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DMF News

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Inside

Massachusetts allocated $23 million for additional CARES Act Fisheries Relief

The Consolidated Appropriations Act of 2021 has provided an additional allocation of $255 million in fisheries assistance funding to support activities previously authorized under Sec. 12005 of the Coronavirus Aid, Relief, and Economic Security Act, also called the CARES Act, to states, Tribes, and territories with coastal and marine fishery participants who have been negatively affected by COVID-19. In this second round of COVID-19 fisheries relief funding, Massachusetts was allocated approximately $23 million, the third-highest allocation in the country, behind Alaska and Washington.

This funding follows the $28 million of fisheries relief allocated to Massachusetts by the CARES Act in May 2020. For the first round of relief, "Round 1", DMF ran programs across four sectors (aquaculture, commercial fishing, for-hire fishing, and seafood processing/wholesale dealing) from June to November 2020. On November 10, 2020, with the mailing of payments for the commercial fishing sector, Massachusetts became the first state to completely disburse their allocation of funds under this program. DMF approved a total of 954 applications for funding through the Round 1 CARES Act Fisheries Relief program. Although the pandemic's financial impacts vary across sectors and individual businesses, this crisis undoubtedly brought unique challenges to every fishing industry participant in Massachusetts. The Round 1 CARES Act Fisheries Relief was sorely needed by Massachusetts' fishery groups and was regarded by many as a lifeline for their struggling businesses. While data gathered by the MA DMF Statistics Program suggest that some fisheries have been able to recover from the most severe losses seen during the early days of the pandemic, Round 2 of this program will continue to provide critical financial relief to those facing economic hardships.

The Consolidated Appropriations Act of 2021 provides the same eligibility requirements as those mandated under Round 1. As required by the CARES Act, eligible participants must have incurred an economic revenue loss greater than 35 percent as compared to their prior five-year average revenue. States are permitted to select the period within 2020 to which the average revenue would be compared. DMF worked with industry working groups to select timeframes at the sector level to better reflect the timing of greatest economic loss for each sector. Further federal guidelines require that participants must be at least 18 years of age and cannot be made "more than whole" when comparing their 2020 revenue (inclusive of both rounds of CARES Act Fisheries Relief as well as other pandemic-related assistance) to revenues earned during a traditional year. Because the federal requirements for Round 2 closely match those of Round 1, DMF intends to run the Round 2 program largely using the same methods that led to the efficient and expedient disbursal of funds during Round 1.

Massachusetts Shellfish Initiative (MSI) Releases Strategic Plan

Massachusetts waters are home to some of the most abundant and accessible near-shore shellfish resources in the country, which provide invaluable ecosystem services while supporting thousands of year-round commercial fishing industry jobs and countless recreational shellfish fishing opportunities in coastal communities. To protect the shellfish industry, MSI, the first of its kind stakeholder driven initiative led by a 21-member task force, has created a strategic plan that works to maximize the economic, environmental, and social benefits of shellfish resources across the state. For more information, visit www.massshellfishinitiative.org/

DMF initiated its Round 2 program by holding meetings with the four sector working groups that were established for Round 1 during April and May of 2021. Working group members were sector participants representing a diversity of businesses and municipalities across the Massachusetts coast. The working groups reviewed decisions made in structuring each sector's eligibility criteria and payment scaling methods for Round 1 and discussed what changes to the program would comply with Sec. 12005 of the CARES Act and associated federal regulations. All four working groups were in favor of using the general Round 1 program structure for Round 2 but supported slight modifications with the aim of allowing more sector participants to qualify for relief funds. One modification to the program will be the addition of another time period within each sector that can be used to calculate revenue loss. Flexibility in selecting a different time period for comparison will hopefully result in a larger pool of eligible applicants in Round 2 as compared to Round 1.

After receiving feedback from each sector, DMF reconvened its larger, cross-sector industry advisory panel on May 25 to finalize the program approach. This process resulted in sector-specific spending plans intended to be as inclusive as possible for those participants whose income is dependent on Massachusetts fisheries.

On June 9, 2021, DMF submitted the Round 2 Spending Plan to NOAA Fisheries and, following NOAA feedback, submitted a revised Spending Plan on June 25. On July 7, NOAA approved DMF's Round 2 Spending Plan. The DMF team is now preparing Round 2 applications and merging in data gathered during Round 1 to streamline the application process where possible. DMF aims to mail all applications to the relevant permit holders by the end of July.

DMF intends to run the Round 2 application periods for all sectors simultaneously. This way, DMF will be able to address any concerns with landings misattributions (e.g., aquaculture sales reported as wild harvest) and avoid confusion for permit holders eligible in multiple sectors. In order to meet the September 30, 2021 target set by the Consolidated Appropriations Act of 2021, all applications must be returned by August 28, 2021. This will allow DMF to reconcile any clerical mistakes in the applications, make rulings on eligibility appeals, and provide the Atlantic States Marine Fisheries Commission a list of recipients to receive payments from the Round 2 CARES Act Fisheries Relief program.

By Maggie Nazarenus, Grants Coordinator

Massachusetts Remains a Top Seafood Producing State

The seafood industry has been important culturally and economically to Massachusetts for centuries. In 2019, Massachusetts remained one of the top states for commercial seafood landings and value in the country, according to NOAA Fisheries' recently released Fisheries of the United States, 2019 Report (https://bit.ly/3xj0Dcl). Massachusetts was second to Alaska in ex-vessel value of landings in 2019 at $679.3 million. For the 20th year in a row, New Bedford was the highest valued U.S. port with a total ex-vessel landings value of $451 million. New Bedford's consistently high landings value is being driven by high-value sea scallop landings. Massachusetts ranks second in the country in lobster landings, behind Maine.

Although the value of Massachusetts landings is being driven by the high-value sea scallop and lobster fisheries, a closer look at the top 10 species landed in Massachusetts by ex-vessel value (see table) shows a variety of shellfish, invertebrates, and finfish. Most of these top species are landed year-round. There are also several species landed seasonally when they migrate into our waters, including bluefin tuna, black sea bass, scup, striped bass, and fluke.

Top 10 2019 MA-landed Species

Species	Landings (whole lbs)	Value
Sea Scallop	348,474,301	$397,097,791
American Lobster	16,688,233	$93,122,838
Eastern Oyster	9,079,916	$30,140,622
Haddock	18,728,143	$18,258,987
Atlantic surf clam	82,678,098	$16,616,040
Ocean quahog	91,328,531	$8,233,267
Jonah crab	9,697,607	$8,137,653
Monkfish	14,024,887	$8,100,894
Northern shortfin squid (Illex)	17,906,382	$7,200,085
Soft shell clam	3,430,426	$6,542,633

** Source: ACCSP Data Warehouse, 4/17/20. 2019 DMF Annual Report .*

The top two species harvested in state waters in 2019, in terms of value, were lobster and oysters. According to data reported by commercial harvesters, 9.4 million pounds of the total 16.7 million pounds of lobster and oyster landed in 2019 were harvested in state waters. This equates to an approximate ex-vessel value of $53.7 million for lobster harvested in state waters. The top five Massachusetts ports for lobster landings in 2019 were Gloucester, New Bedford, Rockport, Plymouth, and Marshfield. Massachusetts issues just over 1,000 Coastal Lobster permits annually and on average about 700 of these permits are fished in a given year.

Eastern oyster landings in Massachusetts have increased significantly over the past ten years. The ex-vessel value of oysters landed has more than tripled from $9.1 million in 2010 to $30.1 million in 2019. The majority of oyster landings in Massachusetts, with an approximate ex-vessel value of $29 million, come from private aquaculture sites. DMF issued permits to 395 private aquaculture license site holders across nearly 30 coastal municipalities in 2019. More detailed information on license sites and landings by municipality can be found in the 2019 DMF Annual Report.

Detailed final landings data are not yet available nationally or in Massachusetts to fully evaluate the impact the COVID-19 pandemic had on the seafood industry but as reported in the 3rd & 4th Quarter 2020 DMF News, it is clear that some segments of the seafood industry were significantly impacted. Seafood that is primarily sold in restaurants, like oysters, suffered the biggest losses. Regardless of 2020 impacts due to COVID-19, seafood remains important culturally and economically in Massachusetts. In fact, many seafood dealers have reported a higher demand for local seafood during the pandemic. It will be several months before 2020 data are available and analyzed to see how the shifting consumer demand and COVID-19 impacts combined to impact seafood landings and value across species.

By Story Reed, Permitting & Statistics Program Manager

Port by Port: Profiles and Analysis of the Massachusetts Commercial Fishery Released

DMF is excited to announce the release of the Port by Port: Profiles and Analysis of the Massachusetts Commercial Fishery report, including individual port profiles. The report was developed through a collaboration between the Massachusetts Division of Marine Fisheries, the University of Massachusetts Boston's Urban Harbors Institute, and the Cape Cod Commercial Fishermen's Alliance. It is now available online: https://www.mass.gov/lists/port-profile-project. Using data from commercial fishing permits, the Atlantic Coastal Cooperative Statistics Program's (ACCSP) Standard Atlantic Fisheries Information System (SAFIS) Dealer Database, and harbormaster and fishermen surveys, the port profiles provide an overview of the commercial fishing activity and infrastructure within each municipality. The port profiles are part of a larger report which describes the status of the Commonwealth's commercial fishing and port infrastructure, as well as how profile data can inform policy, programming, funding, infrastructure improvements, and other important industry-related decisions. The project was funded through DMF's Seafood Marketing Program.

By Story Reed, Permitting & Statistics Program Manager

"Navigating Massachusetts Seafood," a Virtual Speed Dating for Buyers and Sellers

The Division's Seafood Marketing Program primarily focuses on consumer education and events, but in 2019 the seafood marketing steering committee suggested facilitating a business-to-business event to network buyers and sellers of local seafood. We planned an in-person networking event at the annual Seafood Expo North America (SENA) convention, but then pivoted to a virtual event due to COVID-19.

"Navigating Massachusetts Seafood" was held over Zoom on May 4, and hosted 32 buyers and 17 sellers of local seafood. The registration data collected indicated that most of the buyers had never attended the SENA. The group was spread out over many sectors: restaurant groups, universities, chefs, retail stores, hospitals, and others. Geographically, they mostly came from inside of the Commonwealth, but not all.

The event began with a presentation from DMF Seafood Marketing Coordinator, Wendy Mainardi. The buyers and sellers then met with each other in private break-out rooms for ten-minute sessions. All meeting attendees returned to the main room for a door prize drawing: a tour of Plymouth Rock Oyster Farm with owner Bill Doyle.

Outreach to buyers and event organization was done by the Williams Agency. The event was a great success based on industry feedback. While there are some benefits to hosting a virtual event, similar efforts in the future will probably resume in the original form: a breakfast meeting at the Seafood Expo.

By Wendy Mainardi, Seafood Marketing Coordinator

Dish on Fish: Hake Stew

Ingredients
2 pounds cleaned hake filet (skinned or not)
1 or 2 yellow onions
1 or 2 poblano peppers
4 cloves garlic
3 scallions, rinsed, ends trimmed
6 oz. crushed tomatoes
1 tbsp tomato paste
2 tsp piri piri sauce (Portuguese hot sauce)
¼ cup olive oil
Some side bread (preferably Portuguese)

Directions
1.Wash and dry filet of hake and set aside. Leave skin on if you'd like. Cut in large pieces, about 2 inch by 2 inch. Clean peppers, removing seeds and insides; dice peppers and onions into large pieces; mince garlic; and slice scallions.

2.Start cooking the onions and poblano peppers in a large sauté pan at medium heat. Lightly salt and pepper and cook until softened. Add scallions, garlic, tomato paste and piri piri sauce and then stir. Bring to a simmer. Stir in a little bit of water and place your hake on top and nestle in the mixture. Season once more and cover with lid.

3.Turn on medium low heat and cook until your fish is cooked all the way through. Each plate should have fish with an appropriate amount of sauce. Top with a little olive oil and lemon juice and enjoy!

@wildfoxpierogi

DMF Intensifying Its White Shark Research

As another summer is upon us, white sharks are returning to feed in Massachusetts waters. Since 2009, DMF biologists (and collaborators) have been examining the movement ecology, behavior, natural history, and population dynamics of this species through its Shark Research Project. To date, agency staff have tagged more than 230 white sharks with a variety of high-tech tags to study their fine- and broad-scale movements. Most of these sharks were tagged off Cape Cod, but others were tagged off New York, New Jersey, South Carolina, and Florida. The sharks ranged in total length from 4.0-17.5 ft and were comprised of juveniles, subadults, and adults of both sexes.

The agency has been working with SMAST student and Atlantic White Shark Conservancy (AWSC) researcher Megan Winton to estimate the abundance and relative density of white sharks off Cape Cod from photographic mark-recapture, aerial survey, and acoustic telemetry data. To date, Megan and her team have catalogued more than 500 individual white sharks over the study period (2014–2018). She is now conducting her analyses and hopes to have the study completed by the end of the year.

Building on work conducted to date and in light of the growing presence of white sharks in our nearshore waters, DMF is intensifying its research to understand the predatory behavior of this species with particular emphasis on public safety. The aggregation of white sharks off the coast of Cape Cod is one of only a handful of "hotspots" in the world and unique along the east coast of the US. As such, the state of Massachusetts and, in particular, the towns on Cape Cod are faced with a growing potential for negative interactions between this species and people utilizing our coastal waters. This potential has already been manifested by an increase in attacks on humans—the most recent causing fatal injury to a boogie boarder off Wellfleet in September, 2018. Therefore, intensive research on the local movements and behavior of white sharks while in Cape Cod waters is warranted. Specifically, we need to know where, when, and how these sharks hunt seals, the frequency of feeding events, and environmental factors that drive the predatory behavior of these animals.

To do this, DMF is using a variety of tagging methods:

• The existing acoustic receiver array has been expanded to fill gaps around Cape Cod and to include the majority of towns along the Massachusetts coastline. With more than 200 acoustic receivers in our coastal waters, the Commonwealth is well equipped to examine the local movements of this species as well as others, including striped bass.

• We have also expanded our tagging and survey efforts into Cape Cod Bay where charter captains and private vessels have reported more frequent encounters with this species in recent years. Our work to date indicates that these fish tend to be smaller juveniles.

• DMF is now working with Bryan Legare, a Center for Coastal Studies researcher and PhD student at UMass Amherst, to examine the nearshore movements of white sharks as they relate to habitat. To do so, Bryan has deployed two gridded acoustic arrays off Head of the Meadow Beach (Truro) and Nauset Beach (Orleans), and he has intensively mapped both these areas. These arrays allow for the fine-scale tracking of white sharks to examine how they might be using habitat characteristics, like water depth and tide, to hunt their prey.

• Five real-time acoustic receivers are now being deployed off popular Outer Cape swimming beaches including: Newcomb Hollow and Lecounts (Wellfleet), Head of the Meadow (Truro), Nauset Beach (Orleans), and North Beach (Chatham). While our standard acoustic receivers must be retrieved at the end of the season for data collection, these "live" receivers send notifications immediately to beach managers and lifeguards when acoustically-tagged white sharks are detected close to these beaches.

• We are using a new tag technology called acceleration datalogging camera tags (see figure) on white sharks to record very fine-scale movements at sub-second intervals, including tailbeat frequency, amplitude, body posture, and swimming depth. These data will be used to examine swimming patterns (e.g., traveling, resting, hunting, foraging, mating), bioenergetics, and, ultimately, provide estimates of the intensity of white shark predation on gray seals.

• Direct observations of nearshore behavior are now being collected using a fixed aerial camera system, which was tested in Orleans in 2020.

• Real-time satellite tags are also being attached to white sharks for the first time using a new tool developed by the Woods Hole Oceanographic Institution. These tags can now be affixed without exposing the shark to unnecessary capture and invasive handling.

• Working with AWSC researchers, we are developing a near real-time white shark forecast model based on sightings, detections from acoustic buoys, and the results of habitat association models.

These efforts are being conducted with funding and logistical support from the AWSC, the state, and external grants. Collectively, this information can provide valuable information for science-based decision-making as it relates to public safety. For example, in a study just published in the journal Wildlife Research (Winton et al., 2021), AWSC and DMF researchers found that white sharks off Cape Cod spend almost half their time at depths <15 feet deep where there is a high potential for overlap with recreational water users. These results have clear implications for shark-related public safety practices in the region. This research, strengthened by strong collaborations, will continue to produce new, cutting-edge information about the white shark in the North Atlantic and, specifically, off the coast of Massachusetts.

A white shark carries an acceleration datalogging camera tag (orange) while hunting a group of gray seals off the Outer Cape. (photo credit Wayne Davis)

By Greg Skomal, PhD, Senior Biologist and Shark Research Project Leader

Winter Flounder Spawning Habitat Study

New DMF research into winter flounder spawning habitat using advanced DNA technology is expected to aid in the future refinement of spawning closures and time-of-year restrictions on dredging and other projects.

Winter flounder collected during the MA DMF fall 2021 bottom trawl survey.

Winter flounder (*Pseudopleuronectes americanus*) is a commercially and recreationally important flatfish species that is ubiquitous in Massachusetts coastal waters but whose abundance has declined in recent decades. Winter flounder enter Massachusetts embayments to spawn during winter and early spring when they are vulnerable to potential anthropogenic impacts associated with nearshore habitats. Because turbidity and burial can cause mortality to demersal eggs, DMF's Habitat Program typically recommends time of year (TOY) restrictions on dredging projects in Massachusetts embayments during the spawning and larval development periods. However, detailed information regarding the timing and location of spawning within embayments is currently lacking. To maintain a precautionary approach, DMF applies winter flounder TOY spawning recommendations generally across all embayment locations and over a broad timescale (January 15 to May 31 across southern Massachusetts, February 1 to June 30 for Cape Cod Bay, and February 15 to June 30 for the north coast of Massachusetts). This broad TOY period combined with user conflicts during summer months generally restricts the dredging window to the fall and early winter. Dredging outside of this TOY period is often not feasible or practical and many dredge projects seek waivers to work within TOY restriction periods. Determining the impacts of work within TOY periods on winter flounder spawning success is limited by our current lack of detailed knowledge of preferred spawning habitat and behavior.

We are partnering with the Gloucester Marine Genomics Institute (GMGI) to initiate an environmental DNA (eDNA)-based study of winter flounder distribution in southern MA embayments to address existing data gaps relevant to TOY restriction policies. eDNA is genetic material from an organism that enters the aquatic environment (e.g., metabolic waste, shed cells, mucus) that can be used to identify a species of interest without physically sampling it. Field sampling for eDNA is simple, inexpensive, and consequently holds the potential to provide detailed temporal and spatial coverage information. Water samples are collected in the field and genetic material is later condensed onto a filter and frozen.

GMGI geneticist Tim O'Donnell filtering water samples in preparation for later eDNA analysis (photo credit Tim O'Donnell, GMGI)

For our study which is focused on a single species, DNA is extracted from the filter and quantitative polymerase chain reaction (qPCR) analysis is used to detect the presence of winter flounder using primers and probes designed specifically for the detection of this target species.

The project commenced two years ago with the collection of water samples for eDNA analysis during two traditional winter flounder monitoring surveys: Rhode Island's winter flounder fyke net survey and our winter flounder seine survey. This initial phase of sampling will provide important validation information as eDNA data from these collections can be compared directly to conventional estimates of winter flounder presence and abundance. These results will greatly aid in interpreting field eDNA results for the second phase of this project in which water samples will be collected from Cape Cod embayments where winter flounder presence and abundance are unknown. In this upcoming second phase, representative embayments on the north and south sides of Cape Cod will be sampled for eDNA for a full 12-month period starting in Summer 2021. Results will be used to assess the efficacy of an eDNA approach for temporal and spatial characterization of winter flounder embayment habitat.

By John Logan, Fisheries Biologist

Resumption of DMF Survey Operations

Last year, the Division was able to continue most of its standard operations, albeit under modified procedures incorporating necessary COVID-19 safety measures. However, several areas of our activities occurring aboard vessels could not functionally accommodate social distancing practices and were consequently put on hold. These include our fishery-independent resource assessment trawl survey, most of our commercial fishery at-sea sampling, and recreational for-hire head boat sampling for the Marine Recreational Information Program (MRIP). As restrictions are being lifted this spring, we are happy to report that these data collection programs will resume nearly normal schedules in 2021.

Trawl Survey: Up until last year, the Division's Resource Assessment Project had conducted its biannual bottom trawl survey to monitor the abundance, distribution, and size composition of commercially and recreationally important marine resources in state waters every year since 1978. This is one of the longest running inshore trawl surveys in the United States. The information produced from the survey contribute to stock assessments as well as ocean planning and project impact assessment. The 2021 survey is back on track with spring (May 5–22) and fall (September 7–24) cruises occurring aboard the R/V Gloria Michelle.

To complete our 2021 Spring survey, many of our survey logistics were altered to minimize COVID-19 risks to both scientists and vessel crew. Our survey schedule was modified to reduce the number of crew changes and we reduced our staffing levels to a bare minimum. In addition, each participant was required to quarantine for seven days and produce two negative COVID tests prior to boarding. There were three 6-day legs with one day off between legs to clean and sanitize the entire vessel before the next leg begins. Crew changes only occurred at the vessel's homeport in Woods Hole and participants are being restricted from contact with the public while in port.

The Division was not alone in curtailing vessel-based survey operations amidst the peak of the pandemic. Numerous other states and the federal government cancelled fishery-independent research surveys in 2020, including the NOAA Fisheries Spring and Autumn Bottom Trawl Surveys, the spring ME/NH Inshore Trawl Survey, the Northern Shrimp Assessment Survey, the CT Long Island Sound Trawl Survey, the NJ Ocean Trawl Survey, and the NEAMAP Survey. Others resumed after late starts such as the NY Finfish Trawl Survey. Statistical methods will need to be employed to fill the gap in these surveys' fishery independent indices and life history data that are critical to many species' stock assessments.

Commercial At-Sea Sampling: Due to COVID-19 limitations on close personal proximity aboard vessels (particularly those of smaller size), several at-sea commercial fishery sampling operations were fully or partially cancelled in 2020. Our commercial whelk trap sampling program was only able to complete one trip due to COVID safety concerns. Planned sampling of the April commercial groundfish fishery in state waters was suspended. Additionally, no sea sampling occurred during the spring inshore longfin squid fishery. Where possible, staff communicated with fishery participants to monitor effort, gauge catch and bycatch levels, and other trends. All of these activities are expected to resume normal operations in 2021. Fortunately, with the cooperation of participating captains and crew, we were able to continue commercial lobster trap sampling in 2020, completing the 40th year of this program that characterizes the catch in Massachusetts' most valuable state-waters fishery. Other at-sea sampling activities that occur on larger vessels or with fewer crew, as well as port-side sampling, were able to proceed (with some modification) during 2020.

MRIP: For-hire head boat catch sampling, which takes place through direct observations aboard the vessels, proved difficult to safely conduct in 2020. Typically started in Massachusetts in May, head boat sampling was put off until July, when a month-long "trial run" led to the cessation of head boat sampling for the remainder of the year. While only 11 of our scheduled 88 head boat sampling trips for the year were completed, Massachusetts was the only state to attempt head boat sampling at all during 2020. This resulted in a largely unsampled head boat fishery, which also provides the only direct observations on the size composition of discarded fish in the recreational fishery.

MRIP catch sampling for the other recreational fishing modes (shore, private/rental vessel, and charter boat) was less affected by the pandemic because this occurs on shore, where social distancing was more feasible. DMF delayed the start of shore-based angler interviews from April to late May while safety protocols were developed, which resulted in the cancelation of 170 sampling assignments. Despite this, our dedicated staff were still able to complete more shore-based angler interviews in 2020 than 2019. Some states observed much lengthier interruptions to their shore-based MRIP operations.

Unaffected in MA and largely throughout the coast were the MRIP effort surveys, which are conducted by mail and telephone. Because of this, NOAA Fisheries has already developed a method to use the combination of 2020 effort survey data, the 2020 catch data that was able to be collected, plus proxy data pulled from prior years to fill gaps, to develop 2020 harvest estimates for all states, species, and fishing modes. Having such harvest estimates is critical for assessment and management purposes for our recreational fisheries; however, the additional uncertainty in the estimates caused by the imputed proxy data will need to be taken into consideration during their use. The degree to which imputed data contributes to a species' 2020 catch estimates is shown when querying the MRIP database.

Because Massachusetts had limited interruption to our shore-based catch sampling and because head boat catch is generally a minor contribution to total recreational catch, the contribution of imputed data to Massachusetts' recreational catch estimates is on the lower side compared to other states for many species. Some exceptions include scup (larger head boat contribution) and haddock and cod (late winter/early spring fisheries).

By Nichola Meserve, Fisheries Policy Analyst

DMF Conducting Studies on Striped Bass Release Mortality

DMF implemented regulations last year requiring the use of circle hooks while recreationally fishing with live or dead bait for striped bass in place of J hooks which been shown in studies to "deep hook" more often than circle hooks. The rest of the East Coast states joined us this spring in also requiring circle hooks to comply with the rules set out in Addendum VI to Amendment 6 to the Atlantic Striped Bass Interstate Fishery Management Plan. Also part of Addendum VI was the requirement to reduce removals by 18% through new bag and/or size limits. Following Addendum VI, DMF implemented a recreational limit of 1 striped bass per day, within the slot of 28" to less than 35" total length. These strict new rules are intended to reduce mortality so that the striped bass stocks can begin rebuilding.

The circle hook regulations were put in place to try to reduce mortality in the released fish. Studies have shown that about 9% of striped bass die after they are released from hooking and handling damage. In Massachusetts, we release millions of striped bass each year. When we apply the 9% mortality to this number, we end up with 3-4 times more mortality from released fish than from fish we take home to eat! On a coastwide basis, almost half of all the mortality in striped bass is from caught and released fish. As you can see, reducing the mortality of released striped bass is critical to the sustainability of the striped bass population and the use of circle hooks is the first step to accomplish this reduction.

DMF is currently conducting studies to better characterize release mortality in striped bass. The studies are using acoustic tags that have built in accelerometers (the same technology that makes your smart phone screen flip when you turn the phone sideways). A vast array of acoustic receivers all along the Northeast U.S. can detect the acoustic signal from a tagged bass and record not only it's location but also deduce if the fish is dead or alive by detecting tailbeats recorded by the accelerometer. Through these studies we hope to re-evaluate and validate (or change) the currently used 9% release mortality and also determine the benefit of circle hooks vs. J hooks and other features of hooks such as gap size. Future studies will document the effect of handling/fight time, water temperature, and treble hooks on artificial lures. The goal of these studies is to supply fishery managers with good data so that they can implement rules that will maintain a robust and sustainable striped bass population.

By Michael Armstrong, PhD, Assistant Director

New Angler Education Program: Take Me Saltwater Fishing!

This Spring, the Information and Education group launched the pilot year of the Take Me Saltwater Fishing program. The program (an addition to our established Let's Go Fishing saltwater angler education clinics) is specifically targeted to adult anglers who are interested in leading youth saltwater fishing activities within their community. Trainings are focused on preparing adults to plan and run saltwater fishing outings. Additionally, the program allows participants to check out saltwater rods and tackle for free and provides youth saltwater fishing guides and gift bags for kids to take home.

In 2020 we saw unprecedented numbers of saltwater fishing permits issued (with an 8% increase over the previous year!) showing not only the value of outdoor time, but also the draw and interest in the sport of saltwater fishing. The list of reasons to take kids fishing is nearly endless. From fostering a love of conservation, to family bonding time, to building a specific skill set and working on problem solving skills, fishing is beneficial to people of all ages. By offering adult education focused on fishing with kids, we are putting the tools needed to gain access to saltwater fishing directly into the communities' hands. We are now able to offer support through continued education, future partnerships with headboat and charter captains for youth outing access on vessels, and gear loans to ensure that *anyone* who wants to fish has the opportunity.

In conjunction with the adult education trainings, a new youth saltwater fishing guide has been written to support kids as they learn the skills and log trips over their first season. The guide is written on a middle school level, but offers practical tips, tricks, and visuals to get anyone interested in saltwater fishing started. The guide covers basic saltwater fishing gear, knot tying, rig setup, spinning rod casting and strategy, as well as a quick overview of nine popular sportfish and a fishing logbook for kids to fill out. Guides are free to anyone interested in sharing with individuals, be that a local camp group, scouts, or even just a group of kids from the neighborhood looking for a fun family activity.

Further extending the learning, the guide has a series of instructional videos hyperlinked within the book to allow adults and kids a visual of casting, knot tying, tackle configurations, and how to safely reel and release a fish. For individuals new to the sport (or larger groups of kids where one-on-one instruction isn't as easy) the videos are a great way to teach the skills prior to fishing activity. One of the more satisfying aspects of running fishing clinics for the Division is having the opportunity to model and teach right along side new anglers. The production of these saltwater education videos allows us to extend that tool to a whole new group of individuals we might not ever have had the chance to work with!

As a final access point, this summer DMF is starting a rod and reel loan program, free to any individuals who sign up to participate in Take Me Saltwater Fishing programs. Participants can reserve and check out up to 20 rods for fishing outings, as well as reserve tackle boxes stocked with hooks, line, sinkers, swivels, and other general saltwater gear.

Any individuals interested in participating are encouraged to contact Christine Cassidy at christine.cassidy@mass.gov for full program details as well as information for an onboarding meeting. All programs are free, and the only requirement is an interest in saltwater fishing with kids! No prior fishing experiences is needed, and we only ask to keep in touch with participants with short quarterly surveys to allow us to identify additional needs and continually update the program.

We are looking forward to the continued building of recreational saltwater fishing here in Massachusetts. Over 30% of our residents are anglers, and offering the next generation of youth the opportunity to learn alongside family and friends is so valuable. Passing along a love of the outdoors will foster a connection to our natural resources that can't be learned anywhere else. So, get out there, and get saltwater fishing!

By Christine Cassidy, Information and Education Coordinator

Recent Publications

The following publication is a recent article written by DMF staff and published in a scholarly journal. A full list of publications can be found at https://www.mass.gov/service-details/marine-fisheries-contributions.

John Sheppard worked with a team of researchers to examine how temperature affects within-season migration dynamics of river herring. Legett, H., A. Jordaan, A. Roy, J. Sheppard, M. Somos-Valenzuela, and M. Staudinger. Daily Patterns of River Herring (Alosa spp.) Spawning Migrations: Environmental Drivers and Variation among Coastal Streams in Massachusetts. Transactions of the American Fisheries Society. DOI: 10.1002/tafs.10301.

Saltwater Fishing Derby

The Massachusetts Saltwater Fishing Derby is underway! Entries must be caught on rod and reel, meet minimum qualifying weights and lengths, and be caught in state controlled waters and/or first landed in a Massachusetts port. Fish submitted for the weigh-in portion of the derby must be measured and weighed at a Division certified weigh station. Anglers participating in the catch and release portion of the derby are required to submit a picture of their fish on a measuring device. All eligible entries will receive a derby pin.

At the end of the derby year, trophies are awarded to anglers landing the heaviest or longest fish in each species category.

John Clark, Junior Division Angler of the Year 2020

Winners for the weigh-in entries are chosen in three divisions—men's, women's and junior's (age 15 and younger). The catch and release portion of the derby has two divisions, adult and junior. Special annual awards are given out to the two anglers (adult and junior) who have the most derby winning fish: weigh-in, catch and release, or combined. Charter and head boat captains may be recognized with a skillful skipper award. Recently, we added a Top Shop Award for the tackle shop that sends in the most entries and a bonus prize for our skillful skippers. The winning shop and skillful skipper will receive free advertising in our saltwater sportfish guide. Further details, entry forms, and the leaderboard can be found on our web page www.mass.gov/saltwater-fishing-derby.

By John Boardman, Aquatic Biologist

Public Access Update: Deer Island Pier is Open!

Deer Island Pier, Winthrop, MA.

The facility was constructed by the Department of Fish and Game's Division of Marine Fisheries (DMF), in cooperation with DFG's Office of Fishing and Boating Access, the Massachusetts Water Resources Authority, and the City of Boston. The $2.4 million project was paid for mostly with funds from the sale of Massachusetts recreational saltwater fishing permit, with assistance from the MWRA.

The pier extends 260 feet into Boston Harbor and ends in a 60 foot by 17 foot 'T'. 25% of the fishable frontage is handicapped accessible to wheelchair access. The pier has lighting from the walking path the 'T', bait cutting stations, and two benches to sit and take a rest from angling. The end of the pier sits in twelve feet of water at low tide. The pier is constructed on steel pipe piles that support a timber decking of ipe. Ipe is a southern 'ironwood' that is naturally resistant to decay. This decking, though pricey, will outlast any other product making it a solid value over time.

Deer Island Pier, Winthrop, MA.

Construction of the Deer Island Recreational Fishing Pier was supported by the Marine Recreational Fisheries Development Fund, which is financed through the sale of recreational saltwater fishing permits, donations, and grants. One third of the fund is dedicated to providing anglers with public access to saltwater fishing opportunities. The Marine Recreational Fisheries Development Panel is a five member citizens advisory group that helps DMF in crafting annual spending plans from the Fund.

Some of the activities supported by the Fund are:

- Providing anglers with public access to saltwater fishing opportunities
- Monitoring, stocking, and improving the passage of diadromous fish
- Developing the Saltwater Angler Education Program, offering fishing clinics, seminars, and distribution of informational materials
- Recreational catch and effort data through the Marine Recreational Information Program
- Planning, siting, and monitoring of artificial reefs

The Deer Island Recreational Fishing Pier was designed by Foth Engineering and constructed by ACK Marine & General Contracting, overseen by the Division of Marine Fisheries, the Office of Fishing and Boating Access, and the Massachusetts Water Resources Authority.

Deer Island Pier, Winthrop, MA.

By Ross Kessler, Public Access Coordinator

Creature Feature: American Shad (*Alosa sapidissima*)

American Shad (*Alosa sapidissima*)

Description
The diadromous American shad is one of the largest members of the herring family, Clupeidae. Diadromous fish are those that migrate between fresh and salt waters to complete their reproductive life history. This sea-run lifestyle is not all that common and found in less than 1% of the fish on the planet. American shad are anadromous meaning they spend most of their lives in the ocean and return to freshwater to spawn. Shad are closely related to river herring and look similar, with the exceptions of a series of dark spots on their side and a larger size. Shad can routinely reach a weight of 4-8 pounds and 2 feet in length with larger individuals possible.

Distribution and Habitat
American shad were formerly abundant on the Atlantic coast with spawning runs occurring in most moderate or larger size rivers over the extensive range from Florida to the Canadian Maritimes. In Massachusetts, shad spawning runs occur in two large rivers bordering several states and seven smaller sized coastal rivers. The Connecticut River and Merrimack River have relatively large runs of shad that support recreational fisheries and are managed by multi-jurisdiction management plans. The other coastal rivers with known spawning runs are: Palmer River, Taunton River, Jones River, the Indian Head and South rivers in the North River watershed, Neponset River, and Charles River. If able, shad will migrate well upstream of tidal waters to spawn in swift (0.3 to 0.9 m/s), shallow runs.

Management
American shad historically supported some of the largest fisheries on the east coast. Shad have been particularly vulnerable to passage obstructions, habitat degradation by coastal development, and overfishing. Commercial shad landings have declined sharply from approximately 50 million pounds on the Atlantic coast at the start of the 20th century, to 6-10 million pounds in the 1950s and 1960s, to less than a million pounds during the last 15 years. The coast-wide population of American shad is managed on the Atlantic coast by the Atlantic States Marine Fisheries Commission (ASMFC). In Massachusetts, shad are managed in coastal waters by DMF and in inland waters by the MA Division of Fish Wildlife (DFW). The ASMFC currently manages shad through Amendment 3 to the Interstate Fishery Management Plan for Shad and River Herring. This plan is supported by an ASMFC coast-wide stock assessment for American shad with the most recent assessment conducted in 2020.

The 2020 shad stock assessment found coastwide populations of shad to be depleted with the following multiple factors involved: overfishing, fish passage obstructions, river alterations, pollution and water withdrawals, and changing climate and ocean conditions. Particularly concerning is the finding that 40% of their historic river habitat is blocked by dams and other barriers. In Massachusetts, long-term coordinated monitoring occurs in the large rivers at hydropower fish lifts, with the Merrimack River spawning run count for shad starting in 1983 and the Connecticut River count starting in 1967. Both rivers show increasing trends in lift counts of shad in the last decade.

Concern over the status of our shad runs led DMF to reduce harvest, increase monitoring, and look for fish passage restoration opportunities in recent decades. DMF closed the commercial net harvest of shad in 1987. Recreational harvest was closed for all the coastal rivers in 2012, while allowing modest rod and reel recreational harvest in the Connecticut and Merrimack rivers. DMF initiated a shad electrofishing monitoring project in 2018 in the South and Indian Head rivers to evaluate the status of those runs. Despite all the declining trends, the Indian Head River still supports a popular recreational shad fishery that attracts dozens of anglers each year in hopes of the thrill of hooking a ten-pound shad in shallow water.

We teamed up with DFW and the US Fish and Wildlife Service in 2019 to evaluate the status of shad in the Taunton River. Historically, the Taunton River had a robust commercial fishery for shad. The monitoring includes electrofishing and evaluations on the potential to stock shad in the Taunton River. Similar stocking efforts by DMF and our partners stocked millions of juvenile shad in the Charles River from 2006 until recently. This effort included shad tagging studies to document their movements in relation to impediments in the Charles River. The Charles River and the neighboring Neponset River are presently targets for future river and fish passage restoration that could improve future shad runs and create uncommon urban fishing opportunities from the riverbanks for New England's sea-run gamefish.

By Brad Chase, Diadromous Fish Project Leader

Division Comings and Goings

Susan Boehler is retiring after 33 years with the Division. Sue joined the Division in 1988 when the state's Shellfish Program was transferred from the Department of Environmental Quality Engineering (now the Department of Environmental Protection) to DMF. Sue has run the DMF Shellfish Program's south shore bacteriological lab from the start and has even moved the lab six different times to occupy seven different locations. The historic harvest of shellfish along the coast of Massachusetts would not be possible if the safety of the product was ever in question, and Sue's outstanding work ethic and high standards have contributed tremendously to the well-deserved consumer confidence in shellfish harvested in Massachusetts coastal waters. It is no surprise that such distinguished service made Sue a recipient of the Department's Pride

and Performance award for outstanding work performing lab duties not once but twice in 2002 and 2020. Sue's career reach went far beyond Massachusetts. She was one of the originating members of New England Laboratory Evaluation Officers and Managers since 1996, holding the office of Secretary for a number of years and a coordinator of the internationally recognized Proficiency Testing Program. Sue also served as a FDA certified state lab evaluation officer since 1990, and received the FDA Distinguished Service award in 2002. While Sue's professional achievements are impressive, some of her greatest contributions to the Division were in the form of friendship and moral support to all of us who have had the pleasure to work with her. She will be greatly missed.

After more than 35 years of service, **Eileen Feeney** retired from DMF in May. Eileen worked in all the different regions of the state, beginning her career with DMF as a conservation helper out of the Cat Cove Lab in Salem. From there she moved to the DMF lobster hatchery on Martha's Vineyard in 1981 as a seasonal technician. Eileen spent 1986 back at Cat Cove as a lab technician before moving to the Boston office in following year as a licensing specialist. Eileen remained in Boston until 2004 when she was promoted to a Program Coordinator in the DMF Fisheries Habitat Program in New Bedford. As a member of the Habitat team, Eileen actively contributed to the environmental review process for thousands of coastal alteration permits over the years. Eileen is looking forward to spending more time with her friends and family and more frequent trips to her home in Florida. We wish her well in her retirement.

Dr. Kathryn Ford has left DMF and joined the National Marine Fisheries to oversee the Population and Ecosystem Monitoring Program (AKA Survey Division) at the Northeast Fisheries Science Center at Woods Hole. She had served DMF for than 15 years and oversaw-and built-the DMF Habitat Program which is renowned across the region. DMF's Habitat Program provides technical review and comment letters to state and federal agencies that issue permits for costal alteration projects from a project as small as a private dock to an expansive wind farm. Dr. Ford was adept at promoting the application of sound science to management decisions in the areas of fisheries management, ocean planning and offshore wind development. Her hallmark skills included an ability to collaborate with other agencies in the multidisciplinary challenges of assessing impacts of coastal development. She broadened the research areas and focus of the program encouraging staff to conduct more applied research that improved the accuracy and relevancy of DMF positions on coastal alteration projects. She was widely admired for providing inciteful and useful advice concerning so many complex and controversial issues. During her tenure the emerging issues of offshore wind development, aquaculture development and fishing gear impacts to benthic ecology all were handled by Kathryn and her team under her leadership. We wish her well in her promotion to this prestigious position at NOAA Fisheries and look forward to collaborations with her and NOAA.

Eva Morales retired from the Division of Marine Fisheries in February after 35+ years of service. Eva began her career with DMF as a licensing clerk and was well known for going the extra mile to help constituents find their way through the permitting process. She completed her career working in accounts payable where her professionalism and positivity made her a true joy to work with. Eva will be hard to replace and missed by her co-workers, but we wish her all the best in her next great adventure. Congratulations Eva!

Dr. Mike Pol has moved on in his professional career to become the new Research Director of the Responsible Offshore Science Alliance. ROSA is a non-profit dedicated to understanding, prioritizing, studying, and communicating the impacts on fish and fishing of offshore wind development. Mike started with DMF in 1999 in Conservation Engineering. In 2005, Mike became the Senior Biologist of the group, bringing it to a new level of professionalism. Over his tenure, he has worked on a wide variety of interesting projects from the development of experimental bycatch reduction technology like the "tickle dredge" to reduce yellowtail flounders in the scallop fishery and floating haddock pots to reduce cod, to selectivity research for multiple species and projects to improve the fuel efficiency of the fleet. His work led to the establishment of the MA regulated raised footrope whiting trawl that is used today. In a more recent contribution, Mike helped advance the sustainable Gulf of Maine redfish trawl fishery while acquiring his PhD for the same work. He has also represented DMF at the International Council for the Exploration of the Sea (ICES) as a chair, the NEFMC Research Steering Committee and Northeast Trawl Advisory Panel, the offshore wind industry, in many peer-reviewed publications, and additional prestigious roles. Mike has made a definite impact to his coworkers, collaborators, and industry partners. He will be missed, and we wish him well on the new journey.

Scott Schaffer joined DMF in April as a fixed gear data analyst in the Fisheries Statistics Program. He came to us from the Northeast Fisheries Observer Program where he was a data debriefer with a focus in fixed gear fishing. He will be jointly based out of the Gloucester and New Bedford offices, and will be primarily analyzing commercial data submitted for the trap and gillnet fisheries in the waters of the Commonwealth and adjacent federal waters. Scott grew up in Pennsylvania and received a B.S. in Environmental Science from Temple University. He moved to the Cape upon joining the Observer Program in 2018 and is an avid recreational shell-fisherman.

Taylor Stoni started with DMF this past May and will be working as a Permit Specialist within the Protected Species Program out of the New Bedford office. She will be providing critical assistance in the development of DMF's Habitat Conservation Plan and Incidental Take Permit application. Taylor is a recent graduate of Duke University with a Master's in Environmental Management.

Rachel Vollemans started with DMF in January as an Assistant Biologist, and will be working extensively with our lobster Ventless Trap Survey, early benthic phase lobster sampling, and various other projects as a member of the Invertebrate Fisheries Project team out of the Gloucester office. Rachel spent the last seven years with the Florida Fish and Wildlife Research Institute, working in the Florida Keys on stone crab fishery monitoring and acting as a scientific diver and boat operator for various projects from corals to crabs to queen conch. Rachel grew up in Massachusetts and has a bachelor's degree from UMass-Amherst. She has also spent time with Americorps in California, and studied abroad in Australia as an undergraduate.

The Division's new Protected Species Gear Specialist, **Justin Wilson**, hails from Camden, New Jersey where his love of water began. This led him to the University of Maryland Eastern Shore, where he received his Master's degree in Fisheries Science. Justin's background is in fisheries science, environmental education, and community outreach. For DMF, Justin handles the testing, construction, and distribution of modifications to fixed gear that interacts with any protected species. In his role, he interacts directly with the fishing industry, working to make commercial fishing safe and sustainable.

Adjudicatory Proceedings

Under state law, DMF may sanction commercial and recreational fishing permits for violations of the state's marine fishery laws and regulations subject to a due process adjudicatory proceeding. These adjudicatory proceedings are held before a magistrate. They may be initiated by the agency, the Environmental Police, or municipal officials (constables) authorized to enforce the marine fishery laws of the Commonwealth.

From June 1, 2020 – May 31, 2021, DMF initiated six adjudicatory proceedings. A settlement agreement was reached in four of these matters. These settlement agreements resulted in the surrender of a conch pot endorsement; a multi-year seasonal suspension of a Coastal Lobster Permit; the mandatory transfer of fish pot, conch pot, and black sea bass endorsements; and the conditioning of a wholesale dealer permit regarding the primary purchase of shellfish. The other two matters remain ongoing.

Additionally, there were two outstanding adjudicatory proceedings that were resolved during this period. The first involved alleged mobile gear fishing violations. This proceeding was initiated in 2017 but was stayed until February 24, 2020. In response to the COVID-19 pandemic, as well as the respondent's continued compliance with marine fishery laws and regulations, the agency withdrew its claim. The second proceeding involved violations of the state's conch pot trap tag rules. This matter proceeded to hearing and a Final Agency Action suspended the respondent's conch pot endorsement for a period of three years (2021-2023).

Regulatory Updates

April Conditional Commercial Groundfish Closure (322 CMR 8.05). The April conditional commercial groundfish closure in the Gulf of Maine was lifted for 2021. This action allowed commercial fishermen using certain gears to fish for groundfish in state waters during April between 42°00' north (Plymouth) and 42°30' north (Marblehead). DMF did not lift this closure for gillnets and longlines set overnight due to concerns regarding potential for right whale entanglements in the area. The lifting of this conditional closure is reviewed annually in response to an analysis of annual catch by the state waters only groundfish fleet. When the closure is lifted, existing mobile gear closures and spawning closures in the area still apply.

Blue Crab Trapping Prohibition (322 CMR 6.19). The taking of blue crabs with cylindrical or six-sided traps is now prohibited. Fishermen may continue to fish for blue crabs using gears like dip nets and baited lines, as well as collapsible traps and lift traps that are actively tended and fished in an open configuration. This prohibition was implemented to prevent diamondback terrapin turtles from potentially being captured and subsequently drowning in crab traps. These turtles are listed as threatened under the Massachusetts Endangered Species Act and share nearshore estuarine habitat with blue crabs and may be caught incidentally in blue crab trap gear.

Buoy Line Diameter Rules (322 CMR 12.06). Effective May 1, 2021, all traps set in Massachusetts waters are subject to a maximum buoy line diameter. The maximum buoy line diameter for commercial trap gear is 3/8-inch, whereas it is 5/16-inch for recreational lobster and crab trap gear. Establishing maximum buoy line diameters prevents Massachusetts fishermen from setting gear with heavy buoy lines, reducing the potential for injury and mortality to protected species should buoy line entanglement occur. It establishes a de facto gear marking system to differentiate Massachusetts trap gear from heavier gear fished offshore and in Canadian waters.

Buoy Line Modifications (322 CMR 12.06). Effective May 1, 2021, all commercial trap fishermen are required to fish buoy lines with a breaking strength of 1,700 pounds. This may be accomplished by fishermen fishing fully formed 1,700-pound weak rope or by rigging their existing buoy lines with approved contrivances. Approved contrivances include the South Shore Sleeve and a variety of splices involving 1,700-pound weak rope. Each contrivance is to be 2' long and inserted every 60' within the top 75% of the buoy line. Based on a study by the New England Aquarium, 1,700-pound weak rope presents a much lower risk of injury or mortality to right whales should an entanglement occur.

Commercial Menhaden Rules (322 CMR 6.43). DMF enacted a series of new rules to enhance enforcement and compliance in the state's commercial menhaden fishery when it is conducted under a 6,000-pound trip limit. This includes a maximum purse seine size of 450-feet long by 48-feet deep and a requirement that all menhaden caught be immediately brought on board and stowed in 55-gallon barrels or standard fish totes upon retention. A volume-to-weight equivalency was developed for these containers with a level filled fish tote weighing the equivalent of 117 pounds and a level filled barrel weighing 350 pounds. Therefore, 51 fish totes or 17 barrels are the equivalent to the 6,000-pound trip limit. Fish totes and barrels may be used interchangeably, with a three fish tote to one barrel ratio used to determine trip limit compliance. Additionally, to conform state regulations to the Interstate Fishery Management Plan for menhaden, if Massachusetts opts into the Episodic Event Set-Aside Fishery, then all participants are required to obtain a bait dealer permit and report their catch into SAFIS as a bait dealer on a nightly basis.

Commercial Striped Bass Fishing (322 CMR 6.07). Several adjustments were made to the commercial striped bass fishing rules for 2021. The fishery now opens on the first open commercial fishing day on or after June 16; previously the season opened on June 24. The fishery will now commence with three open commercial fishing days—Mondays, Tuesdays, and Wednesdays—rather than two open fishing days— Mondays and Wednesdays. For 2021, the first open fishing day was Wednesday, June 16. Beginning October 1, provided the quota has not been taken and the fishery is still open, the number of open fishing days per week will increase to five: Mondays–Fridays. DMF has taken similar actions through in-season adjustments in recent years. The commercial fishery will also close on November 15 should Massachusetts' annual commercial striped bass quota not be taken prior to this date, to aid in the end-of-year administration of the commercial tagging program. As the open fishing days are now consecutive, commercial fishermen will be afforded the opportunity to fish overnight tides spanning open fishing days. For example, fishermen may retain, land, and sell fish on Monday and then begin fishing again on Monday night and continue fishing into Tuesday morning to land and sell fish again Tuesday. However, if doing so, they may not possess or sell more than one limit during any single calendar day.

Ghost Panels in Black Sea Bass Pots (322 CMR 6.12). DMF regulations require all black sea bass pots be rigged with a panel that is fitted to the trap with biodegradable materials. This panel may then break from the pot if the gear is lost or abandoned, thereby allowing fish to escape from the pot and the pot to cease catching fish. For 2021, the regulation is being amended to clarify that the opening covered by this panel is to be at least 3inches by 6 inches, consistent with the Interstate Fishery Management Plan for black sea bass.

Purse Seining for Bluefin Tuna (322 CMR 6.04 and 7.01). After 2020, all regulated fishery permit endorsements for bluefin tuna purse seining were retired and moving forward DMF will not permit this activity. Accordingly, DMF has eliminated this permit endorsement type and strictly prohibited the use of purse seining for bluefin tuna by regulation. Since the early 2000s, DMF has restricted this purse seining activity through permit conditions.

Recreational Circle Hook Requirement for Striped Bass (322 CMR 6.03). Beginning in 2021, all recreational anglers—including those fishing onboard for-hire vessels—who are fishing for striped bass with bait are required to use inline (non-offset) circle hooks. This rule does not apply to any artificial lure with bait attached. Bait is defined as any marine or aquatic organism, live or dead, whole or parts thereof. Striped bass caught on an unapproved method of take (while targeting other finfish species)—such as a baited J hook or treble hook—must be returned to the water immediately without unnecessary injury. This circle hook requirement is mandated coastwide through the Interstate Fishery Management Plan to increase the survival of striped bass caught and released in the recreational fishery. Recreational discard mortality has grown to be the greatest source of fishing mortality on the striped bass population. When used during bait fishing, inline circle hooks reduce the likelihood of "deep hooking", which in turn decreases the chance that a released fish will die due to injuries sustained from being caught.

Recreational Gulf of Maine Cod and Haddock (322 CMR 6.03). For 2021, DMF established an April 1–April 14 and September 15–September 30 open recreational fishing season for Gulf of Maine cod. During this season, the per angler bag limit is one fish with a minimum size of 21 inches. For Gulf of Maine haddock, the open fishing season is April 1 through the last day of February. The per angler bag limit is 15 fish and the minimum size is 17 inches.

Recreational Lobster and Crab Trap Season (322 CMR 6.02). DMF enacted a November 1–May 15 closed season for recreational lobster and crab trap gear. Accordingly, all recreational trap fishermen are to remove their gear from state waters by November 1 and may not reset their gear until after May 15. This closure applies only to buoyed recreational lobster and crab trap gear and not unbuoyed gear that is fished and retrieved from the shoreline. Requiring the seasonal removal of trap gear from the water at times and places where right whales are known to aggregate significantly reduces the risk that right whales may become entangled in this gear. Additionally, this will reduce the amount of recreational lobster and crab trap gear that may become abandoned or lost due to seasonal weather events and it provides DMF and the Massachusetts Environmental Police with ample opportunities to remove any abandoned or lost gear that is observed before the onset of winter weather and the migration of right whales into our waters.

Seasonal Commercial Trap Gear Closure (322 CMR 12.04). The existing seasonal commercial trap gear closure to protect right whales was expanded in both time and space. Previously, the Massachusetts Restricted Area—which included all state waters north of Cape Cod south of 42°12' north latitude and state waters east of 70°00' west longitude—was closed from February 1–April 30. Beginning in 2021, this closure was expanded northward to include all state waters north of Cape Cod to the New Hampshire border. Additionally, the closure now runs through May 15. However, DMF has the regulatory authority to lift or extend this closure based on the presence or absence of right whales. For 2021, DMF lifted this closure on May 14, as aerial surveillance indicated right whales had migrated out of state waters. Requiring the seasonal removal of trap gear from the waters at times and places where right whales are known to aggregate significantly reduces the risk of right whale entanglements.

Seasonal Gillnet Closure in Cape Cod Bay (322 CMR 12.04). DMF modified the spatial boundaries of its January 1–May 15 gillnet closure in Cape Cod Bay to protect right whales. This action extended the closure to include those waters west of 70°30' west longitude between 42°00' north latitude (Plymouth) and 42°12' north latitude (Scituate). Requiring the seasonal removal of gillnet gear from the waters at times and places where right whales are known to aggregate significantly reduces the risk of right whale entanglements.

Seasonal Small Vessel Speed Limit (322 CMR 12.05). The March 1–April 30 10-knot speed limit for vessels less than 65 feet overall length operating in Cape Cod Bay was temporarily extended through May 14 for 2021. This action was taken due to the continued presence of right whales in Massachusetts waters in early May of this year. Ship strikes are a major source of injury and mortality to right whales and data shows the frequency and severity of these ship strikes is reduced if a vessel is operating at 10-knots or less. Vessels 65' and larger are subject to federal speed limit rules to protect right whales.

Wintertime Summer Flounder Pilot Program (322 CMR 6.22). DMF renewed its seasonal wintertime summer flounder pilot program for 2021. During the Period I (January 1–April 22) summer flounder fishery, vessels fishing offshore in the federal zone—that are also permitted to land summer flounder and black sea bass in Rhode Island, Connecticut, and New York—are authorized to possess multiple state trip limits when offloading in Massachusetts. The possession of these non-conforming quantities of fish is authorized contingent upon the vessel properly labeling the catch destined for each state and not exceeding the aggregate trip limit for the participating states.

Summertime Summer Flounder Pilot Program (322 CMR 6.22). DMF renewed its seasonal summertime summer flounder pilot program for 2021. This pilot programs allows trawlers participating in the Period II (June 10–October 31) summer flounder trawl fishery to possess and land two daily limits of summer flounder and black sea bass lawfully caught and retained over consecutive open fishing days.

Winter I Scup Limits (322 CMR 6.27). The Winter I (January 1–April 30) commercial scup possession and landing limit was set at 50,000 pounds. This matches the federal limit set for this period by NOAA Fisheries and thereby allows vessels fishing offshore to possess and land scup lawfully caught in the federal zone in Massachusetts.

Whelk Gauge Size Increase (322 CMR 6.20). In 2019, DMF implemented a schedule to increase the whelk gauge size to 3 5/8 inches through a series of 1/8-inch biennial increases to the gauge width. Accordingly, for 2021 the gauge width was increased from 3 inches to 3 1/8 inches. This 3 1/8-inch gauge width will remain in place for 2021 and 2022. In 2023, the gauge width will be increased to 3 ¼ inch. The purpose of this measure is to bring the gauge width to a size where approximately 50% of female knobbed and channeled whelks are sexually mature. In doing so, the overfished whelk resource will be afforded spawning stock protection.

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