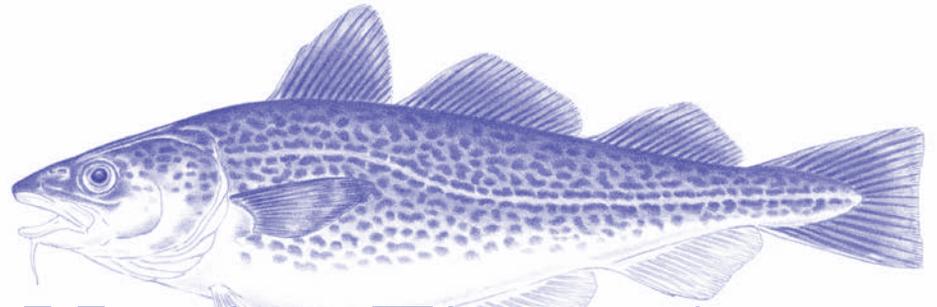


Published by the Massachusetts Division of Marine Fisheries to inform and educate its constituents on matters relating to the conservation and sustainable use of the Commonwealth's marine resources.



Marine Fisheries

A Commonwealth of Massachusetts Agency



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DMF NEWS

2015 • 3RD and 4TH Quarters • Volume 36

From the Director's Desk

After Paul Diodati retired earlier this year and my serving as the Division's Acting Director for about four months, I was finally appointed to be Director for many years to come. However, my colleagues do wonder when I will have had enough—when will I cry, “Uncle!”

I've been with *Marine Fisheries* since 1972 and involved with marine fisheries research and management for all those years, and frankly, it never gets old—just ever more challenging. That's one reason why I'm pleased to lead the Division into the future, made easier for me by the dedicated professional staff who clearly understand our important roles in improving fisheries science and protecting valuable living marine resources and the environments in which they live. Especially those involved in fisheries policy and management; they take to heart the important responsibility of understanding and reducing—to the extent possible—the social and economic impacts caused by such measures as very low catch limits, inequitable allocations, and no-win situations forced upon recreational and commercial fishermen by federal law and guidelines.

Marine Fisheries has high-profile involvement in many fisheries management arenas such as the New England Fishery Management Council and the Atlantic States Marine Fisheries Commission. I'm strengthening our participation by more fully committing Division staff to those important decision-making bodies. Similarly, and of special importance to the Commonwealth, our Massachusetts Marine Fisheries Advisory Commission's (MFAC) contributions and guidance will continue to be invaluable. I'll rely on this nine-person Commission, perhaps more so than ever before, and devote more Division staff to MFAC-related work, thereby increasing its effectiveness.

Other avenues I will pursue are the ones created by partnerships. One especially important partnership was created in 2002—the Massachusetts Marine Fisheries Institute (MFI)—with a mission having taken on even greater importance and relevance: “To promote sustainable fisheries by providing timely information and guidance to protect, conserve, and manage Massachusetts' marine and coastal resources.” I'm now co-chair of the MFI with Dr. Stephen Lohrenz, Dean

of the University of Massachusetts Dartmouth's School of Marine Science and Technology (SMAST). With *Marine Fisheries* scheduled to shift our New Bedford office to the expanded campus (SMAST I & II) once the new facility is completed in a few years, I'm even more committed to the Institute with an Advisory Council that includes the science and management arms of the National Marine Fisheries Service.

One especially attractive aspect of the MFI is graduate students from all the UMass campuses serving as a pool into which I can dip to find highly qualified candidates for employment with the Division. I hope to afford more opportunities for their employment working on problems the Division is tasked to solve. Being an adjunct professor at SMAST, I continue to witness first-hand the talent and skills these students possess.

The more I learn about the Division's areas of expertise, such as that associated with protection of public health through our Shellfish Sanitation and Management Program and improving recreational fishing through our Recreational Fisheries Project, the more I come to value and appreciate the importance of the Director's position and responsibilities. *Marine Fisheries* offers much to the Commonwealth's citizens, and now I must up the ante.

By David E. Pierce, PhD, Director

Public Access Update

The Division's Public Access Project remains busy finding, funding, and overseeing completion of projects that create, preserve, and enhance angler access along our briny coastline. Our goal is to target areas of need based on equitable geography, socioeconomics, and potential quality of fishing. Last year was no different.

Our 2015 capital project was the complete revitalization of the Cashman Park Fishing Pier in Newburyport. This was a joint venture between the Division, Town of Newburyport, Office of Fishing and Boating Access, and US Fish and Wildlife Service. Cashman Park is home to a boat ramp, ball fields, and a playground. The upgrades to the fishing pier—aside from its attractiveness—added to its size, introduced safety railings, and included handicapped accessible features such as an entry ramp and customized railings along the most fished portions of the pier. We recognize Joe Ribeiro of Ribeiro Construction, Inc. for his efforts in diligently overseeing the construction of this project.

The Small Grant program, through which municipalities undertake access improvements after a competitive bid process for state funds, finished its second year by funding three projects in Eastham, Marshfield, and Weymouth. The Eastham project paid for dredging of a State Boat Ramp as part of a larger dredge program. The project in Marshfield at Peter Igo Park on the

Green Harbor River was especially satisfying. Friends of Peter Igo Park, a nonprofit organization, have revitalized this park with the addition of tennis courts, basketball courts, a picnic area, and now, improved access to the Green Harbor River. A \$10,000 grant from *Marine Fisheries* paid to clear a path to the water and for the purchase and installation of a gangway and small floating fishing pier. This path and pier also serve as a good location to launch a kayak or canoe. The Weymouth project involved installing LED lights and light poles at the state boat ramp in Weymouth. These lights are environmentally friendly and increase safety of launching vessels in low-light conditions. In the next iteration of these grants, the maximum award for a project has been increased from \$10,000 to \$15,000.

We have also been working with a multi-agency group to write a Habitat Conservation Plan (HCP) that will allow for alternative management strategies for piping plovers. For more than 20 years, the presence of nesting and fledging plovers has led to automatic beach closures to over-sand vehicles and sometimes foot traffic. While they come at the expense of public access, these closures have led to increased numbers of piping plovers in Massachusetts. When incorporated, the HCP will allow for improved access to our coastlines as long as plover numbers remain strong. The days of four-wheel driving without any barriers are gone, but this will be a step that allows for some compromise.

As this program matures, we continue to reach out to Massachusetts anglers. It is YOU who know where public access improvements are needed most. Upcoming locations for capital projects are scheduled to include Fall River, Salem, and the harborwalk on Deer Island in Boston.

By Ross Kessler, Public Access Coordinator

Tracking Striped Bass: New study to update migration information

This summer, *Marine Fisheries* embarked upon a new tagging study of striped bass in the waters off Massachusetts. Many anglers are likely familiar with long-running tagging programs run by organizations such as *Marine Fisheries*, the US Fish and Wildlife Service, and the Littoral Society that use thin plastic "spaghetti" style tags. This study differs from many previous ones by using both traditional external spaghetti tags as well as surgically implanted acoustic "pinging" tags. These tags are heard by moored acoustic receivers from up to half a mile away and have emerged as a new and powerful tool for researchers and managers to better understand fish behavior and movement patterns.

Between 2008 and 2011, *Marine Fisheries* placed acoustic tags in almost 160 striped bass on Stellwagen Bank. From these tags we learned that most fish moved between federal



The newly improved Cashman Park Fishing Pier, Newburyport.

DMF Staff Photo

waters—where they cannot be kept by anglers—and state waters—where they can be kept—at several points throughout their summer residency off Massachusetts. We also learned important information about the amount of time bass spent off Massachusetts and where they returned in the spring to spawn.

With recent downturns in the coastal stock of striped bass and increased regulation of the fisheries to help the amount of large fish rebound, *Marine Fisheries* decided it was an ideal time to further examine how striped bass in Massachusetts behave and what those behaviors mean from both management and fishing perspectives. Specifically, the goal of the new study is to gain information about how a fish's size, where it resides in Massachusetts waters during the summer, where it was born, and its migratory route (e.g., Cape Cod Canal or around Provincetown) might interact to affect their chance of being caught by the recreational or commercial fisheries in Massachusetts.

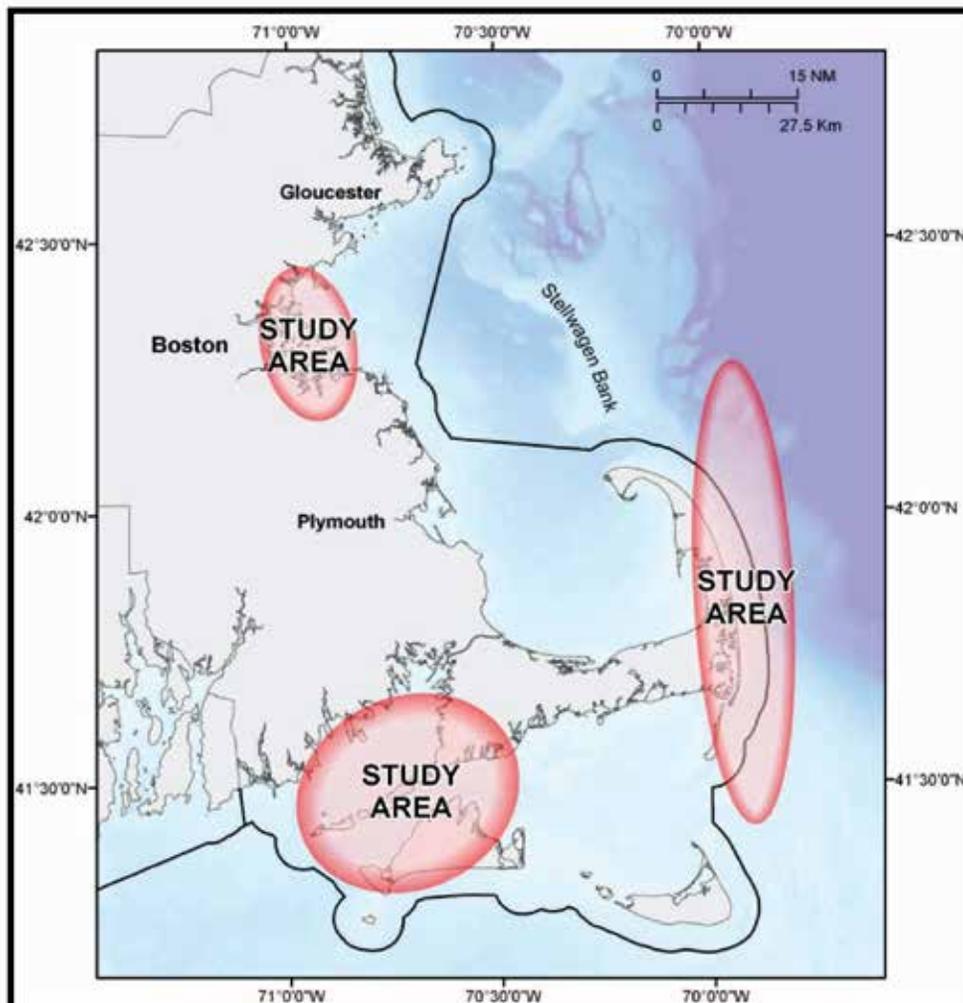
To examine these potential effects we targeted 75 fish in each of three distinct areas: Boston Harbor, the east side of Cape Cod, and the combined waters of Buzzards Bay and Vineyard Sound. Within each area, 25 fish were tagged in three size classes: below the minimum recreational size (less than 28 inches); between the recreational and commercial minimums (28–34 inches); and commercial keepers (greater than 34 inches). To monitor these fish after they were tagged, we set out acoustic listening devices between Nahant and Hull in Boston Harbor, off Provincetown and Monomoy on Cape Cod, and between East Chop and Falmouth, as well as Gay Head and the Gooseberry

Islands in Vineyard Sound and Buzzards Bay. These receivers complemented the many we already had in the water (e.g., Cape Cod Canal, Jeffries Ledge) for other studies.

Another important reason for conducting this study was the availability of receiver networks in all the major spawning estuaries used by striped bass. Researchers and agencies in other states have receivers in the Hudson River, Delaware River, throughout Chesapeake Bay and many of its major tributaries, and in Albermarle Sound. There are also many receivers deployed along the Atlantic coastline, meaning that bass tagged in Massachusetts can be tracked from New England all the way to the mid-Atlantic, or even North Carolina.

From a coastal perspective, the Atlantic States Marine Fisheries Commission and the constituent member states are hoping to move toward assigning coastal fishing catches to specific spawning populations rather than a coastal stock. Massachusetts is an important part of this effort, since the Commonwealth supports the largest commercial and recreational fisheries for striped bass on the eastern seaboard. As in our past study, acoustic telemetry will help with this goal as it will allow us to assign a spawning river to our tagged fish.

Unlike our past study, however, we will also be taking tissues for genetic analysis from our tagged fish as well as those collected through our commercial sampling program and our popular Sportfish Angler Data Collection Team—recreational anglers who volunteer to help provide valuable information such as the lengths and scales from the fish they catch while



Boston Harbor, east of Cape Cod, and Buzzards Bay are the study areas for striped bass tagging work.

fishing in Massachusetts. Using this genetic information in combination with acoustic telemetry information on movement behavior, *Marine Fisheries* will have an unparalleled amount of information to better manage the popular striped bass fishery for angler enjoyment, commercial success, and the long term productivity of the population.

More information on this project and other *Marine Fisheries* striped bass research can be found at <http://www.mass.gov/eea/agencies/dfg/dmf/programs-and-projects/striped-bass-research.html>.

By Ben Gahagan, Aquatic Biologist

Will there be a Marine National Monument in the Atlantic?

President Obama is considering whether or not to utilize the Antiquities Act of 1906 to create the first marine National Monument in the US Atlantic. Several non-governmental environmental organizations (NGOs) lobbied the White House for the protection of the only four seamounts in US Atlantic waters (Bear, Physalia, Retriever, and Mytilus), several canyons near the seamounts (Oceanographer, Gilbert, Lydonia, Nygren, and Heezen), and Cashes Ledge (the EFH closure area that includes Fippennies Ledge and Sigsbee Ridge) in the Gulf of Maine.

The Antiquities Act of 1906 authorizes the President to create national monuments on federal lands that contain historic landmarks, historic and prehistoric structures, or other objects of historic or scientific interest. The President is to reserve “the smallest area compatible with the proper care and management of the objects to be protected.” Congress can also declare a national monument via legislation.

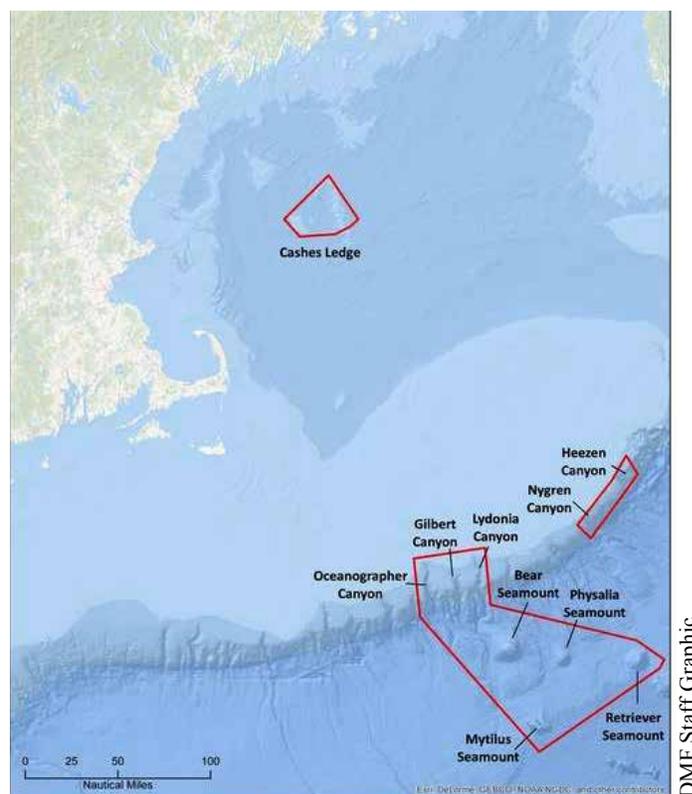
Monument designation can limit or prohibit uses. Restrictions may be included in the proclamations themselves, accompanying administration statements, management plans developed by the agencies to govern monument lands, agency policies, or other sources. It is common for extractive commercial uses to be prohibited. Extractive commercial uses could include oil and gas, mineral extraction, and fisheries.

The first public announcement about this proposal occurred on September 2, 2015. Shortly thereafter, NOAA held a public listening session in Providence, focusing on the canyons and seamounts; however, comments on other areas were allowed. The House Committee on Natural Resources held an Oversight Hearing on Marine National Monument Designations on September 29. As of yet, there are no identified boundaries or suggested regulations for the proposed monuments beyond what the NGOs have mentioned in their press releases. There has been no clear statement as to whether or not Cashes Ledge is being considered.

Governor Baker, both Massachusetts Senators, and three Massachusetts Congressmen wrote letters opposing the designations. The opposition is based on lack of information regarding the objectives, geographic scope, and limits to activities, the lack of public process, the evidence of effectiveness of the fisheries management process in protecting these areas, and the undermining of regional ocean planning process. The regional planning is being conducted in response to President Obama’s Executive Order 13547, a National Policy for the Stewardship of the Ocean, Our Coasts, and the Great Lakes. The Policy Implementation Plan states, “Robust stakeholder engagement and public participation are essential to ensure that actions are based on a full understanding of the range of interests and interactions that occur in each region. Consultation with scientists, technical experts, the business community, and those with traditional knowledge is a foundation of marine planning.”

It is unclear what will happen next. At the second annual Our Ocean Conference in Chile on October 5, President Obama announced plans to create two new marine sanctuaries, one in the tidal waters of Maryland and the other in Lake Michigan, adding that he would be looking for opportunities to protect more waters in the coming months. More telling were Secretary John Kerry’s remarks at the same conference, which identified the Atlantic as the focus for additional designation(s). “We’re working with senators engaged in that particular area in order to make that happen,” he said. “We had hoped to be able to get there; we have a few administrative challenges yet to get over, but I’m confident that we will.” Comments regarding the monument designations can be sent to NOAA at the email atlanticconservation@noaa.gov.

By Kathryn Ford, Environmental Analyst



The outlined areas are suggested sites for the Marine National Monument.

Marine Fisheries begins distribution of final groundfish disaster aid

The start of the new year has seen *Marine Fisheries* begin to wrap up the third and final bin of federal Groundfish Disaster Economic Assistance following NOAA Fisheries’ grant approval in late 2015. Bin 3 reprogrammed these funds away from an unsuccessful buyout/buyback discussion (see DMF News 1st & 2nd Quarters 2015) to a second round of state-by-state allocations. In so doing, NOAA Fisheries allocated \$6.7 million to the Commonwealth of Massachusetts to stabilize the commercial groundfishery in Massachusetts with NOAA Fisheries’ encouragement to give “top priority” to active federal permit holders. *Marine Fisheries* also received an additional non-discretionary \$200,000 for the administrative support in further development of an industry-funded buyback program.

Bin 3

NOAA Fisheries officially notified *Marine Fisheries* that Bin 3 funds had been reprogrammed in May of 2015. *Marine Fisheries* subsequently spent much of the summer engaged with stakeholders in perfecting a Bin 3 spending plan. An industry-based Working Group assisted with developing initial draft strategies that were taken out to four public meetings at the end of July; a written comment period concluded on August 7, 2015.

Given the continued depressed outlook for groundfish rebuilding—Gulf of Maine cod in particular—it was understandable that discussions could at times become heated. In the end *Marine Fisheries* was able to base its final spending strategy on the hard work of industry members to coalesce around some basic tenets that would best reflect port-specific characteristics of the Commonwealth's active federal groundfish fleet.

Groundfishermen disadvantaged by low catch quotas, small shares, and absence of key stocks, especially Gulf of Maine cod—despite benefiting from Bins 1 and 2 direct aid—asked for more assistance they considered critical for their survival as “groundfish” fishermen. Their views contrasted with those permit holders still very active in terms of higher poundage landed in most recent years who insisted Bin 3 allocation should target them consistent with the earlier Bin 3 approach for an industry-funded federal permit buyout program.

Another important point emphasized especially at the Chatham public meeting was the transition away from groundfish—not by choice, but by circumstance. Primarily Fixed Gear Sector members claimed groundfish are unavailable or simply absent making the Chatham fleet one of skate and spiny dogfish. They also highlighted having to take and now pay for at-sea monitors, per mandatory sector federal regulations, even though they no longer catch groundfish unless incidental to skate and dogfish catch.

Based on public feedback, *Marine Fisheries* amended initial direct-aid criteria to be as inclusive as possible all the while recognizing that:

- aid should be “forward-looking” consistent with the purpose of a buyout/buyback of federal permit holders;
- Bin 1 and 2 funds had already been allocated to mitigate past impacts just before and after the disaster declared by the Secretary of Commerce on September 13, 2012 for the 2013 fishing year; and
- Governor Baker opposes disaster aid being allocated for transition of federal at-sea monitoring (ASM) costs to fishermen.

The main Bin 3 tool for supporting continued viability of the commercial groundfish fishery in Massachusetts is distributing \$6,000,000 in direct aid to eligible federal commercial groundfishermen. The remaining \$700,000 will be apportioned between support for an Industry-Based Survey of Gulf of Maine Cod (IBS) and development of extra fishing opportunities for small mesh species like whiting.

Direct Aid to the Commercial Groundfishery

Qualifying criteria for federal commercial permit holders aims to balance the different views throughout the ports of the Commonwealth by qualifying active participants in the groundfish industry that (1) have significant landings, and (2) incur significant costs in the groundfish fishery (e.g., monitoring and quota leasing costs). Therefore, *Marine Fisheries* selected a two-filter criterion to better target active fishermen in the Commonwealth. Eligible limited-access multispecies federal permit holders with a Massachusetts homeport as of April 30, 2015 meeting one of the two following criteria qualified for a flat rate payment:

- Landed at least 10,000 lb. of groundfish in any one year from Fishing Year (FY) 2012 to FY 2014; or

- Was observed on at least one groundfish trip in FY 2014.

After NOAA Fisheries approved the grant for implementation on October 1, 2015, *Marine Fisheries* audited relevant landings and observer history for all 730 federal permits homeported in Massachusetts as of April 30, 2015. On October 9, 2015, *Marine Fisheries* sent a mailing to permit holders notifying them of the Bin 3 program and their pre-qualification status for direct aid. *Marine Fisheries* finalized qualification and payment amounts following a review of appeals received by the October 23, 2015 deadline. In total, 171 federal limited access multispecies holders were notified of their eligibility for a flat rate payment of \$35,250 in a December 2, 2015 final qualification mailing. By the end of the 2015 calendar year, 120 of the 171 eligible permit holders have been paid. *Marine Fisheries* will continue to schedule payments as vendor paperwork is processed.

Industry Based Survey

Given the poor stock of Gulf of Maine (GOM) cod, low catch limits, and many fishermen's claims that the cod status is better than currently assessed; the Division is implementing a new GOM Cod IBS. Relying on fishermen's guidance with additional input from the Massachusetts Marine Fisheries Institute (MFI), NOAA Fisheries and the Northeast Fisheries Science Center (NEFSC), *Marine Fisheries* has begun to administer a three-year study in the southwestern portion of the GOM where remnants of the GOM cod stock currently reside. The IBS will:

- provide another science source (resource data and information) for use in assessments;
- test fishermen's hypothesis about GOM cod redistributing offshore in response to warming water;
- demonstrate relevance and importance of a GOM cod IBS for improving our understanding of the distribution of cod at times and in areas when the NEFSC surveys are not performed;
- acquire additional scientific data on other groundfish stocks in the survey area;
- enable minimum estimates of swept-area biomass; and
- determine the IBS's potential for providing indices of abundance.

Getting the survey on the water for the first quarter of 2016 has been a major undertaking for *Marine Fisheries*' scientific, management, and administrative staff, a critical component of which has been gathering input of the fishing industry on final survey design. As *Marine Fisheries* wraps up contracting of a commercial vessel, the IBS will get into full swing. Important to the successful conduct of the survey will be coordination of trawl stations with fixed gear fishermen. *Marine Fisheries* staff will be working this winter to best inform lobstermen about survey locations and times to minimize gear conflicts. Industry-Based Survey staff will be working to disseminate information to fixed gear fishermen through direct mailings and at industry meetings like the upcoming Massachusetts Lobstermen's Association's (MLA) Annual Weekend.

Extra Small Mesh Fishing Opportunities

Finally, a portion of Bin 3 funds have been set aside to assist groundfishermen in their efforts to both refine the times and areas for small-mesh whiting fishing. *Marine Fisheries*, with input from industry members, proposes to assist interested and eligible groundfishermen in conducting small-mesh experimental fisheries for whiting within the Gulf of Maine Small Mesh Area 1 (currently open July 15–November 15) and the eastern Raised Footrope Exemption Area (currently open September 1–November 20) off Provincetown, Massachusetts. In consultation with NOAA Fisheries-GARFO staff, the Division has reserved funds for at-sea sampling, required under an EFP, and to assist in informational and educational outreach on proper

Bin 2 Program	Number of Eligible Individuals	Flat Rate Payment Range	Number Paid as of 12/31/2015	Cumulative Total Payment	Program Completion Date
Permit holders	142	\$9,750–\$32,500	141	\$3,887,000	ongoing
Crew members	525	\$1,209–\$10,080	515	\$3,126,072	ongoing
Shoreside businesses	30	\$16,071–26,786	30	\$750,005	10/15/2015
Sector administration	10	\$18,300–\$31,300	0	0	ongoing

fishing of authorized nets, e.g., raised-footrope trawl. Interested fishermen should contact Samantha Andrews, *Marine Fisheries* Program Coordinator, by phone at 617-626-1564 or by email at Samantha.n.andrews@state.ma.us.

Bins 1 and 2

Marine Fisheries wrapped up Bin 1 payments (totaling \$6.3 million) on September 18, 2015 when the last of 201 qualified permittees was paid. Payments of \$32,500 to eligible federal groundfishermen had been ongoing since August 29, 2014.

Starting in February 2015, *Marine Fisheries* disbursed an additional \$8.3 million in disaster funds to eligible commercial and for-hire permit holders, crew members including owner/operators and lumper/longshoremen shoreside businesses and Massachusetts based sectors that had qualified for a flat rate payment. As of December 31, 2015, *Marine Fisheries* has wrapped up the majority of Bin 2 payments, excluding sector aid payments.

Early in the new year, *Marine Fisheries* finalized qualifications for sector aid. This program provides funds to qualified Northeast Multispecies Sectors' to subsidize administrative costs. *Marine Fisheries* qualified ten (10) sectors in total, 9 of which will receive a flat rate payment of \$31,300. One sector had its payment reduced in kind for a payment it is qualified to receive from Rhode Island's sector aid program (the only other state to implement a specific sector aid program), so as not to exceed the total flat rate payment to other qualified sectors.

Further information and updates on the Groundfish Disaster Economic Assistance Program can be found on the *Marine Fisheries* spotlight page <http://www.mass.gov/dmf/groundfishassistance>.

By Melanie Griffin, Fishery Policy Analyst & Samantha Andrews, Program Coordinator

Vibrio applied research highlights

Vibrio parahaemolyticus (also known as *Vp.* and *Vibrio*), like other naturally occurring pathogenic species, can present a significant challenge for shellfish managers. Generally, only a small proportion of these species are capable of producing toxin, making the presence of the organism alone not enough to predict a public health threat. The development of reliable laboratory tests or the identification of environmental risk indicators for naturally occurring pathogens can take years and often effectiveness varies between populations. Historically, *Vibrio* illness has been linked to warmer areas, like the Gulf of Mexico. However, *Vp.* has become an emerging pathogen in the relatively cool waters of the Pacific Northwest, British Columbia, and most recently the Northeast US, suggesting certain pathogenic strains of *Vp.* are effective at a much wider range of temperatures than previously thought.

Prior to 2011, cases of *Vibrio* linked to the consumption of raw shellfish harvested in Massachusetts were extremely rare. Although the species has been seen for years, the cool, high-salinity waters in the majority of the State's shellfish growing areas

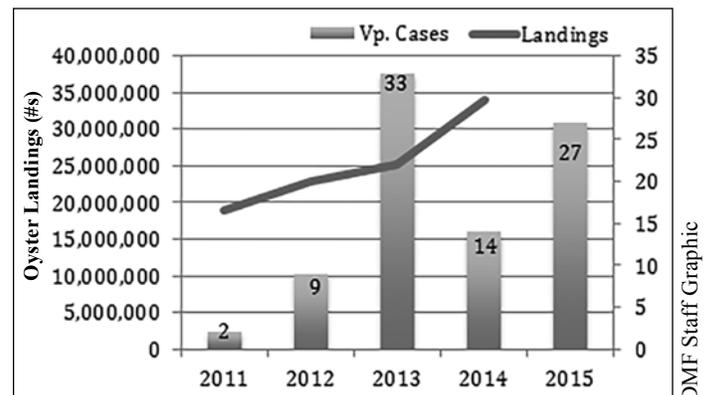
were not considered particularly conducive to blooms of *Vp.* bacteria. Over the last four years, *Vibrio* has rapidly emerged as a significant public health threat in the region, resulting in harvest area closures, recalls, and the implementation of costly control measures for harvesting and handling oysters during summer months.

So why has *Vp.* become such an issue now? That question prompted *Marine Fisheries*, Massachusetts Department of Public Health (MDPH), and the Massachusetts oyster industry to closely evaluate what environmental conditions, industry practices, or other factors have changed to result in this sudden observed increase in *Vp.* illnesses.

Relatively little research had been conducted in the Northeast on *Vp.* prior to 2011, requiring *Marine Fisheries* and MDPH to rely on control measures developed in the Pacific Northwest and Gulf regions for the initial development of *Vp.* controls here in Massachusetts. The wide variation in environmental conditions in areas where *Vibrio* has become a concern, however, emphasizes the need for state-specific data to effectively gauge risk and develop controls. Over the past three years, *Marine Fisheries*' Shellfish Program has invested significant resources into gathering the data required to fine-tune *Vp.* controls to reflect the diversity in Massachusetts harvest areas and in industry practices.

The first step was to validate the effectiveness of the controls currently in place. With one of the fastest growth rates of any known bacteria species, the majority of *Vibrio* controls focus on post harvest temperature controls, e.g. immediate icing or refrigeration after harvest. Currently, Massachusetts harvesters are required to ice oysters within two hours of harvest or exposure. This rapid cooling does not decrease the amount of *Vp.* in oysters, but prevents further growth of the bacterium following harvest. A preliminary study conducted by *Marine Fisheries*, which commenced this summer, shows a significantly lower level of total *Vibrio* levels in oysters iced at two hours after exposure as opposed to those iced at four hours after exposure.

Concern has been expressed for oyster harvest areas on Eastern Cape Cod Bay where oysters are exposed to ambient



Number of Massachusetts *Vibrio* cases compared to oyster landings from 2011 to 2015.

DMF Staff Graphic

air during part of the low tide cycle. This exposure can result in *Vp.* Growth; consequently harvest in these areas is limited to outgoing tides to allow any *Vibrio* growth to purge during the high tide cycle. The research conducted this summer also looked at the impact of tidal exposure in intertidal harvest areas. With similar results as the time to icing experiments, there was a significant amount of *Vp.* growth during the approximately 3.5 hours of exposure at low tide. This was followed by a rapid reduction in *Vibrio* levels during the subsequent high tide cycle, validating that under the conditions tested, *Marine Fisheries* current intertidal harvest control measures are effective at limiting the risk of intertidal exposure.

Marine Fisheries has also invested significant resources into monitoring *Vp.* levels and environmental conditions in four principal Massachusetts oyster harvest areas. These efforts are primarily focused on identifying trends in the data that may be used as indicators of risk. The expected trend of increasing water temperatures and increasing *Vp.* levels is evident, but *Vp.* levels are still extremely variable and increasing temperatures only explains a small amount of the variation seen in *Vp.* levels through the season.

There was a strong correlation between the presence of two genes (*trh* and *tdh*) and illness reports in 2015. These genes have been associated with roughly 80% of the known pathogenic *Vibrio* strain types in the region and may represent a better indicator of risk than total *Vp.* However, presence of these genes in the environment is still not a clear indicator of risk and additional research is needed before they can become an effective management tool.

Perhaps the most informative research conducted on *Vp.* in Massachusetts to date is the result of an on-going partnership between *Marine Fisheries*, MDPH, and Northeast Center for Vibrio Disease and Ecology, housed at the University of New Hampshire (UNH). When an individual becomes sick from *Vibrio* and seeks medical treatment, the bacteria is isolated from the patient's gut and submitted to MDPH for additional genetic analysis. As part of the partnership, these isolates are then forwarded to UNH where partners identify which strains result in the majority of *Vp.* illnesses. Results from isolates collected between 2011 and 2013 were published in *Frontiers in Microbiology* (Xu et al. 2014) and revealed what may be the driver responsible for the sudden increase in *Vibrio* in the Northeast. About 66% of the clinical isolates analyzed by UNH were a match to sequence type 36 (ST36) *Vp.*, otherwise known as the Pacific Northwest Strain. Prior to 2012, ST36 had never been recorded in the Northeast. Additional genetic analysis suggests the degree of variation between ST36 clinical isolates recently collected from Massachusetts and those recently collected from the Pacific Northwest were closely related, suggesting a recent introduction of ST36 into the Northeast region.

Marine Fisheries and its partners plan to continue research in 2016 with a continued focus on developing tools to effectively gauge the human health risk of *Vp.* in the environment. Currently UNH is validating a rapid detection method for ST36 in the environment, which may result in the best yet indicator of *Vibrio* risk. *Marine Fisheries* is continuing to enhance its *Vp.* control plan to incorporate state specific data and, where possible, reduce the regulatory burden that has resulted from *Vp.* None of these efforts would be possible without the support and cooperation of the Massachusetts oyster industry, whose members have taken on the significant costs associated with *Vibrio* management.

By Chris Schillaci, Aquaculture Biologist

2016 Fisheries Outlook

Notable management updates

Spiny Dogfish

The 2016 coastwide commercial quota for spiny dogfish is expected to be a 20% reduction from 2015. Both the Mid-Atlantic and New England Fishery Management Councils have voted in favor of a 40,360,761-pound quota beginning May 1, 2016; the Atlantic States Marine Fisheries Commission will take up the matter in February 2016, followed by final adoption by NOAA Fisheries sometime in the spring. This reduction, while sizeable, is better than it could have been. Acting on the advice of its Scientific and Statistical Committee (SSC), the Mid-Atlantic Council initially voted to reduce the 2016 commercial quota by 50%. However, based on a motion made by *Marine Fisheries* Director David Pierce, the SSC reviewed alternative approaches to setting the Acceptable Biological Catch (ABC)—upon which the quota is based—that resulted in the lesser reduction.

While recent years' landings are below the expected 2016 quota, the reduction limits potential growth in the fishery. Consequently, both Councils supported a continuation of the 5,000-lb trip limit applicable to federal waters. While this decision satisfied those within the fishery that worry about the effect of increased landings on the price (which averages around \$0.20/lb) without more market demand, others counter that greater landings are needed to spur market growth. The Atlantic States Marine Fisheries Commission will specify the trip limit applicable to state waters in the Northern Region (Maine–Connecticut) in February, although this typically follows the federal limit. The Northern Region shares 58% of the coastwide quota.

Summer Flounder (Fluke)

The Atlantic coast fluke fisheries will be operating under a 29% reduced annual catch limit in 2016, due to the 2015 stock assessment update finding that the stock is in decline. This outcome is a reversal from the previous assessment, and appears to be driven largely by the production of below average year classes in 2010–2013. While better than the 43% reduction initially calculated to prevent overfishing, the 29% cut (achieved by spreading the needed reduction across three years) comes as a harsh surprise. The result is a coastwide commercial quota of 8.12 million pounds and a coastwide recreational harvest limit (RHL) of 5.42 million pounds for 2016.

In Massachusetts, we will see an equivalent cut in our commercial quota, to roughly 554,000 pounds, the lowest annual quota in the 23-year history of fluke quota management. *Marine Fisheries* allocates this quota to two periods: a target allocation of 30% to the predominantly offshore fishery between January 1 and April 22 (Period I), and the remaining quota to the predominantly inshore fishery from April 23 through December 31 (Period II). As a consequence of the quota reduction, *Marine Fisheries* is modifying the terms of the Period I Weekly-Trip Limit Pilot Program. In 2015, this experimental fishery allowed participating vessels to land a weekly limit of 1,000 pounds during January 1–April 22 rather than observe the period's 500-pound trip limit during February 1–April 22 preceded by a January closure. For 2016, the Pilot Program won't begin until the first week of February. *Marine Fisheries* will assess whether adjustments to any of the Period II management measures (e.g., open days, trip limits) should be considered this winter.

On the recreational side, we await coastwide harvest estimates for 2015 and the outcome of an interstate management

plan addendum to determine, for certain, the impact on Massachusetts anglers in 2016. Through October 2015, coastwide recreational harvest is estimated to be 4.6 million pounds, down 38% from the same period in 2014. Early projections for annual harvest are below the 2016 RHL of 5.42 million pounds, suggesting that a coastwide recreational harvest cut will not be needed. Draft Addendum XXVII to the interstate management plan considers whether to revert to state-specific management or continue with the regional management system used since 2014. The addendum also has the potential to adjust the exact make-up of the regions in order to establish more uniform regulations within Delaware Bay; under this option, Massachusetts would remain its own region. With the caveat that there is still much to be worked out, it is anticipated that Massachusetts, in all scenarios, will be able to maintain its 2015 measures: 5 fish daily limit, 16 inch minimum size, and May 22–September 23 open season.

Black Sea Bass

We head into 2016 with a mixed-bag of news for black sea bass. On the positive side, the coastwide commercial quota and RHL are increasing by 21%, to 2.71 million pounds and 2.82 million pounds, respectively. Because of uncertainty in the stock assessment for black sea bass, the species' ABC (from which the commercial and recreational limits are derived) had been held constant since 2010 and would have been for 2016 if not for the efforts of three individuals. Credit goes to Jason McNamee of the Rhode Island Division of Fish & Wildlife, and Drs. Gavin Fay and Steve Cadrin of UMass-Dartmouth's School for Marine Science & Technology for providing the Mid-Atlantic Fishery Management Council's Scientific and Statistical Committee a valid alternative method to setting the ABC that resulted in the increase. On the negative side, the increase is mitigated by other factors for our recreational fishery.

While our 2015 commercial fishery exceeded its quota by about 60,000 pounds (21%) due to intense landings the last few days the fishery was open, this overage won't be accounted for until 2017. Quota underages in other states may also reduce or negate the payback amount. Massachusetts did not have an overage in 2014; the result is that our 2016 quota is expected to increase to roughly 350,000 pounds. Under similar fishing effort and resource conditions, this quota could support the same season length as 2015 (14 open days), but without the quota overage.

The outlook for our recreational black sea bass fishery is decidedly bleaker. Coastwide harvest through October 2015 is estimated to be 3.52 million pounds and is projected to grow to 3.66 million pounds by year's end. Given the 2016 RHL of 2.82 million pounds, these early numbers call for a 23% harvest reduction. Although many of us welcomed last year's warm December weather, it could result in greater-than-expected late season harvest (in those states still open), necessitating an even greater cut next year. MarineFisheries shares in the frustration that undoubtedly greets readers of this news. Assuming the Atlantic States Marine Fisheries Commission extends the regional approach to managing the recreational fishery through the adoption of Draft Addendum XXVII this winter, the states of Massachusetts through New Jersey will comprise a region that must adopt state-specific regulations that collectively achieve the required reduction. The alternative to the regional approach—coastwide measures—would be more constraining. MarineFisheries will weight regulatory options after Draft Addendum XXVII is finalized.

Striped Bass

No changes are anticipated for Massachusetts' commercial and recreational striped bass regulations for 2016. The fisheries were subject to several mandatory changes in 2015, including a 25% commercial quota cut to 869,813 pounds and implementation of a 1-fish recreational bag limit, estimated to reduce recreational removals by at least 25%. Both measures are expected to have met their goal and will, alongside cuts made throughout the coast, halt the decline in spawning stock biomass caused primarily by lower than average juvenile recruitment in recent years.

Regarding spawning stock biomass, a "turn-of-the-crank" assessment that was reviewed and approved for management use by the Atlantic States Marine Fisheries Commission this past November has indicated that SSB remains between the target and threshold levels, although greater than estimated in the 2013 benchmark stock assessment. While the overall trend in SSB is still downward towards the threshold, some states (notably in the Chesapeake Bay region) sought management action to reconsider the reductions implemented in 2015 due to economic hardships. In lieu of this, the ASMFC committed to doing another turn-of-the-crank assessment in 2016 that will include 2015 data in order to evaluate whether the new management measures have reduced the fishing mortality rate to the target as intended. The assessment is expected to be completed in late 2016.

Northern Shrimp

The northern shrimp fishery in the Gulf of Maine will be closed in 2016, for the third year in a row. The stock is considered to have collapsed with little prospect of recovery in the immediate future given predicted ocean warming. Abundance and biomass indices for 2012–2015 are the lowest on record for the 32-year time series. The stock has experienced failed recruitment for five consecutive years, including the three smallest year classes on record. As a result, the indices of fishable biomass from 2012–2015 are the lowest on record. A winter sampling program will be conducted in cooperation with several commercial harvesters to maintain data collection for assessment and management purposes in the absence of a fishery.

By Nichola Meserve, Policy Analyst

Diadromous Fish Passage Improvements in 2015

Among the many tasks *MarineFisheries* has working with coastal fish stocks, the management of diadromous fish passage is one of the few not measured by permits and harvested fish or managed with constant interaction from fishery constituencies. It is a blending of time-honored local practices with state laws that directs *MarineFisheries* to work with towns and property owners to help the fish that have adopted the strategy of leaving the ocean to run into coastal rivers each spring. These are the fish that connect freshwater and marine habitats with their migrations. They once supported important fisheries for food and bait in Massachusetts, and remain priceless as food for the masses of fish and wildlife species that depend on small pelagic prey.

MarineFisheries has operated the Fishway Crew since 1934 to maintain diadromous fish passageways. Presently, our work with these fish is focused on cooperative efforts with larger fishway projects, various migratory habitat improvements, and small fishway construction jobs where towns or property owners provide materials and the Fishway Crew brings the experience and labor.



Fish ramp construction at Mill Pond, West Tisbury.



DMF Staff Photos

Replacing the wood fishway at Seymour Pond in Harwich.

The 2015 fishway construction season included several small-scale jobs, preparations for future projects, and an enhanced effort to help towns maintain stream channels for fish passage at six rivers. This followed a busy and productive period during 2013/2014 when four large cooperative fishways, nine Fishway Crew jobs on small fishways, and three eel ramps were completed. The *Marine Fisheries* crew completed fishway projects at six sites in 2015; with most of these jobs involving structural repairs to existing fishways.

The Division's mini-excavator was deployed at three sites: at the Herring Brook in Pembroke to remove and adjust two sections of Alaskan Steeppass fish ladder; at the Pilgrim Lake run in Orleans to repair a 60-foot section of weir and pool fish ladder by straightening the fishway walls and adding new concrete weirs and spreaders; and at the Seymour Pond outlet in the Herring River watershed in Harwich to replace the wood fishway. The latter two projects were town-funded.

The Fishway Crew also addressed the collapse of the diversion wall at High Street Dam on the Town River in Bridgewater in 2015, which was allowing herring to bypass the fish ladder entrance and move up to the dam apron where no passage is accessible. The dam owner provided lumber to replace the boards in the 4-bay diversion wall this past fall. Finally, fishway entrance boxes were installed on two fish ladders that were constructed by the Fishway Crew in 2014: at Mill Pond in West Tisbury and Tom Matthews Pond in Yarmouth. Both these ladders were found to need adjustments to the entrance attraction flow during the first year of deployment. This led to the fabrication of custom entrance boxes to improve fishway attraction and function.

Our project is small and does not directly bring many fish to the dock, but our model of working with towns can be cost effective and is built on decades of experience and dedication to help these fish that run towards us each spring.

By Brad Chase, Senior Aquatic Biologist

Monitoring Massachusetts' American Lobster Population: Survey Work

The American lobster is the second most valuable species landed in Massachusetts, worth more than 68 million dollars in 2014. Over 700 fishermen actively participate in the Massachusetts commercial lobster fishery, and more than 4,000 people fish for lobsters recreationally. Because this species is so important to our fishing communities, *Marine Fisheries* employs a comprehensive approach to monitor the fishery and the health of the population in our waters.

To monitor the fishery properly, it is critical for us to know the total amount of lobsters harvested, as well as the size distribution and sex ratio of those lobsters caught. To achieve this, we collect catch reports from fishermen and dealers to determine the total commercial harvest. Then, our biologists go to sea with commercial fishermen to determine the size and sex of lobsters that make up the commercial catch. We also conduct multiple surveys annually that are designed to monitor lobster populations in the state's coastal waters from the time lobsters settle to the bottom as post-larvae through their adult life. The earliest bottom-dwelling developmental stages are monitored with the Early Benthic Phase Survey, while adolescent and adult lobsters are sampled during the Ventless Trap Survey and the Resource Assessment Trawl Survey.

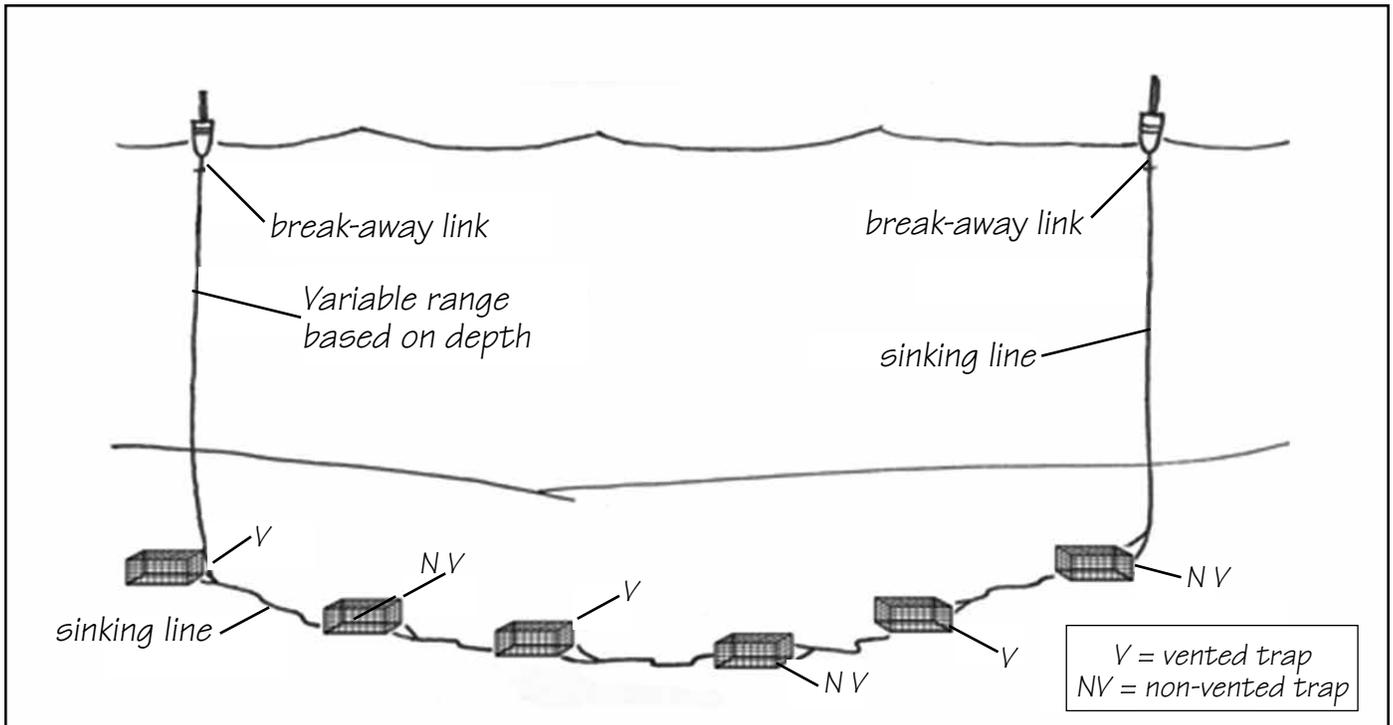
Early Benthic Phase Survey

The Early Benthic Phase (EBP) Survey is conducted by scuba divers and uses a large PVC pipe with a collection bag attached to essentially vacuum up all of the animals within a sampling quadrat. This survey targets lobsters from newly settled (young-of-the-year or "YOY") to young juveniles. This size range of lobsters is collectively referred to as early benthic phase, or "EBP," meaning that these are the lobsters that are new to a benthic (bottom-dwelling) life style. Early benthic phase lobsters range in size from less than a half inch carapace length (CL) to around 1½ inches CL, and are generally restricted to cobble substrates that provide good shelter from predators. The EBP Survey takes place in 23 locations throughout coastal Massachusetts, and has occurred annually since 1995 in many of these locations. The survey is designed to detect trends in lobster settlement and abundance for those size classes that are too small and shelter-restricted to be reliably captured by trap or trawl net.

Ideally, the data from the EBP Survey can be used to predict future landings. Some preliminary work linking lobster settlement abundance to landings suggests that it may take 8 to 10 years for a newly settled lobster to reach harvestable size (3¼ inches CL) in state waters north of Cape Cod.

Ventless Trap Survey

Adolescent and adult lobsters (1½ inches CL and larger) use a variety of bottom types (including mud, sand, and rocky bottom) and depth ranges. As such, it is necessary to survey all habitat types to understand the distribution and abundance of lobsters in our coastal waters. The Ventless Trap Survey (VTS) is designed to produce information on the types of habitats in which lobsters are located, the timing of when they are there, and whether there are any patterns in which lobsters use each habitat (e.g., do females carrying eggs prefer deeper water?). The survey uses a random stratified design, which means that within pre-determined depth ranges (the "strata"), we randomly select locations to place our traps. Understanding how lobsters are distributed throughout their environment allows biologists to accurately determine population abundance.



DMF Staff Graphic

Diagram of a six-trap trawl for the Ventless Trap Survey.

Data are collected by setting a 6-trap trawl at each of our 102 sampling locations. There are three traps with normal escape vents, and three traps with no escape vent (“ventless”) in each trawl, rigged to alternate along the trawl line. This trap arrangement allows us to monitor a broad size range of lobsters; the smallest lobster ever caught in our survey gear was just under one inch CL, and the largest was nearly six inches CL. We conduct the survey from June through September, and work cooperatively with contracted commercial lobstermen to haul and tend the gear. *Marine Fisheries* biologists record information for each individual lobster captured, and collect information on the various other species also captured by the traps (fish, crabs, and other invertebrates).

Data from the VTS, in conjunction with data from the Resource Assessment Trawl Survey, are used to monitor the population of lobsters that are harvestable by the fishery, and those that will grow into harvestable sizes within one to three years. The VTS has taken place since 2006 in Massachusetts; Maine, New Hampshire, and Rhode Island conduct similar surveys in their respective coastal waters. Data from these surveys are incorporated into the US lobster stock assessment. Similar to the EBP survey, eventually we hope to be able to predict future landings using VTS data.

Resource Assessment Bottom Trawl Survey

The Resource Assessment Survey is a standardized bottom trawl survey that takes place every May and September within Massachusetts’ territorial waters. The surveys are timed to coincide with seasons when either adults or juveniles of the various fish and invertebrate species that inhabit Massachusetts waters are available inshore. *Marine Fisheries* contracts the 65-foot NOAA research vessel, *Gloria Michelle*, for these surveys. The objective of this project, the east coast’s longest ongoing inshore survey (1978–present), is to obtain fishery-independent data on the distribution, abundance, size, and age composition of finfish as well as some crustaceans and mollusks. Data produced from the survey contribute to the assessment of numerous regional fish stocks. In addition, this survey provides one of the longest

time series of lobster abundance available, and is invaluable in monitoring the lobster population within state waters. Lobsters caught in the trawl survey gear generally range in size from $1\frac{3}{16}$ inches CL to around 4 inches; the smallest ever captured was about half an inch CL and the largest was $7\frac{5}{16}$ inches.

Utility of bycatch data from the Early Benthic Phase and Ventless Trap Surveys

While the Resource Assessment Survey is designed to capture many species of fish, the EBP and VTS are primarily designed to target lobsters. However, both the EBP and VTS regularly capture other species as bycatch (non-target species), and can be used to varying extents to monitor those species. The EBP Survey captures newly settled crabs, such as Jonah and rock crabs, and is a source of information on crab settlement patterns. Because of the relatively shallow depths in which it takes place, the EBP Survey also provides information on the presence of some invasive species such as green crabs and the Asian shore crab.

The VTS also captures Jonah and rock crabs, but generally larger, adult-sized individuals. In the southern portion of the survey area (south of Cape Cod), we regularly capture channeled whelks, black sea bass, and tautog. Abundance indices have been developed for each of these species, and in the cases of black sea bass and tautog, the data were so useful that we have increased the types of information collected for these species. Beginning in 2015, the VTS began collecting details on the size, sex, and age composition of both species. Information on age and sex, which fill critical information gaps, will likely be included in the 2016 black sea bass and the 2019 tautog stock assessments. Once the time series achieves a certain length, it will likely be included as an index of abundance for both species in future assessments.

In keeping with the Division’s vision of sustainable fisheries and a healthy marine ecosystem, these lobster monitoring programs provide biologists, assessment scientists, and managers with the critical information needed to understand the dynamics and health of one of our most valuable marine resources. Many

of our lobster sea-sampling and monitoring projects benefit from cooperation with members of the commercial lobster industry, and we are grateful for their continued support.

By Dr. Tracy Pugh, Lobster Biologist; Dr. Mike Bednarski, Assessment Scientist; and Matt Camisa, Resource Assessment Biologist



DMF Staff Photo

A young-of-the-year lobster caught during the Early Benthic Phase Survey.

Jonah Crabs: biological monitoring program and conservation rules coming to support new interstate management plan

The Atlantic States Marine Fisheries Commission (ASMFC) approved the Interstate Fishery Management Plan (FMP) for Jonah Crab in August 2015 and addendums are already in the works. The FMP implemented a suite of measures to manage and monitor the Jonah crab resource for the first time along the US Atlantic coast. The Plan allows continued landings by permitted lobstermen, but limits participation in the directed fishery by all others. For biological conservation measures, a 4.75 inch minimum size (shell width) was established, in addition to a prohibition on landing egg-bearing females and a recreational limit of 50 crabs per day.

The ASMFC is already working on subsequent addenda to resolve controversial topics that arose during the approval of the plan. These included trip limits for non-trap vessels, allowances for landing of detached claws, and the grandfathering of some fishermen in certain states who may have targeted and landed Jonah crabs without holding a commercial lobster permit. In Massachusetts, longstanding laws prevent any commercial landing of edible crabs without a commercial lobster permit, so there will be no grandfathering controversy here.

The Plan was initiated in response to industry concerns over sustainability and potentially increasing unregulated targeted fishing effort for Jonah crab, which has long been considered a bycatch in the American lobster trap fishery. These same

concerns led the Monterey Bay Aquarium's Seafood Watch to "red list" Jonah crabs in 2014. Since the early 2000s, growing market demand has increased reported landings by more than six-fold. The vast majority of Jonah crabs are harvested by lobstermen using lobster traps. With the increase in demand for crab, a mixed crustacean fishery has emerged that can target lobster, crab, or both at different times of year based on modifications to the gear and small shifts in the areas in which traps are fished. The FMP seeks to cap effort and participation at current levels and to protect spawning stock biomass in the absence of a range-wide stock assessment.

With the growing economic importance of the Jonah crab fishery, improved scientific data will be critical for management. *Marine Fisheries* biologists are working closely with Jonah crab fishermen, other industry groups, and ASMFC to try to better assess and manage this fishery. Division biologist, Derek Perry, will be working with the Atlantic Offshore Fishermen's Association (AOLA) for the next two years to conduct a NOAA-funded maturity study on male and female Jonah crabs off the southern Massachusetts and Rhode Island coast where the majority of the commercial fishery occurs.

Marine Fisheries and AOLA are also partnering on a study funded by ASMFC to have scientists and trained fishermen tag over 20,000 Jonah crabs. The results of this tagging effort will help determine movement and seasonal habitat use, define stock boundaries, and provide growth information. The tagging project will be conducted in the Gulf of Maine through the mid-Atlantic and will begin in early 2016.

By Dan McKiernan, Deputy Director

Creature Feature: *Mola mola*

You may have seen the video of two anglers who hooked an ocean sunfish. No, it's not a tuna, but it is a bony fish. In fact, it is the world's heaviest bony fish, weighing upwards of three tons. During the warmer months of Massachusetts, there are two types of ocean sunfish sighted: the common mola mola or the sharp-tailed mola mola. If you've been fortunate enough to see one in the wild, they are unlike any other fish species in the



© Adobe Stock Photo

Giant ocean sunfish, Mola mola.

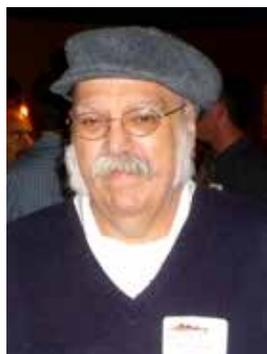
world. With their characteristically long dorsal and anal fins, and nonexistent caudal fin, their length from top to bottom is actually longer than front to back. These gentle giants appear to be simply a colossal head swimming through the water, although it is just their large, rounded, flat body with bulging eyes. Their silvery coloration can almost appear opalescent. Their skin is roughly textured without scales and covered in thick mucus, often populated with large amounts of parasites. They swim with their mouth agape, unable to close it, steered by wobbly dorsal and anal fins.

Ocean sunfish are found in mild and tropical ocean waters throughout the world, driven in migration by pursuing their feed of jellyfish, zooplankton, and algae. There is no commercial value for this fish in the United States but in Asian countries, the fish is hunted for its gelatinous meat and use in Chinese medicine. These sunfish have unfortunately been recorded as a bycatch of the driftnet fishery all over the world, with some countries' fleets having catches composed of almost 90% ocean sunfish. There is also incidental mortality from ingestion of plastic bags drifting through the ocean, resembling jellyfish. Although this may seem alarming, their population is believed to be stable. Little is known about the breeding habits of *mola mola* but it is estimated that female ocean sunfish produce more eggs in a breeding season than any other vertebrate on earth—about three million eggs! Juvenile sunfish grow rapidly; on average about one pound per day and it is thought these giants can live to be 100 years old. The name “ocean sunfish” comes from its characteristic behavior of sunning itself at the surface of the water.

By Maren Olson, CVA and Angler Education Coordinator

Comings and Goings

This past spring, Governor Baker signed an early retirement plan for up to 5,000 employees to leave state work. Out of the Division, four employees took advantage of the Early Retirement Incentive Program: Steve Correia, Jeremy King, Tom Hoopes, Marie Callahan, and Jerry Moles. Naturally, these individuals are some of the Division's longest serving and held important leadership positions. All take with them their great amounts of institutional knowledge. We thank each one for their years!



Steve Correia retired after 31 years in state service. As a Senior Marine Fisheries Biologist for the Division, he was also Manager of our Assessment and Survey Program. Steve participated on numerous technical and management committees including the NEFMC Groundfish, Monkfish, and Atlantic Herring Plan Development Teams, the NEFMC Scientific and Statistical Committee, the ASMFC Winter Flounder and Atlantic Herring Technical Committees,

and the ASMFC Assessment Science Committee. Through these roles, he provided research and analysis to inform state fisheries management decisions and support the development and maintenance of interstate and federal fishery management plans.



Jeremy King has retired after 23 years of dedicated service. Jeremy started with the Division in 1992 as a fisheries observer covering numerous state waters fisheries including squid, lobster, whiting, northern shrimp and dogfish. He joined the Resource Assessment Project in 1996 and assisted in conducting the Divisions bi-annual inshore bottom trawl survey and the annual winter flounder seine survey. In 2004 Jeremy became project leader and for the last eleven years, he has supervised all phases of the Resource Assessment trawl and seine surveys. Congratulations on a job well done!



After 30 years with the Division, beginning as a Marine Fisheries Biologist at the Cat Cove Marine Lab, **Tom Hoopes** retired at the end of June. As Tom's career progressed, he became the Program Manager of the Division's MIS & Fisheries Statistics Program. In his role as the Statistics Project Leader, he led the implementation of mandatory comprehensive trip-level reporting by seafood dealers (2005) and commercial harvesters (2010), greatly improving the catch

and effort data available to fishery managers, biologists, and the public. Tom was instrumental in the Division's role as a partner at the Atlantic Coastal Cooperative Statistics Program, serving on and chairing several committees throughout his career. We hope Tom enjoys his retirement, but doesn't mind the occasional call with an IT-related question!



After almost 36 years with the Division, **Marie Callahan** has retired from state service. Marie began her career with *Marine Fisheries* as a clerk in the Cape Cod Field Station, and worked her way up to the role of supervisor and head of the South Coast Permit Office. The New Bedford office is often noted for its friendly, knowledgeable staff, and that is in no small part due to the effort Marie has put in to make sure the front office always provides the

best possible service. Marie's positive attitude, quick smile, and friendly demeanor were a constant in the New Bedford office. She will be greatly missed by her co-workers and the many constituents she has helped throughout the years. We wish Marie a happy retirement!



Jerome (Jerry) Moles has retired from state service after 31 years with the Division. Jerry started with *Marine Fisheries* as a laborer on the Anadromous Fish Project in the mid-1980s. He quickly worked his way up to construction maintenance foreman and led the fishway construction crew for five years. His education, training, and desire to

learn new skills allowed for an easy transition to the Shellfish Program as a Marine Biologist, and ultimately to the role of the Division's Aquaculture Specialist. During his tenure, Jerry helped to grow the Aquaculture Program threefold. Jerry was well regarded as a true professional, in no small part to his knowledge, dedication, and always positive attitude. We wish Jerry an awesome retirement!



Bob Glenn, of our New Bedford office, has been promoted to Manager of the Assessment and Survey Program. Bob was previously Leader of the Invertebrate Fisheries Project.



Dr. Tracy Pugh, of our Gloucester office, has been promoted to Leader of the Invertebrate Fisheries Project. Tracy was previously a biologist within the same project.



Matt Camisa, of our New Bedford office, has been promoted to Leader of the Resource Assessment Project. Matt was previously a biologist within the same project.



Anna Webb, of our Gloucester office, has been promoted to Manager of the Management Information Systems and Fisheries Statistics Program. Anna was previously the harvester-reporting coordinator for the program.



Wendy Mainardi joined *Marine Fisheries* this summer as the coordinator of the Seafood Marketing Program. She spends her time raising public awareness across the Commonwealth to increase demand for local seafood and support fishing communities. She has been working in the food system in Massachusetts for almost a decade as a producer, entrepreneur, educator, and non-profit program manager. She was recently a data visualization fellow at the MAPC working on the Massachu-

setts Food Plan. Wendy received her undergraduate degree from Boston University and a Master of Science from the Tufts Friedman School of Nutrition Science and Policy with a focus on domestic agriculture and fishery geospatial data and policy. Wendy enjoys transportation by bicycle and her 30-foot sailboat.



Sara Turner was recently hired as a Diadromous Fish Biologist based in the New Bedford office. She will be responsible for monitoring diadromous fish populations and habitat restoration projects. After receiving a Bachelor's degree in Marine Biology at UMass Dartmouth, Sara was a technician with the Division for multiple projects (including the diadromous project). She left the Division for grad school, earning a PhD in Fish and Wildlife Biology and

Management at SUNY College of Environmental Science and Forestry and a Master of Public Administration Degree from Syracuse University. Prior to returning to the Division, she was a Postdoctoral Associate at the NOAA Fisheries Narragansett Lab, working with the Oceanography and Cooperative Research branches. She loves running, and is excited to be back at the Division, and back to her hometown!



Marine Fisheries' Gloucester Habitat Program said aloha to **Wes Dukes** this September, who embarked on a new adventure with his wife and two sons to sunny Honolulu, Hawaii. Both Wes and his wife work in fisheries science and will be working for NOAA's sustainable fisheries and habitat programs. Since 2011, Wes worked hard to plan, plant, and monitor two acres of eelgrass restored to Salem Sound and Boston Harbor under the HUB3 mitigation project. He helped develop

our conservation mooring research programs and coordinated quarterly seagrass monitoring efforts. He was always smiling and knew how to make his coworkers laugh, even underwater. We wish him the best!

DMF Rules UPDATE

Public Hearings • Regulations • Legislation

During the period of July 1, 2015 through December 31, 2015 the following regulatory changes were enacted by Marine Fisheries after public hearings and Marine Fishery Advisory Commission (MFC) approval. Annual specifications and emergency regulations promulgated during this period have also been listed.

Commercial Groundfish Closures

Marine Fisheries revised its commercial groundfish closures in the Gulf of Maine to better protect known spawning cod aggregations and complement federal closures promulgated under Framework 53 to the Northeast Multispecies Groundfish Fishery Management Plan.

From October 1–January 31, all state-waters between 42°00' (Plymouth) and 42°30' (Marblehead) west of 70°24' are closed to commercial groundfish fishing. This commercial closure previously applied to all state-waters between Plymouth and Marblehead only during October and November.

From May 1–May 31, all state-waters between 42°20'–(Boston) and the MA/NH border are closed to commercial groundfish fishing. Previously, all-state waters between Plymouth and the MA/NH border were closed April 1–May 31.

The June 1–June 30 commercial groundfish closure in all state-waters between Marblehead and the MA/NH border was retained.

These closures apply to any gear capable of catching groundfish, including but not limited to, sink gillnets, otter trawls, line trawls, and hook and line. Some exemptions apply.

Commercial Gulf of Maine Cod Trip Limits

For state-waters groundfish permit endorsement holders and for federal groundfish permit holders fishing in state-waters, *Marine Fisheries* adopted a 200-pound Gulf of Maine cod trip limit. This trip limit is designed to reduce fishing mortality on Gulf of Maine cod and matches the federal common pool Gulf of Maine cod trip limit adopted in Framework 53. Additionally, the 75-pound daily open entry commercial Gulf of Maine cod trip limit was amended. This open entry daily commercial trip limit is now 25 pounds of mixed regulated groundfish species.

Recreational Gulf of Maine Cod and Haddock Limits

Marine Fisheries adopted new recreational limits for Gulf of Maine cod and haddock. For most of 2015, the recreational Gulf of Maine cod fishery was closed by emergency action. This complemented the recreational closure in the adjacent federal zone. However, final regulations allow private anglers to retain 1 cod per day at a 19-inch minimum size taken from state-waters. Retention of Gulf of Maine cod remains prohibited on for-hire vessels.

The state's recreational Gulf of Maine haddock regulations were amended to reduce the minimum size from 21 inches to 17 inches and to establish a 3-haddock per angler per day bag limit. These new haddock rules apply to both for-hire and private recreational anglers in state-waters, match the federal rules promulgated under Framework 53, and are designed to reduce recreational discard mortality on Gulf of Maine cod.

Spiny Dogfish

Recreational anglers and commercial fishermen are now prohibited from removing the fins from spiny dogfish at sea. The land-based processing of spiny dogfish, including the removal of fins, may continue. This action is designed to further constrain the illegal finning of sharks and it conforms state regulations to the Interstate Fishery Management Plan for Spiny Dogfish.

White Shark Permit

Any person who attracts, captures, or performs research on a white shark, or attempts to do so, within state-waters must hold a scientific research permit issued by *Marine Fisheries*. This permit will constrain certain activities, particularly those that involve shark chumming. Recent research suggests that these types of activities may alter shark behavior towards humans. This is problematic as it puts both shark and human safety at risk.

Scup Commercial Trip Limits

To facilitate more use of the Summer Period quota allocation, all seven days per week were opened to commercial scup landings during September 11–October 31, 2015 and the trawl vessel trip limit was increased from 800 pounds to 1,500 pounds during October 9–31, 2015. To complement the federal limit for the offshore Winter II fishery, an 18,000-pound trip limit was set for November 1–December 31, 2015. In addition, to complement the federal limit for the upcoming offshore Winter I fishery (2016), a 50,000-pound trip limit was set for January 1–April 30, 2016.

Commercial and Recreational Pot Gear Configuration Rules

Marine Fisheries adopted regulations to complement new federal rules required by the Atlantic Large Whale Take Reduction Plan. All commercial trap/pot fishermen, regardless of whether they are state or federally permitted, are already subject to these federal rules. The new state rules do not differ from the existing federal requirements, except that the state has extended applicable rules to recreational trap fishermen.

Single Pots: The use of single trap/pots is now prohibited in waters north of Cape Cod that are further than 3 miles from shore, except in an area of Billingsgate Shoal in eastern Cape Cod Bay. The area where fishermen can continue to set single trap/pots is now referred to as the Massachusetts Inshore Single Trap/Pot Area. All single trap/pots set within the Massachusetts Inshore Single Trap/Pot Area must have a specific endline marking requirement. This includes fish pots, conch pots and lobster traps.

All buoys affixed to all commercial trap/pots are to bear three 12-inch markings – one marking at the top, middle and bottom of each line. Each 12-inch marking is to feature a 6-inch **RED** marking and the remaining 6-inch marking is to be composed of a specific color related to the Lobster Conservation Management Area (LCMA) where the trap/pot is fished: for LCMA1, the remaining 6-inch mark must be **WHITE**; for LCMA2, the remaining 6-inch mark must be **BLACK**; for Outer Cape Cod (OCC) LCMA, the remaining 6-inch mark must be **YELLOW**. While this endline marking requirement is specific

to an LCMA, it applies to fish pot and conch pot fishermen as well as commercial lobster trap fishermen. If the buoy line is the same color as the required marking, then a **WHITE** mark may be substituted for that color code. The endline is prohibited from exceeding a diameter greater than 3/8-inch.

Pot Trawls: All buoy lines affixed to trap/pot trawls are to bear three 12-inch markings – one marking at the top, middle and bottom of the line. For LCMA1, LCMA2 and OCCLCMA the 12-inch marking must be **RED**. For LCMA3, the 12-inch marking must be **BLACK**. If the buoy line is the same color as the required marking, then a **WHITE** mark may be substituted for that color code. While this endline marking requirement is specific to an LCMA, it applies to fish pot and conch pot fishermen, as well as commercial lobster trap fishermen. For pot trawls featuring two or three pots/traps (doubles or triples), only one buoy line may be used. For pot trawls feature four or more pots/traps, two buoy lines may be used.

Haul-Out Period for Recreational Lobstermen

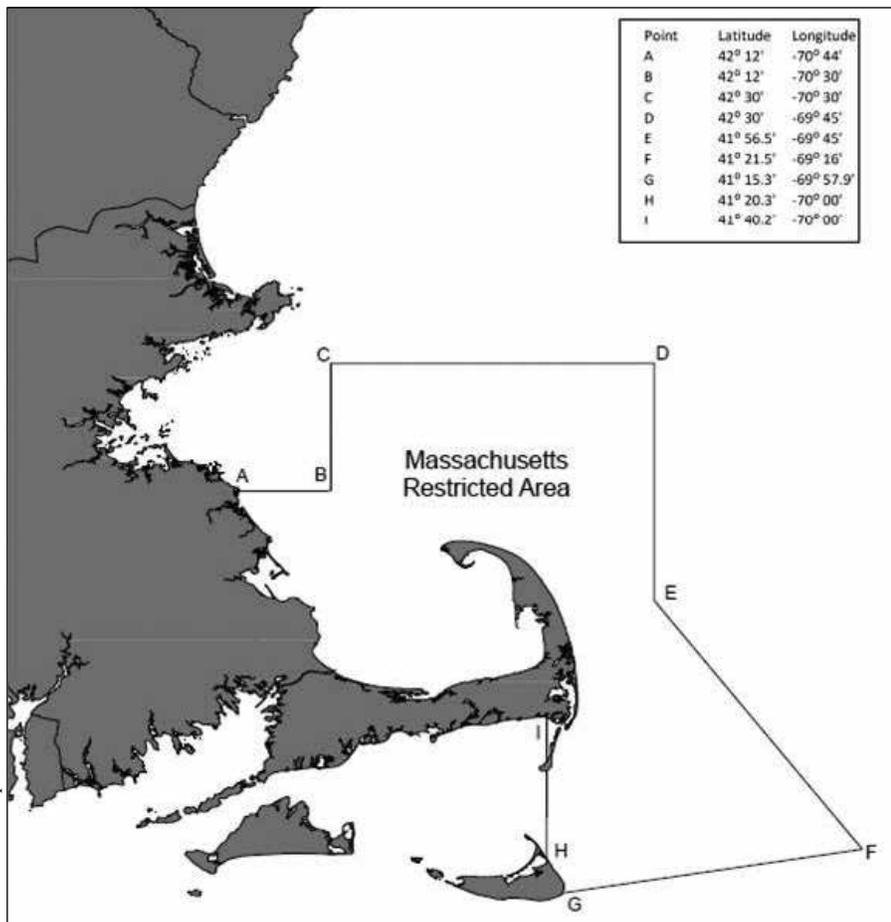
All recreational lobster and crab permit holders are now subject to the Massachusetts Large Whale Seasonal Trap Gear Closure Area. During the period of February 1–April 30, their trap gear must be removed from the closure area. This requirement is expected to reduce the risk of endangered right whales becoming entangled in trap gear set and/or abandoned by recreational trap fishermen. Commercial trap/pot fishermen are already subject to this seasonal closure.

Cancer Crab

The following rules now apply to the take, possession and landing of cancer crabs. Cancer crab is a collective term for Jonah crabs (*Cancer borealis*) and rock crabs (*Cancer irroratus*). The Jonah crab provisions are required under a recently adopted Interstate Fishery Management Plan. *Marine Fisheries*’ also applied them to rock crabs to improve enforcement and compliance due to the difficulty in distinguishing the two species.

As required by existing state law, a commercial lobster permit must be held to commercially fish for, possess or land cancer crabs. All traps set by commercial lobster trap fishermen to take cancer crabs must conform to the existing lobster traps configuration and protected species rules, lobster trap tag rules, and lobster trap allocation regulations. While there is not a trip limit on cancer crabs caught by commercial lobster trap fishermen, non-trap commercial lobster permit holders are limited to 200 cancer crabs per day or 500 cancer crabs on a multi-day trip.

Commercial fishermen and dealers are prohibited from possessing any cancer crab with a carapace width that is less than 4 3/4". It is unlawful for any person to possess at-sea or land any cancer crabs parts. Only whole crabs may be landed. The possession of egg bearing female cancer crabs is prohibited, as is an action that forcibly removes or attempts to remove eggs from an egg bearing female cancer crab. There is a recreational possession limit of 50 crabs per day. Per existing state law, a recreational lobster and crab permit is required to take crabs by traps. The recreational harvest of crabs by other methods does not require a permit.



LMA2 Trap Allocation Reduction and Trap Transfers

Marine Fisheries established the LMA2 trap allocation reduction schedule required by Addendum XXI to the Interstate FMP for American Lobster, including a 25% cut for fishing year 2016, followed by annual reductions of 5% over the next five years (2017–2021). Adjustments to trap allocations will be executed when LMA2 endorsed commercial lobster permits are renewed and trap tags issued. Additionally, in response to lobster permit holders’ desires to obtain trap allocation to mitigate the effects of the cuts, *Marine Fisheries* liberalized its permit and trap allocation transfer rules. Commercial coastal lobster permit holders endorsed for LMA2 may now be issued multiple permits and aggregate trap allocations in excess of 800 traps. It remains illegal for coastal lobster permit holders to fish more than one coastal lobster permit or set or fish more than 800 traps.

The Massachusetts Large Whale Seasonal Trap Gear Closure Area includes the state-waters portion of the Massachusetts Restricted Area, shown above.

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is available on our Web Site!

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DMF NEWS

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