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ASMFC
FISHERIES focus
Vision: Sustainable and Cooperative Management of Atlantic Coastal Fisheries

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Atlantic Striped Bass Board Releases Draft Amendment 7 for Public Comment

States to Conduct Public Hearings throughout March

The Commission's Atlantic Striped Bass Management Board approved for public comment Draft Amendment 7 to the Interstate Fishery Management Plan (FMP) for Atlantic Striped Bass. The Draft Amendment proposes options to address the following issues: management triggers, recreational release mortality, stock rebuilding plan, and conservation equivalency. These issues were identified during the public scoping process for Amendment 7 as critically important to help rebuild the stock and update the management program.

The Draft Amendment's proposed options consider changes to the management triggers, which determine when the Board is required to make management adjustments, and whether to adopt new restrictions or requirements for the use of conservation equivalency, which provides the states the flexibility to tailor the management measures. For stock rebuilding, the proposed options consider the impact of low recruitment and how the Board could respond to the 2022 stock assessment if action is needed to achieve stock rebuilding by 2029. Since release mortality in the recreational fishery is a large component of annual fishing mortality, the Draft Amendment considers options to reduce the number of striped bass released alive and options to increase the chance of survival after a striped bass is released.

The last time a new plan amendment to the Atlantic Striped Bass FMP was adopted was in 2003 (Amendment 6). Since then, the status and understanding of the striped bass stock and fishery has changed considerably, and the results of the 2018 Benchmark Stock Assessment in particular led the Board to discuss a number of prominent issues facing striped bass management. Consequently, the Board initiated the development of Amendment 7 in August 2020 to update the management program to better align with current fishery needs and priorities. The Board intends for this amendment to build upon the Addendum VI to Amendment 6 action to end overfishing and initiate rebuilding in response to the overfished status of the stock.

The Draft Amendment is available at http://www.asmfc.org/files/PublicInput/AtlStripedBassDraftAm7forPublicComment_Feb2022.pdf or via the Commission's website at http://www.asmfc.org/about-us/public-input. All those interested in the management of Atlantic striped bass are encouraged to provide input either by participating in public hearings, which may be conducted via webinar, or providing written comment. Public comment will be accepted until 11:59 PM (EDT) on April 15 and should be sent to Emilie Franke, FMP Coordinator, at 1050 N. Highland St., Suite 200 A-N, Arlington, Virginia 22201; 703.842.0741 (fax) or at comments@asmfc.org (Subject line: Draft Amendment 7). Go to page 12 for additonal information on the scheduled hearings and instructions on joining the public hearing webinars.

continued, see DRAFT AMENDMENT 7 on page 12

The Atlantic States Marine Fisheries Commission was formed by the 15 Atlantic coastal states in 1942 for the promotion and protection of coastal fishery resources. The Commission serves as the deliberative body of the Atlantic coastal states, coordinating the conservation and management of nearshore fishery resources, including marine, shell and diadromous species. The fifteen member states of the Commission are: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, and Florida.

Tina L. Berger, Editor
Director of Communications
tberger@asmfc.org

703.842.0740 Phone
703.842.0741 Fax
www.asmfc.org
info@asmfc.org

Upcoming Meetings

March 7 - 11
South Atlantic Fishery Management Council, Westin Jekyll Island 110 Ocean Way Jekyll Island, GA; visit https://safmc.net/safmc-meetings/council-meetings/ for more information

March 7-11
Illex and Butterfish Research Track Peer Review; visit https://www.fisheries.noaa.gov/event/illex-and-butterfish-2021-research-track-assessment-peer-review-meeting for more information

March 14 (6:30 - 8 PM)
Sea Turtle Bycatch in Trawl Fisheries Webinar (Summer Flounder Focus); visit https://www.fisheries.noaa.gov/sea-turtle-bycatch-reduction-trawl-fisheries for more information

March 24 (10:30 AM - 12:30 PM)
Summer Flounder Scup and Black Sea Bass Management Board; visit http://www.asmfc.org/calendar/3/2022/Summer-Flounder-Scup-and-Black-Sea-Bass-Management-Board/1910 for more information

March 29 & 30
2022 National Saltwater Recreational Fishing Summit, The Westin Crystal City, 1800 Richmond Highway, Arlington, VA; visit https://www.fisheries.noaa.gov/event/2022-national-saltwater-recreational-fisheries-summit for more information

April 5 - 7
Mid-Atlantic Fishery Management Council, Seaview Dolce Hotel, 401 S. New York Road, Galloway, NJ; visit https://www.mafmc.org/council-events/2022/april-2022-council-meeting for more information

April 12 - 14
New England Fishery Management Council, Hilton Hotel, Mystic, CT; visit https://www.nefmc.org/calendar/april-2022-council-meeting for more information

May 2 - 5
ASMFC Spring Meeting, The Westin, Crystal City, 1800 Richmond Highway, Arlington, VA; visit http://www.asmfc.org/calendar/5/2022/ASMFC-2022-Spring-Meeting/1761 for more information

May 17 (1 - 4 PM)
Assessment Science Committee; visit http://www.asmfc.org/calendar/5/2022/Assessment-Science-Committee-/1911 for more information

June 7 - 9
Mid-Atlantic Fishery Management Council, Hyatt Place, Riverhead, NY; visit https://www.mafmc.org/council-events/2022/june-2022-council-meeting for more information

June 13 - 17
South Atlantic Fishery Management Council, Key West Marriott Beachside, Key West, FL; visit https://safmc.net/safmc-meetings/council-meetings/ for more information

June 28 - 30
New England Fishery Management Council, Holiday Inn by the Bay, Portland, ME; visit https://www.nefmc.org/calendar/june-2022-council-meeting for more information

2022 NATIONAL SALTWATER
RECREATIONAL FISHERIES SUMMIT

On March 29th and 30th, the Commission and NOAA Fisheries will be cohosting the 2022 National Recreational Fisheries Summit, with the theme of Recreational Fisheries in a Time of Change. Discussing and addressing change in the world of marine fisheries is essential given factors such as climate change, increasingly diverse ocean uses, advances in data collection and stock assessment methodologies, and the challenges of balancing stakeholder needs given finite resources. Each of these presents us with challenges and opportunities for collaboration among all stakeholders of the fisheries management community (managers, scientists, commercial harvesters and recreational anglers, and their associated industries). This Summit offers us the chance to work closely with the recreational fishing communities along our coasts to improve communication and gain a common understanding of the issues before us, as well as identify ways that we can collectively contribute to positive changes in the management of recreational fisheries with the goal of ensuring abundant and sustainable recreational fishing opportunities for this generation and many to follow.

Working closely with a Steering Committee, composed of marine recreational fishery representatives throughout the coastal U.S., and using the issues raised through a number of regional constituent meetings held by NOAA Fisheries, the planning team identified four major topics to be covered by the Summit: Climate Resilient Fisheries, Balancing Ocean Uses, Data Collection and Use, and Management Reform, Flexibility, and Optimum Yield. Each session will include a mix of presentations, panel discussions and break-out groups, all facilitated by moderators from the Steering Committee, NOAA Fisheries, ASMFC, and the Regional Fishery Management Councils. Following is a brief overview of each session.

Climate Resilient Fisheries

Changes in ocean temperature, currents, acidification, and sea level rise are affecting nearly every facet of fisheries resources and management at the state, interstate, and federal levels. Potential impacts to marine species include prey and habitat availability, water quality, susceptibility to disease, and spawning and reproductive potential. The distribution and productivity of fishery stocks are often changing at a rate faster than fisheries stock assessments and management can keep pace with. This session will explore the state of climate science, on-the-water observations from anglers, and the status of climate scenario planning. Break-out groups will discuss their vision for climate resilient recreational fisheries and identify steps needed to achieve that vision.

Balancing Ocean Uses

Marine spatial planning has become an increasingly popular method of balancing the growing demands on valuable ocean resources. Commercial and recreational fisheries, renewable energy development, aquaculture, marine transportation, offshore oil exploration and drilling, military needs, and habitat restoration are all components that must be integrated into successful ocean use policies. This session will focus on two of these issues that currently have the greatest impact on recreational fisheries: wind energy development and aquaculture. The session will include presentations and discussion on the state of wind energy and marine aquaculture development across the country and anglers' experiences on and off the water. There will also be a panel discussion on having a voice in the wind energy and marine aquaculture processes, maintaining recreational fishing opportunities, and sharing potential mitigation measures to lessen impacts to recreational fishing.

Data Collection and Use

Accurate and timely scientific information, including recreational fishing data, form the basis of fisheries management decision-making. Significant improvements in the collection of recreational catch and effort data through the Marine Recreational Information Program (MRIP) have occurred over the past several years, with changes to the Access Point Angler Intercept Survey, and implementation of Fishing Effort and the For-hire Surveys. Despite these improvements, angler confidence in the collection and use of recreational fishing catch and effort data continues to be a challenge. These concerns include how data are used in setting recreational harvest limits and measures, as well as a lack of understanding regarding how recreational data are used in stock assessments. To address these issues, this session will include presentations and discussion on understanding recreational data collection, catch monitoring,

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Bait, Birds and Biomedical: Managing a Single Species for Diverse Needs

Introduction

Horseshoe crabs provide the backdrop for one of the most interesting marine resource management issues along the Atlantic coast. An ecologically important species, horseshoe crab eggs are a primary food source for red knots, a shorebird that is threatened under the Endangered Species Act (ESA), as they pass through the Delaware Bay on their long migration from South America to the Arctic. Horseshoe crabs are also economically important, providing bait for commercial American eel and conch fisheries along the coast. Their bright blue blood is also used by the biomedical industry to produce Limulus Amoebocyte Lysate (LAL), a critical reagent for detecting contaminants in medical devices and drugs.

The challenge for fisheries managers is to ensure that horseshoe crabs are managed to meet all these diverse needs, while ensuring the sustainability of the resource for future generations. A coastwide stock assessment was completed and peer reviewed in 2019, although horseshoe crabs in the Delaware Bay Region (New Jersey, Delaware, Maryland, and Virginia) have been managed under the Adaptive Resource Management (ARM) Framework since 2013. The ARM Framework is used to set harvest levels with consideration of the needs of migratory shorebirds, including red knots. In the past decade, more data has been collected on red knots and horseshoe crabs and modeling software has advanced. Thus, in 2022 the ARM Framework was substantially revised to address previous peer review critiques, include newly available data, and transition to new modeling software since the old software is obsolete. An article describing the ARM Framework and its revision can be found on page 8.

Life History

Horseshoe crabs are a marine arthropod found along the Atlantic coast from northern Maine to the Yucatan Peninsula and the Gulf of Mexico. Adults either remain in estuaries or migrate to the continental shelf during the winter months. Migrations resume in the spring when the horseshoe crabs move to beach areas to spawn. Juveniles hatch from the beach environment and spend their first two years in nearshore areas before moving further offshore.

Spawning usually coincides with the high tide during the full and new moon. Breeding activity is consistently higher during a full moon and is also greater during the night. Adults prefer sandy beach areas within bays and coves that are protected from surf. Eggs are laid in clusters or nest sites of about 4,000 eggs each along the beach with each female laying approximately 90,000 eggs per year in different egg clusters (although only about ten eggs per breeding female will reach adulthood).

Species Snapshot

Horseshoe Crab
Limulus polyphemus

Taxonomy

- Horseshoe crabs are in the taxonomic class Merostomata, which means "legs attached to mouth"
- Their scientific name "polyphemus" alludes to a one-eyed giant in Greek mythology, due to the fact that people thought they only had one eye (they actually have ten).

Management Unit
Maine through Florida

Interesting Facts:

- Horseshoe crabs have existed for nearly 450 million years, predating flying insects, dinosaurs and humans.
- There are 4 living species of horseshoe crabs: one inhabits the Eastern and Gulf coasts of North America, while the other three are found in Southeast Asia.
- Horseshoe crabs are more closely related to spiders, ticks and scorpions than they are to true crabs. Like other arthropods, they have a hard shell, or exoskeleton, a segmented body and jointed legs.
- Horseshoe crabs use their tails primarily to flip themselves upright if they are overturned.

Horseshoe crab eggs play an essential ecological role in the food web for migrating shorebirds. The Delaware Bay Estuary is the largest and most important staging area for shorebirds in the Atlantic Flyway. An estimated 425,000 to one million migratory shorebirds converge on the Delaware Bay to feed and rebuild energy reserves prior to completing their northward migration. It is estimated that red knots need to double their mass (by consuming a diet of mostly horseshoe crab eggs) before they have sufficient fuel to complete the journey to the Arctic.

Commercial Fisheries & Biomedical Harvest

From the 1850s to the 1920s, between 1.5 and two million horseshoe crabs were harvested annually for fertilizer and livestock feed. Harvest declined throughout the 1950s and ceased in the 1960s. Between 1970 and 1990, reported commercial harvest ranged from less than 20,000 pounds to greater than two million pounds annually. Since the mid- to late 1990s, commercial harvest has primarily been sold as bait for the American eel and whelk pot fisheries. Increased need for bait in the whelk fishery likely caused an increase in horseshoe crab harvest in the 1990s, with a peak of nearly six million pounds in 1997. Since 2004, coastwide commercial bait landings have remained under one million crabs. The average annual harvest for 2018-2020 was 651,569 crabs, well under the coastwide bait quota of 1,587,274 crabs.

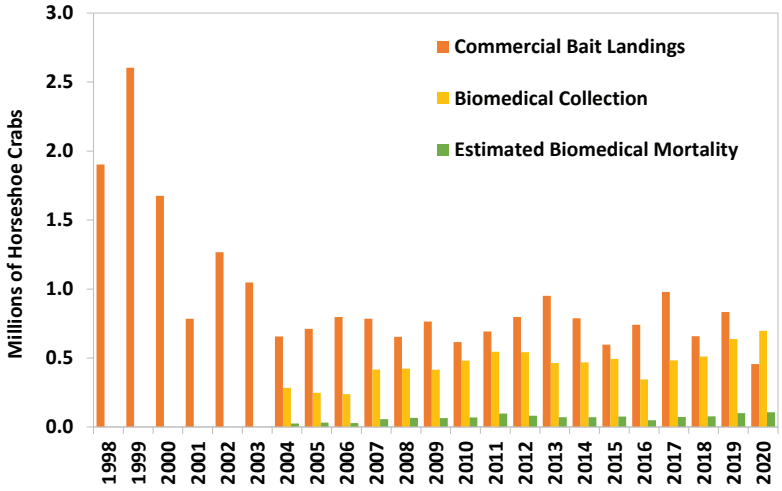
Commercial fishermen have adopted new gear such as bait bags and cups, allowing them to effectively catch eel and conch while using as little as a tenth of the previous portion of bait per pot. The majority of horseshoe crab harvest comes from the Delaware Bay Region, followed by the New England, New York, and the Southeast regions. Trawls, hand harvests and dredges make up the bulk of commercial horseshoe crab bait landings. Horseshoe crab discards occur across commercial gear types, including dredges, trawls, and gillnets. Estimates of discards and associated mortalities, which is only done in the Delaware Bay region, are highly variable and have a lot of associated error. The number of horseshoe crab mortalities due to discards have increased in the last few years, mostly in dredge fisheries. In the Delaware Bay region, only male crabs may be harvested as bait, and these are typically adults. Discard mortality impacts both male and female horseshoe crabs, as well as immature and mature crabs.

Horseshoe crabs are also collected by the biomedical industry for the purpose of producing LAL, a clotting agent that aids in the detection of contaminants in intravenous devices. Blood is obtained by collecting adult horseshoe crabs and extracting a portion of their blood. As required by the FMP, most crabs collected and bled by the biomedical industry are released alive to the water from which they were collected; however, 15% of these crabs are estimated to die from the procedure. Crabs harvested for bait are sometimes bled prior to being processed and sold by the bait industry; these crabs are counted against the bait quota. Biomedical use has increased since 2004, when reporting began, with an estimated 697,025 crabs brought to biomedical facilities in 2020. Biomedical data were included as part of the 2019 benchmark stock assessment, and continue to be provided to the Commission through state compliance reports, although the data remain confidential to the public at a regional or state level.

Stock Status

The 2019 Horseshoe Crab Benchmark Stock Assessment evaluated the stock status of the resource by region, finding populations within the Delaware Bay and Southeast regions remaining consistently neutral and good, respectively, through time. The Northeast region population has changed from poor to neutral, while the status of the New York region population has trended downward from good, to neutral, and now to poor. Coastwide, abundance has fluctuated through time with many surveys decreasing after 1998 but increasing in recent years. The coastwide status includes surveys from all regions and indicates a neutral trend, likely due to positive and negative trends being combined. In the absence of biological reference points, stock status was based on the percentage of surveys within a region (or coastwide) having a >50% probability of the final year (2017) being below their 1998 levels. "Poor" status was >66% of surveys meeting this criterion, "Good" status was <33% of surveys, and "Neutral" status was 34 – 65% of surveys.

Horseshoe Crab Bait Landings and Biomedical Collection
Source: State Compliance Reports, 2021



The Benchmark Assessment was endorsed by the Peer Review Panel and accepted by the Horseshoe Crab Management Board for management use. To date, no overfishing or overfished definitions have been adopted for management use. A model was developed for the Delaware Bay, but it was not used for stock status or management. Rather, the peer review panel recommended it be incorporated in the ARM Framework in the future, which was done in the 2022 ARM Revision (see page 8 for more details).

Atlantic Coastal Management

Horseshoe crabs are managed under the Interstate Fishery Management Plan for Horseshoe Crab (1998) and its subsequent addenda (Addenda I-VII). Under Addendum I (2000), the Commission established state quotas for horseshoe crabs harvested as bait in all Atlantic states. Addendum II (2001) allows voluntary transfers of harvest quotas between states to alleviate concerns over potential bait shortages on a biologically responsible basis, with Commission approval. Addendum III (2004) reduced harvest quotas, implemented seasonal bait harvest closures, and revised monitoring components. In response to decreasing migratory shorebird populations, Addendum IV (2006) reduced quotas in New Jersey and Delaware and added additional protection in Maryland and Virginia to increase horseshoe crab and egg abundance in and around Delaware Bay. Addenda V and VI extended Addendum IV's measures through 2012.

2013 marked the first year the Horseshoe Crab Management Board used ARM framework to set horseshoe crab harvest levels for the Delaware Bay area. The ARM Framework, established through Addendum VII (2012), incorporates both shorebird and horseshoe crab abundance levels to set optimized harvest levels for horseshoe crabs of Delaware Bay origin.

Since 2016, harvest in the Delaware Bay area has been limited to 500,000 male horseshoe crabs and zero female horseshoe crabs.

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FROM EXECUTIVE DIRECTOR'S DESK, continued from page 3

stock assessments, and how uncertainty is accounted for in these processes. There will also be a panel discussion on improving angler confidence in data, and the role of outreach and electronic technology.

Management Reform, Flexibility, and Optimum Yield

Developing recreational management measures that meet angler needs while also ensuring that fisheries resources are not overfished nor experiencing overfishing has become increasingly complex. Concerns related to uncertainty and variability in the recreational fishery data, the need to change measures (sometimes annually) based on those data, as well as the perception that measures are not reflective of current stock status and don't always have their intended effect on overall harvest, have been the major drivers in current efforts for recreational management reform. This session will include presentations and discussion on recreational fisheries management reform and flexibility, and ongoing activities around the U.S. The session will also cover presentations and discussion on optimum yield as a tool to better identify, prioritize, and achieve recreational fisheries management objectives. Attendees will meet in break-out groups to discuss the outlook and tradeoffs for management flexibility and optimum yield, sharing stories across regions.

It's an ambitious agenda for sure but one that I hope will be filled with lots of productive discussions and positive outcomes. In-person registration for the Summit is at full capacity but live-streaming of the presentations and discussions will allow people to view and listen to the majority of the Summit. Information on live-streaming is available at https://www.fisheries.noaa.gov/event/2022-national-saltwater-recreational-fisheries-summit.

HORSESHOE CRAB, continued from page 5

Photo (c) Dr. Rob Robinson, British Trust for Ornithology

This total harvest is allocated among the four states that harvest horseshoe crabs from the Delaware Bay crab population (New Jersey, Delaware, Maryland, and Virginia). The allocation is based upon multiple decision options, including the proportion of horseshoe crabs harvested that originate from Delaware Bay and the allowance for additional male harvest by Virginia and Maryland to compensate for protecting females when the ARM harvest output includes a moratorium on female crabs. Since 2008, New Jersey has had a moratorium on horseshoe crab harvest despite its allocation of the Delaware Bay origin horseshoe crab quota.

In October 2019, the Board directed the ARM Subcommittee to revise the ARM Framework in order to incorporate more available data and update the software platform. Several improvements to the ARM Framework were made during this revision. In the original ARM Framework, the population models for horseshoe crabs and red knots were largely based on life history information taken from literature that was not always specific to Delaware Bay. The ARM Revision improves the models for both species by incorporating region-specific data collected over the past few decades. Horseshoe crab population estimates from the Catch Multiple Survey Analysis (CMSA) model used in the 2019 Benchmark Stock Assessment were incorporated into the ARM Revision. Additionally, the ARM Revision includes more sources of horseshoe crab removals than the previous version, adding mortality in the biomedical industry and commercial discards from other fisheries. For a complete description of the revised ARM model and horseshoe crab trends in the Delaware Bay, see the ARM Revision article on page 8.

After accepting the ARM Revision and Peer Review for management use in January 2022, the Board initiated a Draft Addendum to consider allowing its use in setting annual specifications for horseshoe crabs of Delaware Bay-origin. The Horseshoe Crab Plan Development Team, composed of representatives from the states and federal agencies, will draft management options for Board review prior to the Board considering approving the document for public comment. If approved, the draft addendum will be released for public comment with opportunities to submit comment through public hearings and written comments. Following the public comment period, the Board will meet to review submitted comment and consider final action on the addendum.

For more information, please contact Caitlin Starks, Fishery Management Plan Coordinator, at cstarks@asmfc.org.

ASMFC Releases Draft Addenda on Recreational Harvest Control Rule for Public Comment: *States to Conduct Webinar Hearings in March & April*

The Commission's Interstate Fisheries Management Program Policy Board (Policy Board) approved for public comment the Recreational Harvest Control Rule Draft Addenda to the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan (FMP) and Bluefish FMP. The states of Maine through Virginia have scheduled webinar hearings to gather public input on the Draft Addenda between March 16 and April 13, and written comments will be accepted through April 22. Hearing details and comment instructions can be found below.

The Draft Addenda consider changes to the process used by the Commission and the Mid-Atlantic Fishery Management Council (Council) to set recreational management measures (bag, size, and season limits) for summer flounder, scup, black sea bass, and bluefish. The Council is considering an identical set of options through a framework action. These potential changes are intended to provide greater stability and predictability in recreational management measures from year to year and allow for more explicit consideration of stock status when setting the measures. The Draft Addenda proposes five possible approaches for setting recreational measures. Key differences between the options include the information considered when setting measures and the circumstances under which measures would change. These differences have implications for how often measures would change and the magnitude of those changes. Taking final action on these addenda will not implement any specific bag, size, or season limits but start a new specification process for setting management measures.

The Draft Addenda are available at http://www.asmfc.org/files/PublicInput/HCR_DraftAddenda_PublicComment_March2022.pdf or via the Commission's public input webpage. A quick reference guide is also available at http://www.asmfc.org/files/PublicInput/HCR_FW_addenda_reference_guide_March2022.pdf to aid stakeholders in understanding the options contained in the Draft Addenda. All those interested in the management of the recreational summer flounder, scup, black sea bass, and bluefish fisheries are encouraged to provide input by participating in the public hearings or by providing written comment.

Public Hearing Schedule

Date and Hearing Format	State/Agency	Contact
Wednesday, March 16 ***Webinar Hearing*** 6:00 – 8:00 p.m.	**Virginia Marine Resources Commission**	Pat Geer, 757.247.2236 Shanna Madsen, 757.247.2247
Monday, March 21 ***Webinar Hearing*** 6:00 – 8:00 p.m.	**Maine Dept. of Marine Resources & New Hampshire Fish and Game**	Megan Ware, 207.446.0932 Cheri Patterson, 603.868.1095
Thursday, March 24 ***Webinar Hearing*** 6:00 – 8:00 p.m.	**Rhode Island Dept. of Environmental Management**	Jason McNamee, 401.222.4700
Monday, March 28 ***Webinar Hearing*** 6:00 – 8:00 p.m.	**New Jersey Dept. of Environmental Protection & Delaware Division of Fish and Wildlife**	Joe Cimino, 609.748.2063 John Clark, 302.739.9108
Thursday, March 31 ***Webinar Hearing*** 6:00 – 8:00 p.m.	**Maryland Dept. of Natural Resources & Potomac River Fisheries Commission**	Michael Luisi, 443.758.6547 Martin Gary, 804.224.7148
Tuesday, April 5 ***Webinar Hearing*** 6:00 – 8:00 p.m.	**Connecticut Dept. of Energy & Environmental Protection**	Justin Davis, 860.447.4322
Monday, April 11 ***Webinar Hearing*** 6:00 – 8:00 p.m.	**New York State Dept. of Environmental Conservation**	Maureen Davidson, 631.444.0483
Wednesday, April 13 ***Webinar Hearing*** 6:00 – 8:00 p.m.	**Massachusetts Division of Marine Fisheries**	Nichola Meserve, 617-626-1531

Webinar Instructions

Please note that in order to comment during webinar hearings you will need to use your computer or download the GoToWebinar app for your smart phone. Those joining by phone (audio only) will be limited to listening to the presentation and will not be able to provide input. In those cases, you can send your comments to staff via email, U.S. mail, or fax at any time during the public comment period. To attend the webinar in listen only mode, dial 415.655.0052 and enter access code 964-453-986.

To register for a public hearing webinar go to https://attendee.gotowebinar.com/rt/1135657394291955982 and select the hearing(s) you plan to attend from the dropdown menu. Hearings will be held via GoToWebinar, and you can join the webinar from your computer, tablet or smartphone. If you are new to GoToWebinar, you can download the software at https://support.goto.com/webinar/help/download-now-g2w010002 or via the App store under GoToWebinar. We recommend you register for the hearing well in

continued, see PROPOSED MANAGEMENT ACTIONS on page 10

Adaptive Resource Management Framework Revision Shows an Increased Delaware Bay Horseshoe Crab Population

Introduction

The Delaware Bay is home to both the largest staging area for migratory shorebirds in the Atlantic Flyway and the largest population of horseshoe crabs in the world. Thousands of migratory shorebirds including the threatened rufa red knot converge on the Delaware Bay to feed and rebuild energy reserves prior to completing their northward migration, with horseshoe crab eggs providing an important component of the shorebirds' diet. To address this interrelationship, the Commission developed and adopted the Adaptive Resource Management (ARM) Framework in 2012 to ensure that horseshoe crab harvest within the Delaware Bay region took into account the forage needs of migratory shorebirds. Since 10 years have passed, the Horseshoe Crab ARM Subcommittee was tasked with revising the ARM Framework to incorporate more available data and update the software platform. The ARM Revision was completed and endorsed for management use by an independent peer review panel in 2021 and approved for use by the Horseshoe Crab Management Board in January, 2022.

Photo (c) Gregory Breese, U.S. Fish and Wildlife Service

Background

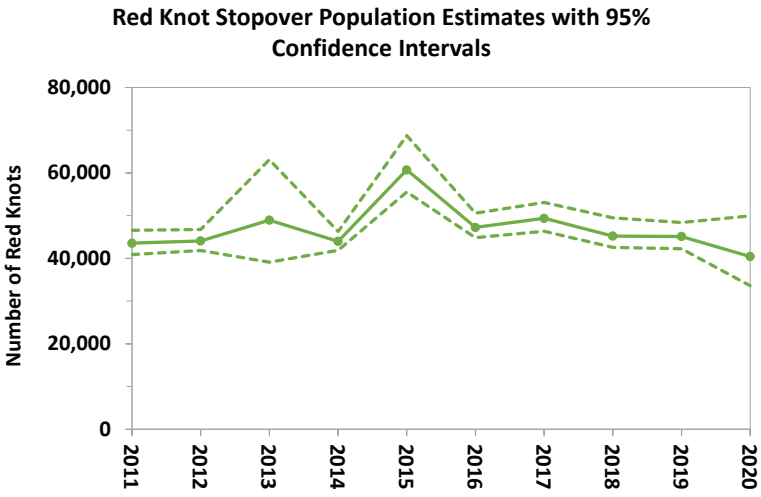
Adaptive resource management is an approach that makes predictions about how a system will respond to management actions, followed by implementation and monitoring of the system. In the ARM Framework, the Delaware Bay is the "system" and the "management action" is the recommended harvest levels for horseshoe crabs. Underlying the original ARM model are population models for both red knots and horseshoe crabs. The ARM model uses an "optimization routine" which is a procedure for finding the best solution given the current state of the Delaware Bay system. In the original ARM Framework, the model determined the best choice among five potential harvest packages (numbers of male and females that can be harvested) given the current abundance of red knots and horseshoe crabs. Since the implementation of this multispecies model in 2013, the ARM Framework has selected a harvest package of 500,000 male-only horseshoe crabs for the Delaware Bay Region.

The original ARM Framework represented the best modeling approach at that time, but since its development and implementation there have been advances in modeling techniques and over 10 more years of data collection. Additionally, the software used to run the ARM model on an annual basis is now obsolete. Today, with more years of data from multiple surveys, both species can be modeled using data specific to the Delaware Bay to estimate population sizes and make predictions about the system in order to recommend harvest levels.

Red Knot Data and Model

Red knots are a medium sized migratory shorebird with several subspecies distributed in distinct flyways throughout the world. The ARM Framework is focused on the Western Atlantic flyway subspecies which overwinter in the southeastern United States and southern South America. The birds migrate north in the spring, stopping at various locations along the route to rest and refuel, most notably in the Delaware Bay. The birds then travel to the northern portions of Arctic Canada, where they breed.

Red knots have been individually marked with leg flags in the Delaware Bay and other locations since 2003. Each leg flag has a unique three number code to identify it. Annually during



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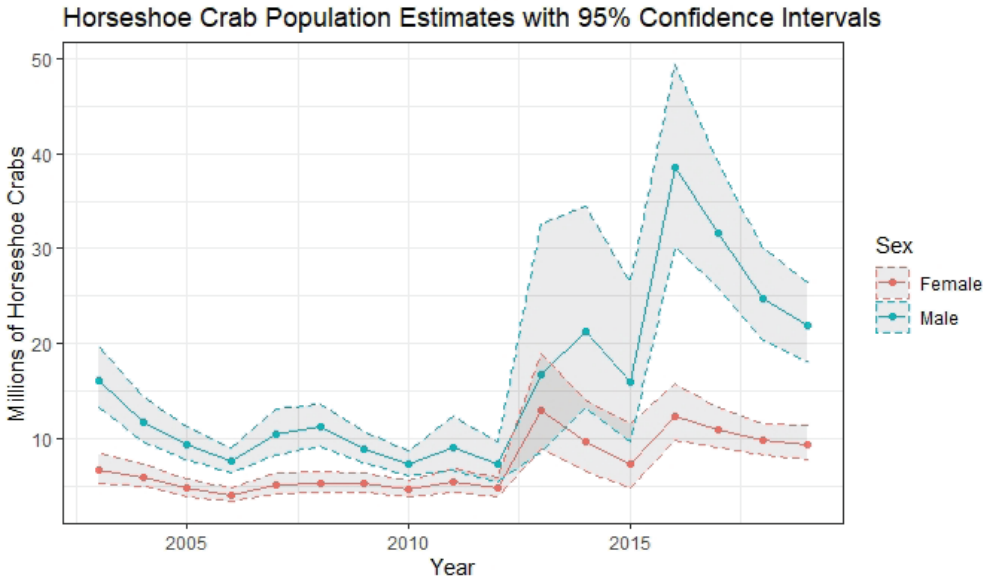
the stopover season in the spring, observers visit multiple sites and count the number of flags in a flock to estimate the proportion of the population with marks ("count data"). The individual number on the leg band is recorded for a subset of birds as well ("mark-resight data"). Aerial and ground counts in the region are also done. Mark-resight and count data from New Jersey and Delaware were used to estimate the population of red knots passing through the Delaware Bay. The passage population estimates were fairly stable between 2011 and 2020 at approximately 45,000 birds. Both the original and revised ARM Frameworks analyzed this data to estimate the stopover population of red knots in the Delaware Bay.



Instead of borrowing life history information from the literature, sometimes from other species or regions, an integrated population model (IPM) was developed to estimate red knot recruitment and survival. The IPM considered the effects of horseshoe crab abundance, the number of horseshoe crabs spawning in the spring, and Arctic snow levels on the red knot population. Estimates of adult red knot survival were consistently high and recruitment rate was fairly low. Additionally, the IPM only showed a positive effect of horseshoe crab abundance on red knot survival, where increased horseshoe crab abundance was correlated with increased red knot survival.

Horseshoe Crab Data and Model

Three fishery-independent surveys were used for the ARM Revision to estimate horseshoe crab abundance: New Jersey Ocean Trawl, Delaware Fish and Wildlife Adult Trawl Survey, and Virginia Tech Horseshoe Crab Trawl Survey. Additionally, the Delaware Bay Horseshoe Crab Spawning Survey was used to estimate spawning beach sex ratios, which have varied annually from three to five males for every female.

Horseshoe crabs in the Delaware Bay Region are harvested as bait for the commercial American eel and conch/whelk fisheries. Horseshoe crabs are also collected by the biomedical industry and a portion of their blood is extracted to support the production of Limulus amebocyte lysate (LAL), a clotting agent that aids in the detection of endotoxins in patients, drugs, and intravenous devices. Most crabs collected and bled by the biomedical industry are released alive to the water from where they were collected; however, a portion of these crabs die from the procedure. A 15% mortality rate is applied to the number of horseshoe crabs bled and released alive to estimate the number of crabs that die each year. This source of removals was not accounted for in the previous ARM Framework but is now included in the ARM Revision. The biomedical harvest data for the Delaware Bay Region is confidential, so coastwide biomedical data has been used for the revised ARM model development. Annual harvest recommendations will be determined based on the region-specific confidential biomedical data if the ARM Revision is used for management.

Another source of removals that was not previously included in the ARM is the number of horseshoe crabs encountered as bycatch in other commercial fisheries. Commercial dead discards were estimated for the Delaware Bay Region as part of this ARM Revision with data from the Northeast Fisheries Science Center's Northeast Fisheries Observer Program.

The previous ARM Framework used a horseshoe crab model based on life history information taken from the literature, some of which came from areas outside the Delaware Bay. In this ARM Revision, a catch multiple survey analysis (CMSA) was used to estimate male and female horseshoe crab population size for 2003-2019 using all quantifiable sources of mortality (i.e., natural mortality, bait harvest, coastwide biomedical mortality, and commercial dead discards) and data specific to the region. The CMSA indicated that adult abundance in the Delaware Bay was stable from 2003-2013 and then began increasing in the past few years for both sexes. This finding is consistent with stock rebuilding due to a period of significantly reduced commercial landings and tight management controls on the fishery beginning in the 2000s in this region. In 2019, the CMSA estimates there were 21.9 million male and 9.4 million female horseshoe crabs of Delaware Bay-origin.

Revised ARM Framework

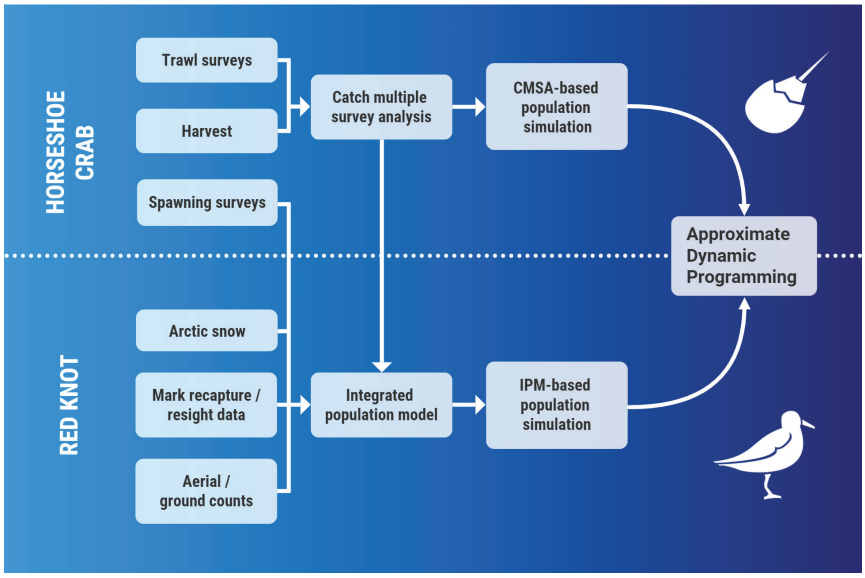
First, the ARM Subcommittee adopted a new modeling approach using modern software that can account for more uncertainty in the data as well as operate with more efficient running times. Then, the

continued on next page

SCIENCE HIGHLIGHT, continued from page 9

ARM Framework was moved into the new software using the red knot and horseshoe crab population models. The populations were projected into the future to simulate the Delaware Bay system and the model then sought to maximize the average total "reward." In this case, reward is a combination of horseshoe crab harvest (within the maximum of 210,000 females and 500,000 males, same as the previous ARM) and the abundance of red knots. Many simulations of the red knot and horseshoe crab model are run and the model solves for the harvest that maximizes the total average reward over all the simulations. The model produces equations known as "harvest policy functions" representing the optimal harvest to implement given the estimated number of horseshoe crabs and red knots at a given point in time. Annual estimates of horseshoe crabs and red knots are used as inputs to the harvest policy functions, which then output the optimal harvest for the next horseshoe crab harvest season. Given the high population numbers of horseshoe crabs, the ARM Framework would currently recommend a harvest of 500,000 males and 144,803 females. Because the red knot population is not at equally high levels, the model does not recommend the maximum allowable harvest for females (210,000 horseshoe crabs), but a mid-range value given the estimated 9.4 million female horseshoe crabs in the region. Regardless, the resumption of female horseshoe crab harvest is a shift from the previous ARM model's recommendations of 500,000 male-only harvest.

Conceptual Model of the ARM Framework for Horseshoe Crabs & Red Knots



Conclusions

The revision to the ARM Framework represents several advancements in not only the knowledge of the population dynamics of horseshoe crabs and red knots, but also how to efficiently model them. An independent peer review panel recommended the new Framework and the Board accepted the ARM Revision for management use. Before it can be used, a new addendum will be drafted, reviewed, and released for public comment before being accepted for setting annual harvest in the Delaware Bay. The Board recognized that there is considerable public concern about

PROPOSED MANAGEMENT ACTIONS, continued from page 7

advance of the hearing since GoToWebinar will provide you with a link to test your device's compatibility with the webinar. If you find your device is not compatible, please contact info@asmfc.org (subject line: GoToWebinar help) and we will try to get you connected. We also strongly encourage participants to use the computer voice over internet protocol (VoIP) so you can ask questions and provide input at the hearing. If you are joining the webinar but will not be using VoIP, you can may also call in at 415.655.0052, access code 964-453-986. An audio PIN will be provided to you after joining the webinar.

The Commission will also post a recording of the hearing presentation on the Commission's YouTube page so stakeholders may watch the presentation and submit comment at any time during the comment process. A subsequent press release will announce the availability of the recording.

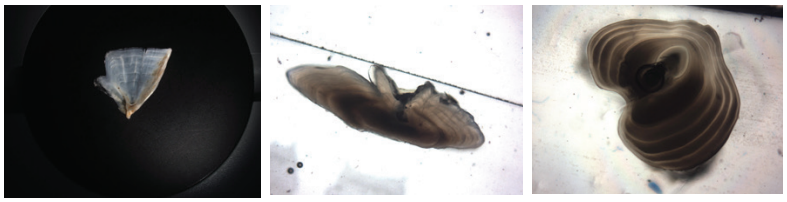
Submitting Written Comments

Written comments will be accepted until 11:59 PM (EDT) on April 22 and should be sent to Dustin Colson Leaning, FMP Coordinator, at 1050 N. Highland St., Suite 200 A-N, Arlington, Virginia 22201; 703.842.0740 (fax) or at comments@asmfc.org (Subject line: Harvest Control Rule). If your organization is planning to release an action alert in response to the Draft Addenda, please contact Dustin Colson Leaning at dleaning@asmfc.org or 703.842.0740, so he can work with you to develop a unique subject line to enable us to better organize and summarize incoming comments for Board review.

Comparing Tautog Ageing Structures

Ageing data is an important component in many of the Commission's stock assessments. Age data can be used to describe the life history of a fish, such as growth, or as an input to age-structured stock assessment models. Fisheries biologists in ageing labs along the Atlantic coast determine the age of a fish by counting annual markings of growth observed on one or more body parts. The most commonly used ageing structures are fish scales and otoliths (ear bones), although, other hard parts such as spines or opercula (gill plates) can be used depending on the species. Annual markings form because fish grow at different rates during the warm (faster growth) and cool (slower growth) seasons, producing alternating translucent and opaque bands on an ageing structure. These marks can be read in the same way that rings are counted to age trees.

An operculum (left), sectioned otolith (middle), and pelvic spine (right) collected from a 422 mm long female tautog. This fish was captured in November, 2018, by MD DNR in their state waters. Participants in the exchange aged the operculum and spine, on average, as an age 8, and the sectioned otolith as a 9-year-old.



An operculum (left), sectioned otolith (middle), and pelvic spine (right) collected from a 313 mm long female tautog. This fish was captured in August, 2019, by RI DEM in their state waters. Participants in the exchange aged the operculum and spine, on average, as an age 6, and the sectioned otolith as a 5-year-old.

Past stock assessments for tautog have included age data since the 1990s. Historically, most states that aged tautog used opercula, although, some were also collecting otoliths. Even though ageing has been a common practice in fisheries science for decades, agers continue to innovate the field by using different hard parts, technologies, and methods. Following a 2016 publication by Scott Elzey and Kimberly Trull from the Massachusetts Department of Marine Fisheries that investigated using pelvic spines for ageing tautog, the Tautog Technical Committee (TC) tasked the Ageing Committee with evaluating its methods for use in future stock assessments.

Agers representing labs and state agencies from Massachusetts to Virginia took part in an ageing workshop and sample exchange. The workshop was an opportunity for agers to look at various ageing structures together as a group, as well as get training on processing and reading pelvic spines for tautog. The group evaluated opercula, otoliths, and pelvic spines. Following the workshop, the group developed an exchange set, or a collection of ageing hard parts, to be circulated to each lab to be aged. The exchange set included 64 complete paired samples, where a "paired sample" means an otolith, opercula, and pelvic spine collected from the same fish, and an additional 11 sets of paired opercula and spine samples, all collected in various state waters. Samples were randomized so participants did not know which paired samples were from the same fish. The exchange set was mailed from lab to lab and each reader evaluated the set knowing only the collection date of the sample. None of the samples in the set were of known age, so the exchange report compared each age determination to those of the other readers. All age readings were compiled and compared between states or between readers in a lab if multiple readers from the same lab participated.

The tautog readers agreed that despite the limited experience most readers had with ageing spines, the results still indicated that the ages from spines were consistent with those from otoliths or opercula. Therefore, this method should be approved as an acceptable structure for ageing tautog. The tautog agers advised the TC to use ages from spines if the agency supplying the ages has demonstrated that the spine ages are consistent with the ages provided from either opercula or otoliths. The agers also recommended that agencies or ageing labs that are interested in switching to spine ages collect paired samples with otoliths and/or opercula for at least one year. During that year, multiple ageing structures should be prepared and aged to gain experience and exhibit consistent ages between structures. Additionally, the exchange set will be maintained by the Commission and be available to any ageing labs or agencies that want to borrow it for training purposes or practice.

There were also some challenges that the participants in the exchange recognized. Readers acknowledged that it was challenging to identify the first annulus (ring) on the spines, while noting that opercula have the same challenge. Additionally, it was noted that a lot of the age discrepancy happens at older ages (>12) and the stock assessment uses a 12 plus age group.

The tautog exchange began in February 2020, and thus was delayed due to the COVID-19 pandemic, which posed many additional challenges. The tautog agers worked creatively and with determination to complete the exchange during the pandemic, sometimes bringing the laboratory equipment home or rescheduling when the samples were held up in the mail. The Commission thanks the tautog agers for their resilience and dedication to their work through challenging times! A copy of the *Summary of the 2020-2021 Tautog Ageing Sample Exchange* can be found at http://www.asmfc.org/uploads/file/61b8eea3TautogAgeingSampleExchangeReport_Sept2021.pdf

DRAFT AMENDMENT 7, continued from page 1

The states of Maine through Virginia have scheduled hearings to gather public input on the Atlantic Striped Bass Draft Amendment 7. Some hearings will be conducted via webinar and some hearings will be conducted in person. Additional details on participating in the webinars can be found later in this release. The public hearing details are provided in the accompanying table.

Webinar Instructions

Please note that in order to comment during virtual webinar hearings you will need to use your computer or download the GoToWebinar app for your smart phone. Those joining by phone (audio only) will be limited to listening to the presentation and will not be able to provide input. In those cases, you can send your comments to staff via email, U.S. mail, or fax at any time during the public comment period. To attend the webinar in listen only mode, dial 951.384.3421 and enter access code 269-324-049.

To register for a virtual public hearing webinar go to https://attendee.gotowebinar.com/rt/6557659292797688075 and select the hearing(s) you plan to attend from the dropdown menu. Hearings will be held via GoToWebinar, and you can join the webinar from your computer, tablet or smartphone. If you are new to GoToWebinar, you can download the software by (https://support.goto.com/webinar/help/download-now-g2w010002) or via the App store under GoToWebinar. We recommend you register for the hearing well in advance of the hearing since GoToWebinar will provide you with a link to test your device's compatibility with the webinar. If you find your device is not compatible, please contact the Commission at info@asmfc.org (subject line: GoToWebinar help) and we will try to get you connected. We also strongly encourage participants to use the computer voice over internet protocol (VoIP) so you can ask questions and provide input at the hearing. If you are joining the webinar but will not be using VoIP, you can may also call in at 951.384.3421, access code 269-324-049. An audio PIN will be provided to you after joining the webinar.

ATLANTIC STRIPED BASS DRAFT AMENDMENT 7 HEARING SCHEDULE

Date and Hearing Format	State/Agency	Contact
Tuesday, March 8 ***In-person Hearing*** 4:00 – 6:00 p.m.	**Potomac River Fisheries Commission & District of Columbia Dept. of Energy and Environment** ***Hearing Location:*** Potomac River Fisheries Commission 222 Taylor St, Colonial Beach, VA 22443	Martin Gary, 804.224.7148 Daniel Ryan, 202.597.1244
Wednesday, March 9 ***Webinar Hearing*** 6:00 – 8:00 p.m.	**Virginia Marine Resources Commission**	Pat Geer, 757.247.2236
Thursday, March 10 ***Webinar Hearing*** 6:00 – 8:00 p.m.	**Delaware Division of Fish and Wildlife**	John Clark, 302.739.9108
Monday, March 14 ***Webinar Hearing*** 6:00 – 8:00 p.m.	**New Jersey Dept. of Environmental Protection & Pennsylvania Fish and Boat Commission**	Joe Cimino, 609.748.2063 Kris Kuhn, 814.359.5115
Tuesday, March 15 ***Webinar Hearing*** 5:30 – 8:00 p.m.	**Rhode Island Dept. of Environmental Management**	Jason McNamee, 401.222.4700 x2772414
Wednesday, March 16 ***In-person Hearing*** 6:00 – 8:00 p.m.	**New York State Dept. of Environmental Conservation** ***Hearing Location:*** NYSDEC Division of Marine Resources 123 Kings Park Blvd (inside Nissequogue River States Park), Kings Park, NY 11754	Maureen Davidson, 631.444.0483
Monday, March 21 ***Webinar Hearing*** 6:00 – 8:00 p.m.	**Massachusetts Division of Marine Fisheries**	Michael Armstrong, 978.282.0308 x109
Tuesday, March 22 ***Webinar Hearing*** 6:00 – 8:00 p.m.	**Connecticut Dept. of Energy & Environmental Protection**	Justin Davis, 860.447.4322
Wednesday, March 23 ***Webinar Hearing*** 6:00 – 8:00 p.m.	**Maine Dept. of Marine Resources**	Megan Ware, 207.446.0932
Wednesday, March 23 ***In-person Hearing*** 6:00 – 8:00 p.m.	**New York State Dept. of Environmental Conservation** ***Hearing Location:*** NYSDEC Region 3 21 South Putt Corners Road, New Paltz, NY 12561	Maureen Davidson, 631.444.0483
Monday, March 28 ***Webinar Hearing*** 6:00 – 8:00 p.m.	**Maryland Dept. of Natural Resources**	Michael Luisi, 443.758.6547
Tuesday, March 29 ***Hybrid Hearing*** 6:00 – 8:00 p.m.	**New Hampshire Fish and Game** ***Note: This hearing will be held in a hybrid format. To virtually attend this hearing, please follow the webinar registration instructions.*** ***You can attend in person at this address:*** Urban Forestry Center 45 Elwyn Road, Portsmouth, NH 03801	Cheri Patterson, 603.608.6637

The Commission has posted a recording of the hearing presentation on the Commission's YouTube page so that stakeholders may watch the presentation and submit comment at any time during the comment process. This recording is available at https://youtu.be/tjUw92-Xl-4. Additional summary resources are available on the Commission's website at http://www.asmfc.org/about-us/public-input.

Understanding ACCSP Network Maintenance

The Atlantic Coastal Cooperative Statistics Program (ACCSP) staff are very proud to have a total system availability of 99.7%. ACCSP computer down time each year averages under 24 hours and, with rare exceptions, is planned in advance. Network infrastructure and system security are technically complex, but notifications are general statements that ACCSP systems will experience intermittent downtime while we perform network upgrades and updates to improve security, performance, and reliability. While this is accurate, it may lead to the question: What is actually done and why?

What happens during ACCSP network maintenance?

Hardware, the physical components of the system, and software, the programs that run the network, need regular maintenance. Most of this can and does happen without the users even noticing. However, sometimes work has to be done that requires the system to stop and start again. On personal computers, it is common to see messages noting the need for a restart in order for the updates to take effect, and this also applies to the ACCSP network. Keeping the hardware components new enough to perform the essential functions means that it is sometimes necessary to turn off the system to make the replacement. ACCSP staff does maintenance during nights and weekends to avoid user interruptions during peak system usage time.

Why is network maintenance important?

ACCSP acts as the stewards of the data that we house and collect. In that role, it is important to uphold and sustain the confidentiality and security of those data. This is a responsibility that ACCSP takes very seriously. It is important to the industry members that have submitted the information and to all of the ACCSP partners that own the data.

Maintaining a robust network improves speed and performance and adds security. Additionally, redundancy in the system, such as secondary power, allows a backup to take over in case of a component failure. To the user, this increases system uptime since most issues are unseen by the user.

ACCSP hopes this information has helped to clarify what is happening and why, the next time that planned maintenance or down time is announced. Please feel free to email info@accsp.org with any questions.

ACCSP is a cooperative state-federal program focused on the design, implementation, and conduct of marine fisheries statistics data collection programs and the integration of those data into a single data management system that will meet the needs of fishery managers, scientists, and fishermen. For further information please visit www.accsp.org.

ACCSP 2022 MEETING & RFP CALENDAR

- **FEB 7:** Recreational Technical Committee Meeting
- **FEB 9:** Biological Review Panel Annual Meeting
- **FEB 9:** Bycatch Prioritization Committee Annual Meeting
- **FEB 22:** Atlantic MRIP FHTS Staff Training
- **FEB 23–24:** Atlantic MRIP APAIS Staff Training
- **MAR 1:** Start of ACCSP FY22
- **MAR 2:** Information Systems Committee Annual Meeting
- **MAR 3:** Commercial Technical Committee Annual Meeting
- **WEEK OF APR 11:** Operations and Advisory Committees Spring Meeting & Recreational Technical Committee Meeting
- **MAY 2–5:** ASMFC/Coordinating Council Meeting
- **MAY 11:** ACCSP issues request for proposals
- **LATE MAY:** APAIS Wave 2 Meeting
- **JUN 15:** Initial proposals are due
- **WEEK OF JUL 11:** Review of initial proposals by Operations and Advisory Committees
- **LATE JUL:** APAIS Wave 3 Meeting
- **AUG 1–4:** ASMFC Meeting/Coordinating Council Meeting
- **AUG 17:** Revised proposals due
- **SEP 20–21:** Annual Advisors/Operations Committee Joint Meeting
- **LATE OCT:** APAIS Wave 4 Meeting
- **OCT 19–21:** ASMFC Annual Meeting/Coordinating Council Meeting

Comings and Goings

STAFF

Over the past couple of months there have been a number of staffing changes, including a veteran moving on, a promotion, and the addition of two new Fishery Management Plan (FMP) Coordinators. Along with these changes there have been some shifts in species coordination responsibilities for the staff leads (see the next page for the species leads within the fisheries management and fisheries science programs and the ACCSP).

KIRBY ROOTES-MURDY

This January, Commissioners and staff bid a fond farewell to Kirby Rootes-Murdy, a 9-year veteran of the fisheries management program, as he moved on to become the Chief of Partner and Employee Engagement for the US. Geological Survey (USGS). While at the Commission, Kirby worked on almost all of the Commission species, diligently working with species boards to draft countless management documents to update and modify species management programs. For each of those documents, he strove to provide the boards with the most comprehensive information in order to make their decision-making as easy as possible. From the beginning, Kirby showed a passion for learning about the Commission's management history and process, always seeking ways to improve how we do business. A dedicated team member, Kirby never hesitated to help out on projects both big and small. Kirby brought to his position at the Commission a strong work ethic, accountability, humility, and a generous spirt to help others where he can.

As Chief, he will lead the Partner and Employee Engagement Team in their work to maintain and expand effective partner and employee relations and promote the Eastern Ecological Science Center's science capabilities. With the Commission's ongoing collaborations with USGS, it is likely we will continue to be able to work with Kirby, just in a different capacity. We wish Kirby the very best in his new position.

CAITLIN STARKS

In recognition of her dedication and great work over the past four and a half years, Caitlin Starks has been promoted to Senior FMP Coordinator. Through her work, she has built strong relationships with Commission staff, committee members, and Commissioners in order to improve and promote the Commission's management activities. In her new role, she will be responsible for the mentorship of new FMP Coordinators. Please join us in congratulating Caitlin.

TRACEY BAUER

As one of the new FMP Coordinators, Tracey Bauer is responsible for coordinating the activities of the management programs for black sea bass, sciaenid species (Atlantic croaker, black drum, red drum, spot and spotted sea trout), weakfish and winter flounder. Tracey has a Master's of Science in marine science from the University of New England. She has been working for North Carolina Division of Marine Fisheries as a Fisheries Biologist for the past six years. Welcome aboard, Tracey!

JAMES BOYLE

Also joing the Commisison as FMP Coordinator is James Boyle, with coordination responsibilities for Atlantic menhaden, Atlantic sturgeon, shad & river herring, and tautog. James has a master's degree in marine conservation from the University of Miami, Rosenstiel School of Marine and Atmospheric Science. Prior to getting his degree, James worked on coral restoration and as a dive instructor in Key Largo and Bonaire. Welcome aboard, James!

STAFF LEADS BY SPECIES

Species	FMP Coordinator	Stock Assessment Scientist	ACCSP Data Lead
American Eel	Caitlin Starks cstarks@asmfc.org	Kristen Anstead kanstead@asmfc.org	Heather Power heather.power@accsp.org
American Lobster & Jonah Crab	Caitlin Starks cstarks@asmfc.org	Jeff Kipp jkipp@asmfc.org	Adam Lee Adam.Lee@accsp.org
Atlantic Croaker	Tracey Bauer tbauer@asmfc.org	Kristen Anstead kanstead@asmfc.org	Anna-Mai Christmas-Svajdlenka Anna-Mai.Christmas-Svajdlenka@accsp.org
Atlantic Herring	Emilie Franke efranke@asmfc.org	Katie Drew kdrew@asmfc.org	Joe Myers joseph.myers@accsp.org
Atlantic Menhaden	James Boyle jboyle@asmfc.org	Kristen Anstead kanstead@asmfc.org	Adam Lee Adam.Lee@accsp.org
Atlantic Striped Bass	Emilie Franke efranke@asmfc.org	Katie Drew kdrew@asmfc.org	Joe Myers joseph.myers@accsp.org
Atlantic Sturgeon	James Boyle jboyle@asmfc.org	Kristen Anstead kanstead@asmfc.org Katie Drew kdrew@asmfc.org	Joe Myers joseph.myers@accsp.org
Black Drum	Tracey Bauer tbauer@asmfc.org	Jeff Kipp jkipp@asmfc.org	Anna-Mai Christmas-Svajdlenka Anna-Mai.Christmas-Svajdlenka@accsp.org
Black Sea Bass	Tracey Bauer tbauer@asmfc.org	Jeff Kipp jkipp@asmfc.org	Heather Power heather.power@accsp.org
Bluefish	Dustin Colson Leaning DLeaning@asmfc.org	Katie Drew kdrew@asmfc.org	Joe Myers joseph.myers@accsp.org
Coastal Sharks	Dustin Colson Leaning DLeaning@asmfc.org	Kristen Anstead kanstead@asmfc.org	Joe Myers joseph.myers@accsp.org
Cobia	Emilie Franke efranke@asmfc.org	Kristen Anstead kanstead@asmfc.org	Heather Power heather.power@accsp.org
Horseshoe Crab	Caitlin Starks cstarks@asmfc.org	Kristen Anstead kanstead@asmfc.org	Heather Power heather.power@accsp.org
Northern Shrimp	Dustin Colson Leaning DLeaning@asmfc.org	Katie Drew kdrew@asmfc.org	Adam Lee Adam.Lee@accsp.org
Red Drum	Tracey Bauer tbauer@asmfc.org	Jeff Kipp jkipp@asmfc.org	Anna-Mai Christmas-Svajdlenka Anna-Mai.Christmas-Svajdlenka@accsp.org
Shad & River Herring	James Boyle jboyle@asmfc.org	Katie Drew kdrew@asmfc.org	Adam Lee Adam.Lee@accsp.org
Spanish Mackerel	Emilie Franke efranke@asmfc.org	Katie Drew kdrew@asmfc.org	Heather Power heather.power@accsp.org
Spiny Dogfish	Caitlin Starks cstarks@asmfc.org	Kristen Anstead kanstead@asmfc.org	Heather Power heather.power@accsp.org
Spot	Tracey Bauer tbauer@asmfc.org	Jeff Kipp jkipp@asmfc.org	Anna-Mai Christmas-Svajdlenka Anna-Mai.Christmas-Svajdlenka@accsp.org
Spotted Seatrout	Tracey Bauer tbauer@asmfc.org	Katie Drew kdrew@asmfc.org	Adam Lee Adam.Lee@accsp.org
Summer Flounder & Scup	Dustin Colson Leaning DLeaning@asmfc.org	Jeff Kipp jkipp@asmfc.org	Anna-Mai Christmas-Svajdlenka Anna-Mai.Christmas-Svajdlenka@accsp.org
Tautog	James Boyle jboyle@asmfc.org	Katie Drew kdrew@asmfc.org	Anna-Mai Christmas-Svajdlenka Anna-Mai.Christmas-Svajdlenka@accsp.org
Weakfish	Tracey Bauer tbauer@asmfc.org	Katie Drew kdrew@asmfc.org	Adam Lee Adam.Lee@accsp.org
Winter Flounder	Tracey Bauer tbauer@asmfc.org	Katie Drew kdrew@asmfc.org	Joe Myers joseph.myers@accsp.org