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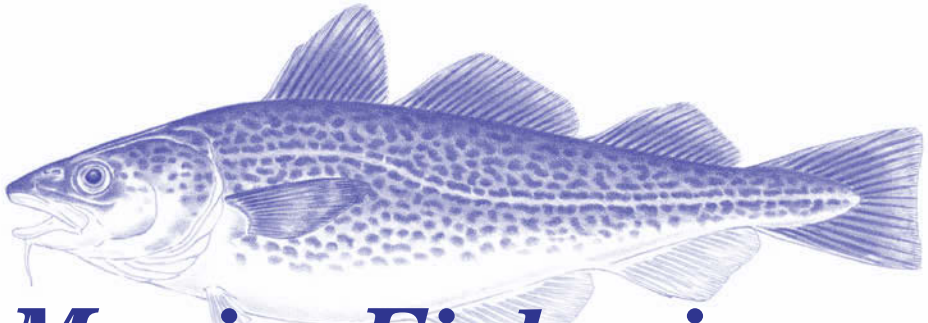


MarineFisheries
A Commonwealth of Massachusetts Agency

Evolving Lobster Markets

Seafood industry members seek rule changes to offer diverse lobster products

During much of the 20th century, American consumers and restaurant owners' purchases of lobsters have been largely restricted to the whole live or canned meat varieties. Looking back, the traditional dining event characterized by a bib-wearing consumer dismantling a whole, boiled lobster is outdated. Today's consumers want convenience and steady supply. These demands, coupled with a surplus of lobster due to the doubling of landings in the U.S. and Canada over the past 30 years, has spurred the development of new, consumer-friendly products: frozen shell-on tails and claws. These food items have captured the attention of consumers and chefs both nationally and internationally and are now in huge demand, especially at inland markets where live lobster tanks are not common.

However, these increasingly popular processed lobster products cannot be sold in Massachusetts due to a 60-year old law. With numerous requests from the industry, the Legislature may address this issue in 2013. In a recent budget bill amendment, *MarineFisheries* was ordered to complete a study of the issue by the end of 2012 and include draft legislation to amend the law.

Current law Chapter 130 Section 44 prohibits the possession and sale of any lobster, alive or dead, cooked or uncooked, that is less than 3.25 inches in carapace length, as well as lobster that has been mutilated in any manner that affects the adequate measurement of its carapace size and thereby prohibits the in-state sale of frozen shell-on lobster parts. This law was passed in 1950 to improve conservation and compliance by prohibiting lobstermen from breaking the tails off sub-legal sized lobsters.

In 1950, the consumer market for lobster was primarily whole live lobsters; however, over the next 50 years dramatic changes occurred. By the end of the 1980s, there was increased demand for frozen shell-on processed lobster products. As this consumer market was evolving, provincial Canadian governments, particularly New Brunswick, invested heavily in the development of onshore processing infrastructure. As a result, Canada is currently responsible for the processing of 75 percent of the U.S. and Canadian lobster harvest, which is then exported globally as a "product of Canada".

The Massachusetts legislature reacted to the changing markets by amending the law in 1997 to authorize the processing of

Orion Seafood Photo

Lobster consumers want the convenience of frozen shell-on lobster tails.

lobster into frozen shell-on lobster tails by licensed Massachusetts wholesale seafood dealers for sale *outside* the Commonwealth; sale inside the Commonwealth remained prohibited. Since this law came to pass, only one Massachusetts seafood dealer, the Boston Lobster Company, has become a certified lobster processor.

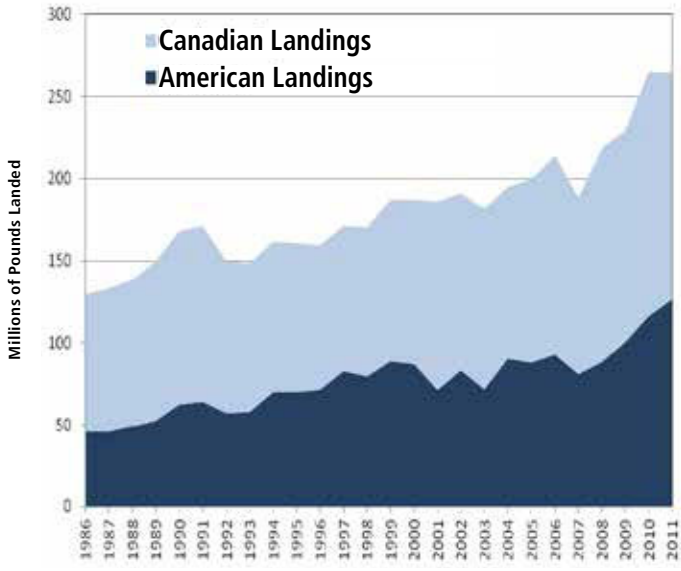
A decade later, the State of Maine drastically amended its laws to promote the production and sale of processed lobster parts. These changes were driven by a governor-appointed Task Force in 2008 to study the Maine lobster industry and ways to improve its economy. The Task Force determined that the state prohibition of lobster processing and sale was limiting access to markets and constraining all sectors of its industry. Today, Maine has approximately 10 licensed processors producing lobster parts; while this is still just a fraction of Canada's capacity, these businesses add substantial value and jobs to the state economy.

There is widespread belief along all sectors of the industry that evolution of the market with these and other value-added products is necessary, especially given the increase in lobster supply, which in a weak economy has resulted in falling prices. The increase in supply is due mostly to improved lobster stock status in the Gulf of Maine – where nearly 90 percent of the U.S. lobster harvest occurs – and the stocks and landings are expected to remain high. This will continue to exacerbate problems for the marketplace, which has seen unprecedented price drops for lobster this past summer.

Industry groups, including the Massachusetts Lobstermen's Association, support changing the law to improve market demand of any and all lobster products. Lobstermen believe amending this statute would not threaten lobster conservation or compliance with size limits within the state. They support maintaining a prohibition on possessing mutilated lobsters at-sea, but support allowing properly permitted seafood processors the opportunity to process and sell frozen shell-on lobster parts in-state. All processed product could be sufficiently labeled with the product and processor information to ensure compliance and traceability.

By Daniel McKiernan, Deputy Director and Jared Silva, Program Coordinator for Regulations

Total annual lobster landings for the United States (dark) and Canada (light) from 1990 through 2011.



DMF Staff Image • Data: NOAA Fisheries and Canadian DFO

BOEM Image

Area of Cape Wind farm off the Massachusetts and Rhode Island coasts.

Offshore Wind Farms: Challenges Allocating Ocean Space

Since the 130-turbine wind project in the center of Nantucket Sound (federal waters), known as Cape Wind, was first proposed, wind farm development has been a hot topic in Massachusetts. As the project proceeded through the permitting process, Massachusetts created the Ocean Management Plan, which specifies regions of state waters where commercial-scale wind energy could be considered. The two areas selected – both in the southwest portion of the state, one off of Gosnold (Elizabeth Islands) and the other south of No Man's Land on Martha's Vineyard – are adjacent to the much larger federal Wind Energy Areas proposed by the Bureau of Ocean and Energy Management or BOEM (formerly the Mineral Management Service). There are currently no proposals to build wind farms in state waters, therefore this article focuses on activities in neighboring federal waters.

Cape Wind

In 2001, Cape Wind submitted the first permit application in the U.S. for an offshore wind farm with the Army Corps of Engineers under the River and Harbors Act. Following the Energy Policy Act of 2005, BOEM became the regulatory agency, and Cape Wind applied for a commercial lease to construct and operate an offshore wind farm. The project has a lengthy history of opposition due to the ecological, commercial, and cultural value of Nantucket Sound, to the point of being the subject of books and movies. Cape Wind was issued a 33-year lease to construct and operate a facility on Horseshoe Shoals in October 2010 and in April 2011, its Construction and Operations Plan was approved. During the summer of 2012, Cape Wind conducted marine geophysical and geotechnical investigations in the lease area on Horseshoe Shoals. The data from these surveys will be used during final siting and design of the seafloor foundations that will support the 130 turbine towers. The towers will be spaced at least one-third to one-half of a mile apart. Construction is anticipated to begin in 2014, although pending litigation could influence the timeline. Mitigation for a variety of impacts is required in the permitting documents, including:

Creative Commons Photo

Offshore wind farm from the air.

No restrictions on fishing activities within the site;

Marking the wind towers with U.S. Coast Guard-approved lighting to ensure safe vessel operation;

Burying cables to a minimum of six feet below the seabed;

Notifying fishermen well in advance of mobilization as to the location and timeframe of project construction activities and daily broadcast on channel 16 as to the construction activities for that and upcoming days;

Specific eelgrass and shellfish surveys;

A benthic habitat monitoring program; and

National Marine Fisheries Service-approved endangered species monitors during sound-producing activities.

For more information and access to all permitting documents, visit the BOEM website (***http://www.boem.gov/Renewable-Energy-Program/Studies/Cape-Wind.aspx***).

Wind Energy Areas

One of the major issues Cape Wind faced was the process used for selecting the wind farm's location. Lacking regional-scale datasets, it was difficult to determine if the location selected was indeed the preferred area. In response to the challenge of selecting a location for a wind farm, BOEM initiated a process called Smart from the Start, in which states can help develop Wind Energy Areas (WEAs) to prioritize where wind farms should be built. Proponents can submit a bid for any location in federal waters (these are known as unsolicited bids), but proposals to build within a WEA will have a more predictable permitting process and will benefit from on-going data collection in the WEAs.

There are two WEAs near Massachusetts: the Massachusetts Wind Energy Area (MA WEA) and the Rhode Island-Massachusetts Wind Energy Area (RI-MA WEA, previously known as the Area of Mutual Interest). These areas were developed by BOEM using feedback from two state Task Forces and a formal public process. In addition to the state Task Forces, Massachusetts Executive Office of Energy and Environmental Affairs organized a Fisheries Working Group and a Habitat Working Group to provide additional feedback opportunities for the fishing industry, non-governmental organizations, and academic institutions. *MarineFisheries* has representatives on each task force and working group.

Recent Announcements

BOEM announced in October 2012 the first lease under Smart from the Start, granting NRG Bluewater Wind Delaware LLC the exclusive right to submit one or more plans to BOEM to conduct activities in support of wind energy development in the lease area. BOEM hosted a series of workshops in fall and winter 2012 to explore mitigation measures that may be used to address use conflicts between fishing activities and offshore wind development. More information about these workshops, renewable energy leasing, and environmental effects is available at: ***http://www.boem.gov/Renewable-Energy-Program/index.aspx.***

By Dr. Kathryn Ford, Habitat Program Manager

Timely Reporting of Landings Still Lacking

New compliance monitoring program will encourage reporting on time

Resource managers rely on landings and effort information from commercial harvesters and seafood dealers to help characterize and manage marine fisheries resources. These harvesters and dealers have been reporting to either the federal or state government for years; however, reporting has not been standardized until recently. Stricter timelines have also been set in place although many reports are still submitted late. Therefore, *MarineFisheries* has instated a new compliance monitoring program to encourage those industry members who need an extra push.

Since 2005, *MarineFisheries* has required seafood dealers who buy directly from fishermen to report every purchase made from commercial fishermen. Under the program, every marine species landed and sold in Massachusetts, regardless of its intended disposition (e.g., food or bait), from every commercial trip, is to be reported by dealers. Purchases are to be reported for each week (Sunday to Saturday) by midnight of the following Tuesday.

Implementation of these dealer reporting requirements meant that – for the first time – comprehensive landings and value data were being collected in Massachusetts in a format meeting standards agreed upon by all fisheries agencies on the Atlantic coast. Prior to this, the available data were incomplete (because not all fishery participants reported), often in different temporal formats (annual, monthly, and trip-level), and occasionally duplicative (because both *MarineFisheries* and NOAA Fisheries collected information from some of the same individuals). Furthermore, the data are stored in a central repository, the Standard Atlantic Fishery Information System or SAFIS, and are thus available for use by all fisheries agencies on the Atlantic coast in order to manage stocks that span multiple jurisdictions.

While comprehensive dealer reports give managers the ability to better characterize commercial landings, they leave out two key management components: (a) fishing effort, particularly with respect to fixed gear fisheries, and (b) area fished (except for shellfish landings, as dealers have to report this information for Department of Public Health requirements). In addition, gear-type reported by dealers is not always reliable. Therefore, harvester reports are still relied upon, the thoroughness of which has also increased over time.

Beginning in 2010, *MarineFisheries* has required trip-level reporting of all commercial fishermen – with the exception of permit holders who already report trip-level information to NOAA Fisheries. The harvester reporting program, requiring monthly reports of trip-level activity for all species by the 15th day of the following month, was initially rolled out in the lobster fishery in response to new requirements in the interstate lobster management plan, with 10% of lobstermen participating in 2008, and 20% in 2009. Harvesters' submission of this all-inclusive report, regardless of whether they fished or not, replaced a fractured reporting system with up to 18 different state annual forms – one for angling striped bass, another for fishing weirs, a third for lobstering and so on – plus duplicative reporting requirements to NOAA Fisheries for some harvesters. This old system was still fraught with data gaps, but now comprehensive and standardized trip-level catch/effort and landings data are collected, and like dealer data, entered into the SAFIS database.

One of the biggest issues with a new program of this sort is not only handling the substantial volume of reports, but also monitoring compliance, particularly with submittal deadlines. Currently there are no established penalties for non-compliance except to hold the renewal of a permit until an individual has complied with all reporting requirements. Consequently, some permit holders are not reporting until the end of the year, or when they renew their permit as late as six months into the next year.

Why is timely reporting so important? First, the closer data are to real-time, the better management decisions are. Characterizing a fishery is difficult at best when only a portion of the participants have reported. Second, the accuracy of reported information often declines as time increases between the fishing activity and when the report is completed. Everyone has a tendency to forget what they do after long enough, lose reports, or hastily fill out forms at the last moment. Lastly, when reports are submitted late, the information forwarded to managers is delayed – sometimes when critical fisheries management issues are at hand.

To ensure timely report submissions, *MarineFisheries* is implementing a new compliance monitoring program. Submission dates for both dealers and harvesters will be monitored, and each reporting period (12 months for harvesters and 52 weeks for dealers) will be assigned a compliance grade depending on when the report is received. If harvesters submit their monthly report more than 30 days after the due date, that reporting period will receive a grade of ***late***. Similarly, if dealers submit their weekly report more than seven days after the due date, that reporting period will be ***late***. At the end of the year, if a dealer or state reporting harvester is late for more than 25 percent of their reporting periods, that permit will be considered to have failed the reporting requirements for the year, and will be put on probation for the following year. If the permit holder again fails the reporting requirement for the following year, the permit will face suspension or revocation.

MarineFisheries currently sends out compliance notices via email and U.S. mail and dealers are often called during the open season for quota-monitored species; this will continue. However, notices will be sent out on a more frequent basis, and in addition to a list of permit holders who are late, those on probation will be posted on the *MarineFisheries* website. It is the Division's intention to make this process as flexible and straight forward as possible, but to also assign consequences for failing to comply with reporting deadlines. In this way, *MarineFisheries* can gather the timely data needed for proper resource management and our fisheries will continue to gain sustainability.

By Tom Hoopes, Fisheries Statistics Program Leader

Commercially Harvested Striped Bass to be Tagged Starting in 2014

A recent investigation into the commercial striped bass fishery revealed the need for better accounting of the fish's harvest and sale to prevent unaccounted-for landings from reaching markets. While the multi-year inquiry by an interstate task force was centered on activity in Maryland, Virginia, and the District of Columbia, the lessons learned concerning the design of fish tagging systems are universal, and correcting some of the shortcomings that were discovered demands action by all states with commercial striped bass fisheries. Consequently, all states are being mandated to require their commercial industry to tag striped bass after harvest and through commerce by 2014.

The investigation uncovered illegal activity rooted in abuse of commercial striped bass tags and tagging systems by both harvesters and dealers. For example, some Chesapeake Bay fishermen were under-reporting the weight of their harvest in order to request more tags, using expired, previously used, or out-of-state tags, applying tags to fish caught out of season, and failing to tag all fish harvested. Entry of these fish into local markets required the collusion of dealers willing to misreport or overlook aspects of their purchases.

Across the eastern seaboard, each state has unique rules on the sale and commerce of striped bass. The investigative team identified a number of problems with the specific jurisdictions' tagging programs – such as tags without the year imprinted, excessive tag distribution, and no end-of-year tag accountability – as well as the lack of a uniform, coast wide tagging system, as major hurdles to preclude similar abuses.

Massachusetts in particular was singled out for being the only state without a tagging requirement for striped bass landed here, and for having limited involvement in the sale of proof of origin tags from a manufacturer to local dealers who export striped bass to states with tagging requirements. These drawbacks were exploited by some of the convicted individuals who were found to have wrongly ordered and applied Massachusetts tags to Chesapeake Bay fish or to have falsely claimed that the fish they possessed were from Massachusetts.

ASMFC Photo

A commercially caught striped bass harvested from the Chesapeake Bay with a tag locked in place through the mouth and gill.

In the end, the investigation resulted in over $1.6 million dollars in fines against 19 individuals and three corporations for more than one million pounds of striped bass harvested illegally. Additionally, the investigative task force made recommendations to improve the accountability of striped bass commercial landings. Some of their recommendations were adopted by the Atlantic States Marine Fisheries Commission (ASMFC) for coast wide implementation this past August.

Specifically, the ASMFC voted to require each state with a commercial striped bass fishery to implement a tagging program. The tagging programs must meet a number of standards, although certain flexibilities were included to allow each state to design a program best suited to its commercial fishery. Most states are required to implement the requirements of Addendum III to Amendment 6 to the interstate striped bass management plan in 2013; however, Massachusetts was given an extra year because it is the only state with a commercial striped bass fishery that does not have some version of a tagging program already in place.

Under Addendum III, Massachusetts must:

1) Implement either a point-of-harvest or point-of-sale tagging program for commercially harvested striped bass prior to the 2014 commercial season;

2) Submit annual reports to ASMFC describing the tag type, color, and inscriptions, and meet established minimum requirements that tags be tamper-evident, valid for only one year, and inscribed with year, state, and a unique number traceable to the permit holder affixing the tag;

3) Base the number of tags issued on the available quota;

4) Account for all tags issued, requiring unused tags to be returned or accounted for by permit holders in a sworn statement prior to the start of the next fishing season;

5) Require that tags remain affixed until fish are processed for consumption, and are thereafter destroyed and not reused;

6) Make it unlawful to sell or purchase striped bass without a commercial tag; and

7) Consider strict penalties for violation of the tag program, including permit revocation.

MarineFisheries is responsible for developing and implementing the mandatory tagging program. Recognizing that industry input will be vital to developing a program that minimizes the burden for all involved, the Division plans to convene a panel of industry advisors to develop a workable plan and to take specific proposals to public hearing in mid-2013 in advance of the 2014 fishing season.

By Nichola Meserve, Fisheries Policy Analyst

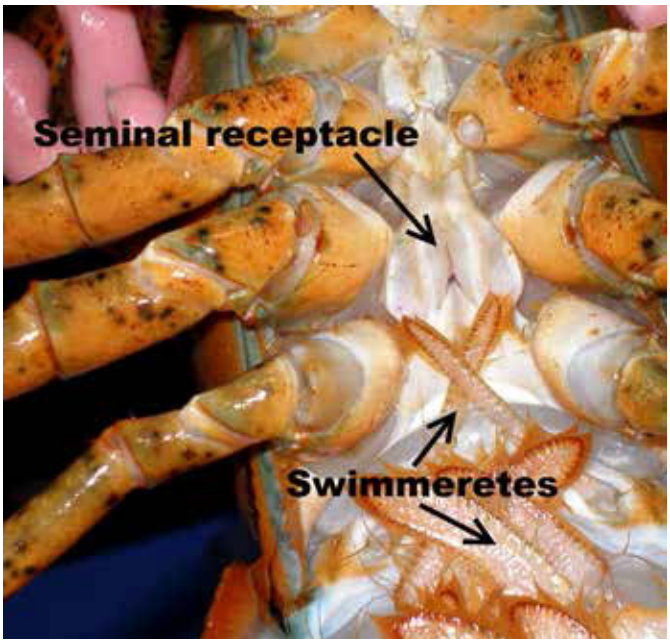
It's not about the size...or is it?

Lobster reproductive research at the UMass Amherst Marine Station

The American lobster (*Homarus americanus*) is a fairly well-studied animal, due in part to its commercial importance. Despite the inherent difficulties in working with a bottom-dwelling marine species that can be highly mobile and cryptic, biologists have developed a good understanding of lobster biology and behavior. However, for everything we think we understand, there are many exceptions and nuances to lobster behavior that will always provide opportunities for exciting research. With a commercially important species like lobster, understanding the behaviors that affect reproductive output, and thus larval production and population growth, is critical to understanding how the species will respond to commercial exploitation and how best to conserve the stocks.

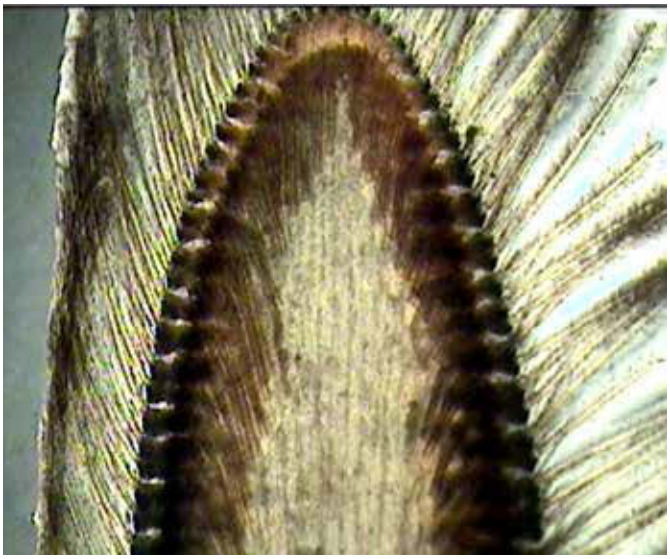
The re-establishment of the UMass Amherst Marine Station at Hodgkin's Cove in Gloucester has provided an opportunity for *MarineFisheries* scientists to perform lobster reproductive research. This opportunity is thanks to the Marine Fisheries Institute, a partnership between the University of Massachusetts and the Division of Marine Fisheries. Last winter, *MarineFisheries* staff re-located several large lobster tanks from the John T. Hughes Hatchery and Research Station on Martha's Vineyard to the Hodgkin's Cove facility initiating the construction of an outdoor sea water laboratory in spring of 2012. Research was well under way by mid-July, after divers installed two pumps to deliver sea water from the cove to the experimental tanks on shore. To date, more than 200 lobsters have been housed at the facility and utilized in one of several on-going experiments.

The lobster research focuses on reproductive behavior to understand how male lobsters may be limited in their ability to contribute sperm to females. American lobster mating takes place immediately after the female has molted and is still soft-shelled. A pre-molt female seeks out a hard-shelled male, sharing his den for a short time period both before and after the female's molt. During mating, a male lobster transfers



DMF Staff Photo

The underside of a female lobster showing the entrance to her seminal receptacle (sperm storage organ) and swimmerets (pleopods).



DMF Staff Photo

The tip of a pleopod from a pre-molt female lobster at 20X magnification. The new pleopod is visible, forming inside the old one, with its hairs (setae) folded inward.

a spermatophore, which contains sperm and seminal fluids, to the seminal receptacle (sperm storage organ) of a female lobster. *MarineFisheries* is working on several experiments designed to examine the quality of spermatophores produced by males as well as the number and sizes of females with whom an individual male might successfully mate. Additionally, one experiment is designed to address whether mating might take place when females are hard-shelled, a potential alternative for those females who fail to find mates at the time of their molts.

Conducting mating studies with lobsters is a 'hurry up and wait' operation. First, researchers have to collect a large number of female lobsters that seem likely to molt during the experiment. Mature females generally molt every two years (very large females molt less frequently), so not every female will be useful for mating experiments. Some indications that a female might be close to molting include a recently hatched clutch of eggs, or an old shell with fouling organisms attached (barnacles, for example). Once the females are collected, 'molt-stage' can be determined in the laboratory by examining one of their swimmerets (pleopods) under a microscope. If the female is preparing to molt, the newly forming pleopod is visible inside the old one. Using this technique, researchers identify which lobsters are experimental candidates. These candidates are given ID tags and are placed into holding tanks. Then the waiting portion of the operation begins. The pre-molt process is temperature dependent. To have the most realistic behavioral results, the processes are allowed to occur naturally: the water temperature is not changed to induce molting. Once the female's molt is imminent, she is put into one of the mating experiment tanks with a male.

One of the more challenging aspects of working with lobsters is that they tend to be most active overnight. This requires the use of cameras and recording equipment, which provide a way to monitor the lobsters' activity at all hours without interference by an observer. Red lights on the cameras are not detected well by lobster, allowing for reduced interference when filming overnight. However, working with electronics outdoors around salt water presents a number of challenges, resulting in a certain degree of creative problem solving requirements. The video system use at Hodgkin's Cove is a home security system designed to record inputs from up to 16 cameras simultaneously. The video is recorded digitally, producing many hours of video to be viewed and analyzed.

The outdoor set-up at Hodgkin's Cove necessitates seasonal work. Data collection wrapped up in late October, with a subsequent shift in focus to data analysis. Winter work will involve conducting image analysis on the spermatophores collected from males and mated females to quantify male reproductive contributions. Additionally, there is a massive amount of video to review, which will be used to describe the behavioral interactions between males and females in each experimental trial.

Data produced by this type of research not only contributes to the understanding of lobster behavior, but can be applied to the lobster stock assessment and management process. The prevailing management strategy for lobsters is to protect reproductive females through v-notching where a v-shaped notch is carved into a specific flipper on a female. This has resulted in a skewed sex ratio dominated by females. Questions persist about whether the population may have a shortage of reproductive males.

Knowing whether male lobsters can successfully mate with many females or only a few females provides researchers with a context for interpreting the effects of skewed sex ratios in lobster populations. Understanding how the size difference between a male and his female partner affects his ability to transfer a spermatophore (and thus fertilize all or only a small portion of her eggs) tells biologists how the size structure of the lobster population may impact larval output. Reproductive research contributes to our understanding of how lobster populations persist and grow - an integral component to providing responsible scientific advice to ensure the health and sustainability of this important resource.

By Tracy Pugh, Aquatic Biologist

DMF Staff Photo

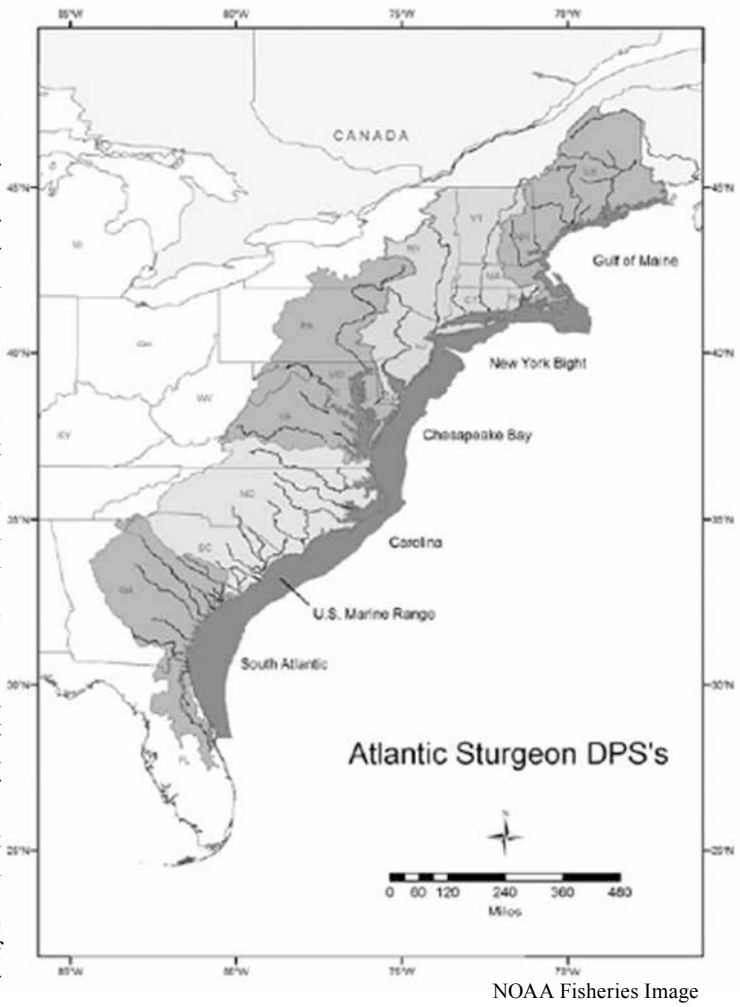
Lobster tank set up at Hodgkin's Cove.

ASMFC's Response to the Listing of Atlantic Sturgeon as Endangered

With a maximum size of more than 14 feet, the Atlantic sturgeon is one of the largest fishes in Massachusetts waters. Fishermen typically capture the species by accident, either while sportfishing or as commercial bycatch. Like striped bass and river herring, Atlantic sturgeon spend the majority of their life in the marine environment, only occurring in freshwater during spring spawning runs. Atlantic sturgeon once supported lucrative fisheries that targeted the species for flesh and roe; however, most of these fisheries had collapsed by 1910 due to a combination of overfishing and Industrial Revolution dams resulting in loss of habitat access. Populations in Massachusetts were hit particularly hard. The three systems that once supported reproduction – the Merrimack, Taunton, and Connecticut Rivers – do not currently host spawning fish. Now, Atlantic sturgeon are present but uncommon within the waters of the Commonwealth. Any that do occur are most likely born in nearby river systems such as the Hudson River in New York or the Kennebec River in Maine.

The National Marine Fisheries Service (NMFS) listed the Atlantic sturgeon as a "species of concern" in 1997, and in 1998, the Atlantic States Marine Fisheries Commission (ASMFC) closed all Atlantic sturgeon fisheries. While designation as a species of concern does not itself carry protections, it does result in periodic status reviews by NMFS to determine whether a species warrants listing (and hence further protection) under the Endangered Species Act (ESA).

Atlantic sturgeon status reviews in 1998 and 2007 found that although total abundance of the species was depressed, protection as an endangered species was not required. Nonetheless, in 2009, NMFS received a petition from the Natural Resources Defense Council to list each of the five distinct populations (DPSs) of Atlantic sturgeon under the ESA. In 2012, NMFS listed four



NOAA Fisheries Image

Photo courtesy of D. Peterson, University of Georgia

Michael Bednarski with Atlantic sturgeon.

of the five DPSs as endangered and one as threatened. The two DPSs that occur regularly within Massachusetts — the New York Bight and Gulf of Maine — were listed as endangered and threatened, respectively.

The listing of Atlantic sturgeon sparked immediate controversy. Many experts felt that the conclusions of the 2007 status review, which did not recommend the listing of any DPS as endangered, were accurate. New information not available at the time of the listing decision indicated that several DPSs may be in the process of recovery, suggesting the protections afforded by ASMFC's moratorium are sufficient to protect and restore the species. In Massachusetts, increases in abundance may explain recent encounters with Atlantic sturgeon in the Boston area, where they had not been observed in decades. Coupled with this uncertainty about the listing's scientific merits are serious implications for numerous Atlantic coast fisheries that incidentally interact with sturgeon.

In light of such information, the ASMFC Atlantic Sturgeon Technical Committee, of which Massachusetts is an active member, recommended a new stock assessment of the Atlantic sturgeon population, including an independent peer review of the results. The last ASMFC stock assessment of Atlantic sturgeon was completed in 1998. Consequently, at its October 2012 meeting, the ASMFC revised its schedule of stock assessments to prioritize sturgeon.

Once completed in 2014, the results of the sturgeon assessment will guide the Technical Committee and Sturgeon Management Board to their next action. Specifically, if the stock assessment indicates that Atlantic sturgeon do not appear to warrant protection under the ESA, the ASMFC is expected to move forward with the development of a petition to down- or de-list Atlantic sturgeon, that is, either remove the species from the endangered species list or reclassify it as a threatened species. If the petition is successful, it would not re-open fisheries on Atlantic sturgeon or take actions likely to slow their recovery. Rather, it would provide greater regulatory flexibility to managers tasked with regulating unintentional capture in other fisheries.

By Michael S. Bednarski, Aquatic Biologist

Inquiry into State Seafood Marketing Program Nearing Completion

Government-supported seafood marketing programs have operated for many years in states like Maine, Alaska, and Washington where – like in Massachusetts – the fishing industry is of major socio-economic importance and serves as a vast employment hub. These programs have successfully established a heightened stature in the marketplace for certain seafood products originating from these states. Consumers throughout the country easily relate "Maine Lobster" with the species *Homarus americanus*, regardless of where it was caught along the Atlantic coast of North America. With products like king crab, salmon, and halibut, "Alaska Seafood" is the second most commonly specified brand on U.S. menus.

These seafood marketing programs increase name recognition and demand for seafood products through a variety of promotional and educational tools. They inform the consumer about the extensive and science-based fisheries management systems, thereby building consumer confidence that seafood is an environmentally-friendly and socially-acceptable selection. The programs highlight benefits of buying locally produced seafood, educating the public about fishing and the difficulties endured by fishermen, thus building community support for these industries. They promote the nutritional value of seafood, offer storing and cooking tips, and provide a directory of seafood dealers. The programs also teach harvesters, dealers, and processors about marketing techniques. Many employ a brand name or logo to allow for product differentiation in the market place.

The Massachusetts Legislature recently established a special commission to investigate the merits of developing a coordinated, generic marketing program for seafood caught in the Commonwealth. The special commission has been assigned a comprehensive task to determine if a permanent Massachusetts seafood marketing program could enhance and stabilize the economic environment for the commercial fishing industry and fishing communities.

The Seafood Marketing Commission, representing a wide variety of commercial fishing industry interests, met three times in 2012 to discuss its task, reviewing programs in other states and available marketing tools while considering the individuality of the Commonwealth's commercial fishery. At its most recent meeting in early October, the Commission determined that, yes, a well-designed and properly-funded seafood marketing program could benefit the industry. A report to the Legislature is expected later this winter that will summarize the Commission's recommendations as to the specific operations and functions of this proposed marketing program. Stay tuned for more details.

By Nichola Meserve, Policy Analyst

Fishermen Become Level 1 Whale Disentanglement Responders

It is often said that fishermen are the eyes and ears on the water. Their presence at sea is increasingly put to use to help distressed whales. In August 2012, approximately 55 commercial fishermen on Cape Cod joined the ranks of thousands of others along the Atlantic coast who have become certified as Level 1 Responders through the Atlantic Large Whale Disentanglement Network. This qualifies them to identify, assess, and report marine animal entanglements. The Cape Cod Commercial Hook Fishermen's Association requested the training, conducted by NOAA Fisheries' Protected Resources Division and the Provincetown Center for Coastal Studies, to create a band of volunteer fishermen properly equipped to be first responders, thereby increasing the odds for successful disentanglements.

Entanglement in fishing gear is a major cause of human-induced injury and mortality for large whales. Through a federal grant and with support of the Massachusetts Environmental Trust, *MarineFisheries* contracts the Provincetown Center for Coastal Studies to perform large whale and sea turtle disentanglement in Massachusetts coastal waters. This past year was extremely busy for entanglement responders around Massachusetts; 34 leatherback sea turtle entanglements and 19 large whale entanglements were reported.

Entanglements are typically sighted by commercial fishermen, recreational boaters, whale watch boats, or researchers. The training conducted at the Cape Cod Commercial Hook Fishermen's Association provided valuable knowledge and training about entanglement to those frequently on the water – a benefit for both fishermen and whales.

In 1984, the Provincetown Center for Coastal Studies partnered with NOAA Fisheries to develop a method for disentangling whales at sea. The method produced was a modified

DMF Staff Photo

Cape Cod fishermen becoming Level 1 Responders for the Atlantic Large Whale Disentanglement Network.

version of restraining whales used in 19th century Yankee whaling fleets, except that the modification makes it suitable for working with live whales rather than harvesting them.

The Atlantic Large Whale Disentanglement Network has five levels of responders, each with an increased amount of instruction and responsibility. Training focuses on what to do and what not to do when encountering an entangled whale. First level responders are trained to identify entangled whales and stay with the whale until a disentanglement crew arrives. Besides being illegal, freeing an entangled whale without having the proper training can prove harmful to both whale and human, despite best intentions.

If you encounter an entangled animal on the water, maintain a safe distance and call the entanglement hotline at 1-866-755-NOAA (6622).

By Erin Burke, Protected Species Specialist

History Made: Two Atlantic white sharks tagged with new technology

White sharks are without a doubt growing in number off the coast of Cape Cod during summer months, likely because of the growing gray seal population in the area. As white sharks increasingly take advantage of this robust source of food, research on these animals becomes more pertinent for understanding their ecology as well as for public safety. This past fall, *MarineFisheries* teamed with Mote Marine Laboratory and the non-profit OCEARCH team to tag white sharks off the coast of Cape Cod – a historic event for multiple reasons.

The team of scientists and crew tagged two white shark females during their 12 day expedition. These two sharks, nicknamed Genie and Mary Lee, were the first white sharks successfully tagged with real time satellite transmitters in the Atlantic Ocean. When one of these tagged sharks surfaces for a short period of time, these SPOT (Smart Position and Temperature) tags communicate with satellites, which can determine the position of the sharks – these data are then relayed to the researchers and posted on the web (***www.ocearch.org***).

Genie and Mary Lee were also the first two white sharks in the *world* to be tagged with accelerometers. Every fraction of a second, these specialized tags record the frequency and force of swimming movements, as well as body orientation, depth, and water temperature. This may sound like something from a science fiction or spy movie, however, these kinds of accelerometers are found in the smartphones, digital cameras, and videogame controllers we use every day. As an example,

DMF Staff Photo

Dr. Nick Whitney of Mote Marine Laboratory ensuring tags are properly attached to white shark Mary Lee.

DMF Staff Photo

Genie being released back into the water after successful tagging.

accelerometers in smartphones relay information to rotate the screen when the phone is on its side.

The high resolution data collected by the accelerometer tags allow researchers to examine the very fine-scale swimming behavior of the tagged sharks, including tailbeat frequency and amplitude, stalling, gliding, and rolling. While on these two white sharks, the tags recorded and archived these data and then detached nine to ten hours after each shark was released. The only catch is that after the tag detaches from the shark, it has to be found in order to gather the data stored on it – fortunately, both tags were recovered.

Like all white sharks tagged off the coast of Massachusetts, Genie and Mary Lee were also fitted with acoustic tags. These tags emit high frequency 'pings' that can be detected by acoustic receivers placed in various areas throughout Massachusetts waters. Whenever a tagged shark swims within about 100-300 meters of the receivers, the shark identification number, date, and time is recorded and stored until retrieved. These data allow researchers to examine fine scale movements, site fidelity, and residency of white sharks around Cape Cod and beyond. They can also examine patterns of behavior as they relate to factors like time of day, tide, and proximity to seal haul-out and human activities. Other advantages to using these tags include longevity as these tags can last up to 5 years, so researchers can determine if and when white sharks are returning to Massachusetts. In addition, this technology is being used by numerous researchers along the Atlantic coast. Therefore, the broad scale movements of these sharks can be determined if they are detected by acoustic receivers in different states waters along the East Coast.

Since 2009, *MarineFisheries* researchers have tagged a total of 34 white sharks, including 23 with acoustic tags, 14 with pop-up satellite tags, and two with SPOT and accelerometer tags. To date, the pop-up satellite tags have shown that most of the white sharks overwinter on the continental shelf in an area from southern Georgia to northern Florida. The acoustically tagged white sharks have been detected off Massachusetts, New York, Delaware, North Carolina, and Georgia. So far, the SPOT tags have told us that Genie was very active around Nantucket in late September and did not surface again until December when she showed up off the coast of Georgia. Mary Lee has already migrated to the Florida coast and is cruising the coastline from Florida to South Carolina and back again since she was tagged in mid-September.

Coupled together, these innovative technologies (SPOT, accelerometer, and acoustic tags) tell a story about Atlantic white sharks that was previously unknown. The fine-detailed information gathered from these sharks will help scientists better understand white shark ecology, which in turn may assist in keeping the Cape Cod and other shorelines safe for both sharks and beach goers alike.

By Dr. Greg Skomal, Senior Biologist and Large Pelagics Research Project Leader

"How big was that fish you caught?"

Recreational angler surveys to increase in 2013 under *MarineFisheries*

You may have seen them – men and women walking up and down docks and piers carrying clipboards and pencils, randomly stopping to talk with people cleaning their boats or packing up their fishing gear. They ask how your fishing day went and write all the information down. These surveyors are part of the Marine Recreational Information Program (MRIP), administered at the national level by NOAA Fisheries. Since 1983, the surveyors have been federal contractor employees, but beginning in 2013, *MarineFisheries* staff will be performing the survey in Massachusetts waters. Additionally, surveyors will be seen more often and at more locations to improve sampling accuracy.

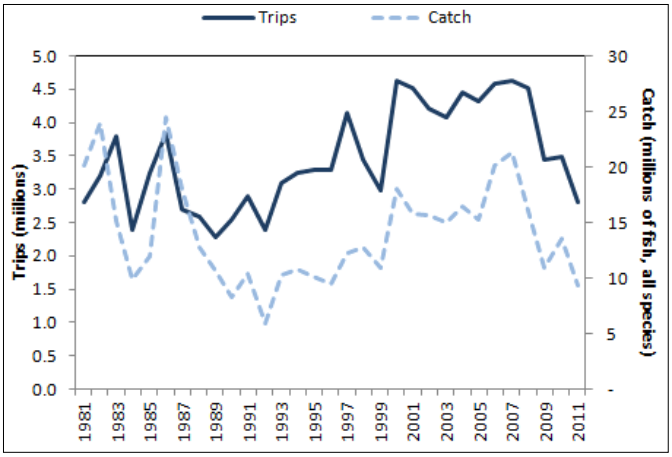
MRIP, known as the Marine Recreational Fisheries Statistics Survey prior to 2012, collects angler catch and effort data through a two part survey. Part one is a telephone survey where interviewers call a random sample of private anglers (those who fish from shore or aboard private or rental boats) and for-hire vessel operators to estimate fishing effort. Private anglers are asked about the number of trips taken during the prior two-month period (called a wave), whereas charter and head boat

operators are asked about their trips in the prior 2 weeks. Part two puts surveyors in the field to learn about the fish caught during trips. Surveyors intercept private anglers and charter boat patrons at coastal locations as they complete their fishing trips while the larger size of head boats allows for surveyors to accompany these trips and directly sample catches while at sea.

Massachusetts has been directly involved in conducting a part of the federal survey's for-hire element since 2003. At that time, *MarineFisheries* biologists began sea sampling head boat catches and providing the data to NOAA Fisheries for use in conjunction with the effort data collected from head boat operators.

In 2013, *MarineFisheries* will continue to sample head boat catches as well as expand the Division's involvement in the shore-side interview portion of MRIP – officially called the Access Point Angler Intercept Survey – to the remaining recreational fishing modes (shore, rental/private boat, and charter boat). Additionally, the goal is to intercept twice as many anglers than in previous years and increase biological sampling, thus improving the accuracy of the resulting recreational fisheries statistics.

Number of fishing trips targeting recreational species in Massachusetts coastal waters 1982-2011.



DMF Staff Image • Data: NOAA Fisheries

In addition to demographic information, shore-side intercept surveyors obtain actual catch data, including the species type and numbers harvested and released. They also take a limited number of length and weight measurements of whole fish. The catch data in turn is applied to the effort data and adjusted with various correction factors to estimate the total numbers of fish caught and released for most recreationally important marine species.

The demographic information collected is largely used to direct the telephone-based effort survey. All information gathered is confidential and known only to the interviewers and data entry personnel. Beyond that level, these data are available to end users only in aggregate form with individual angler information removed. With the shore-side interviews, anglers are intercepted at the end of their fishing activity. On head boat trips, a subset of selected anglers is also observed during fishing to measure their discarded catch.

The resulting data are used extensively by fisheries biologists and managers to assess important species stock conditions and evaluate potential management measures such as possession limits, seasons, and minimum size restrictions. Catch estimation methods were changed in 2012 to address statistical sampling issues associated with intercept site selection. In 2013, additional changes will be seen in the program. Intercept surveying will take place in a rotating six hour time block within each 24-hour period. The telephone-based effort survey will be revised to use the Federal Saltwater Angler Registry, which is populated with information from the state's new saltwater fishing permit database, rather than continue random dialing of coastal households.

By expanding participation by agency staff to the entire Access Point Angler Intercept Survey, *MarineFisheries* hopes to improve the quality of the data, as well as increase contact with the Commonwealth's recreational saltwater anglers. In addition, through participation in the full MRIP survey, the agency becomes a true partner in the collection of critical marine recreational fisheries data with the federal government, other coastal states, and the angling public.

By Paul Caruso, Senior Aquatic Biologist, Recreational Fisheries Project Coordinator

DMF Staff Photo

MarineFisheries surveyors measure and weigh catch on headboats as part of the MRIP survey.

MarineFisheries hits up the towns with Fall Festivals

The air cools, the leaves change colors, and the fish go on their way to their winter homes. Autumn is time for local fairs and festivals in New England. This past fall, *MarineFisheries* spent time at these local events in coastal Massachusetts towns to bring the work of the Division to those who might not normally experience it. Each fair and festival that *MarineFisheries* was a part of supported the Division's mission in promoting sustainable fisheries, diversity of healthy seafood, and coastal Massachusetts cultures.

Topsfield Fair: September 28-October 8

This year, *MarineFisheries* took part in the 194th year of the Topsfield Fair in Topsfield. Within the Sportsman Building, *MarineFisheries* spent time showing visitors how varied life is within our coastal waters. Visitors got a chance to see real marine specimens like clams and oysters, flounder, American eel, and sea lamprey. Visitors also had a chance to speak with Division biologists, asking questions about research and what is out there in the waters surrounding Massachusetts.

DMF Staff Photo

Kim Trull of* MarineFisheries *shows visitors a variety of strange creatures living in our coastal waters at the Topsfield Fair.

New Bedford Working Waterfront Festival: September 28 & 29

The Working Waterfront Festival was created in 2004 to celebrate the largest commercial fishing port in the United States: New Bedford! *MarineFisheries* was there promoting the importance of supporting local fishermen and sustainable fishing practices. While the weather was less than ideal, visitors streamed by the Division's booth, toured commercial fishing boats, and enjoyed fishing-based entertainment throughout the weekend.

DMF Staff Photo

Brian Kelly and Dan McKiernan of* MarineFisheries *talking commercial and recreational fishing with visitors during the Working Waterfronts Festival in New Bedford.

DMF Staff Photo

Commercial fishing boats line up at port for guests to see the fleets at the Working Waterfront Festival, New Bedford.

Boston Local Food Festival: October 7

Started in 2010, the Boston Local Food Festival was created to promote healthy eating, local and sustainable seafood, and community within the greater Boston area. *MarineFisheries*' Deputy Director Dr. David Pierce, and Fish and Game Commissioner Mary Griffin were both judges in the Seafood Throw Down, a competition between two Boston chefs for the tastiest and most unique recipes utilizing bycatch species. This year, the food item was skate wings and the chefs were from two area hospitals: the Boston Children's Hospital and Beth Israel Deaconess Medical Center.

DMF Staff Photo

Crowds enjoying the Boston Local Food Festival.

DMF Staff Photo

Department of Fish and Game Comissioner Mary Griffin, Jared Auerbach of Red's Best Seafood, and* MarineFisheries *Deputy Director David Pierce taste testing during the Boston Local Food Festival's Seafood Throwdown competition.

Boston Seafood Festival: October 6

In its inaugural year, the Boston Seafood Festival was created to promote sustainable fisheries and the local economy. Hosted by the Boston Fisheries Foundation, the Festival celebrated our capital city's 100 year old working fish pier. *MarineFisheries* staff mingled and handed out various informational materials, including our recreational fishing guide and fish identification posters, to a large crowd of commercial industry supporters, urban seafood consumers, and fishing enthusiasts.

Boston Fisheries Foundation Photo

Contestants and spectators prepare for the shucking contest during the Boston Seafood Festival.

Wellfleet OysterFest: October 13 & 14

In the lines of promoting local seafood and community, *MarineFisheries* joined Wellfleet in their 12th annual OysterFest. The OysterFest is hosted annually by SPAT, Shellfish Promotion and Tasting, a Wellfleet based organization who works to educate the community about the town's shellfish industry. *MarineFisheries* staff were there to answer any questions visitors had about shellfish and to provide handout materials regarding shellfish identification, issues, and basic information.

Comings and Goings

This past September, *MarineFisheries* said farewell to **Christopher Wood**. Based in Gloucester, Chris was a fisheries technician working with the anadromous species project since 2010. He assisted in projects focused on rainbow smelt, river herring, and American eel. A team player, Chris was always willing to help on other projects when able to. Before coming to *MarineFisheries*, Chris earned an associate degree in arboriculture and park management, undergraduate degrees in forestry conservation and wildlife, and a master's in conservation biology. We wish Chris the best of luck in his future endeavors!

DMF Staff Photo

Jillian Carr is the new Fisheries Supervisor for the Habitat Project, focusing on Seagrass. Based in Gloucester, Jill performs restoration and research on eelgrass habitat in Massachusetts waters. Jill has her BSc in marine science from University of Connecticut's Avery Point. She started working with *MarineFisheries* as a contractor for the Lobster Project before she came aboard full time in Habitat. An angler herself, Jill enjoys working to restore much needed habitat for recreational sport fish and other various marine species.

DMF Staff Photo

Dave Martins, has joined *MarineFisheries* in New Bedford. He will oversee the Massachusetts portion of the nationally administered MRIP (Marine Recreational Information Program). Dave has his BSc in environmental sciences from the University of Maine at Machias and is persuing a MSc in marine biology from University of Massachusetts at Dartmouth. Before coming to *MarineFisheries*, Dave was a NOAA Fisheries observer, giving him invaluable experience on the water. Dave is excited to improve the recreational fishery data, contributing to more accurate stock assessments.

Notice of Public Hearing Scheduled for February 13, 2013

Under the provisions of M.G.L. c. 30A and pursuant to the authority found at M.G.L. c. 130 § 17A and 21, the Division of Marine Fisheries (DMF) and the Marine Fisheries Advisory Commission have scheduled a public hearing and public comment period to accept comment on regulations to amend 322 CMR 3.00, 6.00, 7.00, 8.00 and 12.00. The proposed regulations will:

1. **Lobster Management (322 CMR 6.01, 6.02 and 12.00)**
    a. Permanently codify the recently enacted emergency regulations that increased the minimum carapace size for lobsters taken from Lobster Management Area 3 from 3 ½ inch to 3 17/32 inch; and
    b. Beginning in 2014, to reduce the risk of right whale entanglements in lobster gear:
        i. Implement a mandatory February 1 – April 30 closure to all lobster gear set in the state waters portion of the Cape Cod Bay Right Whale Critical Habitat Area; and
        ii. Shift the two-month Outer Cape Cod Lobster Management Area haul-out period from January 15 – March 15 to February 1 – March 31 to better correspond with the local presence of right whales.

2. **Commercial Scup and Black Sea Bass Management (322 CMR 6.27 and 6.28)**
    a. Amend commercial black sea bass seasons, daily limits and open fishing days.
        i. Postpone the opening of the commercial fishery until later in the year. Options for proposed opening dates include July 1, August 1, or September 1;
        ii. Contingent up the adoption of the above proposal:
            1. Eliminate the 100 lbs. black sea bass bycatch limit during January – April;
            2. Increase the commercial trip limits to 500 lbs. per day for licensed sea bass pot fishermen and 200 lbs. for other authorized gear types (hook and line, trawl and weir); and
            3. Establish Sunday through Thursday as open fishing days during the open commercial fishing season.
    b. Amend commercial scup seasons, daily limits and open fishing days –
        i. For Hook and Line and Pot Gears Only:
            1. During May 1 – May 31, increase the trip limit for fishermen using hook and line or fish pots from 400 to 800 lbs. and allow commercial fishing five days per week (Sunday through Thursdays);
            2. During June 1 – June 30 allow commercial fishermen using hook and line or fish pots to land 400 lbs. and allow commercial fishing three days per week (Sunday, Tuesday and Wednesday); and
        ii. For All Gears:
            1. Amend scup seasonal trip limits during July – October for all gears (hook and line, pots, and otter trawls) from 800 to 1500 lbs.

    c. Eliminate the requirement that all commercial scup and black sea bass permit holders file annual catch reports.

3. **Commercial Horseshoe Crab Management (322 CMR 6.34)**
    a. Expand the May-June lunar-based spawning closures into April to address early season spawning related to warming water temperatures; and
    b. Eliminate the quota monitoring closure language that allowed DMF to close the fishery on July 7 to tally monthly catch data for quota management purposes. Weekly dealer reporting negated the need for this regulation.

4. **Eliminate outdated recreational regulations (322 CMR 3.00, 7.05, 8.07 and 8.11)**
    a. Eliminate restrictions on the numbers of hooks anglers may use to catch shad on the Palmer River and white perch on the Agawam river;
    b. Eliminate regulations pertaining to coho salmon; and
    c. Adjust various section references to conform to changes to 322 CMR 3.00.

5. **Minimum Size For Surf Clams Harvested in Federal Waters (322 CMR 6.08)**
    a. When warranted, exempt on an annual basis, federal surf clam vessels fishing in federal waters and their dealers from the state's minimum size standard, so as to conform to federal regulations.

6. **Charter Boats and Posting Rules (322 CMR 7.10)**
    a. Exempt permitted for-hire charter boats from the requirement to post minimum sizes and possession limits aboard the vessel.

7. **Gillnet Pingers (322 CMR 12.04)**
    a. Eliminate state regulations requiring gillnet fishermen to use pingers to deter harbor porpoise entanglements. *Note: All vessels using gillnets in state-waters will still be subject to federal gillnet pinger regulations.*

Public Hearing Schedule

Wednesday February 13, 2013 at the Massachusetts Maritime Academy Admiral's Hall, 101 Academy Drive, Buzzards Bay, Massachusetts 02532. From 5:30 PM – 9:30 PM.

Public comments will be accepted until 5PM on Friday, February 15, 2013.

Please e-mail all public comments to ***jared.silva@state.ma.us*** or send to 251 Causeway Street, Suite 400, Boston, MA 02114.

For further information or to obtain a copy of the full proposed regulations please contact Jared Silva by phone (617-626-1534) or through e-mail (***jared.silva@state.ma.us***), or visit our website (***www.mass.gov/marinefisheries***).

Regulations Update

During the period of July 2012 through November 2012 the following laws and regulations were enacted affecting marine fisheries in Massachusetts. This list includes regulations and declarations approved by the Marine Fisheries Advisory Commission, as well as statutory changes approved by the legislature and the Governor's office.

Winter II Scup Trip Limits

The Massachusetts Marine Fisheries Advisory Commission approved an 8,000 lb commercial trip limit for the 2012 Winter II scup period. The Winter II scup period runs from November 1 – December 31.

Winter Flounder

The Division of Marine Fisheries promulgated emergency regulations to liberalize the rules affecting winter flounder harvest in the Gulf of Maine Groundfish Management Area. The commercial trip limit for this area was increased from 250 lbs to 500 lbs per trip or per 24-hour period, whichever is longer. In addition, the September 1 – October 31 recreational winter flounder closure for this area has been eliminated. This action is being taken in accordance with Addendum II to the Interstate Management Plan for Winter Flounder, recently approved by the Atlantic States Marine Fisheries Commission. A public hearing will be held in January 2013 to permanently codify these regulations.

Division of Marine Fisheries
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INSIDE...

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http://www.mass.gov/marinefisheries

DMF NEWS

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MarineFisheries receives state and federal funds to conduct research, management and development of the Commonwealth's marine fishery resources. Information in this publication is available in alternative formats.

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Richard K. Sullivan, Jr., Secretary, EEA
Mary B. Griffin, Commissioner, DFG
Paul J. Diodati, Director, *MarineFisheries*

Comments and suggestions for the newsletter are welcome. Please contact the Editors at (617) 626-1520, or write to:
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