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DMF News

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Director David E. Pierce Retires

On November 1, Dr. David Pierce retired from DMF after 48 years of service. Renowned for his work ethic and attention to detail, David has been a pillar of Massachusetts fisheries management since the 1970s.

Over David's career, fisheries management has evolved to become an intense and complicated process. With the passage of the famous Magnuson-Stevens Act in 1976, the federal regional fishery councils were born and management of the domestic fleets became a full-time job for many. Then-Director Allen Peterson recruited David to come to Boston to assist him with the growing workload created by the New England Fishery Management Council and the next Director Phil Coates relied on him as well.

Meanwhile, the Atlantic States Marine Fisheries Commission (ASMFC) was dealing with a growing number of nearshore stocks that needed coordinated state management due to their migratory nature. Many of these stocks became co-managed with the Mid-Atlantic Fishery Management Council. With the proliferation of interjurisdictional fishery management challenges, David found his niche as a front-line, tip of the spear professional fisheries manager. Just about every cutting edge management initiative that DMF was involved in has his fingerprints on it.

DMF News is Going Digital!

We are excited to annouce that the next issue of *DMF News* will be available through our new email subscription service. For instructions to sign up for our digital newsletter, see page 12. Still want a hard copy? We will have a limited number of printed newsletters available at our offices.

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David's influence in the management scene grew with the progression of management. Fisheries that were largely unmanaged in the 1970s became intensely scrutinized in the following decades. Multispecies groundfish (cod, haddock, and flounders), sea herring, scup, black sea bass, fluke, tautog, and spiny dogfish all required increasingly close attention and David was instrumental in overseeing the management of these species for the Commonwealth.

By 2000, his duties would grow to include serving as both a New England Council member and ASMFC Board member. Because of this dual role, David often effectively crossed over between these management bodies and helped ensure the goals of each organization were being met while the result was seamless and consistent. Occasionally, however, he led efforts to pursue outcomes at ASMFC that differed from the federal counterparts (e.g., spiny dogfish trip limits and scup state-by-state quotas in the early 2000s) but in those instances, he brought forward a transparent and cogent argument supporting his cause.

David brought a dedication and passion to the management of any species that he was assigned. He had a reputation for being prepared for all meetings. Even on those occasions when he failed to get a second to his well-crafted motion, he always maintained his professionalism and never held a grudge.

He sounded alarms about the direction of groundfish management and the negative outcomes of permit consolidation and lack of enforcement and accountability that has plagued the fisheries in New England. For many years he has also served as an adjunct professor at the University of Massachusetts–Dartmouth, teaching and mentoring graduate students in fisheries policy, helping to create the next generation of managers.

Back in Massachusetts, David was instrumental in state waters fisheries initiatives, where his diplomatic skills have served him well. In the early years of his career, his work often featured intense negotiations among competing user groups, such as draggers and trap fishermen, resulting in reasonable compromises. More recently, he has been a key player for the Baker administration dealing with the upcoming impacts of offshore wind development on the fishing industry—a complex and controversial challenge that has many fishermen fearing for their futures. He is also firm in his convictions when needed. Since being appointed Director in 2015, he demonstrated a strong conservation ethic in his aggressive conservation of state waters whelk fisheries, protections of right whale aggregations in state waters, and regulation of the state waters squid fishery.

David's persistence, optimism, and attention to detail have served the citizens of the Commonwealth well and he will be missed. We wish him a long and healthy retirement.

Farewell!

Having spent 48 years with the Division with about 4 and a half as the agency's Director and 15 as a Deputy Director, I acquired a first-hand, up-close understanding and appreciation of DMF's talented and dedicated staff. I've witnessed staff evolution with all becoming adept at handling agency administration and fisheries management and science issues—many of which require great patience and resolve.

No Director should be an island making decisions without staff advice and analyses. In almost every instance during my career, when having to make those decisions, I've been supported—and often corrected—by that staff proving that a leader must be open-minded and willing to see all sides of an argument. This has been especially important for leading DMF and for management and regulation of the Commonwealth's extremely valuable and complicated recreational and commercial marine fisheries.

I also benefited from the nine-person Marine Fisheries Advisory Commission considering my recommendations for decisions to improve fisheries management and to support actions by the New England Fishery Management Council and the Atlantic States Marine Fisheries Commission. I give much credit to Commission members for their voluntary service and sound advice.

During my time as Director, I witnessed DMF's move to our new location in New Bedford alongside UMass Dartmouth's School for Marine Science & Technology (SMAST) as part of my continuation of and support for the Commonwealth's Marine Fisheries Institute. DMF is also a staunch supporter of the New Bedford Fishing Heritage Center, and the work it does to recognize fishing industry contributions to the Commonwealth's economy and culture. The hard-working men and women, past and present, who comprised and still persevere to promote and sustain our diverse fishing industry must never be forgotten and their contributions and sacrifices always recognized.

I've also witnessed and been involved in DMF's many contributions to offshore wind energy development, right whale protection, white shark research, shellfish aquaculture, anadromous fish restoration, striped bass conservation, and improving our understanding and reacting to the plight of Gulf of Maine cod likely tied to ocean warming and worsening climate change (among many other things). My plate always was filled with challenging ocean policy and science issues making my many years with DMF well-worthwhile, engaging, character-building, and often heart-pounding (fortunately, not stopping, although sometimes close).

I leave DMF in the capable hands of staff being supported by Department of Fish and Game leadership and the Executive Office and Energy and Environmental Affairs. I'm gratified that the next DMF Director will have the agency's 2019–2023 Strategic Plan to enable DMF to achieve its vision and accomplish its mission.

Although I am retired and one would think I'd distance myself from the intrigue, glamor, and sometimes craziness of marine fisheries management and science to devote myself to other interests such as my ministry as a Permanent Deacon of the Catholic Church, I just cannot let go entirely. I will continue to teach a course on ocean policy to graduate students as an adjunct professor at SMAST. Helping young men and women appreciate what their careers will entail and the challenges they must face continues to be very rewarding and a give-back to those who eventually will assume leadership roles in a field of endeavor I've come to love and respect.

By David E. Pierce, PhD, Former Director

Striped Bass Management Changes Pending for 2020

Later this winter, the public will have a chance to weigh in on the Division's management of the Massachusetts commercial and recreational striped bass fisheries. A number of the proposed changes for 2020 are new interstate management requirements in response to updated stock status, while others are optional tools to improve the fisheries' performance.

This past October, the Atlantic States Marine Fisheries Commission approved Addendum VI to Amendment 6 of the Interstate Fishery Management Plan for Striped Bass. The addendum followed in the wake of a new stock assessment for striped bass indicating that the rate of fishing mortality has exceeded its threshold level ("overfishing was occurring") and spawning stock biomass has declined to below its threshold level ("the stock is overfished"). Addendum VI mandates 18% reductions in fishery removals from both the commercial and recreational fisheries in order to reduce the rate of fishing mortality to its target level.

For the commercial fisheries along the coast, this means an 18% cut to the state-by-state commercial quotas. For the recreational fisheries along the coast, the FMP standard of a 28" minimum size was replaced with a slot limit of 28" minimum to less than 35" maximum size (at the existing one fish limit). However, states have the option to implement regulations that are approved to be "conservationally equivalent." Conservation equivalency is a hallmark of most Atlantic States Marine Fisheries Commission interstate plans to allow states flexibility to develop alternative regulations that address local differences while still achieving the goals and objectives of the FMP.

The 3-member Massachusetts delegation to the ASMFC supported the selection of the 28–35" recreational slot limit during Addendum VI's passage. DMF judged that the alternative option of a 35" minimum size was overly-restrictive for the stock's condition and would have grave impacts to shore-based harvest and the charter boat industry. There was also ample public sentiment to move recreational harvest, which amounts to about 90% of all fishery removals, off the larger, more fecund fish with the use of a maximum size. DMF has not submitted a conservation equivalency proposal to the ASMFC for our recreational fishery, and consequently, the only option for public hearing later this winter in Massachusetts will be a mandatory 28" to less than 35" slot limit for recreational harvest.

Because the recent stock assessment also found that the biggest source of fishing mortality is from recreational discards, there is also a renewed focus on improving how fish are caught, fought, handled, and released. As a first step in tackling this problem, Addendum VI requires that all states mandate recreational anglers use circle hooks when fishing for striped bass with whole or natural baits—beginning in 2021. DMF already has a circle hook rule in place (effective January 1, 2020); however, the ASMFC's new mandate is broader than DMF's existing requirement. Specifically, the state's rule provides exemptions for anglers fishing aboard for-hire vessels, or when fishing with certain gear configurations. DMF awaits ASMFC review to determine whether or not Massachusetts is allowed to keep any or all of these exemptions. If not, they'll be phased out of the MA rule by 2021 if not sooner. DMF is also proposing to take an additional optional step to reduce recreational discard mortality by requiring recreational fishermen use only non-lethal devices (e.g., boga grip, landing net) if using a device to remove striped bass from the water, effectively banning gaffing for this sector.

The 18% cut to the coastal commercial quotas reduces Massachusetts baseline quota from 869,813 pounds to 713,246 pounds—at our existing 34" commercial minimum size limit. However, DMF has a strong interest in increasing the size limit one inch to 35" such that the recreational and commercial fisheries are completely separate in terms of legal-sized harvest. This has the potential to alleviate some significant ongoing enforcement and compliance issues, particularly in fishing hot spots like the Cape Cod Canal. This will be our preferred option at public hearings this winter, although we will also present 28" minimum and 28–35" slot limit options for the commercial fishery. Each has a consequence for Massachusetts quota due to conservation equivalency requirements.

We anticipate that some recreational fishermen will question why the commercial fishery continues to target larger fish when they are prohibited from doing the same with the new recreational slot limit. Consider that the recreational fishery harvests about 10 times that of the commercial fishery and will kill more large striped bass by means of catch and release mortality than the commercial fishery will harvest. Implementing the same slot limit for the commercial fishery would likely drive more participation in the fishery than the current 34" minimum size and, at the same time, would necessitate a significant reduction in the commercial quota to not impact the spawning potential of the stock. A separate size limit for the commercial fishery will spread out some of the fishing mortality across more age classes, and the one inch increase will result in the removal of fewer numbers of striped bass.

DMF will also be proposing some optional changes to the commercial rules to improve the fishery's performance. These include moving the season's opening day from June 23 to as early as June 1 and changing the open days from Monday/Thursday to Monday/Wednesday. These proposals seek to better time the fishery's operation with when striped bass are widely distributed and enhance market conditions.

Be on the look-out for a notice of public hearings to take place in early March.

By Nichola Meserve, Fisheries Policy Analyst

Striped Bass Conservation Plate in Production!

After a 6-month campaign, orders for the new striped bass license plate have exceeded the 750-minimum threshold. Expectations are that it will take an additional 6 to 8 months to manufacture and distribute the plates to the RMV offices for pickup by the applicants. All applicants will be notified by mail in the weeks ahead.

This plate will become the fourth sponsored by the MA Environmental Trust and the funds generated by its sale will be dedicated to striped bass studies, fish passage improvement projects, and angler education. By fall of 2020, any Massachusetts motorist will be able to obtain this conservation-inspired plate through the RMV. For more information, visit **https://www.mass.gov/info-details/massachusetts-striped-bass-conservation-license-plate**.

Southern Cape Cod Bay Experiences Lobster Mortalities Related to Low Oxygen

Dead lobsters, crabs, and fish reported

In September, DMF was contacted by the Massachusetts Lobstermen's Association after several lobstermen observed an unusual occurrence in their traps. In portions of southern Cape Cod Bay, traps were coming up from the ocean floor containing dead lobsters, crabs, and finfish. All initial reports were from an area between Scorton Ledge and the mouth of Barnstable Harbor, at depths ranging from 30–70 ft of water. Individual fishermen's counts of dead lobsters ranged from a dozen to several hundred within a fishing day.

DMF staff immediately interviewed fishermen in the area to narrow down the timing and location of the observed mortalities. The first known incident occurred on September 15 and 16, when a dragger hauled in dead scallops from an area slightly northeast of the dead lobster reports, in roughly 80 ft of water. The first observed incidence of dead lobsters occurred on September 20, off of Sandy Neck Beach, from traps fished in 40–60 ft water depth. Based on the information collected from fishermen, the affected area was the southern-most portion of Cape Cod Bay, generally from the Cape Cod Canal east to Barnstable Harbor, in water depths of approximately 30–80 ft. Species affected included lobsters, Jonah crabs, rock crabs, sea ravens, cunner, ocean pout, scallops, wrymouth, and sculpin.

To determine what caused these mortalities, DMF initiated a full-scale investigation of the event, including: using SCUBA divers to directly observe the bottom, retrieving a long-term bottom temperature monitor, collecting water quality samples in the affected area, observing the catch aboard commercial vessels, investigating the potential for a harmful algal bloom event, collating information on oceanographic conditions and weather patterns, collecting samples for pathology testing, and investigating the timing and location of pesticide applications for mosquito control.

Not enough oxygen!

In a joint effort with the Provincetown Center for Coastal Studies, we collected water quality data throughout the southern portion of Cape Cod Bay over the course of several days. We observed extremely low levels of dissolved oxygen (DO) in portions of the area at depths greater than 30 ft. Dissolved oxygen describes how much oxygen is available in the water for fish and crustaceans to breath. In many of the places we sampled, these levels were so low (hypoxic) that benthic fish and crustaceans could not survive. While mobile fish and invertebrates can detect these unfavorable conditions and will move to avoid hypoxic conditions, those animals in traps are continuously exposed to low DO may become lethargic and die.

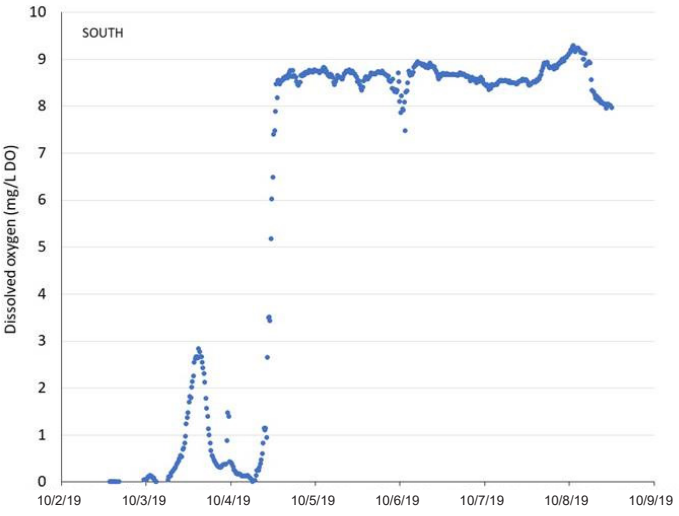
Within days of the initial dead lobster reports, DMF biologists were able to sample aboard three different lobster fishing vessels working in the affected area. The biologists observed very low catch rates, with a few dead lobsters and several lethargic lobsters in traps within the affected area. Catch in traps immediately to the east of the affected area improved (both in quantity and in condition of the lobsters) over a relatively short distance. Some weak and lethargic lobsters improved dramatically after being placed in a tote without water or in the boat's live well (supplied with flow-through water taken from the surface). This recovery supported our presumption that the lobsters had experienced hypoxia, since a return to well-oxygenated conditions resulted in obvious improvements.

DMF divers directly observed the ocean floor at two locations in southern Cape Cod Bay on September 25. The first site was in 25 ft of water on Scorton Ledge where DO levels were normal; they reported typical fish activity and spotted nothing unusual. The second site was in 55 ft of water north of Scorton Ledge where DO levels were severely hypoxic. At this site, DMF divers saw a few dead crabs and fish on the bottom, as well as some very lethargic-looking lobsters in traps. The divers did not observe numerous dead animals, nor did DMF receive any reports of dead animals washing ashore. Taken together, this suggested that many animals were able to avoid the area as conditions became unfavorable; however, those animals stuck in traps were more vulnerable.

Why did the bottom waters become hypoxic?

For most of the year, waters in Massachusetts Bay and Cape Cod Bay are exchanged due to patterns in regional ocean currents. However, in the late summer and early fall water exchange between Cape Cod Bay and Massachusetts Bay becomes reduced due to seasonal changes in those circulation patterns, isolating Cape Cod Bay. At this time of year the waters in Cape Cod Bay also tend to be stratified (layered) with warm waters at the surface and cooler waters at depth. Surface waters in early August of this year were unusually warm, setting up a very strong stratification which acts something like a barrier keeping the cooler, denser bottom waters from mixing with the more oxygen-rich surface waters. The isolation of Cape Cod Bay and strong stratification led to an accumulation of nutrients and organic matter in bottom waters. As the organic matter decays, oxygen is depleted, resulting in an annual decline of DO during the late summer and early fall. This annual decline of DO has been routinely documented by various groups who monitor water quality in Cape Cod Bay, but never to the extent of the values observed this year.

Usually, the onset of stormy weather in the fall breaks down the stratification and alleviates the low DO conditions in bottom waters. As the sea surface waters cool and the wind and waves associated with fall storms persist, surface waters begin to mix down,



Dissolved oxygen (DO) as measured by a continuous logger (recording every 15 minutes) at the bottom within the affected area in southern Cape Cod Bay. Note the dramatic increase in DO levels that occurred starting October 4.

equalizing the temperatures and oxygen levels between the surface and bottom waters. This normally starts to happen around the middle of September but timing varies from year to year. This year, most of September was relatively calm with wave heights generally less than 3 ft, further contributing to the persistent stratification. It wasn't until early October that we finally had storms strong enough to mix the oxygenated surface waters down. Data loggers that DMF deployed on October 2 were able to document the breakdown of stratification and rebound of DO in the affected area on October 4, coinciding with a windstorm that produced 4 to 7-ft seas for nearly 24 hours. This event was followed closely by another strong wind/sea event on October 9–12.

Mosquito control programs were not the culprit

As part of our investigation, DMF staff collected information on mosquito control and spraying activities from Middlesex, Norfolk, Boston, Suffolk, Bristol, Plymouth, and Barnstable Counties to investigate any potential role these control programs may have played in the observed mortalities in Cape Cod Bay. The timing and locations of the spray activities, along with the rapid breakdown of the products used left little to no opportunity for the pesticides to have reached lobsters in Cape Cod Bay. Additionally, there were no reports of fish kills or dead marsh animals along any of the rivers, streams, or tidal marshes leading from sprayed areas to Cape Cod Bay, nor were there reports of dead marine life in depths shallower than 30 ft along the immediate shoreline, which would have experienced the first and least diluted exposure, if any. There is no evidence to suggest that the mosquito control programs were related to the observed lobster and fish mortalities in southern Cape Cod Bay.

Conclusions

The localized lobster and finfish mortality event observed in the fall of 2019 in the southern portion of Cape Cod Bay was caused by extremely low dissolved oxygen (DO) in bottom waters. While low DO values have been recorded in the past, to our knowledge this is the first time that levels have deteriorated to the point of severe hypoxia.

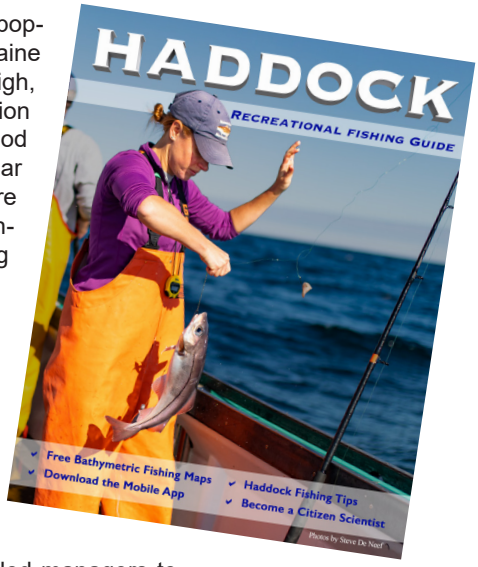
The severely hypoxic conditions resulted in the death of lobsters and other benthic animals that were unable to move away from the deteriorating conditions. We expect that most mobile benthic animals left the area to avoid the hypoxic conditions. Based on diver observations and there being no reports of carcasses washing ashore, there is no reason to believe that there were large numbers of dead lobsters anywhere other than those trapped in gear.

Massachusetts' heavily populated coastline and upstream urban environments will continue to result in downstream accumulation of nutrients and organic material in the waters of Cape Cod Bay. Decomposition of organic materials on the seafloor depletes oxygen from bottom waters and, under highly stratified conditions, the oxygen-rich surface waters do not mix down to replenish bottom waters. With changing climate conditions, increasing sea surface temperatures may strengthen water column stratification so it is reasonable to expect that southern Cape Cod Bay will experience similar hypoxic events in future years.

During our investigations into this event, DMF partnered with the Provincetown Center for Coastal Studies and formed collaborative relationships with oceanographers at the Woods Hole Oceanographic Institution. We will continue to foster these relationships and work towards monitoring and understanding conditions in Cape Cod Bay. The cooperation and commitment from the Massachusetts Lobstermen's Association and local industry members affected by the mortality event were also vital to our work in documenting and understanding this event. Hopefully, with increased monitoring efforts and continued collaboration by everyone involved, we will be able to predict future events and provide industry members with timely forewarning, allowing them to move gear away from vulnerable areas of the Bay. This will help avoid not only financial losses but also inadvertent mortalities of fish and invertebrates trapped in the gear. Increased monitoring of bottom water quality in Cape Cod Bay will also provide additional data to oceanographers working to understand the seasonal dynamics of the Bay.

By Tracy Pugh, PhD, Invertebrate Fisheries Project Leader, Kelly Whitmore, Invertebrate Fisheries Biologist, and Steve Wilcox, Invertebrate Fisheries Biologist

Become a Citizen Scientist!



Although the haddock population in the Gulf of Maine (GOM) is at a record high, the Atlantic cod population is near an all-time low. Cod and haddock prefer similar habitats and are therefore commonly caught together, which presents a big problem.

Despite managers imposing a prohibition on recreational cod harvest, the discarded cod ("bycatch") from haddock anglers has become a leading source of mortality for the cod stock. This has led managers to impose stricter than necessary restrictions on haddock fishing with the intention of decreasing the discard mortality of cod.

DMF has created a bycatch avoidance tool for Atlantic cod in the GOM recreational fishery, in the form of intuitive map products that identify the time and place where the catch rate for cod is low yet legal sized haddock are abundant (See *DMF News* Volume 43).

Our haddock recreational maps were originally based on information from a trawl survey that ended in 2019. That means they will become less useful over time as the distribution of cod and haddock change. That's where you come in! We're looking for anglers to voluntarily report their groundfish catch, fishing time, and locations.

Interested anglers should visit **https://www.mass.gov/haddock** to register as a citizen scientist. One of our biologists will follow up with further instructions. The first 100 participants will receive a pair of fishing pliers as a thank you. Each reported fishing trip will also be an entry into a drawing for a YETI cooler!

Fishway Construction at the Draka Dam on the Three Mile River

River herring have waited a long time to swim up the Three Mile River in the Taunton River Watershed. With the completion of a new fish ladder at the Draka Dam on the Taunton and Dighton border, they will finally get their chance next spring.

The Draka Dam, also called the 620 Spring Street Dam, was built to provide hydropower for the surrounding mill industries in the 1800s. The dam impounds the 45-acre Mount Hope Pond and eliminated upstream passage for sea-run fish to the pond and for several miles upstream in the Three Mile River.

Interest to restore passage for diadromous fish goes back over 30 years. The Boyden Wildlife Refuge runs along the pond and has become a popular location for walking and viewing wildlife. The attraction of the Refuge and use of the pond as a fire suppression water supply by the dam owner has reduced the potential to remove the dam. The goal of restoring river herring and other species in an important tributary of the Taunton River led to the fish ladder project at the long-impassible dam.

The project had more than its fair share of challenges. Formal efforts began in 1997 with DMF and Save the Bay partnering to gather funds for fishway design and permitting. The project stalled for a time due to the complexity of property issues: the dam was owned by one company, the river bank next to the fish ladder was owned by a trust, and the site access was owned by yet another company. Once agreements were made on property issues, the design and permitting work was resumed with continued support from Save the Bay, the Town of Dighton, and the City of Taunton. However, cost increases to the design and permitting required additional funding.

With the receipt of essential awards from the US Fish and Wildlife Service, the Massachusetts Environmental Trust, and the Department of Fish and Game's In-Lieu Fee Program, and DMF's own contribution of fish ladder sections, the construction project was ready to forge ahead in 2018. Unfortunately, high river flows shut down the fishway's construction that year. Finally, in the fall of 2019, SumCo Ecoengineering, under contract with DMF, completed the construction and river flow was released through the new fishway. The construction contract was just under $90,000, a reasonable sum for the benefits gained.

The fishway was cooperatively designed by Tibbetts Engineering, the US Fish and Wildlife Service, and DMF. It includes an aluminum Alaskan Steeppass fish ladder, a concrete-formed entrance box, turnpool and exit box integrated with a notch in the dam crest. A second notch in the dam provides a soft landing for juvenile river herring and other fish leaving the pond into a plunge pool. Flows from the downstream migration channel lead to the entrance box to provide additional attraction flows.

Completed fishway at the Draka Dam.

We hope to see fish passing over the dam this spring for the first time in well over a hundred years. DMF has been stocking herring in Mount Hope Pond the last few years to prime the spawning migration. We'll never know exactly how the fish feel about the completion of this 20+ year project, but we can expect excitement and a sense of relief from local advocates and project partners when the fish start their run.

By Brad Chase, Diadromous Fisheries Project Leader

Draka Dam fishway from across the spillway.

2020 Commercial Quota Outlook

Atlantic herring: 25,289,226 pounds (coastwide limit)
The Atlantic herring fishery will continue to be constrained by reduced catch limits reflecting the stock's declining trend due to poor recruitment of herring into the population. The 2020 catch limit is reduced by 26% from 2019 (34.3 million pounds). For contrast, the 2018 fishery commenced with a 223-million-pound catch limit. Landings for 2019 through mid-December total 28 million pounds. Allocations to Areas 1A, 1B, 2, and 3 are expected to remain status quo at 28.9%, 4.3%, 27.8%, and 39%, respectively, with the addition of an inshore midwater trawl restricted area from the Canadian border to Montauk. The next stock assessment is scheduled to take place in 2020 and affect the setting of the quota for 2021. Beginning in 2019, herring catch limits are set in a manner that accounts for herring's role as forage in the ecosystem.

Atlantic menhaden: 6,046,094 pounds (MA quota)
The 2020 coastwide commercial quota of 476.2 million pounds is unchanged from last year. MA's share is 1.27%, after 1% is set aside for episodic events affecting the northeast states. Our 2020 state quote includes an additional 37,529 pounds relinquished by states that don't intend to use all of their allocation; an amount similar to last year. The 2019 Massachusetts fishery landed nearly 7 million pounds with the assistance of several transfers of quota from other states. The first-ever ecosystem-based stock assessment for menhaden is due to be completed in early 2020 and is expected to inform the setting of future menhaden quotas in a manner that incorporates its important forage role.

Black sea bass: 725,400 pounds (MA quota)
The coastwide commercial quota was increased 59% for 2020, from 3.52 million pounds in 2019 to 5.58 million pounds. Massachusetts' share is 13%, resulting in an additional 267,500 pounds for our fishery in 2020 (up from 457,600 pounds). The Massachusetts fishery landed 110% of its quota in 2019, but this is unlikely to affect our 2020 quota because of sufficient underages in other states. Public hearings will be held this winter to determine whether state regulations should be modified in response to the increased quota.

Bluefish: 185,838 pounds (MA quota)
The most recent stock assessment for bluefish indicates the stock is overfished. The decline in biomass, coupled with there being no excess recreational harvest target to transfer to the commercial fishery, has resulted in a 64% decline in the coastwide commercial quota for 2020 (from 7.71 million pounds in 2019 to 2.77 million pounds). Our state share of the quota (6.7%) is similarly reduced (from 517,828 pounds in 2019); however, this might not limit the 2020 fishery given recent landings trends. Massachusetts landings in 2019 continued their downward trend, totaling just over 183,000 pounds.

Horseshoe crab: 165,000 crabs (MA quota)
Massachusetts' 2020 commercial quota for horseshoe crabs harvested for bait purposes is unchanged from 2019. Horseshoe crabs harvested for other purposes (i.e., biomedical use, research, display) are not counted against this quota. 2019 marked the first year that the fishery reached the quota.

Northern shrimp: 0 pounds (coastwide quota)
The commercial harvest moratorium that has been in place the last seven years for northern shrimp will continue into 2020, due to the stock's low levels of biomass and recruitment. The stock has limited prospects for recovery in the near future due to an increasingly inhospitable environment, i.e., warning ocean temperatures in western Gulf of Maine shrimp habitat.

Scup: 1,868,982 pounds (MA Summer Period quota)
At 22.23 million pounds, the 2020 coastwide commercial quota is down 7% from 2019 (when it was 23.98 million pounds). 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 10.03 and 3.54 million pounds for 2020. Quota during these periods is open to all states. The fisheries have not been limited by these quotas in recent years. Of the 38.95% (or 8.66 million pounds for 2020) allocated to the Summer Period fishery (May–September), Massachusetts receives roughly 21.6%. Our Summer Period harvest in 2019 was roughly 0.68 million pounds, continuing a downward trend. The summer fishery has not been constrained by the quota since 2008.

Spiny dogfish: 13,453,004 pounds (ME–CT quota)
The coastwide commercial quota is increasing 13% to 23.19 million pounds for the May 1, 2020 through April 30, 2021 fishing year. The Northern Region of Maine through Connecticut receives 58% of the coastwide quota, of which Massachusetts generally takes the largest portion. This year's Northern Region fishery is nearing its conclusion with less than 8 million pounds landed, well below the region's 11.9-million-pound quota. 2.2 million pounds of this excess has been transfered to Virginia to avoid an early closure there.

Striped bass: TBD (MA quota)
The coastal states' commercial quotas for striped bass have been cut by 18% for 2020 to end overfishing on the resource. This reduces Massachusetts' baseline quota from 869,813 pounds to 713,246 pounds; however, DMF is considering a revision to the state's commercial size limit which has the potential to affect the quota. There will not be any overage from the 2019 fishery to account for, as just 585,852 pounds of the 869,813-pound quota was landed. Given the fishery's recent underperformance with the quota and the various options for the commercial size limit and quota, DMF will be holding public hearings this winter on the fishery's regulations for 2020.

Summer flounder (fluke): 786,260 pounds (MA quota)
A constant coastwide commercial quota of 11.53 million pounds applies for 2019–2021, representing a 74% increase from 2018. Our state quota for 2020 is anticipated to actually increase by about 45,000 pounds from 2019 (741,532 pounds) due to reductions for overages that applied to the 2019 fishery. The increase to the quotas beginning in 2019 did not take effect until mid-year, making it difficult for the Massachusetts fishery to fully capitalize on the change. About 73% of the 2019 quota was harvested (roughly 540,000 pounds). Public hearings will be held this winter to determine whether state regulations should be modified in response to the increased quota of fluke.

Tautog: 62,797 pounds (MA quota)
Massachusetts' 2020 tautog quota will be marginally reduced by a slight harvest overage in the prior year. The 2019 fishery's quota was set at the baseline amount of 64,753 pounds, of which 103% was landed (66,709 pounds). 2020 marks the first year of mandatory tagging of all commercial harvested tautog along the Atlantic coast.

By Nichola Meserve, Fisheries Policy Analyst

Check the web for quota & landings updates!

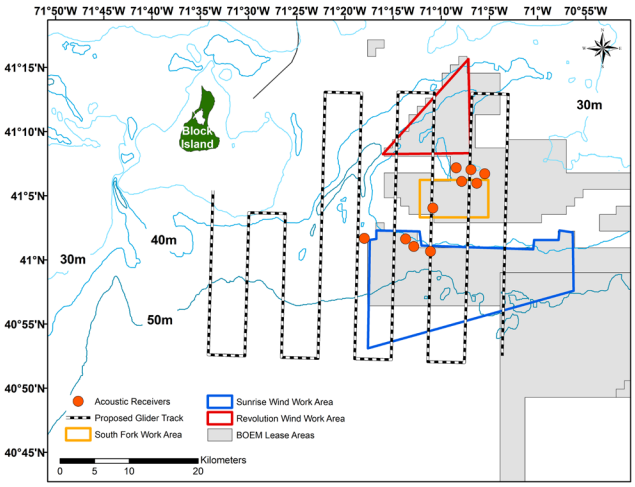
The quotas described herein are subject to change. Check the Division's quota monitoring webpage for updates on commercial quotas and landings. **https://www.mass.gov/service-details/current-commercial-fishing-quotas-and-landings**

Using Advanced Technologies to Map the Distribution and Habitat Use of Spawning Cod near Cox Ledge

Cox Ledge and the surrounding area of Southern New England waters have been slated for wind energy development starting in 2022. This area supports one of the remaining major spawning components of Atlantic cod. Cod use noise to communicate during the spawning season and an increasing body of literature demonstrates that construction noise and operations can disrupt spawning activity. However, there is relatively little information available to evaluate the habitat use and spawning dynamics of cod in the Cox Ledge region.

In order to provide fine-scale information needed to elucidate the potential overlap between offshore wind development and cod spawning activity in this area, DMF researchers are partnering with colleagues from UMass Dartmouth's School for Marine Science & Technology, the National Oceanic and Atmospheric Administration, Woods Hole Oceanographic Institution, Rutgers University, and The Nature Conservancy to better understand the distribution and timing of cod spawning near Cox Ledge. The project team received funding from the Bureau of Ocean Energy Management to conduct this research.

The field work, which is just getting underway, will be carried out in collaboration with recreational and commercial fishermen in the region. Acoustic transmitters will be deployed on cod in the vicinity of Cox Ledge during two spawning seasons. The transmitters have an expected battery life of approximately 1600 days, enabling us to investigate multi-year residence and fidelity to the spawning site. The distribution of cod tagged with acoustic receivers will be monitored over three spawning seasons using an acoustic receiver mounted on an autonomous glider. The glider will follow a pre-programmed route to survey the study area four times during each spawning season. Acoustic receivers moored in strategic locations will also be used to estimate residence, dispersal, thermal preferences, and habitat use of tagged cod. Ten acoustic receivers were deployed in November near Cox Ledge, and the array will be expanded to 25 receivers in 2020.



Map of the study site, including the areas that are slated for wind energy development. The path of the glider and locations of the acoustic receivers are also shown.

Conventional tags will be applied to sub-legal cod in order to investigate regional movement patterns from fishery recaptures. In addition, commercial and recreational fisheries will be sampled in southern New England to characterize cod demographics (e.g., sex, reproductive stages, fish length and age) and to inform regional investigations into cod stock structure.

Outcomes from the research will be a characterization of the spawning dynamics and thermal habitats of cod in Southern New England, and assessment of their connectivity with other cod populations. The anticipated benefits include an understanding of seasonal habitat usage to help evaluate the potential impacts of offshore wind development.

By Gregory DeCelles, PhD, Stock Assessment Specialist

DMF Accolades

Jillian Carr, **Tay Evans**, and **Katelyn Frew** recently received the Department of Fish and Game's Pride and Performance award for their work on the DMF Eelgrass Project. These three—along with **Alex Boeri**—were also awarded the 2019 Melissa Laser Fish Habitat Conservation Award from the Atlantic Coastal Fish Habitat Partnership for their commitment to the restoration of eelgrass habitat. DMF's Eelgrass team has been responsible for the restoration of over 20 acres of eelgrass habitat in Massachusetts between 2004 and 2019. This is one of the largest and most successful eelgrass restoration programs in New England! The team has perfected planting and monitoring methods, yet still works toward optimizing their methods for efficiency. The team also assessed the effectiveness of "conservation moorings" to develop guidelines for the proper installation and maintenance of this type of boat mooring that can reduce the impacts of chain drag on eelgrass beds.

Samantha Kass recently received the Department of Fish and Game's Pride and Performance award for her work as DMF's Internal Control Officer and Communications strategist. As the Internal Control Officer, Sam has developed and maintained the Division's Internal Control Plan and DMF Boat Use and Safety Manual. These policies not only help the Division remain compliant with state and federal regulations, but also helps keeps staff members safe in the field. In 2019, Sam also led a team to develop a marine fisheries educational exhibit at the US Army Corp of Engineers Cape Cod Canal Visitor Center.

Construction Underway at the Deer Island Fishing Pier

A fishing pier providing access to Boston Harbor was first conceived by our Marine Recreational Fisheries Development Panel in 2012. At the time, with several successful pier projects on the Cape and Islands completed or in the pipeline, the Panel members had stressed to DMF that seeking out an urban opportunity for a future large-scale fishing access project would benefit a wider range of anglers. Among the many ideas that were thrown out for a potential fishing pier location was Deer Island in East Boston.

Even at first sight, the area looked promising. Further evaluation by staff biologists and local fishing experts agreed—the site was a suitable location to provide much-needed public access to fish the natural resources of Boston Harbor. In 2015, once the schedule of previously planned access projects allowed, the Panel officially endorsed the development of a recreational fishing pier at Deer Island.

What followed was a long and at times arduous process of permitting, planning, and design of the pier. DMF worked with other state and local agencies, stakeholders, and Foth Engineering to take the Deer Island Fishing Pier from a concept to a shovel-ready project. Fast forward to late July 2019 when, under the direction of ACK Marine & General Contracting, a backhoe began dissembling a section of the rip rap at Deer Island in order to make room for the pier!

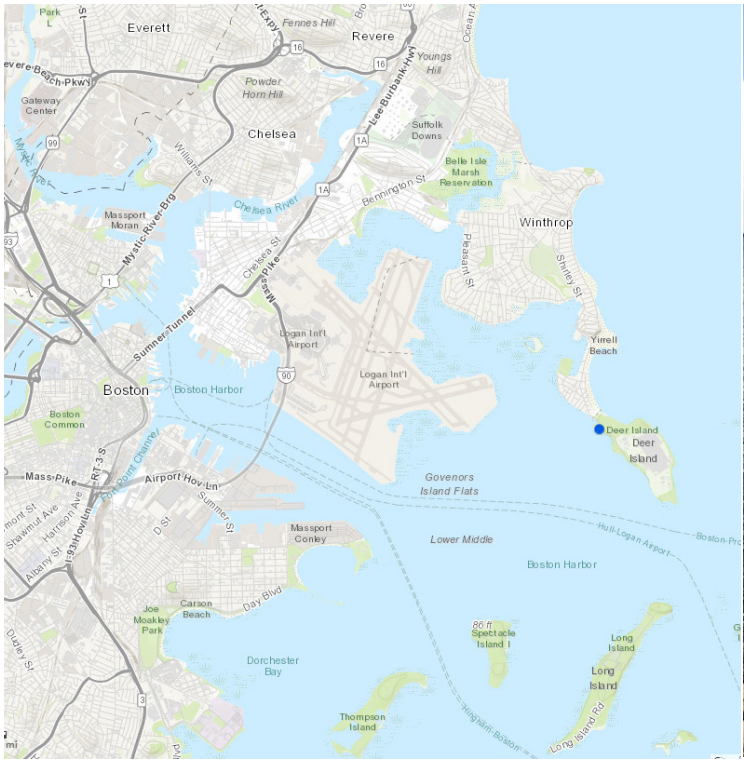
Getting to this point required DMF's close cooperation with two other entities: the Massachusetts Water Resources Authority (MWRA) and the Department of Fish & Game's Office of Fishing and Boating Access (FBA). In addition to operating the Deer Island Wastewater Treatment Plant, which is critical for protecting Boston Harbor against pollution from metropolitan Boston sewer systems, the MWRA also manages the public access areas of Deer Island. These include sixty acres of open space and 2.6 miles of handicapped accessible walking paths providing views of the Boston skyline, Boston Harbor and the harbor islands, Broad Sound, and Logan airport. The FBA provides essential support to DMF throughout the many phases of construction management for public access projects.

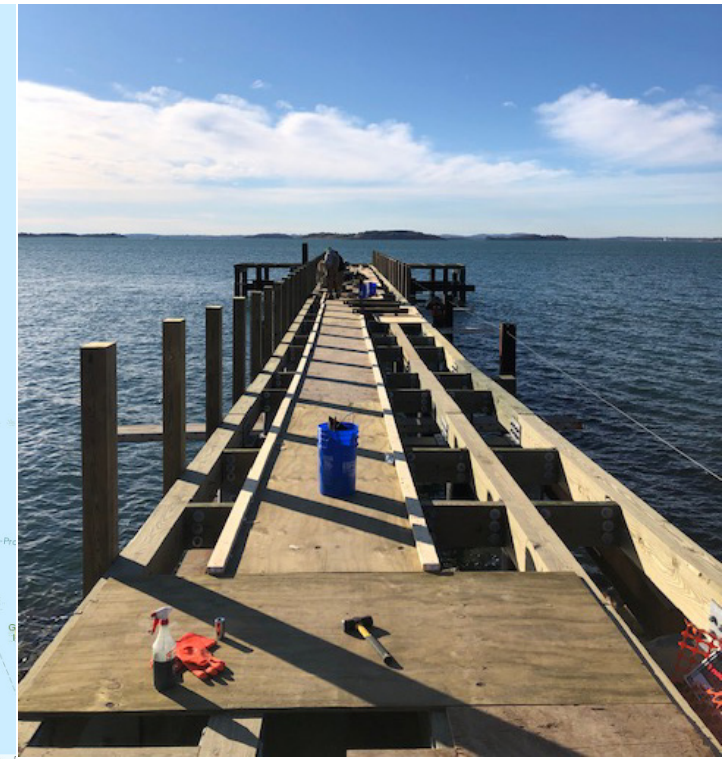
This past summer, the seawall was poured followed by the addition of steel pilings. ACK Marine & General Contracting has been meticulously assembling the structure into the winter. Construction will be continuing into 2020, and soon there will be decking and ADA compliant railings added. The pier is on schedule to be completed this spring. 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.

During construction, schools of striped bass have been seen blitzing within casting distance from the end of the pier. Local angling professionals have told tales of the winter flounder they've caught in the footprint of this location. Bluefish and tautog are no stranger to these waters either. It's a given that a certain number of fish will be harvested form this steel and timber structure. More than that though, memories of good days with family and friends spanning generations will be formed.

This projected is funded by the Marine Recreational Fisheries Development Fund which is financed through the sale of recreational saltwater fishing permits. One third of the fund is dedicated to providing anglers with public access to saltwater fishing opportunities.

By Ross Kessler, Public Access Coordinator

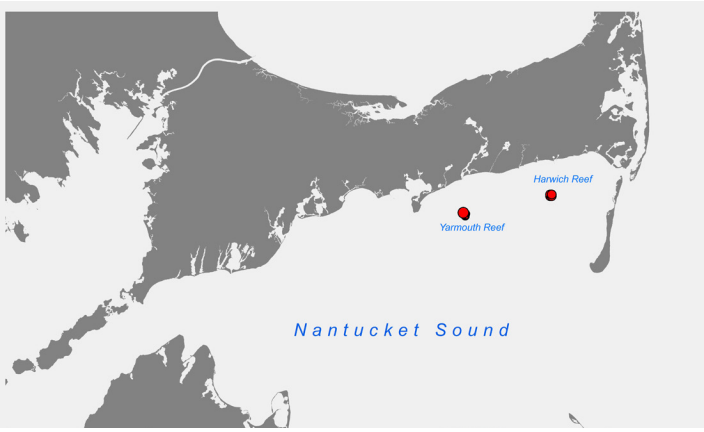




Left: Map of Deer Island Pier location. Right: Pier project construstion underway.

DMF Deploys Materials on the Yarmouth Reef in Nantucket Sound

Through the collaborative efforts of DMF, the Cape Cod Salties, the Yarmouth Division of Natural Resources (DNR), the U. S. Coast Guard, and the MA Department of Fish and Game (DFG), new structures have been deployed to the Yarmouth artificial reef site in Nantucket Sound for the first time in more than two decades. Two separate efforts contributed more than 3000 cubic yards (CY) of new material to the site, covering several acres of bottom.



Location of the artificial reef site in Nantucket sound.

On October 1, two Coast Guard vessels deployed 140,000 pounds of retired concrete buoy sinkers to an area within the southern portion of the permitted site. The Coast Guard delivered and deployed the materials to the site as part of their maritime stewardship efforts in support of local coastal communities and at no cost to the Commonwealth. This effort is an example of state and federal government working together to reduce costs through repurposing and recycling materials while providing added environmental benefits. Additional sinkers are scheduled to be delivered to the site again in mid-January 2020.

A second series of deployment events began on January 6, 2020. With funding from DFG's In-lieu Fee Program, the Robert B. Our Company was contracted to deploy 2000 CY of material to the reef. Over 500 CY of granite blocks originating from the old drive-in movie site on Route 28 in South Yarmouth and from the demolition of a railroad bridge in Dennis were secured by the Cape Cod Salties and Yarmouth DNR for use as reef materials. Additional concrete materials were donated by the contractor. Materials were transported from Fall River to the site over several trips using a barge and tug, and deployed to a designated location in the southeastern section of the reef site.

January 6, 2020 deployment of additional materials to the Yarmouth reef site.

Originally permitted by DMF in 1978, the 125-acre Yarmouth reef is located 2.2 miles south of the entrance to the Bass River in Yarmouth at approximately 32 ft depth, and is the Commonwealth's oldest artificial reef. The reef site is designed to enhance fishing for black sea bass, tautog, and scup by providing benthic relief and interstitial spaces for marine fish and invertebrates in an otherwise featureless location.

With the deployments of new materials, the reef site is expected to provide additional recreational fishing access opportunities for decades to come. As the reef ages, it will undergo various stages of colonization and succession and is expected to resemble natural structured habitat over time. Although colonization of recently deployed material is in the very early stages, fish and invertebrates will be present on the site this spring, and recreational fishing opportunities are expected as soon as the fish migrate into Nantucket Sound. DMF will begin monitoring the site in the spring of 2020.

More information on this and other artificial reef sites in Massachusetts can be found at **https://www.mass.gov/service-details/artificial-reefs**.

By Mark Rousseau, Climate and Artificial Reef Specialist

DMF Biologists Will Study Growth in Large Lobsters

Lobster growth is a complicated process because of their hard shells; growth must happen in distinct steps rather than continuously like fish growth. Lobsters produce a new shell underneath their existing hard shell, and once they've outgrown the old hard shell, they molt. (The scientific term for molting is "ecdysis," which is derived from an old Greek term meaning "to take off".) Immediately after molting, the lobster's new shell is very soft, and the lobster absorbs water to inflate the new shell to its larger size before it hardens. Over time, the water will be replaced with body tissue as the lobster grows, until its shell is full and it needs to molt again.

Understanding growth is very important for assessing the lobster stock because crustaceans are very difficult to age (unlike fish). The population models we use for lobster are based on size instead of age. This means we need to know how often lobsters molt and how much their size increases each time they molt. Lobsters molt several times a year for the first few years of their lives, but as they get larger and reach maturity they don't molt as frequently, slowing to roughly one molt per year. Mature females grow even more slowly, molting only once every other year, since they have

Invertebrate Fisheries Project Leader, Tracy Pugh at end of a sampling day aboard the vessel F/V Victoria Rose. The larger lobster is a female, the smaller one is a male.

to trade off between carrying eggs and molting. We generally have good data to describe growth for lobsters up to and just above the harvestable size, but for much larger lobsters (more than five inches carapace length or over about 3.5 pounds) the data are more sparse.

DMF was recently awarded funding from the National Sea Grant Lobster Research Initiative to collect information on the growth of large lobsters. We will be collecting large lobsters (more than five inches carapace length) from offshore waters during summer, the time of year when they are getting ready to molt. We will sort through catch at the dock, recording lobster size and sex, looking for those with old shells that should be ready to molt. We'll bring these old-shelled lobsters into the seawater tanks at our New Bedford facility, where we will house them in individual compartments and collect measurements from many individuals before and after they molt. This work will allow us to estimate how many of the lobsters that we examine are likely to molt this year, and will give us information on how much their size increases when they do molt. These two pieces of data will be directly useful for future stock assessments and will enhance our general understanding of the biology of these important crustaceans.

By Tracy Pugh, PhD, Invertebrate Fisheries Project Leader

Creature Feature: Kemp's Ridley Sea Turtles (*Lepidochelys kempii*)

Species Overview

The Kemp's Ridley is a small, hard-shelled turtle with adults measuring around 2 feet in length and weighing 70 pounds. They are a benthic feeder that prefer shallow sandy or muddy bottom areas and primarily eat crabs. Approximately 7,000–9,000 nesting females exist and almost all return to a single nesting beach, Rancho Nuevo in Mexico, to lay their eggs. In the US they are listed as Endangered under the Endangered Species Act. While adult Kemp's Ridley are mainly confined to the Gulf of Mexico, juveniles range to temperate coastal areas and are found all along the US East Coast, including as far north as Massachusetts.

While the number of Kemp's Ridley turtles that enter Massachusetts' waters is greater than other species of sea turtles, they are almost never seen in Cape Cod Bay during the summer when they are healthy and active. Unfortunately, most all Kemp's Ridley sightings in Massachusetts are small, cold stunned juveniles that have washed ashore in late fall through early winter. Juvenile Kemp's Ridley sea turtles are by far the most common cold stunned species and age class in the Northeast, with the Bay-side section of the Outer Cape being the prime stranding location.

An unlikely outcome to warming ocean temps...cold-stunned turtles

Rapidly warming ocean temperatures in the Gulf of Maine have a variety of consequences. While this warming may have negative effects on some species (e.g., cod, copepods, right whales), it is making our waters more suitable for other species (e.g., black sea bass, juvenile Atlantic bonito). For Kemp's Ridley sea turtles,

Wellfleet Audubon Society staff member, Jacey Corrente, rescuing a live Kemp's Ridley at Campground Beach in Eastham. Photo courtesy of Wellfleet Audubon Society.

warming ocean temperatures have expanded the northern extent of their range into Massachusetts waters; however, this shift in habitat is not without risks. Over the last 10 years, strandings by Kemp's Ridley sea turtles have skyrocketed. The vast majority of these events are caused by cold stunning and occur in late fall when water temperatures fall below 50 degrees Fahrenheit.

Prior to 2009, more than 100 stranded turtles in a year were uncommon. Since then the number of cold stun events has increased

dramatically. In 2014, there were over 1,000 cold stunned Kemp's Ridley in Cape Cod Bay. Researchers have modeled the factors that might influence these events and found that warmer sea surface temperature in the Gulf of Maine best explains the increasing number of cold stunned turtles. The geography of Cape Cod Bay likely impedes the southerly progress of individuals drawn further north by warm waters during summer, trapping them in the Bay as temperatures plummet.

Sea turtles are ectothermic and rely on external heat for body function. If they fail to leave northern waters in time, falling temperatures will wreak havoc on them, causing organ failure, immune system suppression, and infection. By the time they strand, they've likely been debilitated for some time, making rehabilitation necessary. Even with that intervention, only around 35% of cold stunned turtles survive. The 2019 cold stun season was relatively calm compared to recent years with around 282 strandings, the vast majority of those being Kemp's Ridley.

While the North Atlantic population of Kemp's Ridley has increased over the last 30 years, researchers have not found any correlation between the increased number of hatchlings and the increased incidence of cold stuns. Only around 2% of the juvenile population of Kemp's cold stuns, making up a small portion of the overall population mortality. However, with the Gulf of Maine predicted to continue warming and given the connection of that trend to the incidence of cold stun, managers and responders should anticipate busy cold stun seasons in the near future.

By Erin Burke, Protect Species Specialist

Continued from page 1

Want to Stay Connected?

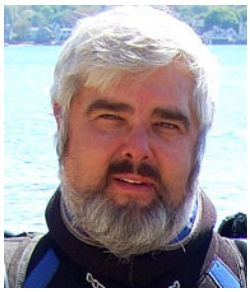
We are pleased to announce that we've implemented a new email subscription service to make it easier for you to get updates on the topics which interest you. Any subscriptions you currently have to DMF updates will continue, however new categories will make them more user friendly.

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 https://www.mass.gov/marinefisheries and click on the link to subscribe.

Comings and Goings

Harriet Booth has accepted a full-time position at the Cape Cod Cooperative Extension Marine Program in Barnstable, MA as a Marine Resource Specialist. Harriet joined the South Coast Shellfish Program as a Seasonal Contracted Employee in May 2018 and advanced to the position of Aquatic Biologist in March 2019. Harriet was responsible for managing two multi-year shellfish mitigation/restoration projects in Buzzards Bay. She played a valuable role mobilizing and conducting the many field activities with these projects as well as coordinating efforts with local shellfish department staff in each participating community, compiling and analyzing monitoring data, and preparing progress reports. We wish her the best of luck in her new role.



After 36 years with the Division, **Neil Churchill** has retired. Neil started with the DMF in February 1981 as a member of the Young Adult Conservation Corps. Over the subsequent years, Neil held a variety of roles in our Anadromous Fish Project and permitting, ultimately joining the Shellfish Sanitation and Management Program in 1984. Neil remained with the Shellfish Program for the remainder of his career where he developed a well-deserved reputation as intelligent, thoughtful, conscientious, and reliable. In addition to work as a shellfish growing area classification biologist, Neil oversaw notification of shellfish public health openings and closures for the program and maintained classification notification files. He obtained and maintained municipal shellfish landings data and local shellfish regulations and management plans. Neil also served as the DMF liaison with the Department of Environmental Protection and the US Coast Guard for oil and chemical spills. Neil was an experienced SCUBA diver involved in numerous activities involving shellfish surveys and work for most other Division programs. Neil will be greatly missed, and we wish him well in his retirement.

Jillian Carr has recently accepted a new position at the Massachusetts Office of Coastal Zone Management as a MassBays Circuit Rider. In her new role, she will provide technical assistance and support coastal monitoring efforts by community-based organizations. Jill was hired by DMF's lobster project as a seasonal contractor in 2009 before joining DMF Fisheries Habitat Project full time in 2012 as a Fisheries Habitat Specialist, where she worked on habitat mapping, eelgrass restoration, protection, and research, and developing habitat monitoring guidelines for both professional and citizen scientists. This year, she received two awards for her work in eelgrass restoration. We wish her the best of luck in her new role.

In November, **Kevin Magowan**, DMF's Shellfish Depuration Coordinator, moved-on to a new opportunity at the Massachusetts Division of Fisheries and Wildlife as the new Assistant Hatchery Man-

ager in Palmer, MA. Hired into his position in November 2016, Kevin managed the Shellfish Purification Plant's day-to-day operations involving routine maintenance and research in depuration and wet storage. Kevin quickly became the go to contact for Master/Subordinate Diggers and wholesale dealers, as well as the shellfish area field biologists. He'll be a great addition for the Division of Fisheries and Wildlife. We wish him all the best in the future.

Forest Schenck joined DMF in January of this year as a Fisheries Habitat Specialist in our Gloucester Office. He will be assisting with restoration, enhancement, research, and monitoring of fisheries habitats and will also be conducting environmental review. Forest holds a bachelor's degree in Biology from Macalester College, and he will be completing is PhD in Marine and Environmental Sciences at Northeastern University in the summer of 2020. For his dissertation, Forest investigated the effects of eelgrass genetic identity and diversity on disease resistance and restoration success. Forest grew up along the MA coastline and enjoys spending time both on or under the ocean.

Chris Schillaci has taken a position with NOAA as an Aquaculture Coordinator for the Greater Atlantic Region. Chris joined DMF in 2009, working within the North Shore Shellfish Program to oversee the Boston Harbor soft-shell clam restoration project. In 2014, Chris transferred to the Shellfish Program in New Bedford, where he took on the position of Vibrio Project Coordinator and was instrumental in the development and implementation of all aspects on DMF's Oyster Vibrio Control program. Chris was promoted to the position of Aquaculture Coordinator in 2015, where he developed sound working relationships with industry members, other state and federal authorities, and various researchers to address the litany of ever-growing challenges facing aquaculture stakeholders across Massachusetts. Chris actively contributed to the Massachusetts Aquaculture Permitting Plan and the Massachusetts Shellfish Initiative. We wish him well in his new role with NOAA.

Sam Truesdell joined DMF in August as a Stock Assessment Specialist focusing on recreational fisheries. He will work with state and federal agencies contributing to population assessment and management for species such as black sea bass, scup, and summer flounder as well as pursue other research related to recreationally important stocks. Sam received his bachelor's degree from Dalhousie University and his PhD from University of Maine, both in Marine Biology. He has worked as a fisheries observer based in New Bedford and more recently held postdoc positions at Michigan State University and the Gulf of Maine Research Institute where his research has focused on stock assessment and management strategy evaluation.

This winter, **Simone Wright** joined the Shellfish Program in New Bedford full-time. Simone started with DMF in 2017 as a seasonal contractor for the Diadromous Project and returned again in 2018 as a seasonal contractor for the Shellfish Program. She will be responsible for updating and maintaining the sanitary classification and status of 50 shellfish growing areas across 16 towns. Prior to her work at the Division, Simone was instrumental in an array of marine conservation projects, including the establishment of a volunteer-based sea turtle poacher watch and nest protection program in Honduras and effort to protect North Atlantic right whales in Rhode Island. Simone received her bachelor's degree in Environmental Biology from Hood College.

Applications Sought for the Climate Change Resilience in Fisheries and Aquaculture Grant Program

DMF is accepting applications for the 2020 Climate Change Resilience in Fisheries and Aquaculture Grant Program. The goal of this program is 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.

Proposals will support commercial fishing and aquaculture by developing, utilizing, or promoting technologies that enhance climate change preparedness or enhance the capacity to monitor water quality in Massachusetts coastal waters. The project can be specific to species or region and can be a piece of a larger undertaking. Priority will be given to those proposals that aid in mitigating economic barriers resulting from climate change and generate the greatest good for the Commonwealth. Project outcomes, technologies developed, and data collected must be shared with the commercial fishing and aquaculture industry, as well as local and state natural resource managers.

Interested parties can learn more about this opportunity and apply through the state's procurement website, **https://www.commbuys.com/bso/**, by searching for bid number # BD-20-1046-DMF-FW003-4761.

The deadline to apply is **February 28, 2020**.

Upcoming Events

FEB 8-16 New England Boat Show
Boston Convention Center, Boston, MA

FEB 13 MA Scoping Hearings for Fluke, Scup, Black Sea Bass and Bluefish Allocation Amendments
MA Maritime Academy, Buzzards Bay, MA
(Internet Webinar March 4 for those unable to attend)

MAR 14-15 MA Striped Bass Association Fishing Expo
Wolves Den Sports Complex, Pembroke, MA

MAR 15-17 Seafood Expo North America
Boston Convention & Exhibition Center, Boston, MA

MAR 27-29 New England Saltwater Fishing Show
Rhode Island Convention Center, Providence, RI

To learn more about the events that DMF will be hosting and/or attending, visit: https://www.mass.gov/orgs/division-of-marine-fisheries/events.

Adjudicatory Proceedings

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

From July 1, 2019 through December 31, 2019, DMF initiated two adjudicatory proceedings, based on incident reports for violations of the state's marine fishery laws and regulations. The violations to be adjudicated were related to trap tag violations in the whelk pot fishery and the transfer of a coastal lobster permit. Decisions have not yet been issued in either matter.

Additionally, during this July 1, 2019 through December 31, 2019 period, DMF resolved five ongoing adjudicatory proceedings. This includes three permit revocations and two permit suspensions:

- A commercial boat permit with limited entry endorsements for conch pots and scup pots was revoked in response to numerous substantial violations of the state's channeled whelk gauge size.
- A commercial lobster permit was revoked for repeated lobster related violations, including the possession of non-conforming sized lobsters, the possession of v-notched lobsters, and the possession of egg-bearing lobsters.
- A commercial shellfish permit was revoked for removing shellfish from a private aquaculture grant without consent, failure to tag shellfish, and violations of municipal shellfish regulations.
- A commercial shellfish permit was suspended for a period of three years (2019–2021) for the possession and attempted sale of shellfish harvested from shellfish growing area closed due to contamination and failure to tag shellfish.
- A for-hire permit was seasonally suspended (September–December) for two years (2019–2020) for having patrons onboard who were in possession of tautog that violated the recreational tautog possession and minimum size limits.

Regulatory Updates

During the period of July 1, 2019 through December 31, 2019 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.

Ocean Quahog Commercial Trip Limit

The commercial state-waters ocean quahog trip limit was reduced from 26 cages (832 bushels) to 8 cages (256 bushels). This action was taken in response to an industry-based petition. Ocean quahog populations in state-waters are limited and can likely only sustain a relatively low level of fishing activity; reduced trip limits are expected to allow existing populations to be fished over a longer period of time. Additionally, a lower limit may help mitigate against potential gear conflicts with fixed gear fishermen. The revised limit approximates the existing state-waters trip limit for surf clams (200 bushels), which has supported an inshore day-boat fishery.

Scup Commercial Winter II Possession Limit

The Winter II (October 1–December 31) commercial scup possession and landing limit was set at 27,000 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.

Spiny Dogfish Commercial Trip Limit

This regulation codifies the commercial spiny dogfish trip limit at 6,000 pounds. For the past several years, the limit has been set at 6,000 pounds through an annual Declaration of the Director. In 2019, NOAA Fisheries announced the federal spiny dogfish trip limit for the Northern Region would remain at 6,000 pounds through 2021. As this limit is expected to remain in place for the next several years, it has been implemented by regulation.

Summer Flounder Commercial Period I Trip Limit

The Period I (January 1–April 22) commercial summer flounder limit has been made less restrictive by increasing the trip limit from 500 pounds to 1,000 pounds and eliminating the closed fishing period that occurs throughout January. During the early spring of 2019, the coastwide summer flounder quota was significantly increased and the quota is expected to remain at this elevated level through at least 2021. These measures are expected to allow the state to better use the available quota by allowing the offshore wintertime fishery with more opportunities to target summer flounder.

Summer Flounder Commercial Period II Adjustments

In-season adjustments were made to the Period II (April 23–December 31) commercial summer flounder limits to facilitate further utilization of the available 2019 commercial quota. For September 21–October 31, Saturday was added as an open commercial fishing day (in addition to Sunday–Thursday). Then during November 1–December 31, the closed commercial fishing days (Friday and Saturday) were lifted and the trip limit was increased to 1,000 pounds for all gear types. Additionally, in late August 2019, DMF initiated a pilot program that allowed trawlers fishing for summer flounder during the summertime and early fall inshore fishery to possess and land two daily limits lawfully caught and retained over consecutive open commercial fishing days provided the first day's catch was segregated in a sealed container.

Tautog Commercial Permitting and Tagging

Two actions were taken regarding the commercial tautog fishery. First, DMF implemented a commercial tautog tagging program. This program is mandated by the Atlantic States Marine Fisheries Commission through Amendment 1 to the Tautog Fishery Management Plan and requires commercial fishermen tag their tautog before sale. Beginning in 2020, DMF will issue tautog tags directly to commercial fishermen prior to the September 1 start of the commercial fishery. Commercial fishermen will then be required to tag their tautog through the operculum prior to offloading the fish. At the end of the commercial season, commercial fishermen will be required to return all unused tags and submit a tag report on forms provided by DMF. All unused tags are to be returned to DMF within two weeks of notification. Dealers and seafood purveyors will be prohibited from receiving any tautog that do not bear a tag; if fish are whole then the tag must remain affixed to the operculum, but if fish are processed (filleted) then the tab must be removed and remain with the product until all portions are sold. Dealers must liquidate their supply of MA-tagged tautog within two weeks of the end of the state's commercial fishing season. Dealers are not allowed to acquire any fish with tags from a prior calendar year; any fish retained on January 1 with a tag from a prior year may only be sold to an end consumer and this product must be liquidated by the last day of February.

Second, DMF limited entry into this fishery beginning in 2020. Renewals will be restricted only to those fishermen who held a commercial tautog regulated fishery permit endorsement ("tautog permit") in 2018 or 2019 and sold at least 120 pounds of tautog in any year during 2010–2016. For 2018 and 2019, DMF issued about 2,000 tautog permits per year (of which about 90% do not report selling any fish). DMF cannot effectively administer the commercial tagging program with up to 2,000 potential harvesters. By limiting entry in this manner, DMF anticipates there will be approximately 200 potential harvesters, which is commensurate with recent activity levels. Tautog permits will be transferable provided the permit was actively fished in four out of the past five years.

Horseshoe Crab Bait Harvest Closure in Pleasant Bay

This regulation codifies the long-standing prohibition on the bait harvest of horseshoe crabs within the Pleasant Bay complex. This restriction has been implemented by a Declaration of the Director since 2006. Pleasant Bay is a shallow intertidal body of water along eastern Cape Cod. The horseshoe crab population in this area is localized, meaning crabs typically do not leave the embayment. Given these factors, the population is susceptible to being depleted by fishing effort. For this reason, the area has been closed to bait harvest. However, the area remains open to bio-medical harvest. Horseshoe crabs captured for bio-medical purposes are transported for bleeding and once bled are returned to the harvest area with a mark to prevent recapture. Horseshoe crab blood contains limulus amoebocyte lysate, which is extracted and used to detect and quantify bacterial endotoxins on medical devices.

Northern Shrimp Moratorium

This regulation codifies the long-standing moratorium on the commercial harvest of northern shrimp. The moratorium was first implemented in 2014 in response to resource depletion driven by the adverse impacts warming water temperature has had on recruitment and spawning stock biomass. In prior years, the moratorium was implemented by an annual Declaration of the Director. Given that the 2018 benchmark stock assessment indicates the stock remains at extremely low levels and it is expected that these conditions will persist or worsen, the moratorium has been codified more formally in regulation.

Processed Lobster Rules

During the summer of 2019, state law at G.L. c. 130 §44 was amended to expand allowances for the processing of lobster and the possession of processed lobster parts beyond frozen shell-on lobster tails weighing three ounces or greater (e.g., to shell-on claws). The revised law allows for the in-state possession and sale of these shell-on lobster parts and for seafood dealers to import these shell-on lobster parts for processing and to process whole live lobsters into these shell-on lobster parts. Accordingly, DMF amended its lobster processing regulations at 322 CMR 6.32 to reflect these changes in state law.

Retail Farmer's Market Permit

DMF has established a new "Retail Farmer's Market" permit category for 2020. The retail sale of seafood at farmer's markets has become more common in recent years. Accordingly, the new permit category will better accommodate the emerging activity and allow for a more streamlined public health inspection.

Recent Publications

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

Gary Nelson authored an article on the effects of multi-stage cluster sampling on the bias of mortality rates produced through catch curve analysis. Catch curve analysis, the estimation of total mortality from a single sample of age composition data, is often used in fisheries stock assessments where limited data about the population are available. An assumption shared among the underlying probability models of these estimators is that fish collected for ageing are sampled from the population by simple random sampling. This type of sampling is nearly impossible in fisheries research because populations are sampled in surveys that use gears that capture individuals in clusters and often fish for ageing are selected from multi-stage sampling. This study explores the bias of the estimate from six different catch-curve methods. Nelson, G. A. 2019. Bias in common catch-curve methods applied to age frequency data from fish surveys. ICES Journal of Marine Science. doi:10.1093/icesjms/fsz085.

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