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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

Seafood Marketing: Chef Series

Presenting our Massachusetts Seafood Home Chef Series: weekly recipes from local chefs featuring our sustainable seafood.

Most seafood that people eat is consumed in restaurants and we want to change that. Join us all summer long on our social media and whip up these tasty meals for your friends & family at home!

Daniel McKiernan appointed as Director

Longtime marine biologist and fishery manager Daniel J. McKiernan was appointed Director by Commissioner Ronald Amidon on May 21. Commissioner Amidon's nomination of McKiernan was approved by the Massachusetts Marine Fisheries Advisory Commission, the Governor-appointed citizens board that advises the Director and oversees DMF's regulations governing fishing. McKiernan had served as the Division's Acting Director since November and succeeds former Director Dr. David E. Pierce, who retired last fall.

McKiernan is well-known to the fishing and seafood industries—as well as the conservation community—for his 35 years of work for DMF. He is a graduate of UMASS-Dartmouth and earned a M.S. degree in fisheries biology from Auburn University. He began his professional career as a field biologist for DMF in 1985, working closely with the commercial lobster fishery as a sea-sampler monitoring catches and conducting research on lobster biology. Since 2003 he has served as the agency's Deputy Director, gaining valuable managerial experience. McKiernan is practiced in the arenas of federal and interstate fisheries management. As a long-standing representative to the Atlantic States Marine Fisheries Commission, he has chaired numerous species management boards (including lobster at present) and was recognized for his management efforts with an award of excellence in 2018. He is also the Chair of the ongoing Massachusetts Shellfish Initiative, a multi-agency and stakeholder effort to develop a strategic plan for Massachusetts shellfish fisheries.

McKiernan has worked tirelessly as a proponent for the co-existence of recreational and commercial fisheries as well as the protection of endangered and threatened species. His advocacy for the seafood industry is well recognized by the public and he will continue to support the fishing community through these challenging times. "Dan McKiernan has the experience, dedication, and knowledge to lead the Division of Marine Fisheries," said Department of Fish and Game Commissioner Ron Amidon. "I am pleased he will continue to serve a leadership role in executing the Baker-Polito Administration's commitment to supporting our seafood industry and recreational fishing sector while maintaining the sustainability of Massachusetts' incredible marine resources."

According to McKiernan, “I am thrilled and humbled to take the helm of DMF that is renowned for its amazing professionals and history of great fisheries management and conservation. The ongoing pandemic presents unprecedented challenges to both the agency and the stakeholders who depend on the resources.” McKiernan credited his former DMF directors David Pierce, Paul Diodati, and Philip Coates who all mentored him during his career and were collectively responsible for the roster of talented professionals at DMF that he has inherited.

McKiernan also thanked the Marine Fisheries Advisory Commission for their endorsement and their unpaid dedication to the agency and the marine resources. He noted that the first report of the Commission in 1961 discussed the need for compromise among user groups and that is as relevant today as it was 60 years ago. “This agency deals with an amazing array of issues and we strive to balance the needs and interests of all our users and the fish and shellfish that support them,” he said.

DMF Operations Continue Amidst COVID

Like everywhere—from work to home to school and all the places in between—the COVID-19 pandemic has wrought new challenges for DMF and our stakeholders.

The agency has continued to function despite the closure of our offices to the public. At the onset of the emergency order, our essential services were defined as permitting, statistics, fiscal administration, and shellfish sanitation. With stringent controls on the frequency and duration of in-office work, our permitting staff have met the demand for permit issuance and transfers; our statistics staff has continued to enter catch reports, monitor quotas, and fulfill information requests; our administrative staff have kept up with encumbering of funds and payments to vendors for necessary equipment and supplies; and our shellfish staff have maintained water sampling and biotoxin monitoring and responded to pollution events to ensure the public’s health.

After a flurry of information technology activities to enable successful remote working, the Division’s staff has juggled the demands of teleworking from home to complete many other core services. We have continued to engage in state, interstate, and federal fisheries management deliberations; finalize and announce regulatory revisions; produce recommendations on various coastal alteration projects; monitor protected species’ distribution and respond with protections; negotiate on mitigation plans for wind energy development; monitor the seasonal return of diadromous species and improve their up-stream passage; design research studies and prepare equipment for the busy field season; manage our grants; produce informational and educational content; and support the commercial fishing industry through seafood marketing initiatives (see Seafood Marketing Update on page 7).

Our activities are not without disruption, however. The 42-year time series of continuous fishery-independent data produced by the Division’s spring trawl survey will have a hole in it for 2020. Recognizing that it would have been nearly impossible to conduct normal survey operations while maintaining CDC-recommended social distancing guidelines aboard the research vessel, we considered delaying the survey, but this too would have been problematic because it is carefully timed to occur in early to mid-May every year. We will have to grapple with this and other data gaps in stock assessments and management decisions down the road.

Also affected was the onset of recreational angler intercept surveys that inform the Marine Recreational Information Program’s estimates of recreational catch. While the surveys that collect angler effort data (which are conducted through mail or telephone) continued, the in-person interviews with anglers at public fishing sites about the number, size, and species of fish caught were cancelled through May 19 in Massachusetts. In advance of this, the Division lined up and trained its seasonal workforce to hit the ground running once considered safe.

The commencement of recreational catch sampling and other field activities in late-May and into June required the incorporation of new guidelines into our procedures to minimize the health risks to our staff and the stakeholders with which we interact. Certain field operations continue to be affected, such as at-sea catch sampling aboard commercial fishing vessels. Alternative approaches to mandatory sampling requirements will be deployed where possible (such as shore-side sampling). States up and down the coast have confronted similar issues, and we’ve been sharing and learning from one another and coordinating where possible.

The Division is also pouring its energy into several new initiatives in response to the impacts of COVID-19. The Commonwealth’s fishing and seafood industries have been hard hit by the necessary measures to slow the spread of the disease. We have endeavored to help these legacy industries and lessen where possible the reduced demand for seafood due to the disruption of markets and closure of restaurants and the curtailment of for-hire fishing businesses. Locally-sourced seafood for home consumption has never been so appealing, and we are capitalizing on this window of opportunity to promote our fisheries. Retail Boat Permits have been issued to harvesters free of charge to encourage direct to public sales, and a temporary pilot program has been developed with the Department of Public Health to add shucked sea scallop adductor meat to allowed products. The local commercial bay scallop fisheries in Eastham, Orleans, and Wellfleet were extended. Aquaculturists were permitted to resubmerge their product when demand fell out, and we’re investigating options to help permit holders buy this year’s seed stock and avoid next year’s potential market glut. Seafood promotional materials have been ramped up. With regard to both the commercial and recreational sectors, the Division is working within the interstate and federal fisheries management circles to consider and advocate for reasonable regulatory adjustments to help offset the impacts of COVID-19.

Following the announcement in early May of the states’ shares of the $300 million in CARES Act fishery disaster aid, Division staff have also been working to develop spend plans for the Commonwealth’s roughly $28 million allotment. These funds are intended to support fishery businesses including aquaculturists, for-hire operators, commercial fishermen, and seafood processors that have suffered a 35% revenue loss due to the pandemic. We are relying on the input of industry advisors and the Division’s prior experience in disaster and mitigation aide to establish a framework for the disbursement of funds that balances the need for expediency while meeting the objectives and requirements of the earmark. It should be recognized by all that while Massachusetts received the third highest share amongst all states, the relief represents a fraction of the losses experienced industry-wide.

On a personal note, and as Director of the agency, I’m extremely proud of the dedication and persistence demonstrated by Division staff to keep our operations running as smoothly as possible in these unprecedented times to meet the needs of our constituency.

By Daniel McKiernan, Director

Closure of Cape Cod Canal to Commerical Striped Bass Fishing

In late February 2020, DMF met with the Army Corps of Engineers (ACOE), Massachusetts Environmental Police (MEP), Bourne PD, and select members of the MFAC to discuss how commercial striped bass fishing along the Canal was contributing to poaching and public nuisance activities. These problems, including anglers conducting themselves in threatening and unruly manners, parking illegally on adjacent roads, trespassing over private property, and interfering with other recreational activities, have been especially acute on open commercial striped bass fishing days. Although the primary mission of the Canal is navigation, a secondary objective of the U.S. Army Corp of Engineers' management of the surrounding area is to provide recreational opportunities for the public. The ACOE followed up with a letter to DMF further documenting this and described how commercial fishing activity was negatively impacting the ability for ACOE to meet its mission to provide recreational opportunities.

Based on this record, Director McKiernan determined it was appropriate to consider prohibiting commercial striped bass fishing along the Canal. On June 3, 2020 DMF announced that all striped bass retained from the Cape Cod Canal or possessed within 1,000 feet of the Canal's shoreline must adhere to the recreational fishing limits of one fish of at least 28" total length but less than 35" total length. An exception is made for the possession of striped bass 35" or greater legally caught elsewhere for commercial purposes and being actively transported through the 1,000-foot buffer area to a primary dealer. The Canal is defined as all waters and shoreline extending bounded by the seawardmost extent of the state pier at Taylor's Point to the seawardmost extent of the northern breakwater jetty at the east end to the seawardmost extent of the southern breakwater jetty at the east end to the northernmost tip of the peninsula at the end of President's Road in Bourne.

Crowding on the Cape Cod Canal

This regulation is expected to enhance compliance and enforcement with this year's recreational striped bass conservation rules (i.e., the 28" to less than 35" slot limit, circle hook requirement when fishing with natural bait, and prohibition on gaffs and other injurious removal devices) at one of the most productive fishing locations for large bass. Given the Canal's great popularity as a shore fishing location for striped bass, the Massachusetts Environmental Police and local police departments rely heavily on public tips of illegal fishing activity; however, these tips have previously been hindered by the virtual indistinguishability of recreational and commercial striped bass fishermen. The closure of the Canal to commercial striped bass fishing (in combination with the new 35" commercial minimum size) will enhance the ability of anglers to see and accurately report illegal striped bass fishing activity.

To enhance this effect, DMF placed signage along the Canal. DMF posted 49 signs along the Canal as part of our outreach regarding the new recreational striped bass slot limit. There will now be companion signage posted at the same locations notifying the public that commercial striped bass fishing along the Canal is prohibited. This signage makes clear that this is a DMF regulation and how to contact MEP should a violation be observed.

This closure of the Cape Cod Canal to commercial striped bass fishing has been adopted as an emergency regulation, pursuant to M.G.L. c. 30A, §2, for the preservation of public safety and the general welfare of the community. As such, it shall remain in effect for 90 days, unless adopted as a final regulation. A virtual public hearing is scheduled for Monday, August 3rd at 6 PM. A final regulation could be voted on by the Marine Fisheries Advisory Commission at its business meeting on August 20, 2020. For more information and the login link visit: www.mass.gov/lists/dmf-public-hearing-notices

By Julia Kaplan, Communications Specialist

Recent Publications

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

Greg DeCelles and **Tiffany Vidal** co-published a study seeking to understand changes in the maturation and growth of Cape Cod/Gulf of Maine yellowtail flounder by examining fisheries-independent data from cohorts produced over a 38-year period (1976 to 2014). Their evaluations demonstrated life history changes suggestive of fisheries-induced evolution. DeCelles, G. R. and T. Vidal. 2020. Long-term changes in the maturation and growth of Cape Cod/Gulf of Maine yellowtail flounder *Limanda ferruginea. Marine Ecology Progress Series* 633: 169-180.

Gary Nelson, Ben Gahagan, and **Mike Armstrong** co-published on their development, calibration, and validation of a mechanistic, spatially-explicit, full life-cycle simulation model that can be used to explore population responses of alewife to various exogeneous drivers. Nelson, G. A., B.I. Gahagan, M. P. Armstrong, A. Jordaan, and A. Bowden. 2020. A life cycle simulation model for exploring causes of population change in Alewife (*Alosa pseudoharengus*). *Ecological Modelling* 422 (2020) 109004.

Brad Chase, Scott Elzy, Sarah Turner, and **Matt Ayer** co-published a study that assessed reproductive attributes of rainbow smelt caught in marine waters during winter and compared their size and age characteristics to those of fish sampled from spring spawning runs in four coastal rivers in Massachusetts. They found multiple indications of declining population health. Chase, B.C., S. Elzey, S. M. Turner, and M. H. Ayer. 2019. Fecundity and reproductive life history of anadromous rainbow smelt (*Osmerus mordax*) in coastal waters of Massachusetts. *Fishery Bulletin* 117:27–44.

Using Advanced Acoustic Telemetry to Test the Conservation Benefit of Circle Hooks in the Recreational Striped Bass Fishery

The waters off Massachusetts are regarded by recreational anglers to have some of the best striped bass fishing in the world. As soon as spring water temperatures begin to rise, the first pulse of juvenile striped bass arrive to feed on the abundance of forage that is found in Massachusetts bays, rivers, and estuaries. By June, after spawning, large predominately female bass leave the spawning grounds found on the Hudson River, Delaware River, and in the Chesapeake Bay and migrate to Massachusetts to spend the summer.

When the striped bass arrive, recreational anglers are always poised and ready. This popular fish is the number one targeted saltwater species in Massachusetts. In 2019, Massachusetts sold over 193,000 saltwater fishing permits and anglers caught an estimated 5.7 million striped bass. Of these, only about 195,000 were harvested, and the rest of the striped bass were released to fight another day, but did they?

In 1996, Paul Diodati, then a sportfish biologist and later the Director of DMF, conducted a study to estimate how many striped bass survive after being caught and released. Results showed that 91% of all the striped bass lived, and the remaining 9% succumbed due to stress and mortal injuries. This calculated rate still stands as the best post-release mortality estimate and is used in the striped bass stock assessment today. Using this estimate and applying it to the 2019 recreational catch estimate, approximately 495,000 striped bass were removed from the stock by catch and release fishing and this is the single largest source of mortality in Massachusetts.

As a result of heavy fishing pressure and unfavorable environmental conditions, the estimated striped bass spawning stock size declined to 151 million pounds in 2017, below its threshold level. This lower level of biomass triggered state marine fisheries managers to adopt new regulations throughout the species range in 2020 to protect the stock and begin rebuilding it back to its target level. DMF implemented a new recreational harvest slot limit, where an angler can only keep a striped bass if it's 28" or greater but less than 35".

DMF also proactively adopted a new circle hook rule, that requires anglers to use an in-line circle hook when targeting striped bass with either live or dead bait (with few exceptions). But why a circle hook? Looking at one, it seems like it would be ineffective at hooking fish with the way the tip is turned, pointing back towards the shank.

Actually, in many situations, circle hooks work better when compared to traditional J-hooks. Anglers catch more fish and rarely does the fish swallow the hook. The circle hook's shape allows the hook to grab on an exposed surface, which is usually the lip or hinge of the fish's mouth avoiding damage to vulnerable areas such as the stomach, esophagus, or gills. This increases the potential of post-release survival, as well as reduces the chance that the line will chafe, resulting in a broken line and a lost fish.

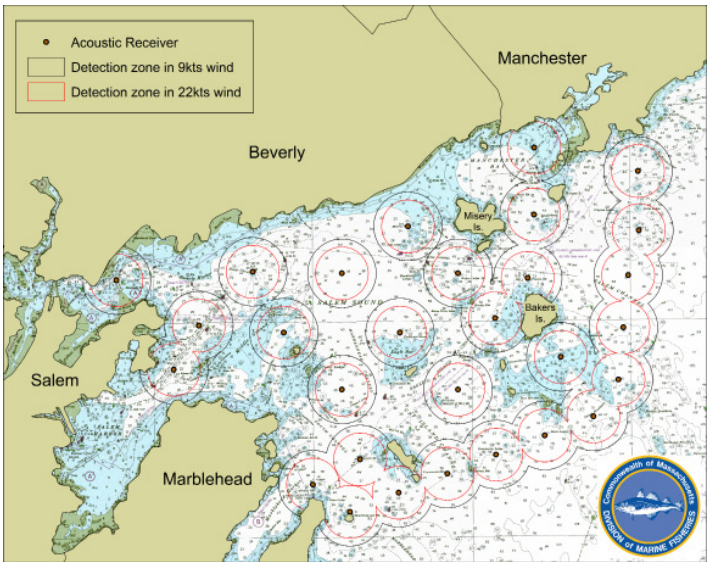
Striped bass are a good candidate for the use of circle hooks due to the way they feed. Unlike some fish (like Atlantic cod and haddock) that tend to catch their prey and swim away with it, a striped bass opens its mouth and inhales the prey, resulting in hook placement that is often deep in its oral cavity.

Circle hooks have been studied in many other small and big game fisheries. The hook is widely used in catch-and-release billfish fisheries and is now required to be used in Federal waters when targeting sharks. Some work has been done estimating the conservation benefit of using circle hooks in the striped bass fishery, but not enough locally. Being a state with a world-class striped bass fishery, DMF has initiated a study that will look at the benefit of using circle hooks in the striped bass fishery using cutting-edge acoustic telemetry technology.

Using a new accelerometer transmitter produced by Innovasea\Vemco, our team of biologists will be externally attaching ("tagging") the transmitters to a target of 175 striped bass that are caught using dead and live bait using both circle and J-hooks. The accelerometer will be measuring tailbeat frequency. Once a fish is tagged inside an array of acoustic listening devices (receivers), the accelerometer will transmit movement data that is uniquely identifiable to each fish. Tailbeat frequency will inform researchers if the fish is alive, dead, been preyed upon, or left the area where the tags are being monitored.

Tagged striped bass with the new accelerometer transmitter.

Tagging will be focused in the Salem Sound area in an array of 29 receivers with a detection area of over 15 square miles. This technology is unique in that the transmitters will not only be detected by the receivers deployed in Salem Sound, but any Vemco receiver deployed in Massachusetts or within the striped bass stock boundary. In Massachusetts alone, DMF has over 150 receivers, which is one of the largest assemblies on the East Coast. Therefore, even if a bass is tagged with a transmitter in Salem Sound and quickly leaves the array, there is a strong likelihood that it will be picked up by another receiver in Massachusetts or beyond, verifying that it survived the catch and release event. This will allow researchers to estimate post-release mortality rates for multiple days after the catch event.



Map of the acoustic array used to track tagged striped bass in the Salem Sound area.

40 in. Striped Bass caught using a circle hook, tagged and released.

In other studies that looked at post-release mortality of striped bass, temperature had a significant influence on survivorship. One study that was done in fresh water in temperatures of 80°F had an 80% post-release mortality rate. Luckily the cool, saline, oxygen-rich waters off Massachusetts are more favorable to survivorship, but as a part of the study, we will evaluate other variables that contribute to post-release mortality such as temperature, salinity levels, dissolved oxygen levels, fight time, release time, and angler experience.

Although understanding the conservation benefit of circle hooks is an important question, it is only the first step that DMF is taking to improve the science and management for striped bass. Starting in 2021, a similar study will be conducted comparing alternate hook types typically used on artificial lures, mainly single hooks that are typically found on jigs or flies, versus treble hooks that are used on swimming and surface plugs. Using the same acoustic telemetry technology and analysis techniques, post-release mortality will be estimated. Ultimately, once enough hook types have been tested in different areas, the intent is to have an updated and robust mortality rate estimate that can be used in substitute to the 1996 Diodati estimate.

If you catch one of the tagged striped bass, you will notice a black transmitter externally attached just below the dorsal fin with orange plastic disks on the opposing side. Please record the tag number and report it to Bill Hoffman at (978) 282-0308. At the end of the season, there will be a drawing for cash rewards, including one high-value reward worth $1000! If the fish is legal size that fits in the recreational slot, you are free to keep it, but please contact us so we can send you an envelope to return the reusable transmitter.

By William Hoffman, Senior Biologist

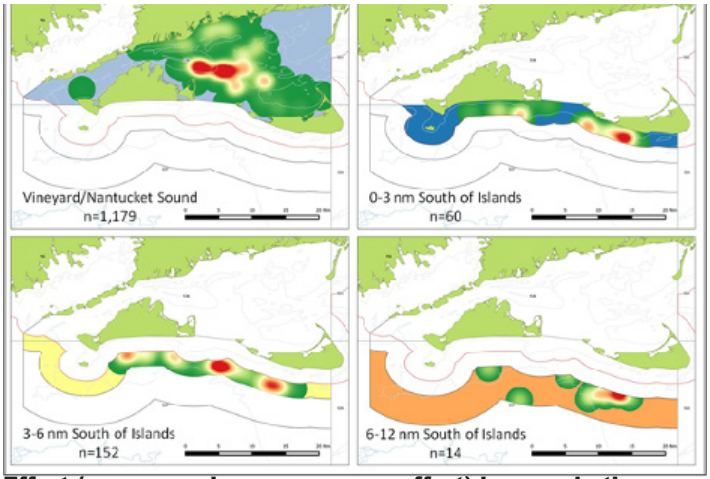
DMF Releases Squid Report

Longfin squid (formerly *Loligo*) represent an important species for local and regional commercial and recreational fishermen, as well as marine predators and seafood enthusiasts. Year-round demand exists and shoreside processing, shipping, and marketing infrastructure have been bolstered in recent decades. A recent economic study found that an average year for the commercial longfin squid fishery created over 2,500 full-time jobs, nearly $100 million in total income and over $240 million in total economic output (Scheld 2020). The longfin squid fishery generally consists of an offshore fishery in the fall-winter months and an inshore fishery in the spring-summer months. While over half of annual longfin squid catch is landed in Rhode Island ports, Massachusetts state waters host an important inshore fishery from late April through early June each year.

Due to the importance of squid as a forage species and the fishery's inshore presence, fishery stakeholder groups have expressed concern over the impacts of the squid trawl fishery. In response to a request from Massachusetts state legislators, a report describing the spring longfin squid fishery in Nantucket Sound and adjacent waters was commissioned in 2019. The resulting report, Characterization of the Massachusetts Spring Longfin Squid Fishery, was completed this spring and presented to the Marine Fisheries Advisory Commission in May. This report, available on the DMF website, summarizes biological information, presents historical landings, profiles the fishing fleet, details the extensive sea sampling dataset, and discusses concerns that have been raised by scientists, stakeholders and managers alike.

The fleet of bottom trawl vessels that pursues longfin squid in Massachusetts state waters is managed both by the Massachusetts Division of Marine Fisheries and the Mid-Atlantic Fishery Management Council at a federal level. Properly-permitted vessels may target squid with the following restrictions, no longer than 72 feet overall, towing nets with ground-gear no larger than 12" in diameter, and nets with codend meshes no smaller than 17/8" may target longfin squid in the squid trawl exemption zone from April 23-June 9 each year. The DMF Director may also extend the squid trawl season beyond June 9. The "Squid Report" found that this fishery is primarily composed of 40-65 foot trawlers landing in Massachusetts and Rhode Island ports. The Massachusetts boats were usually "day boats" while the Rhode Island-based vessels conducted trips of 3-6 days on average. Landings from Nantucket Sound in the 2013-2017 time period studied in the Squid Report averaged 1.05 million pounds each spring season, ranging from a low of 70,000 pounds in 2013 to 1.78 million pounds in 2016. Average annual price for squid sold by fishermen in MA was $1.56/lb, ranging from $0.97/lb to $2.32/lb in 2013. Landings data clearly showed that 2013 was a very poor year for squid fishing in MA state waters. In addition to longfin squid, the top four most valuable species landed during squid trips were scup, summer flounder (fluke), butterfish and black sea bass.

In order to describe and evaluate bycatch and discard levels in this fishery, all observed squid hauls conducted in MA state waters or within 12 nautical miles of Martha's Vineyard or Nantucket islands were queried from the NOAA Fisheries observer database. When combined with DMF sea sampling, over 1,400 hauls from nearly



Effort (warmer colors mean more effort) by area in the small mesh trawl spring squid fishery. Developed from observer data on 1405 squid trips, 2013-2017.

200 individual trips were observed in this area during the squid seasons of 2013-2017. Most of these trips (169) and hauls (1,179) came from Vineyard/Nantucket Sound. Sixty hauls from nine trips came from state waters south of Martha's Vineyard or Nantucket islands, and 166 hauls from 21 trips came from federal waters within 12nm of the islands. This extremely robust dataset allowed for analysis of catch and discard trends, as well as time of year trends, for each distinct area.

The overall discard rate (discarded lb/total catch lb) was 28.6%, which is comparable to other regional small-mesh fisheries, and was fairly consistent between areas. However, annual discard rates were more variable; as high as 54% in 2013 and as low as 8% in 2015. This was likely a result of a smaller available squid biomass in 2013, a theory supported by the low squid catch rates observed in that year (63 lb/hour towing in 2013 vs. 382 lb/hour for all years). Squid catch per hour of towing (i.e., Catch per Unit Effort or "CPUE") increased as the fishery moved south, likely due in part to larger vessels fishing in the southerly federal waters areas (3-6nm and 6-12nm south of islands).

Other trends were exposed when the catch and discard rates of commercially and recreationally important species were examined by area and year. For example, scup discard rates saw a large increase in 2016 and 2017, as did black sea bass rates in 2014 and 2016. Recent stock assessments for these species revealedall-time high year classes in preceding years which explains the more frequent interactions. Additionally, fluke discards were low in state waters hauls, but increased in federal waters as effort moved south.

Conservation concerns exist in regard to significant squid trawl fishery bycatch species that are overfished (e.g., Atlantic mackerel, winter flounder, bluefish, red hake) or are experiencing overfishing (e.g., Atlantic mackerel, striped bass, red hake, Atlantic cod). Of these, only mackerel, winter flounder and bluefish show catches exceeding one-tenth of one percent of overall catch, but remain below 1% of overall catch. Both mackerel and winter flounder have had stock rebuilding plans initiated and have not exceeded overall quotas in recent years. Mackerel quotas have even been increased in recent years. Striped bass bycatch is low (0.1%) and not concerning in the context of recreational and commercial release mortality. Concerns about removing forage for important predator species are dispelled by studies that suggest striped bass in Nantucket Sound have a varied diet (consisting of 3.3% squid by weight, Nelson et al. 2003) and are adaptable to many prey species.

Finally, longfin squid have been shown to be a biologically resilient species capable of large biomass booms and occasional busts. Spawning throughout the year, these cephalopods create "micro-cohorts" that have various growth rates and migration timings. Squid become mature adults in about 5 months, and live roughly 9 months. In general, offshore spawning in the fall-winter months will create the adult biomass that is harvested in inshore waters during the spring-summer months. Correspondingly, the inshore spring-summer spawning events create the adult biomass fished in offshore waters in the subsequent season. Longfin squid quota is federally managed in trimesters, with paybacks for exceeding the quota coming within the same year. These realities buffer both stock components from overharvest and lasting biological damage.

One aspect of the fishery where biological concerns remain unanswered is the catch and discard of squid egg clusters called "mops". While no local studies have been conducted, squid eggs reared in laboratory settings have been shown to hatch early when disturbed, leading to incomplete yolk sac absorption (Boletzky and Hanlon 1983). Egg mops were caught and returned to the water on about 15% of observed hauls, occurring in all areas. While the impact this bycatch has on the overall spawning ability of the inshore biomass is unknown, it is believed that multiple mobile-gear closure areas, untowable bottom and fixed-gear presence create a level of refuge that minimizes any negative impacts. However, this topic would benefit from further local research.

The DMF Squid Report paints a picture of a valuable fishing opportunity for vessels that may not otherwise be fishing during the spring season. The fleet of Massachusetts squid boats makes over 20% of their annual income from the month and a half fishery. Groundfish, fluke, scallops, and monkfish make up the majority of remaining incomes.

For more information about the DMF Squid Report, please contact Brad Schondelmeier at brad.schondelmeier@mass.gov or (978) 282-0308 x123. You can also watch the full presentation at: https://www.mass.gov/characterization-of-massachusetts-spring-longfin-squid-trawl-fishery

By Brad Schondelmeier, Fisheries Biologist

Creature Feature: Longfin Squid (Doryteuthis pealeii)

Description

Longfin squid is a schooling species of the molluscan family Loliginidae. Longfin squid have an internal shell called a "pen." Their fins are long, at least half the length of the mantle (large part of the squid in front of the head), and their head has large eyes that are covered by a cornea. They are typically pink or orange and mottled with brown or purple. They are likely color blind, but are able to use special pigment cells in their skin (called chromatophores) to change their color and patterns to escape predators or disguise themselves from prey. Longfin squid are important forage for many pelagic and demersal fish species of the Northeast US, as well as marine mammals and birds. Marine mammal predators include longfin pilot whales and common dolphins. Fish predators include striped bass, bluefish, black sea bass, mackerel, cod, haddock, pollock, hake, sea raven, dogfish, goosefish, and flounders.

Longfin Squid (*Doryteuthis pealeii*)

Distribution and Habitat
Longfin squid are distributed in the continental shelf and slope waters from Newfoundland to the Gulf of Venezuela. The range of commercial exploitation occurs from Southern Georges Bank to Cape Hatteras, North Carolina. The Northwest Atlantic population is managed as a single stock based on the results of genetics studies conducted on squid samples collected between Cape Cod Bay and the Gulf of Mexico.

Juvenile squid shift from inhabiting surface waters to a demersal lifestyle before reaching a 2" mantle length. Off of Martha's Vineyard, the juvenile life stage lasts about one month. Sub-adults migrate by November to the outer shelf areas where they remain until March, and are thought to overwinter in deeper waters along the edge of the continental shelf. Longfin squid are generally found at water temperatures of at least 9ºC (48ºF). In the waters off Massachusetts, larger individuals migrate inshore first in April-May while smaller individuals move inshore in the summer.

Life History
Longfin squid begin their lives as eggs, encased in a larger gelatinous capsule. Each female can lay 20-30 capsules, which are deposited on the ocean floor in clusters often referred to as "mops". Developmental time in Nantucket Sound varies from 12 to 34 days in water temps from 14-20ºC (57-68ºF). Growth rates of juveniles and sub-adults are relatively fast with growth rates dependent on temperatures. The length at sexual maturity was found to be in the range of 8-12cm (3.2-4.7") mantle length, but also in the 16-20cm (6.3-7.9") range, depending on season and location. Using statoliths for age, it is evident that the longfin squid experiences exponential growth and a life span that can be less than 9 months, reducing previous maximum age estimations. Longfin squid can reach sizes greater than 40-50cm (15.8-19.7") mantle length, although most are less than 30cm (11.8").

Management
Longfin squid is managed primarily by the Mid-Atlantic Fishery Management Council, and more locally, the Division of Marine Fisheries. Fishermen with a limited access permit can fish for unlimited amounts of longfin squid while the fishery is open. All other fishers must obtain an incidental catch permit and abide by possession limits. An annual coast-wide catch quota is divided into trimester allocations. Managers monitor annual quotas closely, as there can be large fluctuations in abundance from year to year. Longfin squid are targeted commercially with numerous gear types, including small-mesh otter trawls, mid-water otter trawls, fish weirs and rod and reel.

During the most recent assessment (2016) the longfin squid stock was determined to be not overfished based on biomass estimates derived from the Northeast Fisheries Science Center (NEFSC) spring and Northeast Area Monitoring and Assessment Program (NEAMAP) fall trawl surveys. The estimated biomass was nearly 3.5 times greater than the pre-determined biomass of a sustainably harvested resource. The overfishing status could not be determined because there are no fishing mortality reference points for the stock. Longfin squid are a short-lived species that mature in approximately 150 days and exhibit spawning cohorts throughout the year. These findings strongly support the hypothesis that the inshore fishery is entirely dependent upon squid which survive the winter offshore fishery season.

By Julia Kaplan, Communications Specialist

Seafood Marketing Program Update

Seafood Expo North America
The 40th edition of Seafood Expo North America/Seafood Processing North America (SENA) was scheduled for March 15-17, 2020. DMF planned to be there highlighting local seafood, however, it made headlines as the first major business event in Boston to be postponed due to the coronavirus. We hope to be back in 2021!

Response to the Coronavirus Crisis
In March, the Seafood Marketing Program emailed all permitted retailers and wholesalers of seafood in the State to create a list of businesses open in any capacity and selling local seafood. This list continues to be updated as businesses open up for the season, lives on DMF's website, and is promoted through our social media and other channels.

The Seafood Marketing Program produced a video "Supporting and Preserving our Seafood Industry during Covid-19" that acted as an informative and nuanced message from DMF's Dan McKiernan about the status of the seafood industry and dynamic response efforts during the Spring of 2020. Dan emphasized how hard-hit the entire seafood industry is due to restaurant closures and encouraged everyone to buy seafood to cook at home. This video was widely spread and applauded by industry members.

Summer is usually a time for the Seafood Marketing Program to participate in and sponsor events around the Commonwealth. We have pivoted to the current climate by creating content to support the seafood industry this summer, such as Massachusetts Seafood Chef Series: Chef recipes for the home cook and demonstration videos, an advertising campaign, and additional messaging about availability.

Seafood Marketing Grant Program
$50,616 was awarded by the Seafood Marketing Grant Program for three projects to enhance the viability and stabilize the economic environment for our local commercial fishing and seafood industries and communities. The funded projects will support the commercial seafood and fishing industries and communities by increasing awareness and preference for seafood from Massachusetts through education, promotion, research, marketing, and/or additional strategies. Priority was given to those proposals that are for the greatest good of the Commonwealth's seafood industry as a whole. Project outcomes, materials created, and reporting from the project will provide information and insight to those in the region doing work with similar goals.

The following received grants:
$13,376 – Eating with the Ecosystem: Real-Time Seafood Marketing: Synchronizing Supply and Demand in a Dynamic Environment

The project will support Massachusetts' fishing and seafood communities by developing a crowdsourcing and consumer mobilization platform to test methods for real-time seafood purchasing advice, with the goal of making the state's retail marketplace rapidly adaptable to variation in supply of local species.

$31,240 – Our Wicked Fish, Inc.: A Blueprint for Marketing Local Seafood at Colleges & Universities

Our Wicked Fish and UMass Dining will conduct a month-long campaign for New England caught seafood at UMass Amherst in

October (National Seafood Month). Components of the campaign will include social media content, on-campus contests, online giveaways, meet-n-greets with fishers, and could also include events such as a film screening, fish cutting demonstrations, cooking demonstrations, and brief before-and-after online survey.

$6,000 - New Bedford Port Authority: Marketing New Bedford Seafood Internationally & Locally

New Bedford Port Authority will update their website and develop additional features that: (1) market the New Bedford-based businesses to international buyers, and (2) further educate local and regional residents about locally landed species. This website will also support the Commonwealth as the species being highlighted are landed throughout New England, and content will be shared.

By Wendy Mainardi, Seafood Marketing Coordinator

Dish on Fish: Wicked Good Crusted Fillets

Comfort seafood in the time of coronavirus: times are tough and sometimes we just want to eat something nostalgic and delicious.

Ingredients:

Feeds 4 people
Prep time: 25 minutes

- 1.5 pounds of local fish fillets such as haddock, cod, hake, pollock, flounder
- 2 tsp Old Bay seasoning
- 1 Tbsp Vegetable oil
- 2 cups crumbled Ritz crackers
- ½ cup breadcrumbs / panko crumbs
- 2 Tbsp dry parsley flakes
- 1 Tbsp dry oregano
- 4 oz butter (melted)
- 2 tsp dry parsley
- 1 tsp dry oregano
- 1 Tbsp granulated garlic or garlic powder

Instructions:

- Wash, pat dry then season the fish with oil and old bay seasoning, then set aside or in the refrigerator.
- Combine the Ritz, breadcrumbs, parsley and oregano in a medium bowl and blend them up well.
- Add parsley, oregano and garlic to melted butter and mix until combined.
- Place each fish fillet into the melted butter mixture then coat them in the crumbs mixture and then place them on a baking tray lined with parchment paper.
- Bake at 375°F for 18-20 minutes. Enjoy with rice, vegetables or salad.

Recipe courtesy of Martha and Son's Kitchen as part of DMF's 2020 Massachusetts Seafood Chef Series.

Meet the Chef: Martha Murray

Martha grew up watching her aunt cook and bake traditional foods of Trinidad. She began her senior year of high school uncertain of where life would lead and had no plans of attending college, let alone a prestigious culinary program. After a potluck in high school, she saw that everyone enjoyed her dish, the reception was overwhelming. Many suggested that she should go to a culinary arts school. Soon after, she attended Johnson & Wales University in Rhode Island. It marked the first step to becoming a great chef and business owner. MSK was established in 2011 and has full catering home services with a menu featuring multicultural dishes and specialty cakes.

Chef Martha Murray

As part of the Chef Series, DMF will be posting weekly during the summer with new recipes. For more recipes and features of local chefs, check out our Chef Series website at: www.mass.gov/lists/massachusetts-seafood-chef-series

2020 Climate Change Resiliency Grant Program

This past January, DMF announced a $500,000 grant program to develop, utilize, or promote technologies that enhance the resiliency of the Massachusetts commercial fishing and aquaculture industries to climate change and enhance the environmental monitoring capacity of Massachusetts coastal waters. Funding for the grant program was provided by the Massachusetts Legislature in the FY2019 Supplemental Budget. Of $1.5 million to support the Commonwealth's agricultural, cranberry growing, and commercial fishing industries (one third each), DMF was identified as the entity to distribute the funds for commercial fisheries in grants of up to $100,000 per recipient, with projects due to be completed before the end of June. These seven exciting projects will have long lasting impacts that enhance Massachusetts' climate change resiliency into the future. The following applicants received grants:

$15,900 – University of Massachusetts, Dartmouth: Investigating The Effects Of Climate On Fishery Catch Rates Of New England Groundfish
UMass Dartmouth will collaborate with fishermen to develop standardized indices of abundance that account for environmental effects on New England groundfish catch rates and contribute to improved stock assessment, fishery management, and climate resilience.

$16,139 - Massachusetts Shellfish Officers Association, Inc.: The Development of a Remote Rain Gauge Network for Improved State and Municipal Shellfish Management Following Storm and Coastal Flooding Events
With this new network, MSOA will reduce adverse economic impacts to the Commonwealth's recreational and commercial shellfishing and aquaculture sectors associated with mesoscale rain events.

$85,047 - Center for Coastal Studies, Inc.: Developing capacity to monitor coastal acidification in Massachusetts waters
CCS will build and expand the environmental monitoring capacity of their laboratory to analyze samples for parameters related to coastal acidification. These results will be widely shar.ed with harvesters, aquaculturists, researchers, and the public.

$88,616 - Salem State University: Environmental Monitoring of Massachusetts Coastal Waters
SSU will expand their current year-round sampling program that consists of basic oceanographic measurements and plankton sampling by establishing a series of sampling stations from Rockport out 8 miles to the NEMAC Mussel Farm site. The expanded sampling will provide a profile of environmental conditions in the waters off the Massachusetts coastline.

$95,763 - Barnstable County Cape Cod Cooperative Extension Marine Program: Evaluating the Potential Impacts of Coastal Ocean Acidification and Changing Water Quality on Commercially Important Shellfish Production Areas
Barnstable County CCCEMP plans to establish in situ ocean environmental monitoring stations at 5 locations in around Cape Cod (Wellfleet, Barnstable Harbor, Duxbury Bay, Cotuit Bay, and Pleasant Bay).

$99,050 - Lobster Foundation of Massachusetts: Study Fleet-Monitor-Dissolved Oxygen-Water Quality in Cape Cod Bay
This funding will allow the Lobster Foundation of Massachusetts to establish a water quality monitoring study fleet in Cape Cod Bay. The project will be conducted in collaboration with the commercial lobster industry and will utilize high tech dissolved oxygen monitors and Bluetooth technology.

$99,485 - Fishing Partnership Support Services: Using Broadband VMS+ IoT@Sea to Enhance MA Commercial Fishermen's Climate Change Resilience, Vessel Performance, and Eco-Responsiveness
Fishing Partnership Support Services will evaluate a new type of NOAA approved broadband vessel monitoring system, VMS+, on five federally permitted, mixed fishery vessels in Massachusetts to evaluate it as a tool for mitigating the impacts of climate change.

By Stephanie Cunningham, Federal Grants Coordinator

Public Access Update

With continued funding from the sale of Saltwater Recreational Fishing Permits, construction of the Deer Island Fishing Pier will soon come to an end and another round of small grants to municipalities will improve the public's access to marine recreational angling in the Commonwealth.

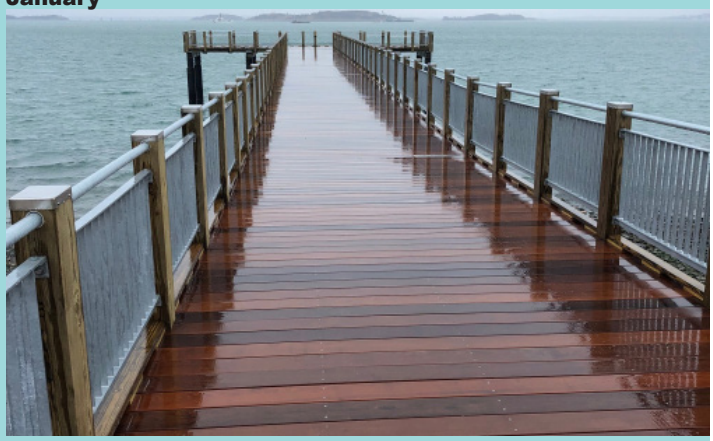
Deer Island Pier
Construction will be wrapping up sometime this summer. The pier itself is essentially complete and a parking lot designated to the fishing public is being constructed. There will be parking and bus service available for the fishing public who would like to travel to this beautiful spot on the Massachusetts coastline.

Small Grant
This year DMF funded three projects for $15,000 each.

- The Town of Sandwich is installing lights and a security camera at the famed boardwalk on Sandwich Creek. These lights will increase safety for anglers after dark.
- The City of Fall River will be installing a digital kiosk at the Bicentennial Park boat ramp. Patrons will now be able to pay their daily fee with both cash and credit card.
- The Buzzards Bay Coalition is adding two kayak and canoe launches at the Horseshoe Mill property they purchased in Wareham, to be placed up and downstream of the bridge spanning the Weweantic River. These facilities will augment separate improvements being made to allow for the passage of diadromous fishes including blueback herring, alewives, smelt, and eels.

By Ross Kessler, Public Access Coordinator

Construction of the Deer Island Pier underway this past January



The completed Deer Island Pier this past March

Diadromous Fish Spring Run Update

Human movements changed dramatically this spring, as much as anyone alive has seen before. The movements of diadromous or sea-run fish, as far as we know, continued on their ancient pathways from the ocean and up coastal rivers. We never know quite what to expect from each spring's run of diadromous fish. For the staff at DMF that works with these fish, this spring was unprecedented with COVID-19 disrupting our routine to assess and assist these fish runs. The challenges of this particular spring were set against a backdrop of a shifting natural landscape influenced by the warming climate.

It was a winter without pond ice or snow cover for most of coastal Massachusetts. With January and February experiencing warm temperatures that exceeded some historic records, diadromous fish were expected early this year. Some rivers had early arrivals of river herring, but the numbers were low, and it was not widespread. Then April set records for low daily high temperatures in the region, which delayed some runs for several diadromous fish species. In particular, juvenile American eels (also called glass eels) were several weeks late at most monitoring stations. While arriving early to tidal areas in coastal rivers with the warm winter, they seemed to hunker down instead of moving further upstream with the cold nights in April.

River herring were following up on some of the largest spawning runs in 20 years in 2019. This year's spawning run counts have not yet been finalized, although overall, it is looking like 2020 will pull back from the high counts of last year. Exceptions were seen at the Nemasket River in Middleborough/Lakeville and Town Brook in Plymouth, where fish kept coming throughout April when other sites seemed to pause with the cool weather. Several small watershed runs will have very low numbers in 2020, a concerning trend in recent years where larger runs are improving yet small runs in some regions are staying at low levels. Low counts are expected in 2020 for much of Buzzards Bay and the North Shore. A few runs are experiencing late-season surges such as the Herring River in Harwich that had 60,000 fish during the last weekend of May to bring that run's total close to 900,000 fish. This surge coincided with late May warming that brought near record high daily temperatures in some locations.

DMF crew conducting stream maintenance in the Fore River watershed, Braintree.

Given the restrictions of the pandemic, Diadromous Fisheries Project field work this spring was focused on completing primary responsibilities that could be completed solo: fish passage maintenance and keeping up the ongoing monitoring series for river herring, American shad, American eel, and rainbow smelt. All river herring stocking events were cancelled except a single trip made to the Three Mile River at Dighton to compliment the new fishway at the Draka Dam. With reduced desk and shop time, we made many site visits to inspect the status of fish passage at fishways and stream channels. We increased stream maintenance activities this spring with 10 sites receiving labor and an emphasis on working with local partners at the following three watersheds with significant channel debris and overgrowth: Jones River, Kingston; Fore River, Braintree; and the Acushnet River, Acushnet. At several locations, we removed jams caused by tree falls, natural debris, and even an anthropogenic dam (kids being kids) that were impassible to migrating fish and causing the river's flow to leave the channel and overtop river banks.

DMF crew gathering herring in the Nemasket River for stocking at the Draka Dam in the Three Mile River, Dighton, and Taunton.

A few more formal jobs were completed this spring by the DMF Fishway Crew. Two new river herring video counter systems were fabricated this spring for the South River, Marshfield, and Lagoon Pond, Tisbury. The South River video system was installed in early May. Two fishways that were recently constructed by the Fishway Crew at Bourne Pond, Falmouth, and Pilgrim Lake, Orleans, were outfitted with new 6" weir notches this spring. These upgrades came after monitoring fish passage performance and pond level staff gauges to tune weir dimensions for the site conditions. A new eel ramp was fabricated and installed at the Forge Pond Dam in Kingston. The custom, aluminum-welded ramp and collection tank was installed in April and has allowed the passage of about 2,000 eels (as of early June) on their way from the Jones River to Silver Lake.

This year was far from average, although it was a year to reconsider what we think of as average. Our crew did a decent job given the circumstances, and through it all, the fish came on their own schedule.

By Brad Chase, Diadromous Fisheries Project Leader

Division Comings and Goings

After 51 and a half years of service, **J. Michael Hickey**, DMF Assistant Director and Manager of the Shellfish Program, retired this past winter. With him goes a career's worth of institutional knowledge that will be hard to replace.

Mike began his career with DMF in June of 1968 as an Assistant Marine Fisheries Biologist protecting salt marsh through the Division's issuance of permits for coastal wetlands alteration projects. In late 1969, he transferred to the Estuarine Research Program, where he co-authored estuarine reports for Wellfleet Harbor and Taunton River-Mount Hope Bay, before being promoted to Marine Fisheries Biologist and Project Leader for a new shellfish technical assistance project in February 1972. When the federal funding for this project sunset in 1980 and DMF assumed its full responsibility, Mike was promoted to Senior Marine Fisheries Biologist. The Division's role in providing technical assistance on shellfish management and propagation to coastal municipalities under this project would later be merged with a newly assigned authority for the sanitary classification of shellfish growing waters for public health protection in 1988, forming the basis of the Division's current day Shellfish Sanitation and Management Program. With a new focus on compliance with National Shellfish Sanitation Program (NSSP) requirements, the Shellfish Program grew in personnel and Mike was promoted to Chief Marine Fisheries Biologist and Program Manager.

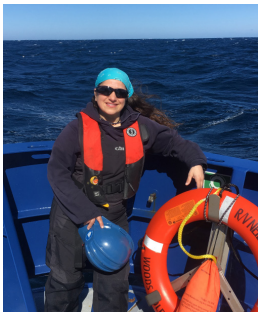
Over the years, Mike was active in various shellfish organizations at the state, interstate, and national level. He is considered one of the founders of the Interstate Shellfish Sanitation Conference (ISSC), having been involved in interstate discussions in 1977–1981 to oppose a 1975 proposal by the US Food and Drug Administration (FDA) to make the NSSP a federal regulation rather than a federal-state-industry cooperative program, and having been present as a MA delegate at the states' 1982 meeting that resulted in its inception. He was elected to represent all state shellfish regulatory agencies in ME, NH, MA, and RI on the ISSC Executive Board in 1984, a position that he held uninterrupted until after his retirement. He also served as Chairman of the ISSC Executive Board during 1997–2001 and again during 2008–2013, making him the longest serving board member and board chair person. During his involvement with the ISSC, he was a regular member or chairperson of various task forces, committees and workgroups dealing with all aspects of the NSSP. These included Vibro illnesses prevention, biotoxins, aquaculture, enforcement, FDA state program evaluations, and a complete rewrite of the NSSP Model Ordinance that nationally and internationally regulates shellfish safety. Mike was also the DMF advisor to the Massachusetts Shellfish Officers Association's Board of Directors, a twice-elected president of the Northeast Shellfish Sanitation Association, and the Division designated point of contact for chemical and/or oil discharges or spills.

Mike plans to enjoy his retirement traveling with his wife Suzanne once COVID-19 subsides, using his new boat, fishing, working on projects around the house and yard including gardening, hunting, and just relaxing in his new teak lounge chair that was a retirement gift. His expertise, historical knowledge, persistence, and good humor will be missed. All of us at DMF wish him the best in retirement.

Conor Byrne is DMF's new Shellfish Plant Depuration Coordinator, located in Newburyport. He is filling the position vacated by Kevin Magowan last October. Conor will oversee the labor staff at the plant, managing their daily schedule as well as receiving and releasing shellfish to Master Diggers and wholesale dealers. Coming to DMF from Roger Williams University, he brings experience in aquaculture and seafood distribution, as well as hatchery management. Conor's initial interest in the field was spawned from a year spent hauling bags of remote set for OGRE (Oyster Gardening for Restoration Enhancement) in Rhode Island with Steve Patterson, a long time mentor. From there, he went on to intern with the Town of Chatham's Shellfish Propagation program, learning much from shellfish staff Rachel Hutchinson and Renee Gagnee.

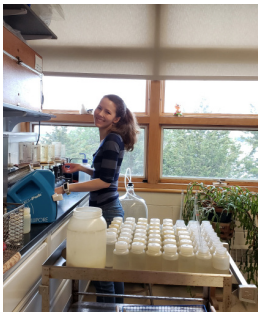
Alex Hansell will be the new Stock Assessment Specialist, based out of New Bedford. He will be responsible for serving on the New England Fishery Management Council's Groundfish and Monkfish Plan Development Teams. He will also work as an assistant chief scientist on the Division's trawl survey. Alex recently graduated from UMass Dartmouth with a Ph.D. in fisheries oceanography. He completed his Bachelor's degree in Biology with a minor in history at Northeastern University. Before starting with DMF, he worked as a postdoctoral researcher for the Gulf of Maine Research Institute. He also was a research assistant at UMass Dartmouth and completed his Master's degree at the Bimini Biological Field Station in the Bahamas.

Julia Kaplan joined DMF in May as a communications specialist. She will be based out of the Boston office and will serve as an assistant to the Director while also advancing internal and external communications. Julia grew up in Hull, MA, and recently graduated from the University of Maine with a Bachelor's in ecology and environmental science and two minors in business administration and economics. During her undergraduate career, she studied in Ecuador and the Galapagos Islands, which enhanced her knowledge of marine fisheries. She has intern experience with the Alaska Longline Fishermen's Association based in Sitka, AK, as well as Clean Harbors.



Christian "Chrissy" Petitpas has taken on a new role as Aquaculture and Vibrio Specialist in DMF's Shellfish Program in New Bedford. Chrissy joined DMF in the summer of 2009, assisting the Habitat Program's Technical Review Project. Chrissy joined the Shellfish Program full time in 2016, working as an aquaculture specialist before moving over to shellfish growing area classification in 2017. Chrissy received her undergraduate degree in biology and biochemistry from the University of Massachusetts Dartmouth and earned her Ph.D. in marine resource science and management from SMAST in 2015. Her graduate and post-doctoral research focused on harmful algae, particularly the species responsible for Paralytic Shellfish Poisoning in the northeastern US.

As a new Aquatic Biologist, **Einat Sandbank** will be DMF's lead biologist responsible for running field activities associated with two major shellfish restoration projects in Buzzards Bay. Einat joined DMF at the end of May and previously worked as a biological scientist at the Florida Fish and Wildlife Research Institute. Through this experience, she estimated the abundance of adult and juvenile queen conch in the Florida Keys, conducted yearly diving surveys to monitor queen conch, and created maps and spatial analysis of data using ArcGIS. In 2014, Einat completed a Master's in Tropical Marine Ecosystem Management from the University of Miami Rosenstiel School of Marine and Atmospheric Science.



Brianne Ryder Shanks recently started as a Bacteriologist working in DMF's bacteriology lab to assist with the classification of south coast shellfish growing areas and other microbiological studies. Before beginning her role at DMF, Brianne worked in the New York State Department of Environmental Conservation – Division of Marine Resources as a lab technician. In this position, some of her duties included conducting bacteriological analysis of water and shellfish samples, shucking shellfish for analysis of bacteria, and conducting QC testing including, but not limited to, spore testing of sterilizers, sterility testing, and inoculating growth controls to test media. She holds a Bachelor's in Marine Vertebrate Biology and a Master's in Marine Conservation Biology, both from Stony Brook University.

This spring **Kristen Thiebault** joined DMF full time as a Marine Fisheries Phone Interviewer in Gloucester. Kristen started with DMF in 2017 as a seasonal contractor performing MRIP surveys, staying for the 2018 and 2019 seasons. She will be responsible for performing the For-Hire Telephone Survey and managing the vessel database. Prior to her work at the Division, Kristen worked and volunteered for the Ipswich River Watershed Association. She built maps using ArcGIS and assisted on various projects, such as the NAACC Tidal Barriers Assessments. Kristen also spent a season as a Biology Technician at Assateague Island National Seashore for Northeast Coastal and Barrier Network. There she monitored nekton and vegetation by sampling in the saltmarshes. Kristen received her bachelor's degree in Wildlife from Unity College, and her master's in G.I.S. from Salem State University.

Kaley Towns was hired into an Aquatic Biologist II position as a Shellfish Area Field Biologist, responsible for the classification and monitoring of shellfish areas in compliance with the National Shellfish Sanitation Program (NSSP). After a training period, she will be assigned specific shellfish areas/municipalities and responsible for designing and carrying out water quality surveys and reporting. She will become the primary point of contact for the local municipality and shellfish constable and will advise/provide technical assistance for shellfish program operations. Prior to starting at DMF, Kaley completed her Master's degree in coastal marine and wetland ecology at Coastal Carolina University. During her undergrad career, she participated in water quality monitoring programs, shark tagging cruises, and independent marine research in the Galapagos Islands.

Audrey White joined the South Shore Shellfish Program in June. As a seasonal contracted technician, she will be assisting on two Buzzards Bay shellfish restoration projects. She recently graduated with a Master's in coastal environmental management from Duke University. She has experience working as an aquaculture technician, student researcher for IFAW, and working as an assistant in a hydrology lab for the University of Illinois. As an Americorps Cape Cod Member for a year, Audrey served the county of Barnstable, splitting time between IFAW and the Town of Barnstable Shellfish Department.

Kelly Whitmore began a new role at DMF in June as a Fishery Policy Analyst. She will be serving in a policy role for many of our regional fisheries by participating in various New England Fishery Management Council committees and plan development teams as well as the Stellwagen Bank National Marine Sanctuary Advisory Council. For the past 14 years, Kelly has been a Marine Fishery Biologist with the Invertebrate Fisheries Project. In this role, she has routinely sampled lobster and other benthic species aboard commercial and research vessels and through dive surveys; coordinated the annual early-benthic-phase lobster suction sampling program, HubLine artificial reef monitoring, and lobster-related grant projects, including impacts of derelict gear, settlement dynamics, and tagging; managed the state's European green crab removal program; and served on ASMFC's Northern Shrimp technical, stock assessment, and plan development committees. Kelly received her B.S. in Biology from Union College, NY, and M.S. in Conservation Biology from the University of New Orleans, LA.

Holly Williams recently accepted a permanent position within the Shellfish Program as a classification biologist. She started at DMF in 2016 as a seasonal contractor. She has worked on several projects, including MRIP, permitting, and shellfish restoration. In her new role, she will be responsible for maintaining the sanitary classification and status of various designated shellfish growing areas throughout the state. Holly received a Bachelor's degree in Biology with a focus in Marine Biology from the University of Massachusetts Dartmouth. Holly enjoys running, SCUBA, gardening, and spending time with her animals.

After six years with the Division, **Samantha (Andrews) Kass** recently accepted a new position as a budget and revenue analyst for the Department of Fish and Game. Sam began working for DMF as a contract employee administering the Groundfish Disaster Economic Assistance Program, which distributed over $21 million in direct payments and other programmatic assistance to members of the Massachusetts groundfish industry. In 2016, Sam was hired as a Program Coordinator in the Boston office, adding many additional duties to grant management¾ranging from newsletter editor, website designer, internal controls officer, inventory manager, contract overseer, and much more. Sam has been the go-to person for many difficult tasks requiring special attention, while also attending graduate school for an MBA this past year. We wish her the best in her new role down the hallway!

Cate O'Keefe left the Division this past February to launch her own fishery science and management consulting business, Fishery Applications Consulting Team, based in Dartmouth. Cate joined DMF in 2016 as a Marine Science and Policy Analyst. Her work focused on federal fisheries management, particularly sea scallops and sea herring, including serving on several New England Fishery Management Council committees and technical teams. Cate also supported the Division's involvement in offshore wind energy development, served as Policy Director to the Massachusetts Marine Fisheries Institute, participated in collaborative research with members of the fishing industry, and led the development of the Division's strategic plan for 2019-2023. We wish Cate good luck in her new endeavor!

Stock Assessment Specialist **Dr. Greg DeCelles** parted ways with DMF this past March for a position as a Fisheries Science Specialist for the renewable energy company Ørsted. Greg will be working across US offshore wind projects to provide scientific support in the development and execution of fisheries surveys and monitoring plans. Hired in 2016, Greg represented the Division on numerous technical committees to the New England Fishery Management Council and Atlantic States Marine Fisheries Commission.

Want to Stay Connected?

We are pleased to announce that we've implemented a new email subscription service to make it easier for you to get updates on the topics which interest you. Any subscriptions you currently have to DMF updates will continue, however new categories will make them more user friendly.

We hope that you will find it useful to have the ability to customize your emails based upon your particular areas of interests such as Newsletters, Commercial and/or Recreational Fishing Advisories, Event Updates and more.

To subscribe to the new DMF emails visit www.mass.gov/marinefisheries and click on the link to subscribe.

In Memoriam: Jack Sheppard

Last January, Jack Sheppard stepped down as the Director of the Office of Fishing and Boating (FBA) after a 48-year career in public service. He had been at the helm as director of this office within the Department of Fish and Game since 1988. He started his career in public service at the Division of Fisheries and Wildlife in 1972 after completing an engineering degree at Northeastern University. Sadly, Jack succumbed to an illness in early March. Jack's legacy, however, will live on. No one would guess, judging by his humble ways, that he oversaw the creation and management of 300 fishing and boating access locations in his career.

As a civil engineer with a passion for fishing, Jack loved visiting new locations and others that his agency had been instrumental in developing. At every visit, harbormasters, town managers, and others would greet Jack like an old friend. He knew how to treat and work with people. In Jack's tenure, FBA purchased land to transform it into public ways to water; built boat launches and fishing piers; protected the Commonwealth's investment in access facilities through Land Management Agreements; permitted use of facilities for activities like fishing tournaments; and lent its engineering expertise to other state agencies. DMF benefitted from Jack's expertise at Craven's Landing on Scorton Creek in Sandwich; fishing piers in Oak Bluffs, Newburyport, Yarmouth, and Boston among others; and many diadromous fish passage projects.

The former President of the Massachusetts Sportsmen's Council, Mike Moss, championed Jack as a public servant who always "showed up" to defend access for all. Jack will be missed but the sporting public of the Commonwealth will reap the benefits of his work for generations. The next time you're launching your boat or fishing from a shore location, remember Jack Sheppard. He gave his all for many years working behind the scenes to create a legacy providing shoreline access to the masses.

Regulatory Updates

During the period of January 1, 2020 through June 30, 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 Commercial Fishing Limits (322 CMR 6.28). DMF took several actions to make commercial fishing limits less restrictive and provide greater access to the increased quota level for 2020. The directed pot fishery trip limit was increased from 300 to 400 pounds, and the directed hook and line fishery trip limit was increased from 150 to 200 pounds. The commercial seasonal weir fishery set-aside was increased from 15,000 pounds to 24,000 pounds. The bycatch limit for trawlers during April 23 – June 9 was increased from 50 pounds to 100 pounds with open fishing days seven-days per week (still capped at 50,000 pounds in aggregate). During the summertime large mesh mixed trawl fishery beginning June 10, trawlers may now retain 100 pounds of sea bass on the open fishing days in the commercial summer flounder fishery (Sundays–Thursdays), rather than the previous rule of 150 pounds but only on open fishing days in the commercial black sea bass fishery (Sundays, Tuesdays, and Thursdays) beginning July 9. These revised measures are designed to reduce regulatory discarding by allowing trawlers to retain an incidental catch of black sea bass when they are actively fishing for squid and summer flounder.

Bluefish Recreational Fishing Limits (322 CMR 6.18). The recreational bluefish bag limit was reduced from 10 fish to 3 fish per angler for anglers fishing from a private vessel or from shore. Anglers fishing onboard a for-hire vessel during a for-hire trip are exempt from this 3 fish limit and may retain 5 fish. This action is consistent with interstate coastwide measures to reduce harvest in 2020, so as not to exceed the recreational harvest limit.

Closure of Cape Cod Canal to Commercial Striped Bass Fishing (322 CMR 6.07). DMF has taken emergency action to prohibit commercial fishing for striped bass along the Cape Cod Canal shoreline. This action restricts anglers fishing along the Cape Cod Canal from retaining any fish measuring 35" in total length or greater or possessing more than one striped bass. 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 (see page 3 for more details).

Edible Crabs (322 CMR 6.19, 6.44 and 7.01). DMF made several housekeeping adjustments to its edible crab regulations. This included consolidating its edible crab regulations into one regulatory section; clarifying that a non-commercial lobster and crab permit is not needed when fishing for crabs with baited lines, nets or collapsible traps; and that edible crabs is not inclusive of non-native crab species that may be consumed.

Groundfish Closure for April (322 CMR 8.05). DMF temporarily lifted the April state-waters groundfish closure in the Gulf of Maine between Plymouth and Marblehead. Accordingly, commercial

groundfish fishermen were allowed to fish within that portion of state-waters between 42°00' north (Plymouth) and 42°30' north (Marblehead) west of 70°30' west that is not otherwise closed to protect cod and winter flounder spawning. The lifting of this conditional closure is reviewed annually in response to an analysis of annual catch by the state-waters only groundfish fleet.

Horseshoe Crab Open Access Limit (322 CMR 6.34). DMF established a 75-crab open access incidental catch limit for trawlers who do not hold a regulated horseshoe crab bait fishery permit. This action was taken to better control the harvest of horseshoe crabs to prevent an early season quota closure that may result in trawlers discarding of horseshoe crabs later in the year.

Menhaden Commercial Limits (322 CMR 6.43, 7.01 and 7.06). DMF rescinded the limited entry menhaden fishery's 95% quota use trigger that would reduce the trip limit from 25,000 pounds to 6,000 pounds when met. Accordingly, the limited entry fishery will now operate under a 125,000-pound trip limit until 85% quota use, and then 25,000 pounds through 100% quota use. This was done to better utilize the available commercial quota. With the increased likelihood of 100% of the state's quota being taken, DMF also adopted regulatory language that will allow the state to participate in the Episodic Event Set-Aside (EESA). The EESA is a program allowed under the Interstate Fishery Management Plan for Menhaden that sets aside 1% of the coastwide quota for the northeast states (ME-NY) to use if they take their commercial quota prior to September 1 and local menhaden abundance remains elevated. If MA were to enter into the EESA set-aside program, limited entry menhaden permit holders would be authorized to continue to fish in state-waters under a 120,000-pound trip limit until the cumulative effort of all participating states exhaust the quota set-aside. DMF also amended its allowance for commercial harvest after the quota is taken, consistent with the interstate plan. The incidental catch and small scale fishery allowance lets commercial fishermen continue to fish at a 6,000 pound trip limit once 100% of the quota is taken, provided they are not using purse seines larger than 150 fathoms length or 8 fathoms in depth. This replaces the prior bycatch allowance that allowed for the possession and landing of up to 1,000 pounds of menhaden, provided the menhaden catch did not exceed 5% the weight of the entire catch. Lastly, DMF established the limited entry menhaden permit as an owner-operator permit that requires the permit holder to be onboard the vessel when fishing activity is occurring.

Permitting Housekeeping (322 CMR 7.03, 7.07 and 7.10). Several clarifications were made to existing permitting regulations. First, consistent with longstanding policy, DMF codified that lobster fisheries with effort control plans are subject to a minimum trap allocation transfer of 10 traps, not 50 traps, and that coastal lobster permits are not retired once their trap allocations are reduced to less than 50 traps. Second, DMF clarified that the agency may waive the coastal lobster permit transfer performance criteria in certain circumstances (i.e., death, disability, military duty) provided the permit was actively fished prior to the qualifying circumstance. Third, DMF made explicit that the initial sale of fish from a commercial permit holder must be to an authorized primary buyer. Lastly, DMF codified that the for-hire permit covers the recreational fishing activity of paying customers on a for-hire trip as well as the private recreational fishing activity of the named individual.

Sand Lance (322 CMR 6.42). DMF adopted a 200-pound possession and landing limit for sand lance. This will prevent any potential proliferation of an industrial fishery while continuing to allow for traditional harvest.

Scup Commercial Trip Limit (322 CMR 6.27). By Director's declaration, DMF set a 50,000-pound trip limit for the Winter I scup fishery (January 1 – April 30). The Winter I fishery occurs offshore and is a federally managed quota period. This 50,000-pound trip limit mirrored the trip limit adopted at the federal level and thereby allows vessels to land scup lawfully taken from the federal zone in Massachusetts.

Sea Herring (322 CMR 9.00). DMF amended its commercial sea herring regulations for Management Area 1A (inshore Gulf of Maine). This included establishing a 2,000-pound incidental and small-scale fishery limit for state-only permit holders and federal category permit holders during closed periods. The regulatory terminology regarding the MA/NH Spawning Area was also refined to better align with the Interstate Fishery Management Plan for Atlantic Sea Herring. Additionally, DMF adopted initial effort controls for Season 1 (June 1 – September 30) in Area 1A. The directed fishery will open on July 20 with Category A vessels being able to land sea herring Mondays – Thursdays with an aggregate weekly landing limit of 240,000 pounds; Category C small mesh bottom trawl vessels being able to fish for and land sea herring Mondays – Fridays with a 55,000 pound trip limit; and Category D vessels being able to possess and land sea herring seven days per week with a 6,600 pound trip limit. These effort controls will be adjusted in-season in response to quota utilization.

Striped Bass Commercial Fishing Limits (322 CMR 6.07). For 2020, the commercial striped bass minimum size has been increased from 34" to 35". With this change and the change in the recreational size limit described below, commercial fishermen fishing recreationally on closed fishing days are no longer required to clip the pectoral fin of commercial-sized fish and for-hire operators are no longer able to sell any fish taken recreationally during a for-hire trip. Additionally, the commercial open fishing day schedule has moved from Mondays/Thursdays to Mondays/Wednesdays. The 2020 commercial fishery is scheduled to open on June 24, with no changes to the commercial possession limits.

Striped Bass Recreational Fishing Limits (322 CMR 6.07). The 28" recreational minimum size has been replaced with a slot limit of 28" to less than 35". This conforms to the coast-wide slot limit recently approved in the Interstate Fishery Management Plan for Striped Bass. Additionally, DMF is requiring all anglers fishing from a private vessel or from shore to use circle hooks when fishing for striped bass with natural baits. This does not apply when fishing with an artificial lure that is to be cast and retrieved or vertically jigged, nor does it apply to recreational anglers fishing on a for-hire vessel during a for-hire trip. Lastly, recreational fishermen are prohibited from removing striped bass from the water with a device other than a non-lethal device. Non-lethal devices are defined as those devices that do not pierce, puncture, or otherwise cause invasive damage to the fish.

Summer Flounder Commercial Limits for Period I (322 CMR 6.22). The Period I (January 1–April 22) commercial summer flounder trip limit was increased from 500 pounds to 1,000 pounds, and the closed fishing period for January was rescinded. The trip limits were further increased to 2,000 pounds by an in-season adjustment. A pilot program was also implemented, allowing vessels permitted in multiple states to possess multiple state trip limits of summer flounder when offloading.

Summer Flounder Commercial Limits for Period II (322 CMR 6.22). The Period II (April 23 – December 31) commercial summer flounder limits were amended. During the inshore summertime fishery (June 10 – October 31), the trip limits were increased from 300 to 400 pounds for net fishermen and from 200 pounds to 250 pounds for hook and line fishermen. A pilot program adopted in 2019 was renewed for 2020 that allows trawl fishermen to possess trip limits on consecutive days, provided the catch from the first day is segregated. For the offshore, early winter fishery (November 1 – December 31), the closed fishing days on Fridays and Saturdays have been eliminated, and the trip limit has been adjusted to allow vessels to possess and land 1,000 pounds of summer flounder if 5% or more of the quota remains available on November 1; if less than 5% of the annual quota remains available, the trip limit will be 500 pounds.

DMF Creates Website to Streamline Aquaculture Projects

DMF has developed a website outlining the process to permit aquaculture projects in Massachusetts. The objective of this project was to create a web-based interface that aquaculture growers can use to navigate the permitting pathway in Massachusetts. Keeping in mind the needs of Massachusetts aquaculture growers, the website provides a one-stop shop for information about the cost, timeline, and permit application, as well as resources for new growers and detailed steps for the annual reporting process. The permitting tool steps growers sequentially through the state permitting requirements and provides on-line access to permit applications. Information related to preventing negative impacts to fisheries habitats, protected species, and public access of our shared coastal waters is also provided. To ensure the tool was user-friendly the team communicated with growers one-on-one and at group meetings. The website was built with partners from University of Massachusetts-Boston, NOAA Greater Atlantic Regional Fisheries Office, and the Cape Cod Cooperative Extension with funding from the Atlantic States Marine Fisheries Commission. You can check out the new website at: www.massaquaculturepermitting.org/

DMF News

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