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DMF News

Published by the Massachusetts Division of Marine Fisheries (DMF) to inform and educate its constituents on matters relating to the conservation and sustainable use of the Commonwealth's marine resources.

Inside

DMF Office Update

DMF offices remain closed to the public due to the COVID-19 public health emergency. Permit applications should be mailed to:

Division of Marine Fisheries
251 Causeway St., Suite 400
Boston, MA 02114.

Drop boxes are also available on weekdays from 9 am to 3 pm at our Gloucester and New Bedford offices. If you have any questions, please email us at: marine.fish@mass.gov.

Fisheries Relief Provided through the 2020 CARES Act and Other Assistance Programs

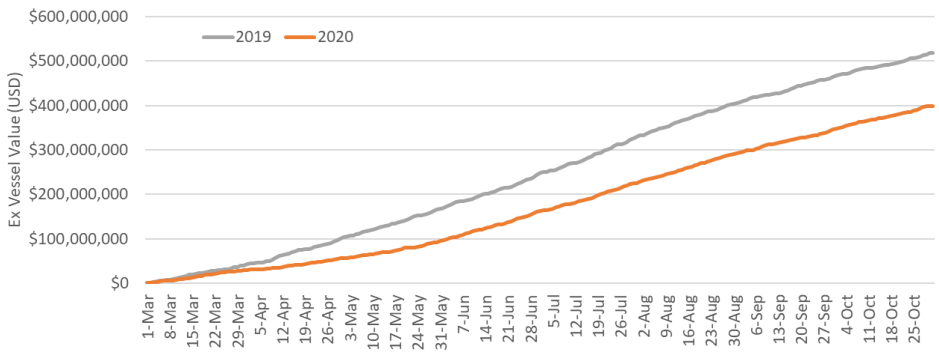
This past spring, DMF responded rapidly to the availability of federal funding through the CARES Act to provide relief to the beleaguered fishing and seafood industry. With critical input from industry-based working groups, Massachusetts became the first state in the nation to distribute CARES relief funding to fishermen and seafood processors, with all payments issued by mid-November. The federal government recently announced another $300 million that will be distributed to states in early 2021 for fishing and seafood relief. DMF plans to reconvene the working groups to aid in the distribution of this next round of congressionally approved funding.

On May 7, 2020, the Secretary of Commerce announced the allocation of $300 million in fisheries assistance funding provided by Section 12005 of the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) for those seafood and fishing industry sectors negatively affected by the COVID-19 pandemic. Approximately $28 million of this funding was allocated by NOAA Fisheries to the Commonwealth of Massachusetts, the third highest allocation in the country. The allocation to states was based on past revenues from four identified fishing sectors: seafood processing, commercial fishing, aquaculture, and recreational for-hire fishing. In Massachusetts, the contribution from each sector was estimated as 51.2% seafood processing, 45.2% commercial fishing, 2.1% aquaculture, and 1.5% for-hire fishing. The Division of Marine Fisheries (DMF) was tasked with distributing these relief funds to the four identified fishing sectors.

Information gathered during the first months of the COVID-19 emergency demonstrated that economic assistance was sorely needed. The ex-vessel value of commercial and aquaculture landings across species during March and April had declined over 30% as compared to the prior five-year average. Landings data collected from March through October would later reveal a total loss of over $121 million, or over 23%, paid to harvesters as compared to 2019 (see figure), with losses occurring in nearly all fisheries. Species that are served primarily in

Loss of Commercial Fishing Revenue in 2020

Running Total of Daily Ex-Vessel Value Species Landed in MA from March through October, 2020 to 2019 Comparison



Data Source: SAFIS Dealer Reports, November 13, 2020. Data are preliminary, and include incomplete landings for surf clams and ocean quahogs.

restaurants, including oysters, lobsters, and bluefin tuna faced even greater reductions in value. The oyster industry suffered the greatest overall percentage loss with over 85% documented in the month of April and roughly 50% from March through October as compared to 2019.

While similar loss calculations were not immediately possible for seafood processors and for-hire fishing businesses, social distancing mandates had easily observed impacts: seafood processors took a major hit from the loss of the restaurant market, while for-hire fishing businesses faced complete shutdowns or strict restrictions on their operations. Data subsequently collected from charter and head boat businesses that were eligible for funding revealed average revenue losses or more than 60% during March through June.

Accordingly, DMF set an ambitious goal of distributing the CARES Act relief to all sectors within a matter of months. DMF put together an internal team of DMF employees to make up the "Massachusetts CARES Act Fisheries Relief Team" to develop and implement a relief program for an industry with over 9,000 participants. The first step was to craft a spending plan for submittal to the Atlantic States Marine Fisheries Commission (ASMFC) for approval by NOAA Fisheries.

The Team felt strongly that the relief program and spending plan could only be developed with significant industry participation. DMF formed an eleven-member industry-based advisory panel and held its first virtual meeting on June 1, 2020. Following that meeting, working groups were created for each of the four sectors. Each working group was assigned two DMF employees to serve as co-chairs and included industry representatives of diverse characteristics. By mid-June 2020, nine virtual meetings had been held with the sector working groups, and within five weeks of the announcement by the Secretary of Commerce, DMF submitted a spending plan to the federal government. In July, Massachusetts became the first state to have an approved spending plan for this critical program.

To be eligible for participation in the relief program, applicants were required to self-certify to several CARES Act stipulations: that they had suffered a 35% revenue loss caused by COVID-19 relative to a previous five-year period specified for each sector, and that relief from this program plus other forms of COVID-19 pandemic-related aid and traditional fishing revenue would not total more than their normal revenue. In addition, DMF implemented residency and age restrictions as required by the Act. Criteria were developed for each sector to further refine the pool of eligible permit holders and to tier payments based on such elements as vessel activity and size in the for-hire fleet, ex-vessel sales for the commercial and aquaculture sectors, and minimum seafood sales and number of employees for seafood processors.

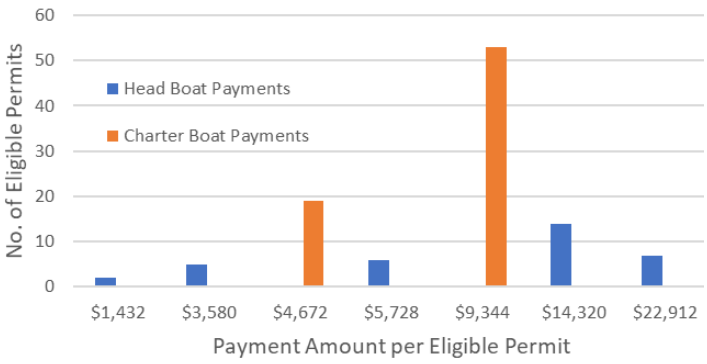
Applications were developed based on the specific criteria approved for each sector and all permit holders were direct mailed an application packet that indicted their potential eligibility. Initial eligibility determinations were based on data submitted to DMF by the permit holders, through either normal reporting processes or pre-application surveys. Applicants were given a deadline for submitting an application, followed by an appeals period. At the conclusion of the appeal period (once the final pool of eligible applicants was known), payment values were determined according to the tiering metrics. Payments for most sectors were processed through the ASMFC on behalf of the Commonwealth. The exception to this was the for-hire head boat sector which the Commonwealth expedited direct payments to and requested reimbursement from ASMFC.

Key Dates for MA DMF CARES Act Fisheries Relief by Sector

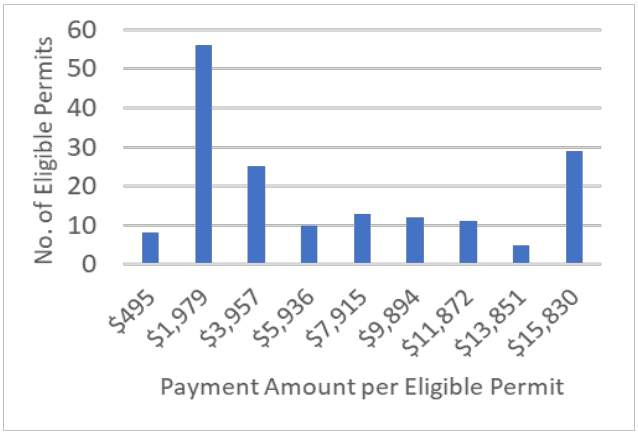
	For-Hire: Head Boats	For-Hire: Charter	Aquaculture	Seafood Processor	Commercial Fishing
Working Group Meetings	10-Jun-20	10-Jun-20	10-Jun-20	8-Jun-20	11-Jun-20
	24-Jun-20	24-Jun-20	18-Jun-20	15-Jun-20	17-Jun-20
Applications Distributed	24-Jun-20	3-Aug-20	3-Aug-20	21-Aug-20	9-Sep-20
Applications Due	30-Jun-20	22-Aug-20	21-Aug-20	12-Sep-20	10-Oct-20
Payment Mailed	22-Jul-20	15-Sep-20	30-Sep-20	2-Oct-20	10-Nov-20

Across all four sectors, MA DMF approved more than 950 applications for this relief program. In the for-hire sector, $1,000,000 was shared across 34 head boats (totaling $416,000) and 72 charter boats (totaling $584,000); payments ranged from $1,432 to $22,912. The $1,152,000 designated for the aquaculture relief program was shared between 170 eligible applications; payments ranged from $495 to $15,830. The $13,779,788 designated for seafood processors/wholesale dealers was shared between 113 eligible businesses; payments ranged from $44,740 to $357,917. In the commercial fishing sector, over 560 applications were accepted into the program; payments ranged from $6,353 to $38,117, totaling $11,822,468 for this sector.

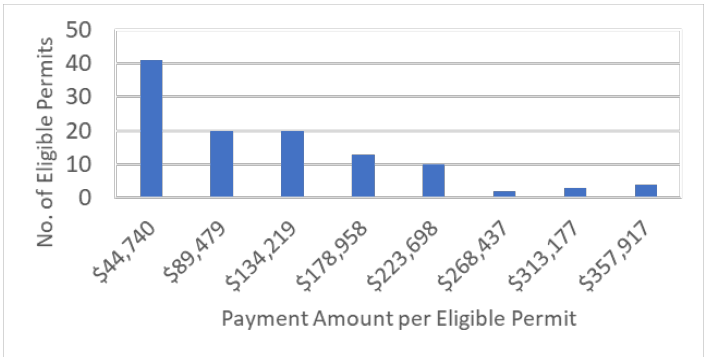
For-Hire Fishing Payment Distribution



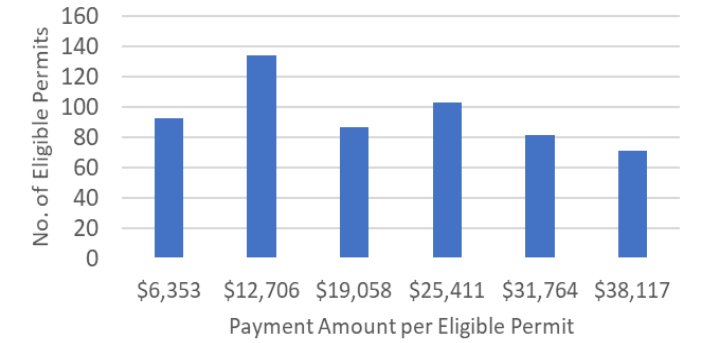
Aquaculture Payment Distribution



Seafood Processor Payment Distribution



Commercial Fishing Payment Distribution



The Massachusetts fishing industry attributable to these four sectors is valued at approximately $1.4 billion annually. Although the $28 million of CARES Act fisheries relief allocated to the state will only cover a portion of the total losses faced by local fisheries as a result of the COVID-19 pandemic, the Commonwealth was fortunate to receive the funds and is proud to have been able to provide relief to local businesses in an expedient manner.

In addition to the CARES Act fisheries relief, other relief programs are providing support to the fishing industry. The United States Department of Agriculture's Seafood Trade Relief Program is offering fishermen with relief payments to mitigate impacts of foreign tariffs affecting seafood value. For each eligible species, participants will receive payment per pound of landings in 2019 (for example, the per pound payment is 50 cents for lobster, 20 cents for squid, 15 cents for flounder, and 13 cents for tuna). Based on DMF's calculations, this could result in over $15 million in direct payments to fishermen.

USDA is also providing molluscan shellfish farmers with a 10% payment based off their 2019 revenues. In Massachusetts, this could result in about $3 million in direct payments to growers because 2019 aquaculture sales by farmers to wholesale dealers were approximately $30 million.

Two other small-scale plans are underway for oyster relief. The first is a program funded by The Nature Conservancy to buy surplus oysters and place them on established or permitted oyster "reefs" for ecological services. These purchases would be limited to those in nearby locations of the reefs. Secondly, a private grant organized by Sea Grant and Barnstable County will support the purchase of "oversized oysters" to go into value-added foods, such as chowders, for those in need.

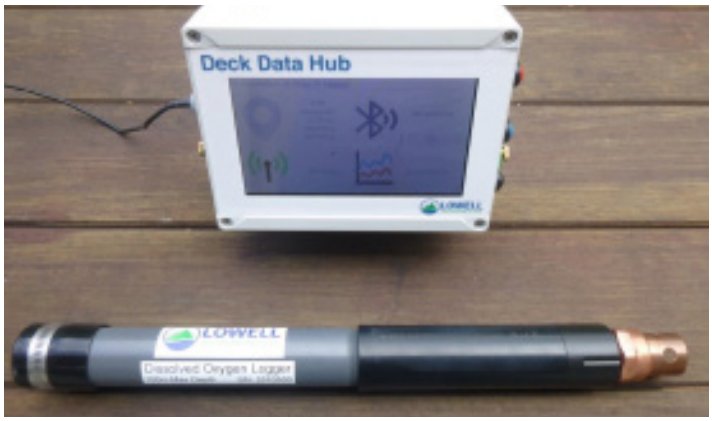
By Maggie Nazarenus, Grants Coordinator

The Return of "the Blob"

Monitoring the Formation and Movements of a Hypoxic Water Mass in Cape Cod Bay

During September 2019, lobster fishers in the southern portion of Cape Cod Bay hauled up a nasty surprise—hundreds of pounds of dead lobsters, crabs, and finfish. DMF quickly learned that these deaths were caused by a severe hypoxia event; the bottom waters in the region did not have enough oxygen to sustain the life of those animals that couldn't move away, like those stuck in the traps (See DMF News 2019 Q3/4 for more background). Determined to avoid this situation in the future, DMF and several fishermen from the affected area talked about developing a monitoring program so we could detect the formation of another hypoxic event, allowing fishermen to move their gear away from the affected area. This was the beginning of the Cape Cod Bay Study Fleet.

This past spring, the Lobster Foundation of Massachusetts was awarded funding from the MA Climate Change Resilience in Fisheries and Aquaculture Grant Program to support the Study Fleet's goal of starting a monitoring program. The funding was used primarily to purchase Data Deck Hub Systems and data loggers developed by Lowell Instruments. These data loggers are attached to lobster traps and record dissolved oxygen (DO) and temperature every 15 minutes. When the traps are hauled, the data logger wirelessly communicates with the deck box. The data are rapidly downloaded, and a GPS location stamp is added to the file. The captain never has to touch the logger; everything is completely automated and happens so quickly that the normal pace of hauling, emptying, re-baiting, and setting back the traps is unaffected. The logger stays attached to the trap and goes back in the water when the gear is set back. The data stored on the deck box are downloaded to a land-based server using a cell phone signal. Five vessels participated in the Study Fleet, covering the southwestern portion of Cape Cod Bay (Manomet to Barnstable) and the northeastern corner (Provincetown area).



Lowell Instruments Data Logger and Data Deck Box used by the Cape Cod Bay Study Fleet.

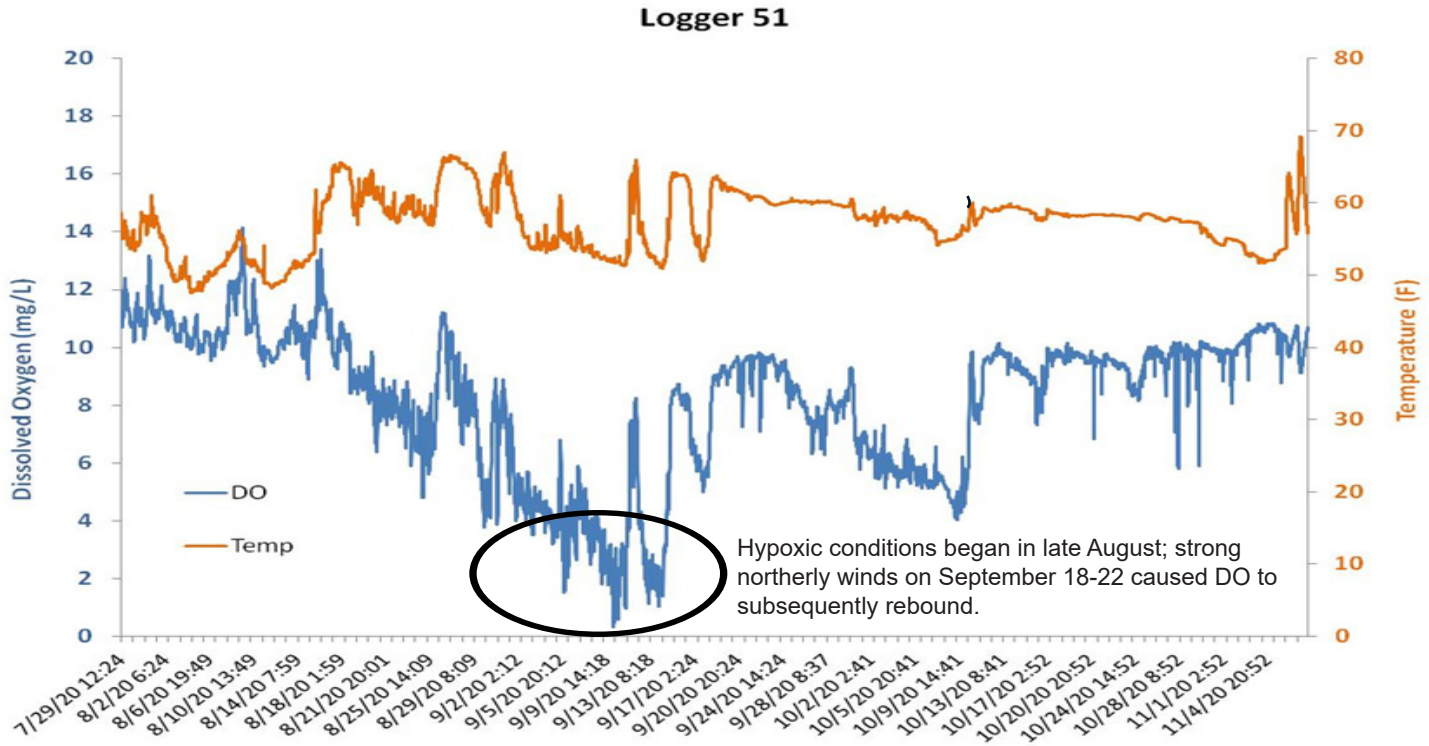
In addition to the Study Fleet, DMF has partnered with researchers from the Center for Coastal Studies (CCS) and Woods Hole Oceanographic Institution (WHOI) for their expertise in water quality and oceanographic conditions. This collaborative partnership is funded by the National Sea Grant American Lobster Initiative, and aims to provide data to describe fine-scale resolution of the oceanographic factors influencing bottom conditions in Cape Cod Bay, and allow researchers to better understand the processes that drive environmental changes impacting lobsters and other bottom -dwelling organisms.

CCS researchers regularly monitor water quality in Cape Cod Bay, using an instrument called a CTD (CTD stands for conductivity, temperature, and depth, which are three of the primary measurements the instrument collects) to collect information at various depths from the surface to the bottom at each sampling location (a water column profile). This September, they conducted additional surveys focused in the region where the Study Fleet loggers indicated DO was decreasing, which allowed us to monitor the changing conditions in three dimensions (east-west, north-south, and depth).

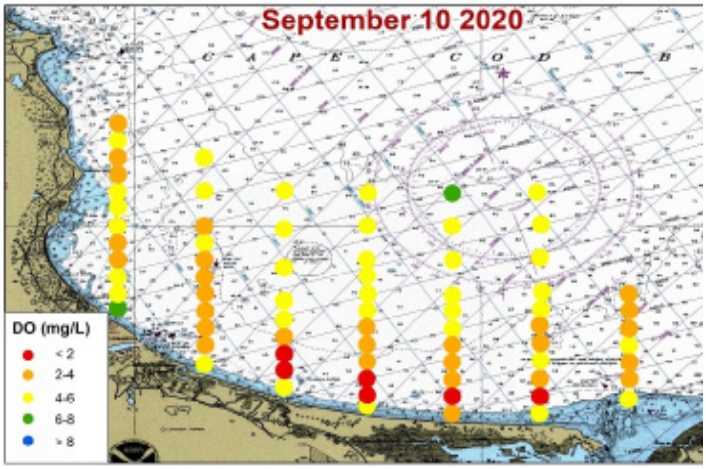
The monitoring technology deployed by the Study Fleet and our collaborators at CCS and WHOI allowed us to detect the formation of the "the Blob" this year. The Blob is what we've been calling the relatively cohesive hypoxic (insufficient oxygen) water mass that is formed near the ocean bottom in southern Cape Cod Bay. Starting in mid-August, DO declined throughout the southern portion of Cape Cod Bay, and hypoxic conditions were detected from the Sagamore area east to Barnstable in late August and throughout September. Hypoxic conditions were also detected by Study Fleet loggers for a short time in the Manomet area from late September to early October, but conditions here were less severe than farther south.

As a result of these monitoring efforts, we have learned that the Blob moves around in the southern portion of Cape Cod Bay, driven by wind and sea conditions. Strong northerly winds will push surface waters towards the shore, causing downwelling along the southern shoreline, which would push the Blob away from shore into deeper waters. Conversely, southerly winds blow surface waters away from shore, allowing for upwelling along the shoreline, which causes the Blob to move closer to shore. The only reports we received this year of dead lobsters were the result of the Blob being pushed into deeper waters in mid-September by a period of strong northerlies. A few days later the high seas from those same northerlies finally mixed the water column and replenished the DO on the bottom, breaking up the Blob for the season. Thankfully the Blob appears to have been less severe this year than last, and caused fewer lobster mortalities this year than it did in 2019.

Cape Cod Bay normally experiences a seasonal decline in the DO content of the bottom waters, taking place annually in the late summer and early fall. This is at least partially driven by upstream inputs of nutrients and resulting blooms of phytoplankton and plankton that then sink to the bottom to decay. The decomposition of organic materials depletes oxygen from bottom waters, and under stratified conditions oxygen cannot be replenished by mixing with the surface. The stratification of Cape Cod Bay is also a normal occurrence, isolating very warm surface waters from cooler, denser bottom waters. This stratification limits mixing and prevents the replenishment of oxygen to the bottom waters. The difference between normal and the formation of the Blob in 2019 and again in 2020 are what we are trying to understand with this new monitoring and research.



Dissolved oxygen (DO) and temperature recorded by a Study Fleet logger in southern Cape Cod Bay, near Sagamore, from late July through early November 2020. DO values less than 4 mg/L are considered hypoxic, and values less than 2 are severely hypoxic.



Dissolved oxygen (DO) content in bottom waters of southern Cape Cod Bay, collected by the Center for Coastal Studies on September 10, 2020. DO values less than 4 mg/L are considered hypoxic, and values less than 2 are severely hypoxic.

The collaboration between DMF, the Study Fleet, and researchers from CCS and WHOI has drastically improved our ability to detect the formation of hypoxic conditions, and to track the movement of the Blob in southern Cape Cod Bay. We plan to continue this work in 2021, and in the meantime the partners from WHOI and CCS will be working to better understand what drives the development of the Blob, to increase our ability to detect and predict the potential onset of hypoxia in Cape Cod Bay. Here at DMF we will continue to develop ways to use the monitoring data to alert the commercial lobster fleet and other stakeholders of changing conditions in the Bay. This work represents an important collaboration between commercial fishers and scientists to ultimately benefit both the commercial fishing fleet and the resources on which they depend.

By Tracy Pugh, PhD, Invertebrate Fisheries Project Leader

2021 Quota Outlook

Atlantic Herring: 10,613,053 pounds (coastwide quota)
The Atlantic herring fishery will be severely restricted in 2021. The stock was officially declared overfished by NOAA Fisheries in October 2020, triggering a two-year timeline for the New England Fishery Management Council to implement a rebuilding plan. This comes on the heels of the latest stock assessment indicating that spawning stock biomass in 2019 was at its lowest value since the late 1980s and well below its threshold level (just 58% of it). The coastwide catch limit for 2021 represents a 58% reduction from 2020, and is just a fraction (<5%) of what is was in 2017. The coastwide limit is allocated among four management areas. The NEFMC has recommended status quo allocations of 28.9% to Area 1A (inshore Gulf of Maine), 4.3% to Area 1B (offshore Gulf of Maine), 27.8% to Area 2 (south of Cape Cod), and 39% to Area 3 (Georges Bank). The next stock assessment is scheduled for 2022.

Atlantic Menhaden: 5,422,022 pounds (MA quota)
The coastwide commercial quota—and MA's 1.27% share of it—are down 10% from 2020 per action of the Atlantic States Marine Fisheries Commission (ASMFC) to establish a harvest limit that is consistent with its newly-adopted ecological reference points (ERPs) for menhaden. These ERPs are more conservative than the single-species reference points in order to account for menhaden's role as forage. The ASMFC set the coastwide quota at 194,400 metric tons (or ~428.6 million pounds) for both 2021 and 2022, a level projected to approach a 50% probability of achieving the ERP target in its second year. Massachusetts' initial quota of roughly 5.4 million pounds has the potential to be increased by state transfers of quota, and the state may also opt into the episodic event fishery which provides access to a 1% set-aside of the coastwide quota (~4.3 million pounds for 2021 which is available to ME–NY when certain conditions apply). In 2020, the MA fishery landed over 8.4 million pounds of menhaden, which was made possible by an additional 2.35 million pounds of quota via state transfers and access to over 400,000 pounds of episodic event set-aside quota.

Black Sea Bass: 791,700 pounds (MA quota)
The ASMFC and Mid-Atlantic Fishery Management Council (MAFMC) previously set a 5.58 million-pound coastwide commercial quota of black sea bass for both 2020 and 2021, which represented a 59% increase from the 2019 quota. More recently, the management bodies revised the 2021 quota to incorporate changes to the MAFMC's risk policy and to update the discard projections, resulting in an additional 9% increase and a coastwide quota of 6.09 million pounds. Massachusetts share is 13%, or 792,165 pounds. Despite the challenges of COVID, the Massachusetts fishery was able to fully make use of its quota increase in 2020, with a fishery that extended into early November (compared to more typical quota closures in late summer) with commensurate increases to the trip limits and open fishing days. Massachusetts' 13% allocation of the coastwide commercial quota may be subject to revision in the near future, as the ASMFC and MAFMC are expected to vote on possible reallocation options in February 2021 that aim to incorporate changing stock distribution and fishery conditions into the state shares that are currently based on historical landings.

Bluefish: 185,904 pounds (MA quota)
Massachusetts' bluefish quota is unchanged from 2020. The coastwide quota was set a 2.77 million pounds for 2020 and 2021, a 64% reduction from 2019, based on a decline in biomass that has resulted in an overfished stock determination. MA's fishery was not constrained by its 6.72% share of the coastwide quota in 2020, landing roughly 60% of it. Our remaining quota was transferred to two other states that experienced better fishery conditions than MA. A draft amendment is under development that has the potential to result in revised state-by-state commercial allocations (as well as a revised commercial/recreational allocation) in time for the 2022 fishery.

Horseshoe Crab: 165,000 crabs (MA quota)
Massachusetts' 2021 commercial quota for horseshoe crabs is unchanged from 2020. This quota is for crabs harvest for bait purposes (primarily used in the whelk and eel pot fisheries). Horseshoe crabs harvested for other purposes (primarily biomedical use) are not counted against this quota. After the fishery experienced an early quota closure in 2019 that had the potential to result in unwanted discarding in the mixed-species trawl fishery and insufficient supply of crabs for biomedical use in the fall, the Division made several modifications to the management measures which served to provide a full season of harvesting in 2020. About 3% of the quota remained at year's end.

Scup: 1,723,757 pounds (MA Summer Period quota)
At 20.50 million pounds, the 2021 coastwide commercial quota is down 8% from 2020, a level still above typical landings. The quota is divided among three seasons. The Winter I Period (January–April) and Winter II Period (October–December) receive 45.11% and 15.94% of the coastwide quota, respectively; this equates to 9.25 and 3.27 million pounds for 2021. Quota during these periods is open to all states at federally-set trip limits. The fisheries have not been constrained by these quotas in recent years. Of the 38.95% (or 7.98 million pounds for 2021) allocated to the Summer Period fishery (May–September), Massachusetts receives roughly 21.6% (or 1.72 million pounds). Our Summer Period harvest in 2020 was roughly 571,000 pounds, continuing a downward trend. Overall, the commercial scup fishery is unconstrained by its quota due to insufficient market demand for this abundant stock.

Spiny Dogfish: 17,144,556 pounds (ME—CT regional quota)
The coastwide commercial quota is increasing 27% to 29.56 million pounds for the May 1, 2021 through April 30, 2022 fishing year. The Northern Region of Maine through Connecticut receives 58% of the coastwide quota. Most of the landings in our region occur in Massachusetts and between the months of June and November. This year's Northern Region fishery is nearing its conclusion with less than 8 million pounds landed, well within its 13.4-million-pound limit and leaving plenty of quota available for transfer to more southern states (whose fisheries primarily occur between November and April) should it be needed. The federal waters and our region's trip limit will remain at 6,000 pounds, although more consideration of changes to the trip limit is expected to occur after additional socio-economic analyses planned for the coming year are completed.

Striped Bass: 735,240 pounds (MA quota)
Massachusetts' 2021 commercial striped bass quota will be unchanged from 2020. All states' commercial quotas were reduced by 18% beginning in 2020 in order to end overfishing and achieve the target fishing mortality rate. The MA fishery landed only 52% of its quota in 2020, due to a combination of factors including reduced abundance of large fish that meet the commercial 35" minimum size limit, the impacts of changing oceanographic conditions and predator/prey distribution on striped bass spatial availability, and the cumulative effect of an increasing number of restrictions placed on the fishery over the last half dozen years, many of which were tailored to prior fishery conditions (e.g., near unprecedented abundance) that no longer exist. DMF will be considering options to increase the fishery's access to its available quota in 2021.

Summer Flounder: 1,014,509 pounds (MA quota)
The 2021 coastwide commercial quota of 12.48 million pounds is up 8% from 2020 due to application of the MAFMC's recently revised risk policy that allows a higher catch given the stock's status. However, Massachusetts' state quota of summer flounder will increase 29% due to implementation of the ASMFC and MAFMC's joint amendment revising the state-by-state allocation method. Previously, the state allocations were based on 1980-1989 landings, which for Massachusetts resulted in a 6.82% share (or a 786,399-pound quota in 2020). Under the new allocation scheme, the first 9.55 million pounds of the coastwide quota are allocated in this same manner, while any quota above this "trigger" is allocated in equal shares of 12.375% to all states (except ME, NH, and DE which share 1% of the additional quota). This method is intended to increase equity in the state allocations when the stock is in better condition, and results in an effective share of 8.12% of the 2021 commercial quota for MA. Massachusetts' summer flounder harvesters landed more fish in 2020 than 2019 but still struggled to achieve their allocation in large part due to reduced participation in the inshore fishery and low daily summertime limits that constrain seasonal participation by offshore vessels. Several factors reportedly reduced effort in the inshore fishery including COVID-related impacts on personal safety and market demand, offshore redistribution of larger fish, and large amounts of filamentous algae clogging fishing nets. DMF will be considering additional tools for 2021 to assist the fishery in achieving its allocation.

Tautog: 64,753 pounds (MA quota)
Massachusetts' 2021 tautog quota will be set at its baseline amount of 64,753 pounds. This is marginally larger than 2020 (62,797 pounds), given no prior-year quota overage to account for (as was the case in 2020). The 2020 quota sustained the fishery until early November, similar to recent years. Novel to 2020 was the successful implementation of the first year of mandatory tagging of all commercial harvested tautog in Massachusetts, per the new interstate management plan requirement. Close to 30,000 DMF-purchased tautog tags were distributed to permitted tautog harvesters despite the complications of COVID-19. The Division intends to purchase a larger amount of tags for 2021 (to augment the initial distribution amounts) and produce instructional videos on proper tagging method (to ensure tag retention and fish survival) to further improve this program. The tagging requirement, while meant to curtail non-compliance and aid enforcement of tautog harvested for commercial purposes, has the added benefit of providing state of origin to seafood consumers. A recent assessment of consumer preferences for seafood in Massachusetts (supported by the Division's Seafood Marketing Program) revealed demand for seafood that is both sustainable and locally sourced.

By Nichola Meserve, Fisheries Policy Analyst

Consumer Preferences for Local and Fully Traceable New England Haddock

DMF's Seafood Marketing Program provided Dr. Joshua Weirsma and Michael Carroll a grant last year to develop and implement a consumer preference survey to better understand the value of local haddock and traceability labels. Local retailers and others were interested in exploring pilot programs for "fully traceable" local haddock, but needed more information from the consumer about their demand for this type of program, fish species, and new traceability labels that would allow digital transparency and new information about the location, method, and date of harvest.

A survey was designed to capture consumer preferences. By implementing the survey in person (at grocery stores and other retail seafood locations), the project was able to collect a small but robust set of 118 completed surveys from the target audience of consumers who frequently purchase seafood at retail establishments, who like (and purchase) white fish, and who are the primary shopper in the family. The results showed that consumers have different preferences for attributes of a seafood label (e.g. vessel name, gov't record, landings date), and were willing to switch the purchase of white fish species (in this case towards haddock) if it had their ideal traceability label. Furthermore, on average, consumers were willing to pay about 8 percent more per pound for their 'ideal traceability label'; and consumers who shop at more high-end grocery stores (e.g. Wholefoods and Wegmans) are willing to pay even more per pound.

By Julia Kaplan, Communications Specialist

Joint Ghost Gear Recovery Project on Stellwagen Bank

Derelict fishing gear is well known to create entanglement hazards for marine life. Such is the case with gear aboard the F/V Patriot, a small dragger that sank 14 miles off Gloucester in January 2009. While the vessel is intact and lying on its starboard side in 100' of water within the Stellwagen Bank National Marine Sanctuary, over time, its trawl net has loosened from its reel and billows out across the stern, and additional pieces of derelict netting have also been snagged. In July 2020, a group of divers on the M/V Gauntlet found a large grey seal entangled in a section of this netting. The seal was likely attracted to the net by fish caught in the gear.

Subsequent discussions between DMF, the Office of National Marine Sanctuaries, and North Atlantic Diving Expeditions (the owners of M/V Gauntlet) led to the development of a project to remove as much netting as possible and secure any remainder on the net reel. Although scientific diving efforts have been limited this year due to COVID restrictions, a small group of divers from DMF and the Woods Hole Oceanographic Institution (WHOI) were able to perform a reconnaissance dive on August 11, 2020 using DMF's R/V Alosa. The intent of this dive was to survey the vessel and determine the best way to cut and lift the nets. The current plan is for teams of divers to use lift bags to raise the net off the wreck, reducing the number of contact points. The netting will then be cut away and sent to the surface for recovery by DMF's R/V Craven or the Stellwagen Bank Sanctuary's vessel R/V Auk.

Divers from DMF and WHOI conducting a reconnaissance dive on August 11, 2020.

Given the extremely unsettled weather that occurred this fall, the project has been placed on hold until spring. As soon as conditions permit, the divers will revisit the wreck and begin clean-up. We will also deploy an acoustic receiver (with mooring) as part of what we hope will be the first of a series of receivers on offshore wrecks provide data for the coast-wide tracking network.

By Vin Malkoski, Diving Safety Officer

"Ropeless" Fishing: DMF's Role in this Burgeoning Technology

In recent years, scientists and conservationists have called for the broad scale use of ropeless fishing systems to prevent entanglement of the endangered North Atlantic right whale. As the population has continued to decline, those calls have gotten louder. The most recent population estimate for right whales is 366 individuals—much lower than anticipated—and the majority of right whale serious injury and mortalities are still caused by entanglement in fishing gear and ship strikes. While ropeless fishing may be beneficial to right whales as a way to reduce entanglements, legitimate concerns remain about the feasibility and cost of ropeless gear, along with technological, legal, and regulatory issues.

Marine industries and the military have used devices to retrieve equipment from the seafloor for many years. Ropeless manufacturers are now translating that technology into systems that can work on retrieving commercial lobster traps. Currently, a standard ropeless fishing system includes a gear retrieval component and a gear marking component. Many of these retrieval systems are in fact not ropeless but have a buoy line stowed at the bottom in a bag or coil that is released once triggered. Some manufacturers have utilized compressed air and lift bags to bring the trap to the surface. All of these systems use an acoustic signal to trigger the release of the buoy line or lift bag. In the last year, fishermen in Massachusetts, Maine, and Atlantic Canada have been partnering with ropeless manufacturers and other collaborators to field test these systems under real fishing conditions. While there is a learning curve with using this new technology, the small-scale testing of ropeless systems has been fairly successful.

However, a number of challenges exist regarding the broad-scale use of ropeless technologies. A key component is the development of a universal gear location marking system. Currently, ropeless technology companies use their own software systems to communicate just with their gear.The development of an interoperable system that can communicate with a variety of systems and store multiple data sources is a critical next step. This is needed for fishermen to track the location of their gear on the seafloor, as well as for other fixed and mobile gear fishermen to know the position of that gear. Without it, the potential for costly and dangerous gear conflicts is high. Woods Hole Oceanographic Institution and the Island Foundation are in the process of researching the needs of such a gear location marking system and have also created a fund to assist in its development. Many important details need to be worked out, such as how the data are stored, who pays for the storage system, and what type of gear and permit information is available to a variety of users.

Fishermen interested in testing ropeless systems can utilize a gear library operated by the Northeast Fisheries Science Center (NEFSC) and other collaborators, where they currently house over 43 ropeless systems from seven different manufacturers. The NEFSC will work with fishermen on acquiring the necessary authorizations to fish ropeless gear and assist them in learning how to operate the gear. Contact Eric Matzen (eric.matzen@noaa.gov) at NEFSC if interested.

In addition, DMF was just awarded a grant from the National Fish and Wildlife Foundation to conduct a comprehensive, regional scoping project to characterize the issues and challenges associated with the integration of ropeless fishing technology into New England fisheries. The implementation of ropeless fishing would have wide-ranging economic, technological, regulatory, and enforcement consequences. To understand the current landscape and future implementation challenges, DMF will engage stakeholders across New England, including fixed and mobile gear fishermen, fisheries managers, whale conservation groups, gear technologists, economists, and marine law enforcement. DMF will also continue to support the testing of ropeless technologies by issuing Letters of Authorization for small scale projects to fishermen and research organizations.

By Erin Burke, Protected Species Specialist

Dish on Fish: Sun Dried Tomato Steamed Quahogs/ Littleneck Clams

Ingredients
2 lbs Littleneck Clams
2 Shallots, minced
3 Cloves of Garlic, minced
3 Tablespoons Sundried Tomatoes & Oil
¼ cup butter
1 Cup of White Wine
½ Cup of Parsley for Garnish
Salt to taste
Pepper to taste

Directions
1.Soak Littleneck Clams in cold water for at least 10 minutes
2.Melt butter a wide saucepan over medium-low heat until fully melted. Add Shallots, Garlic, & Sundried Tomatoes. Saute until tender and fragrant, 5-7 minutes.
4.Deglaze with White Wine, let simmer for 3-4 minutes
5.Add Clams to saucepan and cover for 8-12 minutes, until clams have opened.
6.Transfer to a deep bowl and garnish with Parsley. Eat on up!

Recipe Courtesy of Julian Cohen, Bountiful Kitchen

@bountiful.kitchen

DMF Shellfish Program Adapts to Pandemic Challenges to Provide Critical Management

DMF's Shellfish Program has risen to the challenge of managing one of the nation's most productive shellfisheries during the ongoing national pandemic. Adept at emergency response, staff provided uninterrupted essential services to program partners and the public. Resources have focused on core program functions including classification of growing areas, laboratory services, aquaculture, contaminated harvest management, restoration, and administration.

Growing Area Classification: All primary classification activities have continued through a combination of field, office, and telework. Classification biologists are still collecting water samples to monitor over 1.5 million acres for fecal coliform contamination, keeping areas open to harvest. On average, shellfish staff collect around 10,000 water samples annually often with assistance from local shellfish constables or other DMF staff. Field surveys for pollution sources, suspected failed septic system leaks, reported sewage bypasses, and marina evaluations have also been conducted.

Biologists continued to provide technical support to DMF's Environmental Review project addressing proposed coastal alterations that could impact shellfish habitat. Fortunately, it has been a quiet year for harmful algal blooms (HAB) in Massachusetts waters apart from a near-annual spring red tide (PSP) closure in the Nauset marsh system. PSP (paralytic shellfish poisoning) is monitored by shellfish staff weekly from April through mid-October, predominately through the collection and analysis of blue mussels from designated stations. Our year-round phytoplankton monitoring not only surveys for PSP HABs but for others that could threaten human health including *Pseudo-nitzchia*, a species of phytoplankton that produces neurotoxins causing amnesic shellfish poisoning (ASP). Notifications regarding growing area status can now be carried out from home thanks to state investments in upgraded software services. Additional program technological improvements that will occur early in 2021 include dynamic shellfish growing area maps on the Division's website and mobile based tools for field data collection.

Laboratory: The heart of the Shellfish Program, our shellfish laboratories provide invaluable data used to manage our state's shellfishery. Amidst pandemic restrictions on in-person work, staff coordinated schedules to keep open all three labs (Newburyport, Gloucester, New Bedford). Our Newburyport lab has continued researching new viral testing methods in partnership with the Gloucester Marine Genomics Institute in addition to monitoring depuration and wet storage shellfish lots. Gloucester lab staff have made it possible to perform water quality tests on weekends and continue the seasonal biotoxin assay program that monitors PSP levels statewide, processing a total of 371 PSP samples this year. The New Bedford lab was still able to process high volumes of routine classification water samples while testing oysters for the human pathogen *Vibrio parahaemolyticus*, wrapping up a three-year study by the Shellfish Program and the University of New Hampshire. Our lab managers even received a Department of Fish and Game Performance Recognition Program Citation for not only maintaining workloads but advancing program priorities during the pandemic.

Sue Boehler, Baceteriologist in the New Bedford Laboratory

Aquaculture: The Aquaculture Project balanced applicant support and Vibrio control plan tasks with the addition of supporting pandemic economic relief programs. Staff continued to process applications for new and renewed permits, certify 16 new aquaculture site licenses, and establish this year's Vibrio Control Plan in partnership with MA Department of Public Health. There were no Vibrio related closures required this year. In collaboration with DMF's Habitat Program and other permitting agencies (e.g., DEP, MEPA, USACE), an online tool was completed as part of the Massachusetts Aquaculture Permitting Plan (MAPP) to assist applicants navigating the complex multi-agency aquaculture permitting process (www.massaquaculturepermitting.org). A substantial amount of time in March was invested fielding calls from growers desperate to find alternative markets for cultured oyster product or to resubmerge harvested oysters when their primary market collapsed in response to the closure of all restaurants in the state to on-site dining due to COVID-19.

A major focus of staff energy has been addressing numerous state and private aquaculture pandemic stimulus programs. A total of $1,152,652 was distributed to members of our hard-hit aquaculture industry as part of the DMF CARES Act Fisheries Relief Program (see page 1). We are also supporting two external programs which involve the purchase of oversized oysters from culturists for outplanting. The Nature Conservancy and Pew Charitable Trusts' Supporting Oyster Aquaculture and Restoration ("SOAR") program involves purchasing surplus oysters to bolster oyster reef restoration sites. A Woods Hole Sea Grant and Cape Cod Cooperative Extension COVID-19 relief project is focused on providing funds to Barnstable County municipalities to purchase oysters from local growers for transplant into municipal recreational shellfishing beds. Through these opportunities, DMF remains committed to the survival and success of our culturists in this year and beyond.

The decline of restaurant sales during the pandemic has left wild harvesters and aquaculturists with a surplus of product. In response, DMF's Permitting Staff have been assisting the town of Wellfleet shoe-horn a request to allow direct sales of shellfish to consumers. DMF created a model consistent with the joint DMF/DPH "shellfish at Farmer's market" policy where wholesale dealers could play a role in a scheduled on-site event. This creates the feel of buying direct and in fact the pre-ordering allows customers to order a particular grower's oysters. This model is transferable to other communities and involves local Boards of Health similar to a retail store or a typical farmer's market.

Contaminated Harvest Management: DMF's soft shell clam depuration fishery on the North Shore and quahog relay programs in Taunton River form our contaminated harvest program. The Newburyport Shellfish Purification Plant staff have evolved safety and sanitation protocols throughout the pandemic to keep everyone safe while maintaining its operating hours. Plant staff remain committed to providing year-round depuration services which has been crucial for the steady return of harvest of soft shell clams throughout Greater Boston Harbor and the Pines River.

Despite a late start (June rather than April), the contaminated shellfish relay program occurred, ending in mid-November. Ten municipalities participated in the spring, relaying quahogs from various sites in the Taunton River including Fall River, Somerset, Freetown and Dighton. Another five municipalities relayed within local waters over the course of the season. Most of the transplanted quahogs will be harvested this year pending fecal coliform analysis from the DMF lab demonstrating levels have been reduced significantly. Another five communities participated in the B-120 mitigation project (part of the response to an oil barge spill that occurred in 2003) and to date a total of 25,600 bushels of quahogs have been relayed into restoration sites throughout Buzzards Bay. B-120 restoration sites remain closed to recreational fishing for one to three years.

Restoration: Since 2014, Shellfish Program staff in New Bedford have been involved in two major shellfish restoration and mitigation activities in Buzzards Bay: the New Bedford Marine Commerce Terminal Quahog Mitigation Project and the Buzzards Bay Shellfish Restoration Project. An estimated 9.8 million quahogs were lost because of the filling and dredging activities involved with the creation of the terminal. To date, Division staff have planted more than 3.2 million seed quahogs within pre-selected mitigation areas (16.6 acres total). In addition, DMF staff have overseen the relay of more than 4,500 bushels of adult quahogs to a 21-acre mitigation site off Fort Tabor in New Bedford Outer Harbor. Agency staff have continued to monitor the survival and growth of planted quahogs this year.

The Buzzards Bay Shellfish Restoration Project consists of three restoration strategies to restore shellfish to the region to recover from damages sustained from the grounding of the B-120 oil barge in 2003. As mentioned above, contaminated quahogs have been relayed from the Taunton River to designated transplant sites within the municipal waters of Bourne, Dartmouth, Fairhaven, Gosnold, Marion, Mattapoisett, New Bedford, Wareham, and Westport. Shellfish Program staff assist shellfish officials in each town with the selection and assessment of relay sites. Restoration staff have continued supporting the towns of Wareham, Dartmouth, and Fairhaven with the operation and maintenance of floating upweller systems (FLUPSYs) purchased with B-120 funds to grow small quahog seed. The quahogs are out-planted in recreational shellfishing areas once they reach a larger size. Finally, program staff have continued work with Bourne, Marion, and Wareham's oyster propagation programs. This includes technical support on rearing seed, purchase of adult stock, and survival assessment from FLUPSY to flat and beyond.

Massachusetts Shellfish Initiative: Since 2017, the Massachusetts Shellfish Initiative (MSI) has worked towards a robust plan to improve the state's shellfisheries informed by a collaborative team of stakeholders. Division staff remain very active in the MSI as it continues towards completion with development of a strategic plan as a derivative of the Assessment and Scoping Committee Reports. Read the MSI Update below for more information.

By Greg Sawyer, Tom Shields, Chrissy Petipas, Sue Boehler, Diane Regan, and Devon Winkler, Shellfish Program Staff

MSI Update: A Strategic Plan for Massachusetts Shellfish Coming Soon

Over the next few months, a strategic plan is being written to improve all things "shellfish" in Massachusetts. This effort, known as the Massachusetts Shellfish Initiative (MSI), was funded with a federal grant to "maximize the economic, environmental, and social benefits of Massachusetts' shellfish resources, built with input from shellfish stakeholders across the state." This is a once in a generation opportunity for government agencies and stakeholders to exchange ideas while making recommendations for improved programs, policies, or rules governing shellfish.

The MSI was conceived and developed over three years ago by a group of stakeholders working with DMF to do what other states in the region and across the country were doing: developing strategic plans for in-state shellfish management. The effort was begun in 2018 with some outreach meetings, though much of the work has been accomplished over the past two years. The progress has been slowed by the enormity of the task and by the distraction of the ongoing pandemic.

The MSI Task Force was convened twice in early 2019 concluding that to be most effective, a comprehensive accounting of the shellfish resources, authorities, and players was warranted. An amazingly detailed report called "MSI Assessment Committee Report" was released in October 2020. It's a long but extremely informative document. Captured in the report is an explanation of the various jurisdictions, regulatory landscape, and landings trends, along with the results of surveys filled out by municipal officials about the state of affairs in their communities. In Massachusetts, state law allows municipal control of most shellfisheries and towns are proud and protective about their local shellfish management. There is a lot of diversity among towns in the amount and types of shellfish but also in approach. In addition, there's also an appendix of "who's who" in the Massachusetts shellfish universe. It should be required reading of anyone involved with shellfish in the Commonwealth.

Much of the work has been accomplished by Sean McNally, a PhD student at UMASS Boston who was a principal author of the surveys, and has been busy compiling responses as well as all MSI documents to provide transparency for the public. DMF Shellfish program leader Jeff Kennedy chaired the Assessment Committee, relying on DMF staff to complete the polished Assessment Report. After the release of a first draft of the Assessment Committee report, a second committee—the Scoping Committee—held four public, town hall-style meetings to receive public feedback. Under the leadership of Rob O'Leary of the Massachusetts Maritime Academy, the Scoping Committee digested all the comments and crafted a document published last spring that clearly launches us well on the way to writing a strategic plan.

The Task Force, having not met for over a year-and-a-half, was "virtually" reconvened in December via an online conference. A working group from the Task Force is now constructing a strategic plan for final public review later this winter.

This effort is reminiscent of a 1985 white paper called "Assessment at Mid-Decade" that raised attention to marine fisheries challenges in its day, and it resulted in legislation that gave DMF the responsibility to conduct water quality sampling for shellfish area classification. So, while the pandemic has probably altered priorities, it will not deter the Task Force from completing a meaningful, long-range strategic plan. I am hopeful and optimistic about the final product. I see the strategic plan as a policy driver. It can ask agencies to re-prioritize their activities, resolve differences among agencies, recommend streamlining regulations, give researchers direction and justification when pursuing grant funding, even guide the Legislature on emerging issues of law and policy, plus request funding for priority activities.

For more information on the Massachusetts Shellfish Initiative and to stay up-to-date on our progress visit the MSI website at: www.massshellfishinitiative.org.

By Daniel McKiernan, Director and Chair of the MSI Task Force

Diadromous Fish Update

DMF's Diadromous Fish Project maintained a nearly routine schedule this year to monitor river herring, shad, eel and smelt populations and work on fishways despite the challenge of the pandemic.

Spring Recap

Most river herring spawning runs had a down year after the near coast-wide improvements seen in 2019. The impact of the 2016 drought on fish born that year (4-year olds this past spring) is coming into view as a likely factor in the lower numbers in 2020. A few rivers had high herring counts relative to time series datawith both the Herring River in Harwich, and the Nemasket River in Middleborough and Lakeville, posting over 800,000 fish. Many others had lower counts in 2020 but maintained the positive trend seen since the harvest ban in 2005. The decent flow conditions experienced in April and May quickly gave way to drought conditions in the summer of 2020, which may not be as severe as 2016, but raise concerns over the potential for poor recruitment again this year.

Fishway Work

The low flow of summer and fall is the right time to work on fishway construction and maintenance. The DMF Fishway Crew focused on five fishway repairs in 2020 that were requested by Towns or identified during routine inspections. Weir notch adjustments and fishway entrance improvements were made at the Bog Pond

fishway in Falmouth. While the Broad Street fishway in Weymouth was dewatered for construction, we surveyed the fishway weirs and repaired the weirs and pools with hydraulic cement as needed.

New Baffles at Indian Head River, Pembroke. October 2020.

The fishway at the Elm Street Dam on the Indian Head River received a major tune-up with removal of large debris jams and shrubs growing in the fishway, replacement of 13 Denil baffles, and the installation of new stop log board slots and a trash rack. Our crew returned to the site of a large 2019 job at Herring Brook Park in Pembroke to install an additional concrete fishway weir and make adjustments to the fishway weirs and walls. Finally, while the Wareham Street fishway on the Nemasket River in Middleborough was dewatered from the drought, we refinished several concrete stop log slots that were causing irregular fishway flow. In most cases, the Towns funded materials and our crew provided the labor. These jobs reflect the efficient model of DMF's Fishway Crew providing labor to match Town contributions of material costs to repair and rebuild fishways. The material cost range for these five jobs was $200 - $1,100.

Large Cooperative Jobs

Noteworthy progress was made in 2020 on two long-developing Boston Harbor fish passage improvement projects. The Weymouth Herring Passage and Smelt Habitat Restoration Project in the Back River was completed in October. This project originated from concerns over herring getting trapped behind the gate of a flood control tunnel at the Broad Street Dam over 20 years ago. The project design began over 10 years ago and included a diversion wall to keep fish out of the tunnel, a resting pool for fish, and specific channel designs to improve rainbow smelt spawning habitat. The Town of Weymouth led the project to successful completion this fall. The Fore River Watershed Restoration project includes a fish ladder at the Great Pond Reservoir, two dam removals, and a natural bypass at the rock falls. The project is led by the Town of Braintree, with an excellent team of federal, state, and private partners. The project is now completing the design and permitting stage in hopes of going to construction in 2021.

Stream Maintenance

Stream maintenance has been practiced in Massachusetts herring runs for centuries. Stream channels with low seasonal outflow can be altered from trash accumulation, erosional sediment, tree falls, leave and stick debris jams, and encroachment of both native and invasive plant growth. These alterations can impede upstream spawning runs and downstream juvenile herring migrations. In worse cases, juvenile herring can be impinged in blockages or diverted out of stream channels. Rivers with higher flows are able to shift and scour these jams, thereby maintaining natural channels.

Many streams in coastal Massachusetts do not have surface flows that can prevent these jams. And this problem is exacerbated in municipal water supply watersheds, small watersheds with large groundwater withdrawals, and drought conditions. Combine this modern status with a declining awareness of the importance of stream maintenance since the river herring harvest ban in 2005 and we are seeing conditions that are likely negatively impacting juvenile herring recruitment in some coastal watersheds.

Traditionally, this work was largely led by municipal crews who were aware of the importance of maintaining the herring runs. Many communities are still doing a great job; however, in other locations, the practice of stream maintenance has faded, and the need for this work has increased as coastal development and water use are negatively impacting stream flow. Since 2016, the DMF Fishway Crew has committed to work on stream maintenance in locations where juvenile river herring emigration is threatened, and to train and educate local crews to restore this essential activity. This work increased this summer and fall as pandemic restrictions limited staff activities and led the crew to focus on smaller fishway jobs and stream maintenance. Also, the regional drought created difficult conditions for downstream passage for juvenile river herring and increased the necessity of stream maintenance at many locations.

Throughout this past summer and fall, the Fishway Crew worked in 16 coastal river systems with large cooperative efforts in the Jones River (Kingston), Fore River (Braintree), and the Acushnet River (Acushnet)—watersheds where low flow and wetland plant encroachment is physically altering river channels to the point where juvenile emigration will be impacted. Several jams impassible to adult river herring were removed this spring with local reports in the following days of herring reaching upstream spawning grounds. This fall has been especially challenging with the drought conditions. In many locations, juvenile river herring have been held up by the lack of outflow at pond outlets. When early November rain raised the pond levels, fish spilled out to channels choked with leaves and debris. At two Cape streams, crews saw juvenile herring respond immediately to jam removal and move passively downstream. In the absence of stream maintenance, significant fish mortality could have occurred from fish entrained into the jams.

Fore River Stream Work, Braintree. November 2020.

Stream maintenance can be controversial because of past occasions when overzealous participants removed too much material from the channel and bank. Secondly, this traditional practice is not well-addressed under the State's present Wetlands Protection Act, leading to questions on permitting. DMF developed stream maintenance guidelines for diadromous fish runs in 2016 and has been actively working with Town and watershed association partners since to conduct the right amount of work in the field to protect this ancient sea-run migration. The more we work on this task, the more we realize that, if left unchecked, some of these streams will transition to wetland havens for invasive plants. Removing flow restrictions benefits a wide range of aquatic life and in some cases reduces flooding potential in our crowded flood plains.

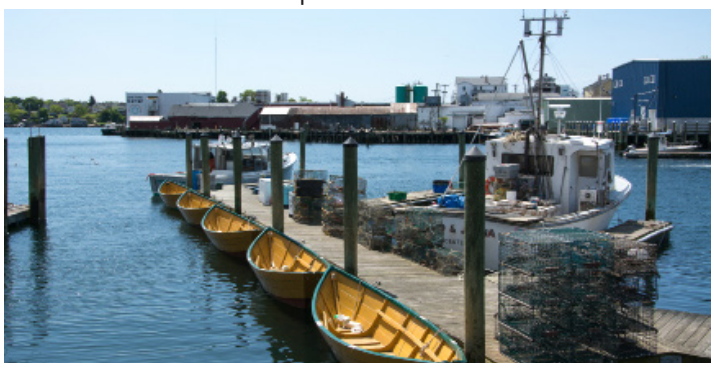
By Brad Chase, Diadromous Fisheries Project Leader

Port Profile Report Nearing Completion

In 2019, DMF awarded the Urban Harbors Institute (UHI) at the University of Massachusetts Boston a Seafood Marketing Program grant to complete a research project detailing the commercial fishing activity, existing infrastructure, and infrastructure needs of the commercial fishing industry in the coastal municipalities of Massachusetts. Led by UHI, the project has been a collaborative effort involving DMF and the Cape Cod Commercial Fishermen's Alliance. The report, "Port by Port: Profiles and Analysis of the Massachusetts Commercial Fishery," is nearing completion and will be published early in 2021.

The Massachusetts commercial fishing industry continues to be an important economic driver for the state, with annual seafood landings consistently valued at approximately $600 million to harvesters. The top species landed in Massachusetts include sea scallop, lobster, oyster, and groundfish (cod, haddock, flounders, etc.). New Bedford is not only the top port in the state, in terms of the value of seafood landed, but it is also the number one valued port in the country year after year, due to valuable sea scallop landings.

Despite the continued economic importance of the industry, competing interests have put a strain on commercial infrastructure in many ports. DMF recognized the need for this report over the past several years as members of the commercial fishing industry repeatedly expressed concerns about increasingly limited infrastructure in some ports and competing interests with other coastal activities. In addition to infrastructure needs, a key component of the report is identifying and describing the important commercial fisheries in each port, so the fishing industry and municipalities know the economic value of their ports.



Port of Gloucester, Photo Courtesy of Thomas Hoopes.

DMF statistical and permitting data were used to quantify and detect trends in commercial fishing activity, including participation and value, statewide and in each port for the time period 2014 to 2018. During the five-year period, important statewide trends were noted, including a significant increase in the value of oysters landed, as well as an increase in the amount of lobsters being landed north of Cape Cod. These statewide trends were noticeable in individual ports, as well. Categorizing the important commercial fisheries in each port provides an important tool for municipalities and industry when advocating for infrastructure improvements. Ports in Massachusetts vary greatly in physical size, value of seafood landed, and species composition of commercial landings.

PORT	2018 EX-VESSEL VALUE
NEW BEDFORD	$431,019,838
GLOUCESTER	$53,213,326
CHATHAM	$18,790,198
BOSTON	$16,422,110
BARNSTABLE	$12,846,065
FAIRHAVEN	$8,413,421
PROVINCETOWN	$7,752,074
WELLFLEET	$7,735,511
DUXBURY	$6,793,342
SANDWICH	$6,765,111
ROCKPORT	$6,643,559

Top 10 ports in Massachusetts by 2018 ex-vessel value of landings. Source: SAFIS dealer data

In order to assess existing and needed infrastructure in individual municipalities, UHI developed two surveys: one for harbormasters and one for commercial and for-hire fishermen. Participation was strong for both surveys. Harbormasters reported that over 50% of harbors statewide had parking for fishermen, access to a launch ramp, fuel stations, and commercial offloading infrastructure. Several other types of infrastructure, including trash disposal, dedicated commercial dock space, and ice, were reported as available in less than half the harbors statewide.

The top three infrastructure needs identified by the surveys were dredging, commercial dock space, and additional shoreside parking. These three needs were identified in 50% or more of the municipalities surveyed. Additional infrastructure issues included conflicts with other users, infrastructure project permitting, and a lack of commercial moorings. Notably, there are many common infrastructure issues and needs across harbors and municipalities.

The composition of the fishing industry in each harbor and municipality in Massachusetts varies greatly and so do the infrastructure needs. The report provides suggested resources and recommendations for municipalities and the fishing industry to help address some of these infrastructure challenges. These include potential funding sources, infrastructure projects, and policy suggestions, among other recommendations for consideration.

The report authors would like to thank the harbormasters and members of the fishing industry that responded to surveys and provided valuable information for this report. The report will be published on the DMF website in early 2021.

By Story Reed, Permitting & Statistics Program Manager

Division Comings and Goings

Maggie Nazarenus joined DMF in August as a grants coordinator. She is based out of the Boston office and recently completed processing applications for the CARES Act Fisheries Relief Program. Maggie grew up in Colorado and moved out to the East Coast to attend Tufts University. She spent the last four years as a project assistant with Tetra Tech, where she supported international engineering projects for a variety of federal clients. In 2017, Maggie volunteered for a month-long field assignment in Florida to coordinate Hurricane Irma clean-up on behalf of FEMA. She spent 2019 in Kabul, Afghanistan, on a year-long assignment as Communications Manager for a USAID program.

Kerry Faugno left the Division in October for a new and exciting adventure in California. Kerry worked in the DMF licensing program for over 20 years. She was the first person you saw if you came to the licensing counter in Boston. We wish Kerry and her husband good luck on their new journey.

Recent Publications

The following publications are recent articles written or co-written by DMF staff and published in scholarly journals or the DMF technical series. A full list of publications can be found at https://www.mass.gov/marine-fisheries-publications.

Nelson, G. A., B. I. Gahagan, M. P. Armstrong, Adrian Jordaan, Alison Bowden. 2020. A life cycle simulation model for exploring causes of population change in Alewife (Alosa pseudoharengus). Ecological Modelling 422 (2020) 109004.

Legare, B., B. DeAngelis, and **G. Skomal**. 2020. After the nursery: Regional and broad-scale movements of sharks tagged in the Carribean. Marine Ecology. DOI: 10.1111/maec.12608.

TR-75: **Nelson, G**. A. 2020. Massachusetts striped bass monitoring report for 2019.

New Marine Fisheries Advisory Commission Members

The MFAC represents recreational and commercial fishing interests from various parts of the Massachusetts coast. Proposed regulatory changes affecting the management of marine fisheries are approved or disapproved by a majority vote of the MFAC. The group's nine members are qualified in the field of marine fisheries by training and experience. The Governor appoints Commissioners to terms of up to three years.

Bill Amaru of Orleans has been fishing commercially since 1972 and continues to fish onboard the 36' F/V Paladin from ports along the Outer Cape. In his almost 50-years on New England waters he has accumulated professional experience in most aspects of commercial fishing, having fished inshore and offshore and fished longlines, gillnets, trawls, sea scallop dredges, and bay scallop dredges. Through Bill's work in commercial fisheries, he has experience in conservation engineering and was awarded a Saltonstall-Kennedy grant to research, test, and promote the use of square mesh. He also previously served as a member of the New England Fishery Management Council from 1994 – 2000 and currently serves in advisory roles on local fisheries and marine matters.

Shelley Edmundson of Tisbury is the Executive Director of the Martha's Vineyard Fishermen's Preservation Trust. She holds a Ph.D. in Zoology/Marine Biology from the University of New Hampshire. Her doctoral studies focused on channeled whelks, a species that supports one of the Vineyard's largest commercial fisheries. Throughout her research, Shelley collaborated with many local fishermen with the goal of helping protect the species and sustainably manage the local fishery. Shelley's love of the marine biology, Martha's Vineyard, and the commercial fishing community began in her youth exploring the island's shores and fishing off her grandfather's boat, the Seabird. This passion continues to drive her work today with the Martha's Vineyard Fishermen's Preservation Trust and the Marine Fisheries Advisory Commission.

DMF Accolades

Dan McKiernan, Kevin Creighton, Michael Armstrong, Jeffrey Kennedy, Story Reed, Darlene Pari, Melanie Griffin, Jared Silva, Nichola Meserve, Anna Webb, Christian Petitpas, Erich Druskat, Maren Budrow, and Stephanie Cunningham recently received the Department of Fish and Game's Pride and Performance award for their work on the CARES Act Fisheries Relief Program. The CARES Act Team was also nominated for and selected to receive the 2020 Manuel Carballo Governor's Award for Excellence in Public Service. Through the CARES Act, Massachusetts received $28 million in federal grant money to distribute amongst fishing industry participants negatively impacted by the COVID-19 pandemic. DMF worked with the Atlantic States Marine Fisheries Commission (ASMFC) to finalize the required MA CARES Act Fisheries Relief Spending Plan, approved by NOAA Fisheries on July 29, 2020. The Massachusetts plan was developed through a public process with significant industry participation. Using this relief plan, Massachusetts worked with NOAA Fisheries, ASMFC, and the seafood industry to send out applications and get the funding out as soon as possible. Massachusetts was the first state in the nation to distribute funds received from the CARES Act to the fisheries industry.

Susan Boehler, Diane Regan, and Florence Cenci received the Department of Fish and Game's Pride and Performance award for outstanding work performing lab duties despite the pandemic to ensure samples were processed and shellfish areas could remain open throughout the Commonwealth. DMF labs maintained uninterrupted operations with no compromise in the quality or timeliness of results. This commitment allowed shellfish growing areas within 65 Massachusetts cities and towns to remain open to shellfish harvest. A primary goal of the Division of Marine Fisheries as noted in the Mission Statement is to ensure the availability of diverse, healthy seafood that supports our coastal culture. Without the outstanding contributions of these three dedicated employees, Massachusetts would not have open waters to safely harvest shellfish for human consumption.

Anticipated Rule Making for the Winter of 2021

Final Protected Species Regulations

In December 2020, DMF went out to public hearing to take comment on a suite of fixed gear closures and modifications designed to reduce the potential risk of endangered right whales becoming entangled in buoy lines. This included expanding the geographic extent of both the existing wintertime trap and sink gillnet closures, establishing a seasonal recreational lobster and crab trap closure, requiring the use of buoy lines with a 1,700-pound breaking strength, prohibiting the fishing of single traps onboard vessels 29' in length and greater, and adopting maximum buoy line diameters for commercial and recreational trap fisheries.

The complete proposal, the public comment record, and public hearing presentations may be found on DMF's proposed regulations website and recordings of the public hearings may be found on DMF's YouTube channel. At present, DMF is developing a final recommendation to present to its Marine Fisheries Advisory Commission at their January 28, 2021 business meeting. Approved measures will then be promulgated in regulation in February 2021 and details on this final rule will be published on DMF's website.

In 2019, a citizen's lawsuit was filed against the Commonwealth of Massachusetts under the Endangered Species Act. The complaint alleged that DMF's permitting of commercial fixed gear fisheries and requirements that they use buoy lines violated the endangered species act because the buoy lines may entangle endangered right whales and leatherback turtles. In April 2020, the court ordered DMF to apply to NOAA Fisheries for an Incidental Take Permit (ITP). An ITP application requires the applicant to develop a Habitat Conservation Plan. The HCP must detail the steps being taken to minimize and mitigate the impacts the activity is having on endangered species. These regulations make up the backbone of DMF's HCP for right whales and its ITP application for the continued use of vertical buoy lines in its trap and gillnet fisheries. DMF is also currently developing additional regulations to address its ITP application for leatherback turtles. DMF anticipates these regulations will be taken out to public hearing in mid-to-late 2021 for implementation in 2022.

Draft Regulations Affecting Recreational Fisheries

During late 2020, DMF developed several regulatory proposals affecting its recreational striped bass, groundfish, and blue crab fisheries. DMF expects to go to public hearing during the winter of 2021 on these regulatory adjustments, which will then go into effect for the spring of 2021. The details of the proposals are provided below. Be on the lookout for a public hearing notice in early 2021.

Circle Hook Requirement for Striped Bass: DMF will be proposing to eliminate exemptions and therefore universally apply its circle hook requirement for recreational striped bass fishing with bait.

The most recent stock assessment for striped bass demonstrated that, due to the great popularity of this resource amongst anglers, the largest single source of fishing mortality on striped bass is the discard mortality associated with the recreational fishery (i.e., fish that die as a consequence of being caught and released by recreational anglers). Studies have demonstrated that circle hooks can significantly reduce the rate of deep hooking striped bass, as compared to j-hooks and treble hooks, and thereby reduce discard mortality. In 2020, DMF implemented new regulations requiring the use of circle hooks by recreational anglers fishing with whole or cut natural baits for striped bass. Based on public input, this regulation exempted anglers onboard for-hire vessels and anglers fishing with natural baits affixed to artificial lures designed to be vertically jigged, cast and retrieved or trolled (e.g., tube and worm).

In implementing this regulation, DMF was getting ahead of the Atlantic States Marine Fisheries Commission's (ASMFC) requirement for 2021 that all Atlantic coastal states implement a circle hook mandate for recreational striped bass fishing with natural bait.

While the interstate fishery management plan provides states flexibility to propose exemptions to the requirement—and Massachusetts and Maine requested to keep theirs—the ASMFC ultimately decided not to allow any. Concern was expressed that the exemptions would weaken enforcement and undermine the intent of the provision, especially if additional states submitted requests. Accordingly, DMF's circle hook rule needs to be amended for compliance with the interstate plan, and DMF will be proposing to rescind the exemptions for anglers onboard for-hire vessels and anglers fishing with natural baits affixed to artificial lures.

It is noteworthy that during the winter of 2020 angler groups coastwide have petitioned the ASMFC to reconsider an exemption to its circle hook rule to continue to allow for tube and worm fishing with a j-hook. The ASMFC is expected to review this petition at their February 2021 meeting. DMF supported such an exemption when the ASMFC was developing its circle hook mandate, and if allowed by the ASMFC, DMF intends to adopt the exemption in the final state regulation.

Recreational Gulf of Maine Cod and Haddock Limits: DMF will be proposing to open additional days to recreational cod and haddock fishing in the Gulf of Maine in April.

The recreational GOM cod fishery is heavily restricted due to its depleted status. This also impacts the recreational GOM haddock fishery on account of the species' overlap and the unintentional catch of cod in the haddock fishery. Fishing year 2020 (May 1, 2020–April 30, 2021) began with the following open seasons: September 15–September 30 for GOM cod; and May 1–February 28 and April 15–April 30 for GOM haddock. Subsequent modeling of alternative recreational measures using more complete catch estimates indicated that some liberalization could occur without catch limits being exceeded, prompting NOAA Fisheries to provide additional access in federal waters in April, as recommended by the New England Fishery Management Council. For consistency with the federal regulations, DMF will be proposing to establish an April 1–April 14 open season for Gulf of Maine cod with a 1-fish bag limit and 21" minimum size, as well as extending the recreational haddock season throughout the month of April with a 15-fish bag limit and 17" minimum size.

Blue Crab Traps Restrictions: DMF is proposing to prohibit the use of trap gear to take blue crabs and the retention of blue crabs taken by trap gear.

The blue crab fishery in Massachusetts is predominately recreational, as the 25-crab limit has constrained its commercialization. Typically, blue crabs are harvested by trot lines (sinking lines to which one or more baited hooks is attached), dip nets, or star traps (open-top or collapsible traps). However, DMF has received reports that the use of six-sided, fixed trap gear is becoming more common. During the summer of 2020, the Massachusetts Environmental Police documented the capture of northern diamond-backed terrapins in six-sided traps set in estuaries around Cape Cod. When these salt marsh turtles, which are listened as threatened under the state's Endangered Species Act, are captured in trap gear they typically drown unless the gear is hauled immediately after capture. To prevent this, DMF is proposing to prohibit the use of trap gear in taking blue crabs.

Draft Regulations Affecting Commercial Fisheries

Throughout this winter, DMF will be working through the MFAC to draft regulatory proposals affecting certain commercial fisheries. These proposals are being developed to better utilize available quota and improve enforcement of existing regulations. Draft proposals may include changes to the management of commercial striped bass and summer flounder quota, reducing the extent of the longstanding bluefish gillnet closure in southeastern Cape Cod Bay, new restrictions on the open entry menhaden fishery, and additional surface marking requirements to differentiate between trap types. DMF expects these draft proposals will proceed to public hearing during the early spring for implementation prior to the summertime start of these fisheries.

Regulatory Updates

During the period of July 1, 2020 through December 31, 2020 the following regulatory changes were enacted by DMF after public hearings and Marine Fishery Advisory Commission approval, or by the Director under his declaratory and emergency authorities.

Black Sea Bass For-Hire Recreational Fishing Season (322 CMR 6.28). For 2020, DMF extended the recreational black sea bass fishing season for for-hire vessel operators through October 9; the season was previously scheduled to close after September 8. This action was taken through a Letter of Authorization and Statement of Permit Conditions. The extension was implemented to offset the impacts of the public health measures that prohibited for-hire fishing activity during the first seven days of the recreational black sea bass season. Based on past recreational harvest estimates, DMF projected that the for-hire fleet would take as many black sea bass during the period of September 9–October 9 as it would have during May 18–May 24 if not closed. This action was approved by the Atlantic States Marine Fisheries Commission in August 2020.

Closure of Cape Cod Canal to Commercial Striped Bass Fishing (322 CMR 6.07). DMF permanently implemented the closure of the Cape Cod Canal's shoreline to commercial striped bass fishing that was enacted by emergency regulation earlier in the year. Anglers fishing along the Canal are now prohibited from retaining any striped bass measuring 35" in total length or greater or possessing more than one striped bass per person. These restrictions extend within 1,000 feet of the canal's shoreline, except for commercial fishermen fishing on open commercial fishing days actively transporting striped bass lawfully caught in another location. This exemption covers the transiting of the Canal in possession of commercial striped bass, the landing of fish at Taylor's Point or Sandwich Marina, and the trucking of fish across adjacent surface roads. The Canal is defined as extending from the northernmost point at President's Road and the seawardmost point at the state pier at Massachusetts Maritime Academy on the west end to the seawardmost points of the jetties at the east end.

Gulf of Maine Cod For-Hire Recreational Fishing Season (322 CMR 6.03). DMF extended the for-hire recreational fishing season for Gulf of Maine cod during the fall of 2020; the season was scheduled to occur from September 15–September 30 but was extended through October 7. This action was taken through a Letter of Authorization and Statement of Permit Conditions. The extension was implemented to offset the impacts of the public health measures that prohibited for-hire fishing activity during the open springtime season (April 1–April 14) and mirrors a federal interim rule enacted by NOAA Fisheries in August 2020.

In-Season Adjustments to Commercial Fishing Limits for Quota Managed Species (322 CMR 6.41). DMF enacted several in-season adjustments to 2020 commercial fishing limits for quota managed species. These actions were implemented by Declaration of the Director and expire at year's end. For striped bass, black sea bass, and summer flounder, they were designed to provide commercial fishermen with additional opportunity to harvest available quota and mitigate for lost access due to worsening fall weather. The action for horseshoe crab was intended to reduce their being discarded in the inshore trawl fishery for summer flounder.

- *Striped Bass.* Beginning on September 1, DMF added Tuesday as an open commercial fishing day, providing for three open fishing days per week (Monday–Wednesday) throughout the fall. This action also accommodated interest from certain commercial fishermen who sought to conduct night fishing activity over consecutive fishing days.
- *Black Sea Bass.* From August 31 through October 1, Monday and Wednesday were added as open commercial fishing days for the directed pot and hook & line fisheries, providing for five open fishing days per week (Sunday–Thursday). Effective October 2, the directed pot and hook & line fisheries went to having no closed fishing days, as Friday and Saturday were also added as open fishing days. Additionally, the daily trip limits for the directed pot and hook & line fisheries were increased by 25% on August 30, with the pot limit going from 400 pounds to 500 pounds and the hook & line limit going from 200 pounds to 250 pounds.
- *Summer Flounder.* For the period of August 23 through October 3, the commercial summer flounder trip limit for trawlers was increased from 400 pounds to 600 pounds. The trip limit for all gear types was increased to 1,000 pounds effective October 4, and to 2,000 pounds effective November 1 (through year's end). From October 4 through December 31, Friday and Saturday were added as open fishing days, providing for seven open days per week.
- *Horseshoe Crabs.* DMF authorized trawlers to land horseshoe crabs seven days per week once closed fishing days in the summer flounder fishery were eliminated

Summertime Summer Flounder Pilot Program (322 CMR 6.22). DMF renewed a seasonal pilot program begun in 2019 that allows trawlers participating in the summer flounder fishery during June 10–October 31 to possess and land two daily limits of summer flounder lawfully caught and retained over consecutive open fishing days. On July 22, the program was modified to similarly allow the landing of two consecutive daily trip limits of horseshoe crab and black sea bass. The program was suspended on October 4 when in-season adjustments to the summer flounder fishery limits went into place (see above).

Winter II Scup Limits (322 CMR 6.27). The Winter II (October 1–December 31) commercial scup possession and landing limit was set at 24,000 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.

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