental shelves of northern and southern temperate zones throughout the world. It is the most abundant shark in the Western North Atlantic and ranges from Labrador to Florida, but is prevalent from Nova Scotia to Cape Hatteras, North Carolina. Its major migrations on the Northwest Atlantic shelf are north and south, but it also migrates inshore and offshore seasonally in response to changes in water temperature.

The species is known for its relentless pursuit of prey. The name "dogfish" stems from the species' habit of feeding in packs. Juvenile spiny dogfish school by size until sexually mature and then aggregate by both size and sex. As the name suggests, the species has sharp, venomous spines in front of each dorsal fin.

Historically, the resource has been in demand as a food item on the international market, predominantly

Spiny Dogfish Spawning Stock Biomass (SSB) (>=80 cm)

Source: NEFSC Update on the Status of Spiny Dogfish in 2015 and Projected Harvests at the FMSY Proxy and PSTAR of 40%



Note: 2014 data unavailable due to incomplete survey.

Timeline of Management Actions: Emergency Action ('00); FMP ('03); Addendum I ('05); Addendum II ('08); Addendum III ('11); Addendum IV ('12)

in Europe. However, a downward shift in international market demand has motivated spiny dogfish fishermen and processors to work on creating a domestic market for the species. The limited markets for the species is not a related to abundance or availability—the resource has been rebuilt since 2008.

The Commission and MAFMC have jointly managed spiny dogfish since 2000. The revised 2015 stock assessment update indicates spiny dogfish are not overfished and not experiencing overfishing. Spawning stock biomass is estimated to be at 106% of the target. The assessment time period is 2013-2015, however the survey data from 2014 was not included in the 2015 update due to a mechanical breakdown in the Northeast Fisheries Science Center (NEFSC) trawl survey. In order to overcome the 2014 data gap, the MAFMC's Science and Statistical Committee applied a Kalman Filter for the update. This was the best approach because it provided the most stable estimates of survey abundance and hence catch advice.

The spiny dogfish fishing season is from May 1 through April 30. Landings have been half of the commercial quota for the last two full fishing years and appear to be on a similar trajectory for the 2015-2016 fishing year, which has a commercial quota of 50.6 million pounds. In recent years, the maximum possession limit has been 5,000 pounds per day for the northern states (Maine through Connecticut) and state-specific trip limits for the southern states.

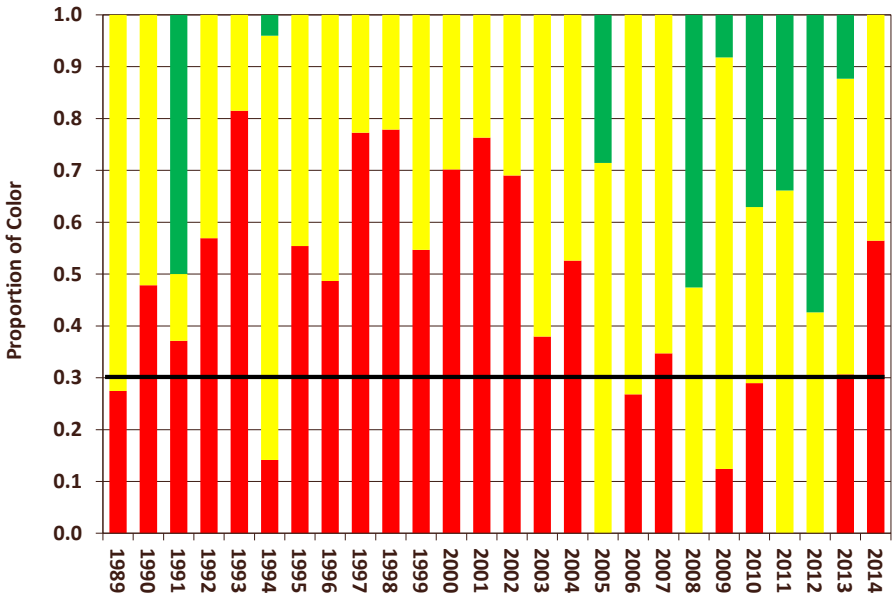
Spot

Spot is one of 275 sciaenid species worldwide. The Commission manages six sciaenid species, which are commonly called drums, croakers, or hardheads for the repetitive throbbing or drumming sounds they produce. Spot occur along the U.S. Atlantic coast in estuarine and coastal waters and are most abundant from the Chesapeake Bay to South Carolina. They are an important forage species for predators such as Atlantic striped bass, weakfish, summer flounder, bluefish, and sharks. They are also an excellent food and sport fish, supporting recreational and commercial fisheries in the Mid- and South Atlantic.

In 2015, the South Atlantic Board initiated the first coastwide

Traffic Light Analysis of Spot Fishery-independent Survey Indices (Abundance Metric)

Solid line represents 30% threshold

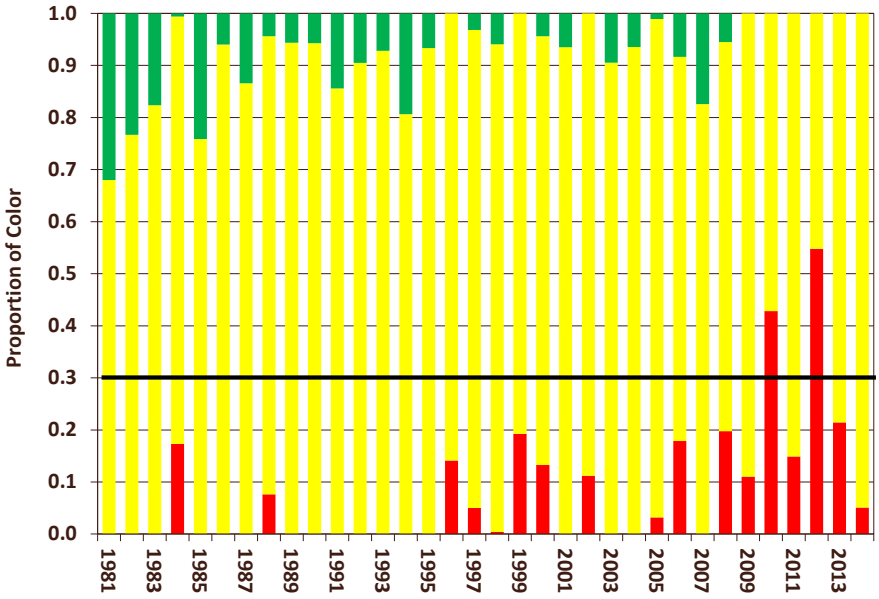


Management response is triggered when proportion of red exceeds the 30% threshold level for two consecutive years in both fishery characteristics (landings and fishery-independent survey indices).

Timeline of Management Actions: FMP ('87); Omnibus Amendment ('11); Addendum I ('14)

Traffic Light Analysis of Spot Commercial and Recreational Harvest (Harvest Metric)

Solid line represents 30% threshold



benchmark stock assessment for spot. The stock assessment seeks to estimate population parameters (e.g., stock status, natural mortality, discard rates and mortality) and biological reference points. A data workshop was held in September 2015 and the assessment is scheduled for completion in late 2016.

In order to evaluate the status of the stock in between stock assessments, the South Atlantic Board reviewed the TLA for spot. Established under Addendum I, the TLA is a precautionary management framework which evaluates fishery trends and develops management actions. The name comes from assigning a color (red, yellow, or green) to categorize relative levels of population indicators. When a population characteristic improves, the proportion of green in the given year increases. Harvest and abundance thresholds of 30% and 60% (proportion of red) were established in Addendum I, representing moderate and significant concern for the fishery. The TLA improves the management approach as it illustrates long-term trends in the stock and includes specific management recommendations in response to declines in the stock or fishery.

The TLA showed a significant decrease in spot harvest in both the commercial and recreational sectors. Data from fishery-independent surveys also showed a decrease in the abundance of spot coastwide. Reviewing 2014 data, management measures were not tripped in 2015 since the abundance index was just below the management threshold; however, the TLA does show a declining trend in the fishery which warrants close monitoring in the future.

Total landings in 2014 were 8.37 million pounds, with 65% harvested by the commercial sector and 35% by the recreational fishery. Commercial harvest in 2014 was estimated at 5.4 million pounds, a two million pound increase from 2013. Small spot are also a major component of the bycatch in haul seine and pound net fisheries in Chesapeake Bay and North Carolina, as well as a significant part of the bycatch of the South Atlantic shrimp trawl fishery. However, substantial reductions in the magnitude of bycatch have occurred in the latter fishery in recent years.

For the past three decades, recreational harvest along the Atlantic coast has varied between 1.7 and 6.9 million pounds. In 2014, recreational harvest was 2.9 million pounds.

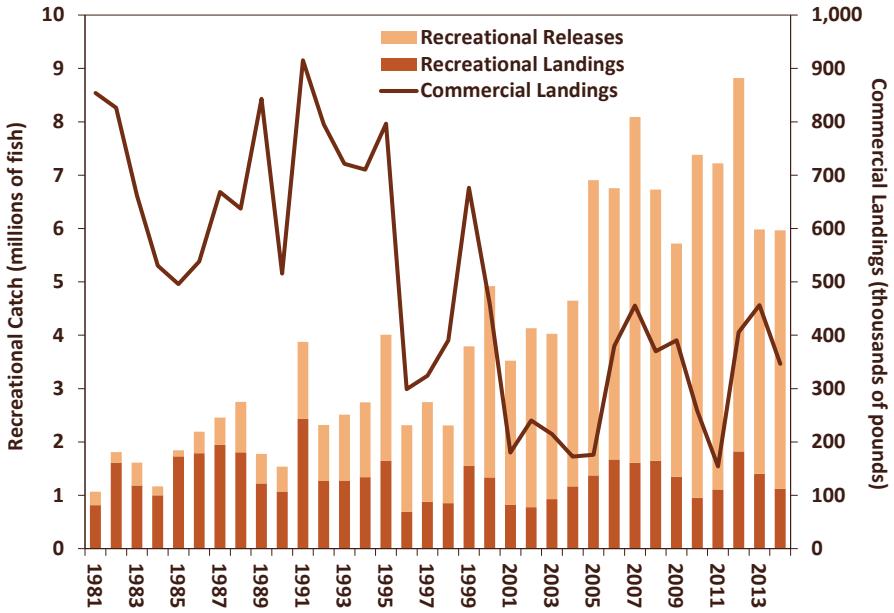
Spotted Seatrout

Spotted seatrout, a member of the drum family, are managed under the Commission's Omnibus Amendment for Spot, Spotted Seatrout, and Spanish Mackerel, which includes recommended measures to protect the spawning stock, as well as a required coast-wide minimum size of 12".

A coastwide stock assessment for spotted seatrout has not been conducted given the largely non-migratory nature of the species and the lack of data on migration where it does occur. Instead, states conduct their own age-structured analyses of local stocks. These regional

Spotted Seatrout Recreational Catch & Commercial Landings

Source: NMFS Fisheries Statistics Division, 2015



Timeline of Management Actions: FMP ('85); Amendment 1 ('91); Omnibus Amendment ('11)

assessments are important given that spotted seatrout are susceptible to inshore events such as winter freezes, excessive fresh water, hurricanes, and red tide conditions.

Over the past three decades, recreational catch (kept and released fish) has shown a strong upward trend, increasing from 1.8 million fish in 1982 to a peak of 8.8 million fish in 2012. Recreational catch in 2014 was 5.9 million fish. In contrast, recreational harvest (kept fish) has remained relatively stable throughout the times series with an average of 1.3 million fish. This is due, in part, to recreational size and creel limits as well as the encouragement of catch and releases practices. In 2014, nearly 81% of recreational catch was released.

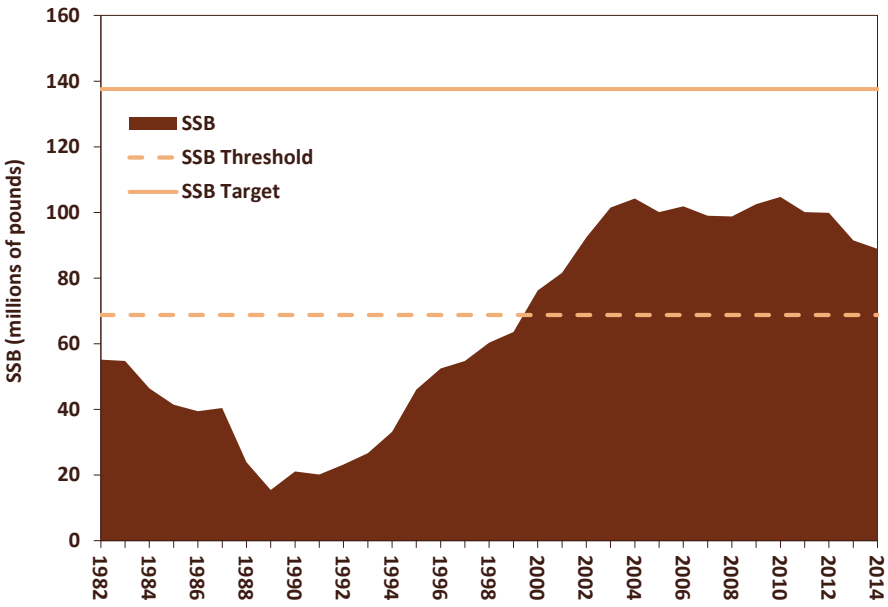
Summer Flounder

Jointly managed by the Commission and MAFMC for more than two decades, the summer flounder population was declared rebuilt in 2012. The latest stock assessment update (2015) found the stock not overfished but experiencing overfishing, with the SSB estimated at 88.91 million pounds, below the target of 137.55 million pounds. These results appear to be driven largely by below average recruitment, with the stock having experienced four below average year classes from 2010 to 2013. The update also showed the annual recruitment estimate has been overestimated by a range of 22% to 49% for five of the last seven year classes (through 2013), which has contributed to an overestimation of stock size in recent years. Taking these findings and the 2014 landings into account, the Commission and MAFMC established an RHL of 5.42 million pounds and a commercial quota of 8.12 million pounds for the 2016 fishing season, a decrease from 2015.

Summer flounder are one of the most sought after commercial and recreational fish along the Atlantic coast, with landings at approximately 18.7 million pounds in 2014. Since 1981, both commercial and recreational landings have undergone significant fluctuations. Commercial landings peaked at 38 million pounds in 1984 before declining to a low of 9.4 million pounds in 1990. Landings showed an increasing trend through 1995, but have varied without trend through 2010. For the past six years, commercial landings have been above 10 million pounds, with 2014 landings at 11.3 million pounds. Otter trawl is the principal commercial gear. After reaching a low of 3.2 million

Summer Flounder Spawning Stock Biomass (SSB)

Source: Northeast Fisheries Science Center Stock Assessment Update, 2015



Timeline of Management Actions: FMP ('88); Amendment 1 ('91); Amendments 2 -5 ('93); Amendment 6 ('94); Amendment 7 ('95); Amendments 8 & 9 ('96); Amendment 10 ('97); Amendment 11 ('98); Amendment 12 ('99); Amendment 13 ('03): Addenda (VIII & XV ('04); Addenda XVI & XVII ('05); Addendum XVIII ('06); Addendum XIX ('07); Addendum XXV ('14); Addendum XXVI ('15)

pounds in 1989, recreational landings increased to 11.9 million pounds in 1997 and 16.5 million pounds in 2000. Since 2009, landings have averaged approximately five million pounds per year, with 7.4 million pounds landed in 2014.

In 2015, the states continued to use the adaptive regional management approach, first used in 2014, for their summer flounder recreational fisheries, with the intent of providing more equity in harvest opportunities along the coast. In early 2016, the Board will consider whether to continue to use the adaptive regional management approach for 2016 fisheries.

The Commission and MAFMC also continued work on the comprehensive summer flounder amendment, which will consider modifications to the current management program's goals, objectives, and management strategies for summer flounder. The Board and Council will continue to develop the Draft Amendment in 2016, with the anticipated draft document available for public comment in 2017.

Tautog

Tautog are a stout fish that becomes darker in color with age, and is commonly known by fishermen as "blackfish". The species is slow growing and can live 35 to 40 years throughout its distribution from Nova Scotia to Georgia, although greatest abundance occurs between Cape Cod, Massachusetts and the Chesapeake Bay.

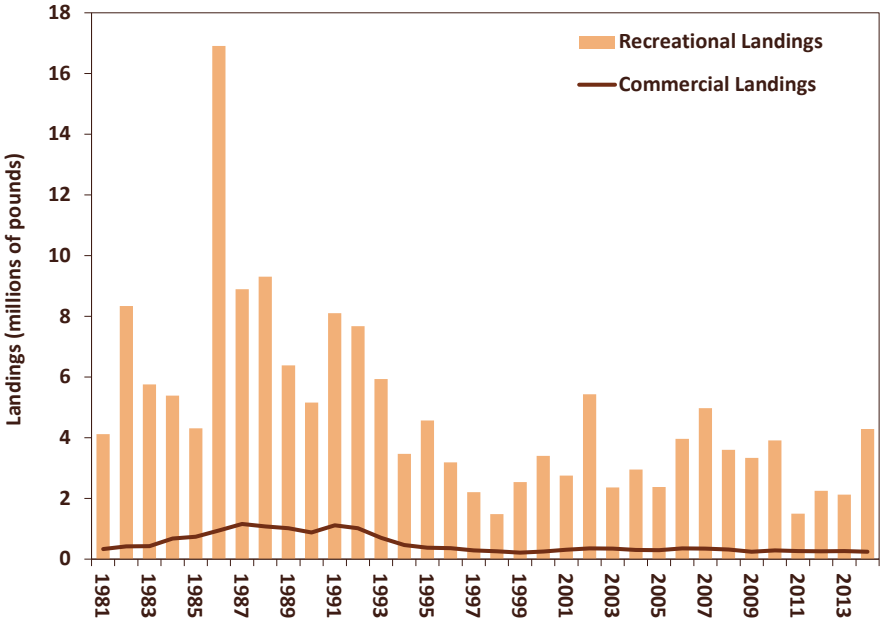
Tagging data suggest strong site fidelity across years with limited north-south movement and some seasonal inshore-offshore migrations. In the northern part of their range, adult tautog move from offshore wintering grounds in the spring to nearshore spawning and feeding areas, where they remain until late fall, when the reverse migration occurs as water temperatures drop. Populations in the southern region may undergo shorter distance seasonal migrations, while in the southern-most part of the range they may not undergo seasonal migrations at all.

The 2015 benchmark stock assessment indicates tautog continues to be overfished and experiencing overfishing on a coastwide scale (Massachusetts to Virginia). The estimated three-year (2011-2013) fishing mortality of F=0.30 is well above the FMP's fishing mortality target of 0.15, despite the implementation of Addendum VI management measures in 2012, which sought to reduce exploitation.

The benchmark assessment explored alternative regional groupings to account for the limited north-south migration and regional harvest patterns instead of a coastwide assessment. In May 2015, the Tautog Board initiated the development of Draft Amendment 1 to consider the

Tautog Commercial and Recreational Landings

Source: NMFS Fisheries Statistics Division, 2015



Timeline of Management Actions: FMP ('86); Addendum I ('97); Addendum II ('99); Addendum III ('02); Addenda IV & V ('07); Addendum VI ('11)

use of regional management areas and evaluate the illegal harvest of undersized and unreported tautog, which has become an increasingly pervasive issue. Draft Amendment 1 development is underway with an expected 2017 implementation date.

While tautog are targeted by both commercial and recreational fisheries, approximately 90% of the total harvest is recreational. Between 2000 and 2014, the annual recreational harvest averaged 3.3 million pounds; on average, 90% was harvested within state waters. In 2014, recreational fishermen harvested approximately 970,000 fish weighing a total of 4.2 million pounds, an increase from the 2011-2013 average recreational harvest of approximately 500,000 fish per year across a three-year landing average of 1.96 million pounds.

In 1987, commercial landings peaked at nearly 1.16 million pounds and steadily declined to a low of 208,000 pounds in 1999. From 2000-2014, commercial landings varied without trend, ranging from approximately 241,000 to 351,000 pounds. Commercial landings have been dominated by Massachusetts, Rhode Island, and New York, each averaging more than 20% of coastwide harvest (1982-2014). Rod and reel are the predominant commercial gear; in addition to bottom otter trawls and fish pots and traps—collectively they represent the top three commercial gear types for the past two decades. The ex-vessel value for tautog has increased since the historic low of $0.03/pound in 1962, along with the increasing landings trend. In 2012 and 2013, the value surpassed $3/pound.

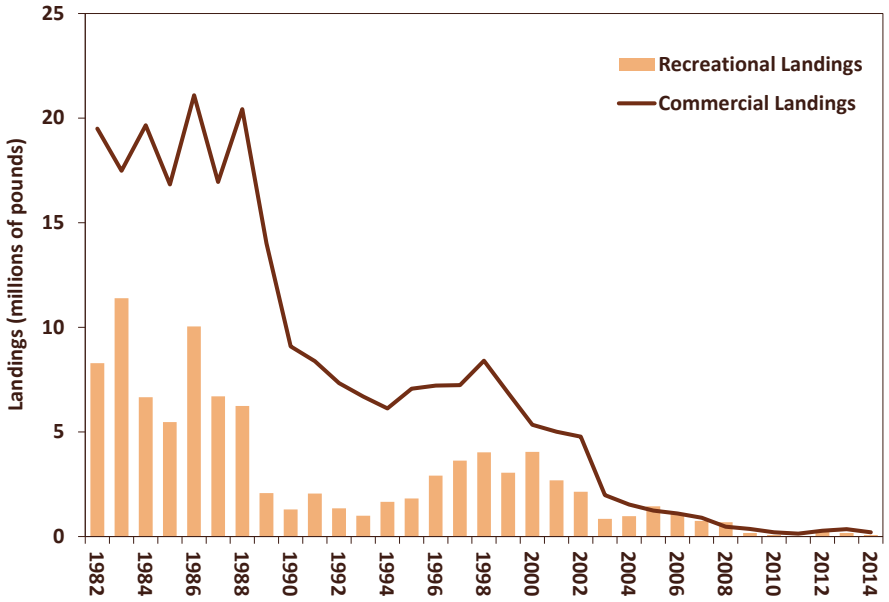
Weakfish

Weakfish have been one of the most important components of a mixed-stock fishery on the Atlantic coast since the 1800s. Beginning in 2000, however, weakfish biomass began to decline, reaching an all-time low of 2.9 million pounds in 2008 (compared to 30.8 million pounds in 1996).

Total landings in the weakfish fishery have continued to decline with 2014 landings estimated at 273,660 pounds, a noticeable decrease from the 2013 landings (519,000 pounds). At 196,000 pounds, the commercial fishery accounted for 72% of the total 2014 landings. North Carolina accounted for the largest share of this harvest at 53%. Recreational landings

Weakfish Recreational and Commercial Landings

Source: NMFS Fisheries Statistics Division, 2015



Timeline of Management Actions: FMP ('85); Amendment 1 ('91); Amendment 2 ('95); Amendment 3 ('96); Amendment 4 ('02); Addendum I ('05); Addenda II & III ('07); Addendum IV ('09)

in 2014 were 77,000 pounds and recreational releases were estimated at 553,000 fish.

In 2015, the Weakfish SAS began work on a new benchmark stock assessment to update these biomass trends. The previous stock assessment, which was completed in 2009, found natural mortality, rather than fishing mortality, was the source of the weakfish decline. However, given the small stock size, the assessment indicated that total fishery removals represented a significant proportion of the remaining biomass and were unsustainable. In response, the Weakfish Management Board approved Addendum IV to Amendment 4, which implemented a one fish recreational creel limit and a 100 pound commercial trip limit.

The new stock assessment seeks to evaluate the status of the stock and understand what impact the restrictive management measures have had on abundance. In July 2015, the SAS held an Assessment Workshop to review data inputs and develop potential models. It is expected the stock assessment will be peer reviewed in the spring of 2016, with final model results presented to the Board in the summer of 2016.

Winter Flounder

Winter flounder is a small-mouthed, right-eyed flounder distributed along the Atlantic coast. The species is managed as three separate stocks: GOM, Southern New England/Mid-Atlantic (SNE/MA) and GBK. Except

for the GBK population, adult winter flounder migrate inshore in the fall/early winter and spawn in late winter and early spring throughout most of their range. Winter flounder may grow up to 23" and attain 15 years of age. Growth varies among geographical areas, with slower growth in the north than the south.

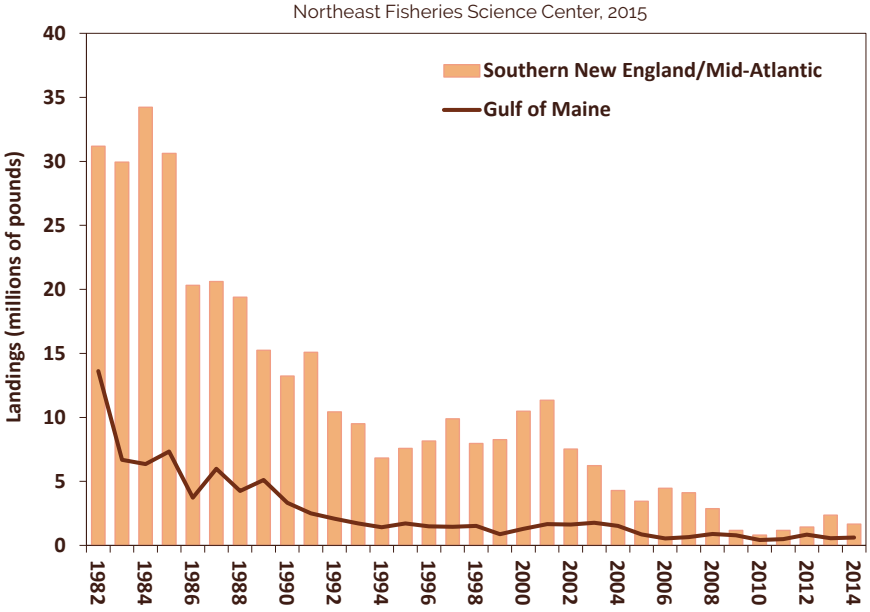
Winter flounder are managed by NEFMC in federal waters and the Commission in state waters, which includes the GOM and SNE/MA stocks. Information from the 2015 stock assessment indicates the SNE/MA stock is overfished and biomass estimates are at 23% of the target. While there have been some modest increases over the last decade, the SNE/MA stock has remained at approximately a quarter of the target since the early 2000s. Since 1981, recruitment has been declining. The 2013 value is the lowest in the time series, at approximately 4% of the estimated recruitment in 1981 (the highest in the time series). While the 2014 SNE/MA recruitment estimate increased slightly, the overall stock productivity continues to decline. The GOM stock does not have a recruitment estimate due to modeling restrictions. Overfishing is not occurring. The primary concern for the GOM and SNE/MA stocks is that the stocks are not responding to lower exploitation rates.

The winter flounder commercial fishery was once a highly productive industry with annual harvests of up to 40.3 million pounds. Since the early 1980s, landings have steadily declined. Total commercial landings for all stocks (GBK, GOM, and SNE/MA combined) dipped to 3.5 million pounds in 2010. Landings have risen since 2010 due to doubling of quotas in 2011 and again in 2012 for the GOM stock, and the lifting of the SNE/MA moratorium in 2013 by NOAA Fisheries in federal waters. The states, however, have maintained a very restrictive commercial bycatch limit of 50 pounds or 38 fish per trip and a recreational bag limit of two fish in state waters of SNE/MA. Landings have only increased slightly; the total commercial landings for all stocks (GBK, GOM, SNE/MA combined) reached 4.4 million pounds in 2014.

Recreational landings peaked in 1982 at 16.4 million pounds and have since maintained a declining trend. In 2013, only 77,000 pounds of winter flounder were harvested – the lowest amount ever recorded for the recreational fishery.

Winter Flounder Commercial Landings by Stock Unit

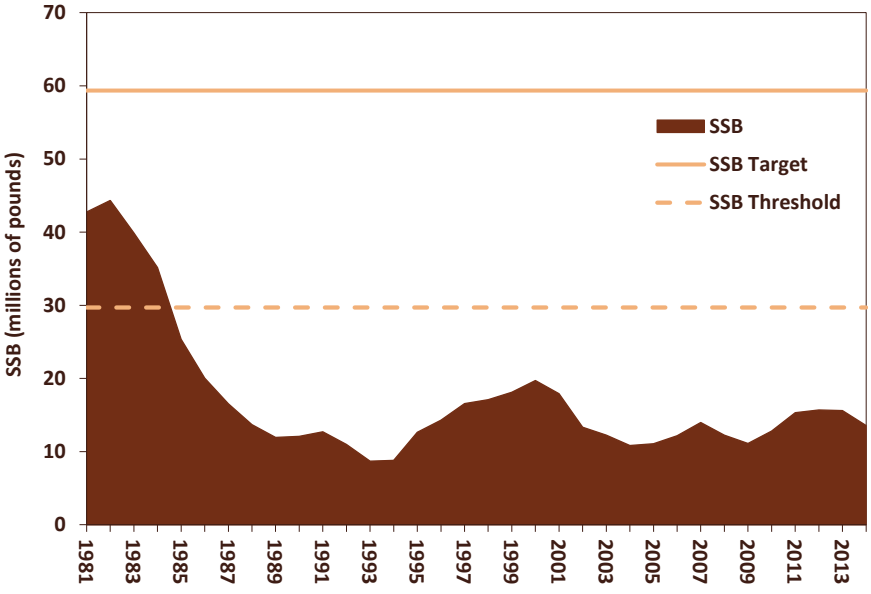
Northeast Fisheries Science Center, 2015



Timeline of Management Actions: FMP & Addendum I ('92); Addendum II ('98); Amendment 1 ('05); Addendum I ('09); Addendum II ('12); Addendum III ('13)

Southern New England/Mid-Atlantic Winter Flounder Spawning Stock Biomass

Source: Groundfish Assessment Review Meeting Update, 2015



Fishery-Independent Data Collection

Fishery-independent monitoring provides insight into the status of fish stocks without the biases inherent to commercial and recreational fisheries catch information. The data collected through monitoring programs are a critical component to the Commission's stock assessment and fisheries management processes. The Commission coordinates two primary Atlantic coast fishery-independent data collection programs – the South Atlantic component of the Southeast Area Monitoring and Assessment Program (SEAMAP) and the Northeast Area Monitoring and Assessment Program (NEAMAP).

SEAMAP

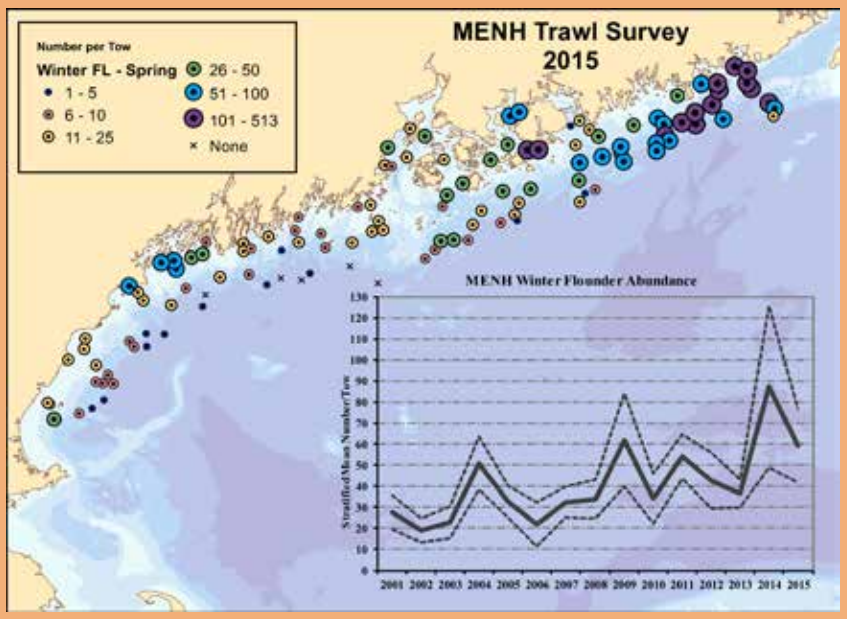
SEAMAP is a cooperative program among state and federal agencies, and universities to facilitate the collection, management, and dissemination of fishery-independent data in the Southeastern U.S. and Caribbean. Since 1982, SEAMAP has conducted long-term standardized surveys that have become the backbone of fisheries and habitat management for its three regions – South Atlantic, Gulf of Mexico, and Caribbean. Each SEAMAP component operates independently, planning and conducting surveys and information dissemination in accordance with administrative policies and guidelines of NOAA Fisheries Southeast Regional Office.

In 2015, SEAMAP-South Atlantic surveys (trawl, longline, and trap) continued to collect data on the distribution and abundance of a variety of important commercial and recreational species from North Carolina to Florida (e.g., red drum, Spanish mackerel, striped bass, snapper, and grouper). A total of 326 stations were sampled by the SEAMAP-South Atlantic Coastal Trawl Survey and the Pamlico Sound Survey completed a total of 108 stations during the 2015 funding cycle. The Coastal Longline Survey completed a total of 648 sets in 2015 with 1,007 red drum captured. Many of the drum were tagged and released as well as sampled for genetic material. Data collected from all SEAMAP-South Atlantic surveys provide long-term population metrics such as abundance trends, diet composition, and age structure for use in interstate, state, and federal stock assessments of recreationally and commercially important fish stocks.

In 2015, SEAMAP-South Atlantic finished the development of a web-based application to integrate and disseminate information among several SEAMAP-South Atlantic fishery-independent surveys and the fishery managers that use SEAMAP data. The compilation of datasets has been useful for management of several important commercial and recreational fish species that migrate between the states' coastal waters and estuaries. With these data, fisheries scientists and managers can determine annual population trends, set fishing regulations, and evaluate management strategies. Visual and spatial representations of SEAMAP and other South Atlantic fishery-independent data are available through a developing geographic information system *http://ocean.floridamarine.org/safmc_dashboard/*. Additionally, SEAMAP-South Atlantic continued to support bottom mapping and fish habitat characterization activities, which gather seabed mapping data for managers to use when considering the establishment of marine protected areas and other fish habitat conservation areas. The SEAMAP-South Atlantic database can be accessed through *www.seamap.org/index.html*.

NEAMAP

NEAMAP is a cooperative state/federal fishery-independent research and data collection program for the coastal waters from Maine to North Carolina. Its mission is to facilitate the collection and dissemination of fishery-independent information obtained in the Northeast for use by state and federal fisheries management agencies, commercial and recreational fishermen, researchers, and others requesting such information. The intent of NEAMAP is not to change existing programs, but to coordinate and standardize procedures and improve data quality and accessibility. The



program, which was initiated in 1997 and became operational in 2006, was developed to respond to the lack of adequate survey coverage and coordination in the coastal waters of the Mid-Atlantic Bight. Its primary tool to fill the gap in coverage has been the SNE/MA Nearshore Trawl Survey. The Nearshore Survey is conducted in the SNE/MA regions and has completed spring and fall surveys from 2007 to present. The survey samples inshore waters from Cape Hatteras, North Carolina northward to Martha's Vineyard, Massachusetts. NEAMAP also includes the Maine-New Hampshire Inshore Trawl Survey and the Massachusetts Inshore Trawl Survey. Survey data are used to complement data from NOAA Fisheries NEFSC Trawl Survey, which samples in deeper, offshore waters of the Mid-Atlantic and New England.

In 2015, the Nearshore Trawl Survey conducted tows at 150 locations in depths ranging from three to 25 fathoms. To date, over seven million individual fish and invertebrates, representing over 175 different species, have been collected by the survey. In 2015, the Maine-New Hampshire Inshore Trawl Spring and Fall Surveys, which have been in operation since 2000, conducted over 200 tows in five regions along the Maine/New Hampshire coast in depths ranging from five to 56 fathoms. The Massachusetts Inshore Trawl Survey, which has conducted spring and fall surveys since 1978, surveyed 200 stations in five geographic regions at depths up to 180 feet in 2015.

Data collected by both the Maine/New Hampshire and Massachusetts Surveys included information on length, sex and maturity, age, and food habits of dozens of fish and crustacean species, as well as ocean bottom temperatures. Data from all three surveys – catch numbers, and individual fish and invertebrate lengths, weights, ages, and diets – are being used in stock assessments and are vital to improving our ability to track annual changes in population sizes and age structures. For further information about NEAMAP and its partner surveys, please visit *www.neamap.net/.*

In 2015, NOAA Fisheries provided funding to support the SNE/MA Nearshore Trawl Survey, which had previously been funded through the MAFMC's Research Set-Aside Program. In 2017, NOAA Fisheries will also begin funding the Maine-New Hampshire Trawl Survey, which is partially funded by NOAA Fisheries Northeast Cooperative Research Program.

In January 2015, a collaborative workshop focusing on fishery-independent trawl survey catch processing was held. Representatives from NEAMAP, SEAMAP-SA, the states, and the U.S. Geological Survey attended the workshop. The Workshop was designed to improve communication and collaboration among Atlantic coastal fishery-independent surveys and personnel, and discuss methodologies used in catch-processing for each individual survey. Workshop outcomes include identifying future sampling needs and areas where standardization among surveys is feasible.

Research Initiatives

The Commission conducted several fisheries research initiatives in 2015 to address high priority issues for the Atlantic states and their stakeholders. Information gathered from research initiatives provides the scientific basis for Commission stock assessments and is fundamental to advising fisheries managers on the health of fish and shellfish populations.

Atlantic Menhaden

In response to the positive findings of the 2015 Atlantic menhaden benchmark assessment, which found the resource is not overfished nor experiencing overfishing, the Atlantic Menhaden Management Board approved a 10% increase to the TAC for the 2015 and 2016 fishing seasons. As part of this action, the Board also committed to moving forward with the development of an amendment to establish ERPs that reflect Atlantic menhaden's role as a forage species, as well as consider changes to the current state-by-state allocation scheme. To help inform allocation decisions, the Commission solicited proposals to conduct a socioeconomic analysis of the Atlantic menhaden fishery. The study, expected to begin in early 2016, is intended to characterize the coastwide commercial fisheries, including bait and reduction sectors and the fishing communities they support. The analysis will be

conducted throughout 2016 and will rely on stakeholder engagement to obtain socioeconomic data to conduct the analysis. The results are expected to assist fishery managers, industry, and stakeholders as they contemplate difficult allocation decisions in the future.

Horseshoe Crab

From 2002 to 2011, the Horseshoe Crab Trawl Survey, conducted by Virginia Tech University's Horseshoe Crab Research Center, has been the only fishery-independent survey designed to sample horseshoe crab populations in Atlantic coastal waters. The survey's data have been a critical component of the Commission's coastwide stock assessment and ARM Framework, which incorporates both shorebird and horseshoe crab abundance levels to set optimized horseshoe crab harvest levels for the Delaware Bay area. The ARM Framework was used to set specifications for the 2013 to 2015 fishing seasons.

Due to funding shortfalls, the Horseshoe Crab Trawl Survey has not been conducted since 2012. The temporary break in the survey and its data present challenges for use of the ARM Framework, which depends on the adult abundance indices derived from the Horseshoe Crab Trawl Survey data. In 2015, the Commission received funds to conduct the Trawl Survey in 2016. While this is a positive development, it is a one-time funding appropriation/allocation. The Commission will continue to seek long-term funding for this important survey.

Jonah Crab

Jonah crab commercial fishing has gained popularity on the Atlantic coast in recent years. Historically, Jonah crab was considered bycatch in the New England lobster fishery. However, over the past 15 years market demand has more than quadrupled, increasing targeted fishing pressure on Jonah crab. Size at maturity is a key information gap toward understanding Jonah crab population dynamics. In areas where most of the U.S. Jonah crab fishery is conducted, no information exists on the size at maturity for male and female crab. The absence of maturity data makes it impossible to estimate spawning stock size and the stock's reproductive potential, which undermines our ability to set biological reference points and conduct a stock assessment. A new study was initiated in 2015 to assess the size at maturity for both female and male Jonah crab. Anticipated results will improve our understanding of stock dynamics and more fully inform the new FMP established in 2015.

Northern Shrimp

The 32nd Gulf of Maine Northern Shrimp Trawl Survey was conducted in 2015 by NEFSC in cooperation with the Commission's Northern Shrimp Technical Committee. A total of 84 stations were sampled in the offshore waters of the Gulf, with information on shrimp numbers, sizes, gender, and maturity collected to provide data for annual stock assessments and related analyses. The survey is a valuable tool for consistently evaluating the shrimp stock's condition. Results show shrimp abundance and biomass have declined steadily since 2008, with 2014 and 2015 catches at the lowest levels ever recorded in the survey's history. A notable decline in shrimp sizes across life stages and genders was also detected in the 2015 survey.

Red Drum

The Commission identified red drum as a priority species in need of additional research because the status of the adult portion of the population is not well known. Information on adult red drum is a

major deficiency, which limits the stock assessment to characterizing only age 1-4 fish before they migrate offshore and reach a maximum age of up to 60 years. With federally dedicated research funds, state scientists from North Carolina, South Carolina, and Georgia conduct bottom longline surveys to provide a fishery-independent index of adult red drum abundance. Many red drum encountered in the survey are tagged to provide information on survival rates, migratory behavior, and stock identification. Information is also collected on the presence of hatchery-origin fish in the offshore adult population, as well as sex ratios, maturity, and age structure of the population. All of the information is critical for evaluating the status of the red drum population, including use in the newest stock assessment, and developing a successful red drum management program. Data on coastal shark distributions and abundances are also recorded in the long line surveys.

Fish Ageing

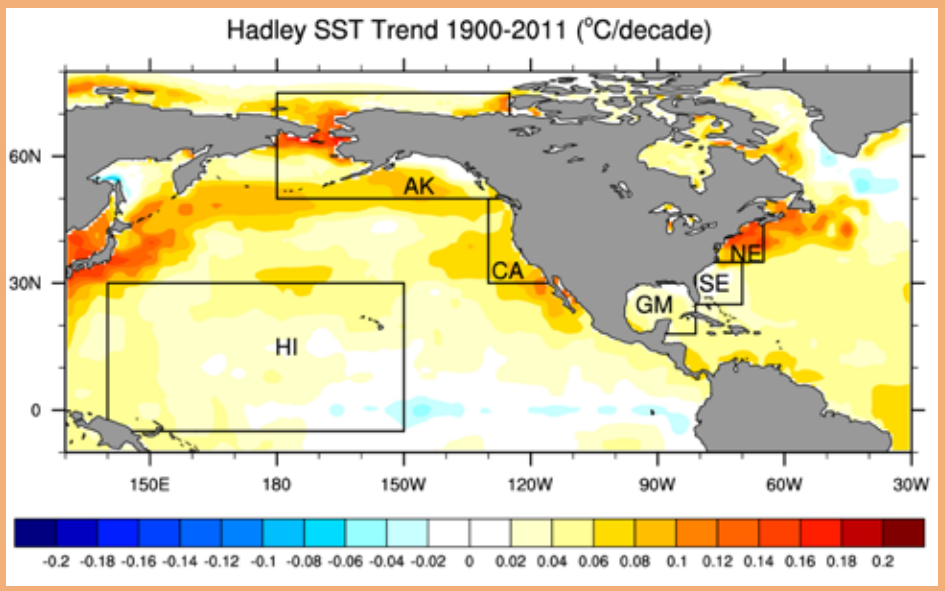
Fish age and growth information are key components of stock assessments that improve our understanding of species' population dynamics. With age samples being collected, processed, and read by scientists at several institutions every year, it is important to ensure all ageing labs follow consistent protocols. In 2015, the Commission facilitated fish ageing consistency and data sharing among different Atlantic coast laboratories through the development of standardized ageing protocols, the exchange of ageing samples, and a fish ageing workshop for Atlantic menhaden. Results from the ageing workshop will be included in the next benchmark assessment of menhaden. Workshop results and ageing protocols can also be found on the Commission website at www.asmfc.org/fisheries-science/research. American eel and spot age sample exchanges and workshops are planned for 2016. The Commission will also be initiating in 2016 a new black drum age sample collection program among the Mid-Atlantic states to obtain better age data on larger, older individuals in order to work toward developing an age-based stock assessment model.

Climate Change

Climate change can have significant impacts on the behavior and geographic distribution of fishery resources. With warming waters, the availability of habitat for fish stocks may change and species may shift their range to seek out more suitable conditions. With stocks that are on the move, there is a need to reassess current management plans and fishery allocations. However, it is important to first fully evaluate the environmental and regulatory drivers that control stock distributions before revising management strategies.

In 2015, the Commission investigated whether climate change and warming coastal water temperatures are causing shifts in the geographic distributions of populations as part of the benchmark stock assessments for American lobster, scup, and bluefish. In addition, based on previous analysis by the Commission's Management and Science Committee on climate-induced shifts in black sea bass, scup, and summer flounder stocks, the Summer Flounder Management Board continued regional allocation approaches for the summer flounder recreational fishery to account for changes in stock availability along the coast.

In anticipation of future climate impacts to fish and crustacean stocks, the Commission is adding evaluations of climate-induced distribution shifts to upcoming stock assessments for black sea bass, weakfish, spot, croaker, and northern shrimp. The Commission is also incorporating the latest science and analytical tools to evaluate climate impacts to fish habitat through its Habitat Program and the Atlantic Coastal Fish Habitat Partnership (ACFHP). The Commission will continue to track developing scientific tools and management issues related to climate and fisheries, including a new fish stock climate vulnerability tool developed by NOAA Fisheries *(www.st.nmfs.noaa.gov/ecosystems/climate/activities/assessing-vulnerability-of-fish-stocks).*



Rate of change in global sea surface temperatures/decade from 1900-2011. Note the high rate of change in waters off New England. Image (c) NOAA

Cooperative Tagging

Tag and recapture data are valuable inputs to the stock assessments of several Commission-managed species, including Atlantic striped bass, red drum, Atlantic sturgeon, weakfish, spiny dogfish, and coastal sharks. The Interstate Tagging Committee (ITC) seeks to improve the quality and utility of fish tagging data through the development and promotion of protocols for effective tagging programs. ITC maintains a Cooperative Tagging Website and Registry, providing information on coastwide tagging programs. Anglers can search the database by fish species, tag type, and tag color in order to identify recovered tags. Recent ITC activities include certification of state tagging programs in Massachusetts, Virginia, and South Carolina and development of online tagging videos to guide anglers on proper tagging techniques. The cooperative tagging website can be found at *www.fishtag.info.*

Since the early 1980s, the Commission has been a partner to the Cooperative Winter Tagging Program led by USFWS. The Program organizes annual field tagging of Atlantic striped bass, Atlantic sturgeon, spiny dogfish, and other species that aggregate each winter in the coastal waters off Virginia and North Carolina. In 2015, trawling was conducted aboard a research vessel to catch, tag, and release striped bass and other target species. To supplement the trawl sampling, scientists and captains aboard recreational charter vessels caught, tagged, and released approximately 1,000 striped bass. Information from recaptured fish with tags provides scientists with data to better understand fish survival and growth, habitat preferences, seasonal movements and migrations, and stock boundaries.

Multispecies Models and Assessments

The Commission recognizes the importance of ecological interactions, such as predator-prey relationships, in understanding the population dynamics of fishery resources. The Commission's Multispecies Technical Committee (MSTC), a group of state, federal, and university scientists, is responsible for evaluating relationships among species via a multispecies analytical framework that utilizes a suite of predator-prey models.

The MSTC periodically performs updates to the models and works with the Commission's Assessment Science Committee to consider and evaluate alternative single-species stock assessment models that incorporate ecosystem factors. In addition, a new ERPs Work Group continues to develop multispecies models and ecosystem-based approaches that may be used to develop ERPs for Atlantic menhaden. The reference points would be based on the forage needs of menhaden's primary predators (e.g., Atlantic striped bass, weakfish, bluefish). In 2015, the committees updated the traditional multispecies model and provided new multispecies models to complement the results of the 2015 Atlantic menhaden benchmark stock assessment.

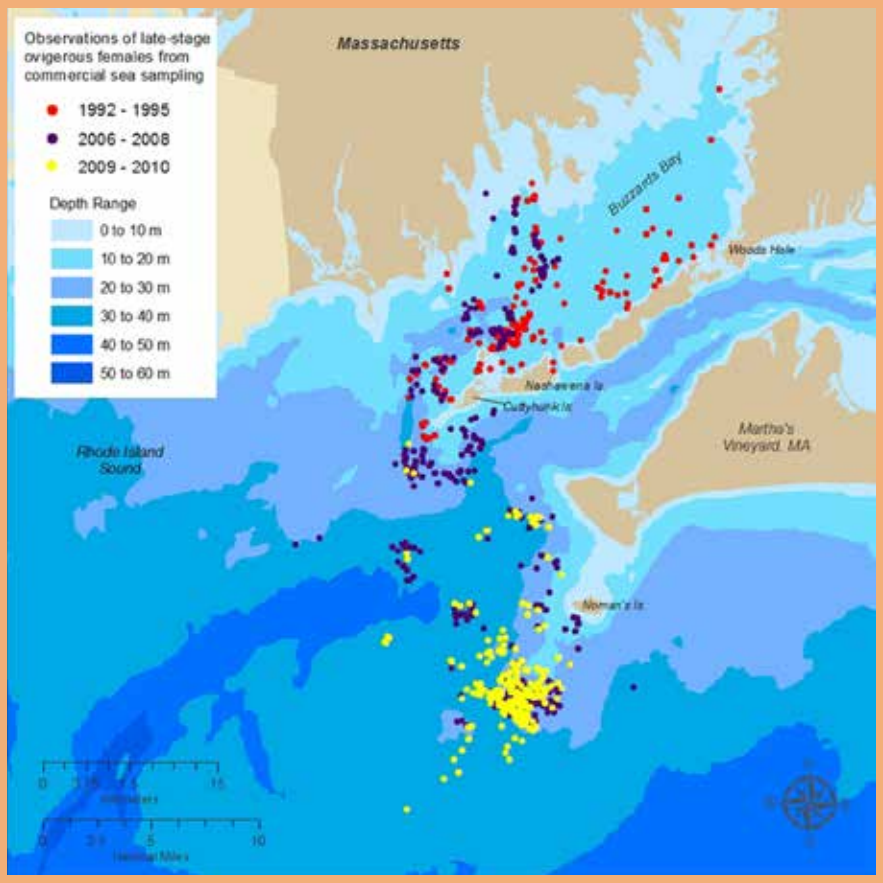
Stock Assessment Peer Review

The Commission's species management boards rely on the scientific and technical information provided by independent peer reviews of stock assessments to evaluate stock status and develop fisheries regulations using the best available science. In 2015, four stock assessments were evaluated through various peer review processes. The bluefish and scup assessment reviews were conducted through the Northeast Regional Stock Assessment Review Committee. The red drum stock assessment was evaluated through the SouthEast Data and Assessment Review process. The American lobster, tautog, and black drum stock assessments were reviewed through the Commission's external peer review process. Each assessment was presented to the respective species management boards to inform management decisions for the stocks.

Stock Assessment Training

The Commission organizes stock assessment training courses to provide instruction to fisheries professionals on the most progressive analytical methods available for use in stock assessments. Courses are provided each year to meet the specific training needs identified as critical to supporting coastwide assessments and to provide managers with a better understanding of assessment results. The courses are designed to provide state scientists with hands-on experience in developing stock assessments, using fishery-independent and -dependent data in a variety of analytical methods and models. In 2015, the Commission held two stock assessment training courses. The first was a weekly webinar designed to introduce fisheries scientists to basic population dynamics and stock assessment theory in preparation for future participation on Commission technical committees. The second was an advanced training course for more experienced stock assessment scientists to enhance their knowledge, skills, and use of Bayesian statistics in stock assessment modeling and related technical analysis. The Commission anticipates holding an intermediate level training course in 2016.

The Commission has created a dedicated page on Fisheries Science 101 at *www.asmfc.org/fisheries-science/fisheries-science-101.* The webpage explains the basic concepts of fisheries science to give stakeholders a better understanding of the types of information scientists provide to fisheries managers. It also includes links to stock assessment seminars, such as *Understanding the Science Behind Northern Shrimp Management.* Additional seminars will be posted as they become available.



Habitat Bottlenecks: Map of distribution shift in late-stage egg bearing female lobsters in Southern New England that has been related to changes in temperature. Image (c) MA DMF

Habitat Protection, Restoration, and Enhancement

The Commission recognizes that protection, restoration, and enhancement of fish habitats are essential to promoting the sustainability of fisheries along the Atlantic coast. The Habitat Committee's goal is to identify, enhance, and cooperatively manage vital fish habitat for conservation, restoration, and protection, and to support cooperative management of fisheries activities. The Committee successfully performed this role through several activities in 2015.

The Habitat Committee released its annual issue of the ***Habitat Hotline Atlantic***. The issue focused on the impacts of energy development on fish habitats and included four articles from the Bureau of Ocean Energy Management, as well as an article on the importance of sounds to fish communities and their habitats. The Hotline also included updates from ACFHP and state and governmental agencies.

The Habitat Committee finalized, and the Commission approved, the latest installment of the Commission's Habitat Management Series, *Habitat Bottlenecks and Fisheries Management.* The report provides examples of environmental

and physical bottlenecks facing managed species along the Atlantic coast, including American lobster, horseshoe crab, summer and winter flounder, and Atlantic sturgeon. The report is available at *www.asmfc.org/habitat/hot-topics.*

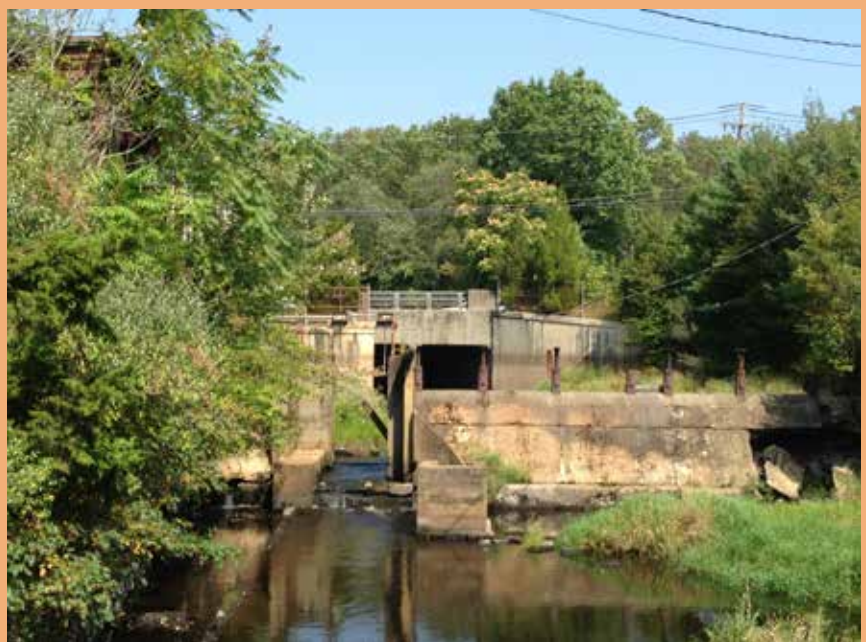
As part of its responsibility to provide the most up-to-date information on the habitat needs and ecosystem functions of Commission-managed species, the Habitat Committee continues to update habitat sections of the Commission FMPs. In 2015, the Commission began updates to the habitat sections for upcoming plan amendments for Atlantic menhaden and tautog. The Habitat Committee also updated the habitat factsheets for 25 Commission-managed species. The factsheets include the latest science on species migratory behavior, environmental and habitat requirements, as well as threats to habitat and species restoration efforts. The factsheets can be found on the website at *www.asmfc.org/habitat/program-overview* as well as on each species page.

Throughout 2015, the Habitat Committee continued the development of a sciaenid species habitat source document, similar to the Atlantic Coast Diadromous Fish Habitat document published in 2009. Information from the source document will be used to develop new habitat sections for the Commission-managed sciaenid species, such as Atlantic croaker, black drum, and weakfish. The document is close to completion, and will presented to the Commission for approval in early 2016.

Atlantic Coastal Fish Habitat Partnership

Beginning in 2006, the Commission contributed to the establishment and growth of ACFHP, an assembly of state, federal, tribal, and non-governmental groups whose mission is to conserve habitat for Atlantic coast diadromous, estuarine-dependent, and coastal fish species. The Partnership addresses habitat threats with a broad and coordinated approach, leveraging resources from many agencies, organizations, and corporations to make a difference for fish habitat. ACFHP operates under the purview of the National Fish Habitat Partnership (NFHP).

2015 was the sixth year of ACFHP's successful partnership with USFWS in funding on-the-ground fish habitat conservation projects. Three new projects were funded, each aiming to improve fish habitat in rivers and streams along the Atlantic coast. The first project is led by the Town of Surry and will restore fish passage in Patten Stream, Maine. The second, led by The Nature Conservancy, will remove a dam on the Satucket River



in East Bridgewater, Massachusetts. The third project is focused on restoring spawning habitat for shad and sturgeon in the Cape Fear River in North Carolina, and is being led by the Cape Fear River Watch. For more information on all ACFHP-USFWS funded projects, please visit *www.atlanticfishhabitat.org/projects/fundedprojects/.*

In cooperation with its state partners, and with funding from NOAA Fisheries, ACFHP successfully installed four conservation moorings near Jamestown, Rhode Island. Conservation mooring is a system designed to avoid contact with the seafloor and reduce physical damage to the seagrasses that provide valuable habitat for young fish. The system uses an elastic connection, akin to a bungee cord, to connect the surface buoy with the anchoring device. This eliminates chain sweep that physically damages or eliminates vegetation growing on the seafloor. An interpretive sign will be installed at nearby marinas to inform the public on the benefits of conservation moorings and submerged aquatic vegetation. Post-installation monitoring will occur throughout 2016 to measure success.

ACFHP was awarded a grant from MAFMC to solicit projects that promote restoration or research on offshore black sea bass habitat in

the Mid-Atlantic. A subcommittee of habitat experts developed the request for proposals, which was released in late 2015. Project evaluation and selection will occur in early 2016.

In 2015, significant progress was made in the development of a Decision Support Tool to Assess Aquatic Habitats and Threats in North Atlantic Watersheds and Estuaries. ACFHP and its partners worked with Downstream Strategies, LLC to compile and analyze the threats to inland, estuarine, and coastal aquatic species across the Northeast Atlantic. The data were used to model habitat and species distributions, which will yield two products: distribution maps, and a multi-criteria decision support tool for resource managers when planning habitat restoration projects. The work was funded by the North Atlantic Landscape Conservation Cooperative. Eastern brook trout and winter flounder models have been completed, and river herring analyses are underway. To view the tool, please visit *www.fishhabitattool.org*.

ACFHP and The Nature Conservancy successfully completed their final report on river herring habitat restoration needs in select watersheds along the U.S. Atlantic coast, with funding from the National Fish and Wildlife Foundation's River Herring Initiative. The project involved collaboration with river herring experts from state and federal agencies and non-governmental organizations via in-person workshops, meetings, and webinars. The project resulted in multiple reports on river herring habitat needs, advanced the cooperation among stakeholders in each region, and will aid ACFHP in prioritizing river herring restoration needs for future ACFHP-USFWS project funding. To find out more, please visit *www.atlanticfishhabitat.org/planningresources/publications/*.

ACFHP continued the Whitewater to Bluewater project in 2015 with its Fish Habitat Partnership neighbors, the Southeast Aquatic Resources Partnership (SARP) and the Eastern Brook Trout Joint Venture *(www.easternbrooktrout.org/groups/whitewater-to-bluewater/)*. The initiative promotes a collaborative approach to protecting and restoring habitat from the headwaters of small streams, to downstream estuaries, and out to the continental shelf by implementing the shared goals of the three partnerships and the National Fish Habitat Action Plan. ACFHP and SARP also collaborated on submitting a joint mangrove restoration proposal to NOAA's Coastal Resiliency Program. The three partnerships have continued to work on a fish passage barrier removal factsheet to assist conservation groups and agencies in developing outreach products to enhance public understanding and support for fish passage projects.

In August, ACFHP attended the 145th Annual American Fisheries Society Meeting to display outreach materials at the NFHP booth and present at the conference during the NFHP Symposium. The NFHP Symposium highlighted science and data, on the ground restoration, and collaborative successes of many of the 19 Fish Habitat Partnerships from around the country. For more information on the meeting, please visit the American Fisheries Society website at www.*2015.fisheries.org*.

Two new partners joined ACFHP in 2015: the International Federation of Fly Fishers (IFFF), and the North Carolina Coastal Federation (NCCF). The IFFF is a 46-year old international non-profit organization dedicated to the betterment of the sport of fly fishing through conservation, restoration, and education. The NCCF is a 33- year old non-profit organization dedicated exclusively to protecting and restoring the coast of North Carolina through education, advocacy, and habitat preservation and restoration. ACFHP is excited to have both of these well-respected organizations join the Partnership.

Dependable and Timely Fisheries Statistics

The Atlantic Coastal Cooperative Statistics Program (ACCSP) is a cooperative state-federal program that designs, implements, and conducts marine fisheries statistics data collection programs and integrates those data into a single data management system to meet the needs of fishery managers, scientists, and fishermen. Its mission is to produce dependable and timely marine fishery statistics for Atlantic coast fisheries that are collected, processed, and disseminated according to common standards agreed upon by all Program Partners, who include the Commission, the three Atlantic fishery management councils, the 15 Atlantic states, the Potomac River Fisheries Commission, the D.C. Fisheries and Wildlife Division, NOAA Fisheries, and USFWS.

Fisheries-Dependent Data Collection

ACCSP's primary objective is the collection and management of fisheries-dependent data to provide necessary information to its program partners for near-term fisheries management activities (quota and compliance monitoring) and for longer-term processes such as stock assessment. ACCSP standardizes methods and systems through collaboration among its partners. Using these standards, ACCSP developed and manages an online data collection program, the Standard Atlantic Fisheries Information System (SAFIS) and a consolidated fisheries-dependent data storage and dissemination system, the Data Warehouse.

SAFIS

SAFIS is currently deployed as a web-based system to collect dealer and trip data in many Atlantic states and NOAA Fisheries Northeast and Southeast Regional Offices. Dealer reporting systems that use swipe cards to uniquely identify harvesters were developed for use in Massachusetts and Maine. These new systems will initially be deployed for American eel and sea urchin dealers in Maine, and shellfish dealers in Massachusetts. The Program received requests to expand this tool into Rhode Island in 2016 and expects to develop and deploy a standard version that could be used for all fisheries during 2016-2017.

Throughout 2014 and 2015, staff continued development of tablet-based systems for both dealer and

ACCSP
Good Data, Good Decisions

trip reporting. Tablet systems have the advantage of not requiring a full time connection to the internet and are increasing in popularity. The first project was developed for the for-hire fishery in Rhode Island, followed by a collaborative project in the Northeast with the Northeast Regional Ocean Council and SeaPlan to track ocean use. Working with volunteers, the latter project tested the feasibility of using the built in GPS capabilities of most tablets to track vessel location providing data needed to assess ocean use. The system is currently in the process of being approved for use in federal fisheries.

In 2015, 143,507 trips were entered into SAFIS using the on-line eTrips application. Over 650,000 dealer reports were entered into the SAFIS dealer reporting module. There were 1,893 commercial dealers and 6,890 commercial fishermen using the system.

Data Warehouse

The Data Warehouse contains fisheries-dependent landings and catch data back to 1950 and is used for stock assessment and other data intensive research. Data are loaded twice yearly with preliminary data for the prior year being made available by mid-April and final data in November. Minor updates are made on an as-needed basis. The Data Warehouse provides an access controlled online user interface that utilizes Oracle Discoverer. Staff are in the process of developing a new interface that will be more intuitive and easier to use. In addition, a new biological module has been designed and will be deployed in early 2016.

In 2015, 89 data users (commercial fishermen, dealers, state and federal staff, fishery managers, scientists, and stakeholders) accessed the Data Warehouse to run 12,047 data queries for stock assessments, management purposes, industry research, and other needs. Users of the public version of the Data Warehouse ran an additional 1,590 queries.

Website

In 2015, ACCSP launched its newly revised website, highlighting the program and its major tools, products, and partner projects. To learn more about ACCSP, visit us at *www.accsp.org/*

During 2015, the Commission had the privilege of presenting awards to several deserving individuals who have directly contributed to furthering the Commission's Vision of Sustainably Managing Atlantic Coastal Fisheries.

Captain David H. Hart Award

The Commission presented **Willard "Bill" Cole,** formerly with the USFWS, the Captain David H. Hart Award, its highest annual award, at the Commission's 74th Annual Meeting in St. Augustine, Florida.

Throughout his nearly 40-year career as a state, university, and federal fishery manager and scientist, Mr. Cole worked to protect, restore, and conserve fisheries resources and their habitats along the Atlantic coast. Mr. Cole graduated from North Carolina State University in 1966, and moved to Lake City, Florida, where he began his career with the Florida Game and Freshwater Fish Commission. Shortly after, he joined USFWS, where he stayed for the remainder of his career. At USFWS, Mr. Cole served in different capacities and numerous offices from North Carolina, to New York, D.C., Texas, and even New Mexico. In each place he left an indelible mark; serving on review teams for the first Everglades study; developing the Navigable Waters Handbook; protecting riverine, wetland, and coastal habitats in Long Island Sound, the Hudson River, and St. Lawrence Seaway; and establishing what ultimately would become USFWS' South Atlantic Fish and Wildlife Conservation Office. While with the South Atlantic Office, he worked closely with the State of North Carolina to restore anadromous fishery resources throughout the Albemarle and Pamlico Sounds, once the site of the largest commercial American shad and river herring fisheries on the entire East Coast.

With his customary vision, Mr. Cole understood early on that management of fishery resources in North Carolina required participation in regional fishery management institutions as well. As such, he became involved with both the SAFMC and the Commission as the Southeast Regional Director's designee for both institutions. He served in that capacity continuously for 19 years. Mr. Cole served on numerous committees and management boards for both groups and, prior to his retirement, served as Chair of the Commission's South Atlantic State-Federal Fisheries Management Board.

Along with several colleagues, Mr. Cole conceived the Cooperative Winter Tagging Cruise off the coasts of North Carolina and Virginia. The Cruise was designed to tag striped bass in a mixed stock of migratory fish wintering off North Carolina's Outer Banks and southern Virginia as a part of the Commission's Atlantic migratory striped bass management program. The Cruise began in 1988 and has been conducted annually with few interruptions. It is one of the longest time series of any such coastal tagging program, as well as one of the most effective federal, state, and academic partnerships. Mr. Cole served as Chief Scientist on all but two of the cruises during an 18 year period and annually coordinated scheduling, equipment acquisition, and recruitment of all Scientific Party members. Through the years, tagging of additional Commission and Council managed species was added to the Cruise protocol. To date, the Cruise has tagged 252 Atlantic sturgeon and over 47,000 striped bass, with a tag return rate approaching 20 percent.

Mr. Cole is a charter member of the Atlantic Coastal Cooperative Statistics Program Operations Committee. He has been an ardent supporter of the Program since its inception, providing staff to serve as the initial Program Coordinator, and working tirelessly with federal and state partners to move the program forward.

Finally, during his last year with USFWS, Mr. Cole was detailed to the NOAA Fisheries where he served as Special Assistant to the Assistant Administrator for Fisheries, Dr. William Hogarth. Mr. Cole was a key element in planning several national-level meetings that brought together fisheries professionals from Regional Fishery Management Councils and Interstate Commissions to consider the future direction of fisheries management.

Mr. Cole has characterized himself as a "biopolitician," but his contribution to the management of U.S. East Coast fisheries goes well beyond his many notable accomplishments. Mr. Cole has been a true friend and mentor to many in the fisheries management community.

The Commission instituted the Award in 1991 to recognize individuals who have made outstanding efforts to improve Atlantic coastal marine fisheries. The Hart Award is named for one of the Commission's longest serving members, who dedicated himself to the advancement and protection of marine fishery resources.

Awards of Excellence

Management & Policy Contributions

Steven Heins

New York State Department of Environmental Conservation (NYS DEC)

Steven Heins has been dedicated to state, interstate, and federal management issues for nearly three decades, providing leadership, innovation, and technical excellence that represents the core mission and values of the Commission. From 1988 to 2000, Mr. Heins oversaw New York's species monitoring programs, playing an important role in helping to inform management decisions at the Commission and MAFMC. He developed and implemented New York's Artificial Reef and Access Program, authoring the original Reef Management Plan and environmental impact statement that made the program a reality. He is also a longstanding member and past chair of the Commission's Artificial Reef Committee, which has been providing guidance on and coordinating artificial reef development activities along the Atlantic coast since the mid-1980s.

Since 2006, with his promotion to Chief of Finfish and Crustaceans Section, Mr. Heins has represented NYS DEC on MAFMC and a number of its committees including Atlantic mackerel, squid, and butterfish; surf clam, ocean quahog, and tilefish; and demersal and coastal migratory species. He is the lead for management and compliance information for all Commission-managed species in New York and has been a longstanding member and active participant on the Management and Science Committee. He is also a member and chair of the NEAMAP Board, which oversees three fishery-independent data collection surveys for the coastal waters of Maine to North Carolina. When other funding was unavailable to support the program, Mr. Heins played a pivotal role in securing over $500,000 to support NEAMAP. Recently, he helped craft the current summer flounder regional management approach and he continues to work to find solutions to current management challenges with striped bass, black sea bass, tautog, and Atlantic sturgeon.

Scientific & Technical Contributions

Matthew Cieri, Ph.D.

Maine Department of Marine Resources (ME DMR)

Throughout his career, Dr. Matthew Cieri has provided critical assessment expertise to aid in the management of marine resources in Maine, New England, and along the Atlantic coast. Since 2001 as a marine resource scientist, Dr. Cieri has led Maine's Atlantic herring monitoring and stock assessment activities, providing technical advice and data analysis for resource assessment and management purposes. The monitoring program encompasses the collection and verification of landings data and biological information, as well as management of the herring ageing program and portside bycatch sampling program. On the regional front, Dr. Cieri has helped formulate herring "days out" options for managers and industry decision making, and worked closely with the NEFMC's Atlantic Herring Plan Development Team to develop river herring and shad catch cap options for use in the Council's Framework 3.

Dr. Cieri is also a member and important contributor on numerous Commission and Council committees, including technical/stock assessment committees for Atlantic menhaden, spiny dogfish, American eel, and Atlantic herring, which he chaired for many years. He chaired the Commission's Multispecies VPA (MSVPA-X) Subcommittee and the American Eel Stock Assessment Committee. His efforts led to the successful review of the MSVPA-X, as well the timely and successful completion of the first coastwide benchmark stock assessment for American eel. The findings of the American eel benchmark assessment led to the current American eel management program.

Jeffrey Brust

New Jersey Division of Fish and Wildlife (NJ DFW), Marine Fisheries Administration

For the past 16 years, Jeffrey Brust's hard work, dedication, and innovative approaches to assessment science has made significant improvements to the Commission's stock assessment process and modeling techniques. For the last decade, Mr. Brust has either chaired or been one of the lead scientists for a number of species assessments, including weakfish, American eel, and tautog, developing innovative modeling approaches and successfully navigating them through peer review for their use in management. He is one of the lead

scientists for assessing data poor species by employing methods traditionally used on the West Coast and applying those techniques to Commission species, such as American eel. Even when not serving on the stock assessment subcommittee, Mr. Brust has a way of making an impact on the success and utility of an assessment. As a member of the Atlantic Menhaden Technical Committee, which he also chaired through the development and implementation of Amendment 2, Mr. Brust conducted a review and analysis of the historical menhaden fecundity studies, where he found an error in the interpretation of those results which led to new fecundity at age/size estimates and a significantly improved stock assessment.

Dedicated to increasing the stock assessment capabilities of state biologists, Mr. Brust has taught a number of beginner and intermediate stock assessment training courses. He also created, through the Assessment Science Committee, a stock assessment mentoring program to help technical committee members become exposed to the assessment process in an effort to develop future lead assessment scientists.

Michael Hendricks

Pennsylvania Fish & Boat Commission, Retired

Michael Hendricks dedicated his 32-year career to restoring American shad to Pennsylvania's Susquehanna, Delaware, Lehigh, and Schuykill Rivers. As a past member and chair of the Commission's Shad and River Herring Technical Committee, he pioneered the use of oxytetracycline (OTC) for marking American shad. He chaired the OTC Tagging Task Force which coordinates otolith tagging of hatchery produced American shad among the Commission member states. He developed and implemented culture techniques for American and hickory shad, and led research activities at the Van Dyke hatchery, located on the Juniata River, for over 25 years. The Van Dyke hatchery was constructed in 1976 and was the first modern American shad hatchery in the nation. Under Mr. Hendricks' direction, approximately 237 million American shad fry have been reared and stocked in Pennsylvania's rivers. Mr. Hendricks has also chaired the Technical Committee of the Susquehanna River Anadromous Fish Restoration Cooperative, playing a lead role in drafting the current comprehensive Susquehanna River Anadromous Fish Restoration Plan. He has served on the Delaware River Fish and Wildlife Cooperative Committee.

Dedicated to improving the passage of anadromous fish both up and downstream, Mr. Hendricks provided consultation on fishway development and implementation on the Schuylkill and Lehigh Rivers and served on various Chesapeake Bay Commission fish passage and fisheries management plan committees. He was an active participant on fish passage technical committees for four Susquehanna River hydroelectric dams and was a key player in the ongoing Federal Energy Regulatory Commission relicensing of four hydroelectric facilities on the Susquehanna River from 2004 to 2013 to ensure that anadromous fish protection and restoration are in the forefront in the negotiations.

Law Enforcement Contributions

Sergeant Jim Kane

Connecticut State Environmental Conservation Police

Sergeant Jim Kane's dedication, knowledge of fishing practices and laws, and ability to work well with other law enforcement agencies throughout the region has earned him the respect and admiration of his law enforcement colleagues. For a decade, he has worked to ensure fishery management regulations within Rhode Island and neighboring states are being upheld, consistently performing a high level of at-sea and dockside inspections of commercial and recreational fishing vessels in his state, as well as numerous recreational shoreside fisherman inspections. Sergeant Kane has worked with New York, Rhode Island, and Massachusetts Law Enforcement as well as NOAA Office of Law Enforcement (OLE) on a number of fisheries investigations and enforcement initiatives. Several of these multi-state investigations involved commercial and recreational lobster, scallop, striped bass, scup, American eel, and winter and summer flounder fisheries. A couple of the investigations have been high level, such as one case which involved the illegal possession and sale of striped bass taken from Rhode Island and offloaded in Connecticut. Another case involved the successful prosecution of a Rhode Island commercial lobster fishing investigation, which involved New York and NOAA OLE; several hundred illegal lobster traps were seized as part of the investigation. During the past several years, Sergeant Kane has also been involved with numerous violations and federal referrals to NOAA OLE for commercial fishing vessels landing over the legal limits or possessing illegal species.

Outreach & Advocacy Contributions

Janice Plante

Former writer and associate editor for Commercial Fisheries News (CFN) and Fish Farming News

Through her diligent reporting on fisheries issues, Janice Plante has significantly advanced stakeholder understanding of fisheries management and scientific activities along the Atlantic coast. No writer or journalist has done more to bridge the gap between fisheries managers/scientists and commercial fishermen than Ms. Plante. For the past three decades, Ms. Plante has not only been committed to, but also excelled at, breaking down complex fisheries management and science issues in clear, understandable, and accessible language that both inform and engage New England fishermen in the fisheries management process at all levels of government (state, interstate, regional and federal). Not an easy task given that she has had to digest complicated fishery stock assessments, gear requirements, and regulatory issues, translating the bottom line into terminology easily grasped by commercial fishermen and the public. She has covered a multitude issues ranging from American lobster to Atlantic herring, northern shrimp, spiny dogfish, and groundfish. Even though the news that she reported on has not always been favorable from the perspective of the commercial fishing industry, she has always done it in an unbiased way, presenting both the facts of matter and the full range of viewpoints, allowing her readership to come to their own opinions about the issue at hand. Throughout her career with CFN, Ms. Plante has worked closely with Commission staff to ensure that her stories correctly characterize the management issues and the science behind the Commission's management decisions, always with the intent to demystify and make more accessible the Commission's activities to the stakeholders it impacts the greatest. Ms. Plante's body of work is a true testament to her deep and abiding commitment to both the fisheries management process and the industries it seeks to support.

ACFHP Melissa Laser Fish Habitat Conservation Award

Deb Wilson was presented the 2015 Melissa Laser Fish Habitat Conservation Award by the ACFHP for her exemplary work in furthering the conservation, protection, restoration, and enhancement of habitat for native Atlantic coastal, estuarine-dependent, and diadromous fishes. The award was presented at the 74th Atlantic States Marine Fisheries Commission Annual Meeting.

From left to right: Chris Powell (ACFHP Vice-Chair), Jake Kritzer (Habitat Committee Chair), Deb Wilson, Kent Smith (ACFHP Chair), Lisa Havel (ACFHP and Habitat Coordinator)

Through her tireless fundraising and project oversight to restore the Damariscotta Mills fishway in Nobleboro, Maine, Deb has been instrumental in the return of more than 1 million alewives accessing 4,700 spawning acres upstream. With too many depleted runs along the coast, the Damariscotta Mills fishway serves as a model of sustainable, community-based fisheries management and a beacon of possibility for other communities seeking to restore their diadromous fish runs. Deb spreads that message through education and outreach initiatives such as the annual Damariscotta Mills Fish Ladder Restoration Festival, which welcomes around 100,000 visitors each year. She brings her restoration experience to the whole coast through service on the Atlantic States Marine Fisheries Commission's Shad and River Herring Advisory Panel.

The award was established in memory of Dr. Melissa Laser, who was a biologist with the Maine Department of Marine Resources, where she worked tirelessly to protect, improve and restore aquatic ecosystems in Maine and along the entire Atlantic Coast. Dr. Laser brought her smiling dedication and enthusiasm to the Commission's Habitat Committee and Atlantic Coastal Fish Habitat Partnership's Steering Committee. Her contributions to these committees and to her home state were tremendous. Deb approaches her work with the same combination of warmth, humor, positivity, respectfulness, and quiet enthusiasm that Melissa exemplified, which has led to truly unique contributions to habitat conservation.

Atlantic States Marine Fisheries Commission

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Executive Director

Deke Tompkins
Legislative Executive Assistant

Tina L. Berger
Director of Communications

Patrick Campfield
Fisheries Science Director

Kristin Anstead, Ph.D.
Stock Assessment Scientist

Katie Drew, Ph.D.
Senior Stock Assessment Scientist

Lisa Havel, Ph.D.
ACFHP and Habitat Coordinator

Jeff J. Kipp
Stock Assessment Scientist

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Rachel Foster
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Lisa Hartman
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Amy Hirrlinger
Fisheries Specialist I

Ed Martino, Ph.D.
IT Manager and Programmer

Cynthia Robertson
Meetings Assistant

Toni Kerns
Director, Interstate Fisheries Management Program

Max Appelman
Fishery Management Plan Coordinator

Ashton Harp
Fishery Management Plan Coordinator

Kirby Rootes-Murdy
Fishery Management Plan Coordinator

Michael Waine
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Megan Ware
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Atlantic Coastal Cooperative Statistics Program

Mike Cahall
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Julie DeFilippi
Data Team Leader

Karen Holmes
Software Team Leader

Ed Martino, Ph.D.
IT Manager and Programmer

Geoff White
Recreational Program Manager

Alex DiJohnson
Recreational Data Coordinator

Joseph Myers
Data Coordinator

Nicholas Mwai
Fisheries Programmer

Jennifer Ni
Fisheries Data Analyst

Sarah Rains
Scan Technician

Coleby Wilt
Recreational Data Coordinator

Elizabeth Wyatt
Program Assistant

The federal budget cycle continues to be uncertain which makes planning and budgeting challenging. However, the Commission was fortunate to receive adequate funding to conduct all fundamental programmatic activities and maintain current staffing. Of note, 2015 was the first year the Commission received funding from NOAA Fisheries to support NEAMAP. Following is a financial snapshot of the Commission for the years ended June 30, 2015 and 2014. Detailed financial statements audited by the firm Jones and McIntyre, PLLC, are available from the Commission office.

Atlantic States Marine Fisheries Commission

Condensed Statement of Financial Position Information

For the Years Ended June 30, 2015 and 2014

ASSETS

	2015	2014
CURRENT ASSETS:		
Cash and Investments	$ 865,572	$ 751,506
Grants and accounts receivable	1,390,510	506,897
Prepaid expenses	42,400	24,701
Total Current Assets	$ 2,298,482	$ 1,283,104
Property and Equipment, Net	$ 3,766,596	$ 3,933,076
TOTAL ASSETS	$ 6,065,078	$ 5,216,180

LIABILITIES AND NET ASSETS

CURRENT LIABILITIES:		
Accounts payable and accrued expenses	$ 1,079,965	$ 585,647
Deferred revenue and contract advances	337,466	161,804
Current maturities of long term debt	180,636	206,532
Total Current Liabilities	$ 1,598,067	$ 953,983
OTHER LIABILITIES:		
Long term debt	$ 791,454	$ 979,014
Obligation under interest rate swap	49,353	70,040
Total Other Liabilities	$ 840,807	$ 1,049,054
TOTAL LIABILITES	$ 2,438,874	$ 2,003,037
UNRESTRICTED NET ASSETS	3,626,204	3,213,143
TOTAL LIABILITIES AND NET ASSETS	$ 6,065,078	$ 5,216,180

Atlantic States Marine Fisheries Commission

Condensed Statement of Activities Information

For the Years Ended June 30, 2015 and 2014

	2015	2014
REVENUE:		
Contract reimbursements	$ 7,707,989	$ 5,720,578
Contributions from member states	665,241	633,579
Other	48,235	49,633
Total Revenue	$ 8,421,465	$ 6,403,790
EXPENSES:		
Salaries and fringe benefits	$ 3,695,869	$ 3,312,581
Subcontracts	2,663,955	1,036,827
Travel	986,842	921,172
Other	661,738	765,644
Total Expenses	$ 8,008,404	$ 6,036,224
CHANGE IN NET ASSETS	$ 413,061	$ 367,566
NET ASSETS, BEGINNING OF YEAR	3,213,143	2,845,577
NET ASSETS, END OF YEAR	$ 3,626,204	$ 3,213,143

Commission managed marine resources generate billions of dollars in economic activity annually and provide tens of thousands of jobs within our coastal communities

Acknowledgements

We would like to thank the following people and agencies for the use of their photographs throughout this report.

Cover

- Maine Lobstermen's Association

Title page

- flickr/Scania Group, http://tinyurl.com/hrxutkq

Page 3 (from top to bottom)

- Fishery Management Plan Coordinator Kirby Rootes-Murdy with an Atlantic striped bass captured as part of the SEAMAP Winter Cooperative Tagging Cruise © ASMFC
- Maine Lobstermen's Association
- Fishing gear at sunset © NEAMAP
- Rod and reel used as part of the SEAMAP Hook and Line Tagging Survey © Tom Crews, USFWS

Page 4 (from top to bottom)

- Commercial brailing for black sea bass © MA DMF
- Angler with a red drum © Captain Walter Bateman, www.carolinaguide.com
- Fishing gear © ASMFC
- Students conducting habitat restoration © NOAA

Pages 9-11

- ASMFC fish illustrations by Dawn Witherington, http://www.drawnbydawn.com/

Page 12

- Glass eels © Chris Bowser, NYS DEC

Page 14 (from top to bottom)

- Hattie Train with a commercially-caught American lobster © Stephen Train
- Atlantic croaker captured as part of the Delaware River Seine Survey © NJ DEP

Page 17

- Purse seining for Atlantic menhaden © John Surrick, Chesapeake Bay Foundation

Page 18

- Atlantic striped bass captured as part of the SEAMAP Hook and Line Tagging Survey © Tom Crews, USFWS

Page 20

- From Left: Matthew Breece and Dewayne Fox with a large female Atlantic sturgeon captured as part of Delaware State University's (DESU) Spring Sturgeon Sampling Program. The female measured 8.6 feet in total length and weighed 260 pounds. Photo © DESU.

Pages 22 & 23 (from left to right)

- Juvenile black drum © SC DNR
- New Jersey record black sea bass reeled in by Steve Singler of Philadelphia, PA on December 12, 2015. The fish weighed in at 9 pounds and measured 27.5" in length and had a girth of 18.5" © NJ DEP
- Bluefish close-up © ASMFC

Page 24

- Tiger shark © Bryan Frazier, SC DNR

Pages 25 & 26

- Juvenile horseshoe crab © Derek Perry, MA DMF
- Jonah crab © Derek Perry, MA DMF

Page 25

- Northern shrimp captured as part of the GOM Northern Shrimp Survey © Elaine Brewer, MA DMF

Page 29 (from left to right)

- Young angler with a red drum © Captain Walter Bateman, www.carolinaguide.com
- Angler with scup © Mark Terceiro, NEFSC

Page 31

- Senior FMP Coordinator Mike Waine with an American shad © Mike Waine

Page 33

- Spiny dogfish captured as part of NEAMAP SNE/MA Trawl Survey © NEAMAP

Page 35

- Anglers with spotted seatrout © Chris Kalinowsky, GA DNR

Page 37 (from left to right)

- Juvenile summer flounder captured as part of Maryland's Coastal Bay Survey © ASMFC
- Angler with tautog © Chip Lynch

Page 38 and 39

- Juvenile winter flounder © CT DEEP

Page 40

- Atlantic striped bass captured as part of the SEAMAP Winter Cooperative Tagging Cruise © ASMFC

Page 41

- Graph of survey coverage and sampled winter flounder by number and weight as part of the Maine/New Hampshire Inshore Trawl Survey © Maine/New Hampshire Inshore Trawl Survey

Page 42 (from top to bottom)

- Mating horseshoe crabs © Gregory Breese, USFWS
- Northern shrimp being sampled as part of the GOM Northern Shrimp Survey © Elaine Brewer, MA DMF

Page 44

- Atlantic striped bass captured as part of the SEAMAP Winter Cooperative Tagging Cruise © ASMFC

Page 45

- Scientists attending stock assessment training workshop © ASMFC

Pages 46 & 47 (from top to bottom)

- Alewifes © Jerry Prezioso, NOAA Fisheries
- Bottom left: Nature-like rock weirs will allow for fish passage at the undersized Route 172 crossing on Patten Stream © Town of Surry.
- Bottom right: Cotton Gin Mill Dam, looking upstream © Cathy Bozek, The Nature Conservancy.

Page 48

- Data entry Cooperative State/Federal/Industry Bycatch Survey © ASMFC

Page 56

- Rod and reel used as part of the SEAMAP Hook and Line Tagging Survey © Tom Crews, USFWS

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