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.

DMF NEWS

2014 • 1ST and 2ND Quarters • Volume 35

MarineFisheries
A Commonwealth of Massachusetts Agency

From path clearing to pier building, recreational saltwater fishing permit fees increase public access

The past 12 months have been busy for *MarineFisheries*' Public Access Project, which is dedicated to enhancing angler access to the Commonwealth's marine fish resources. This Project is primarily funded by monies collected from the sale of Massachusetts recreational saltwater fishing permits. During fiscal year 2014, the Public Access Project invested over a quarter million dollars on infrastructure projects to improve public access facilities. Each project was endorsed by the state's Marine Recreational Fisheries Development Panel, a five-member citizen review board. Here's a run-down of the new or improved fishing facilities receiving funding. We hope you'll pay them a visit!

The year's biggest project by far, the Oak Bluffs Fishing Pier on Martha's Vineyard, is now open for fishing. Officials held an opening ceremony for the pier this past June. However, folks have been fishing off the pier since its completion in early spring. So grab your tackle and start catching striped bass, scup, or black sea bass from right off this 320-foot, L-shaped pier, located on the north end of Seaview Avenue. It's easily walkable from the Oak Bluffs ferry docks and downtown. The pier is accessible by ramp and stairs, and benches have also been installed throughout the length of the pier, for when you need a break after reeling in the big one!

The pier was built in partnership with the Department of Fish and Game's Office of Fishing and Boating Access. Roughly half of the funds were from a Sport Fish Restoration Act reimbursement grant secured by *MarineFisheries* through the U.S. Fish and Wildlife Service Sport Fish Restoration Program. An additional quarter of its cost was funded by saltwater permit sales.

Working with the Office of Fishing and Boating Access, *MarineFisheries* also made improvements to several existing access sites. At the Westport River Launch Ramp in Westport, eight ramp floats were replaced at this heavily used, state facility. At Popponesset Beach in Mashpee, the stairs from the parking area on Wading Place Road to the beach were replaced in order to continue providing anglers with safe access to this great shore fishing location. *MarineFisheries* also added gravel to parts of the sandy parking area at Craven's Landings in East Sandwich – at Scorton Creek – to ease vehicle access.

MarineFisheries partnered with the Department of Conservation and Recreation to rehabilitate the fishing pier on the Cape Cod Canal at Scusset Beach State Reservation in Sandwich. Improvements to the pier will include superstructure repairs, decking, handicapped accessible railings, and a new access ramp on the eastern most end of the pier. These repairs, scheduled to begin this summer, will ensure many more safe years of fishing from this structure.

In addition to projects receiving direct oversight by *MarineFisheries,* the Public Access Project introduced a Small Grant Program to fund smaller town-led projects to improve saltwater fishing access. Municipalities applied through a competitive bid process for grant awards of up to $10,000. Five municipalities' projects were selected for funding, totaling $39,500. They are:

- Pearse Landing, Swansea: This project will re-establish public access to the western banks of the Cole River through the clearing out of overgrown vegetation, and upgrades to the access route. The revitalized site will include vehicle and bicycle parking, cartop vessel launch access, and shore fishing

DMF Staff Photo

Federal, state, and local officials and many members of the community braved the rain during the Oak Bluffs Pier dedication this past June.

access. Swansea has been looking to improve this area for a number of years; this grant opportunity provided the means to complete the project.

- Atlantic Path, Rockport: Rockport will hire a professional arborist to clear this 1.5-mile, public foot trail that hugs the Atlantic coast. This path provides access to the water's edge and is popular among recreational anglers, especially its proven striped bass fishing locations, but becomes impassable due to encroaching vegetation without proper maintenance.
- Taunton River Basin Boat Ramp, Fall River: A grant will enable Fall River to install lighting at this state-owned facility at Brownell Street. This project will greatly improve the safety of launching and retrieving boats, as no lightening currently exists. This facility is the only ramp in the City open to the public year round.
- Town Pier & Float Facility, Duxbury: The town will add a fish cleaning station with running water and lighting for angler safety. In addition, a webcam will be installed next to the Harbormaster's Office for anglers to see the daily fishing activity and check the weather on Duxbury Bay before heading down.
- Houghs Neck Boat Ramp, Quincy: This joint state-city maintained boat ramp provides convenient angler access to the Fore-River, Quincy Bay, and surrounding southern sections of the Port of Boston. The ramp receives frequent use given its accompanying trailer parking lot and local amenities, but is in need of repairs to correct erosion damage. The city will use its grant to shore up the boat ramp and maintain the functionality of this 24-hour public access facility.

The Small Grants Program will be continued in the coming year, with additional funding to enable more municipal-led public access projects. Municipalities not awarded in the last round of grants will be considered with other applicants for the upcoming round of awards. We expect the Program to result in more smaller-scale public access improvements that *MarineFisheries* would otherwise be unable to complete on its own.

Funds were also allocated to permitting and engineering costs associated with preparing potential access sites for construction or existing access sites for improvements. Two projects expected in the upcoming year include rehabilitation of the fishing pier at Cashman Park in Newburyport, and re-establishment of public access at Dogfish Bar in Aquinnah. The work plan for the Cashman Park pier includes construction of a longer T-section to facilitate fishing activity in the Merrimack River. This renovation will complement the area's existing amenities including a playground, sports fields, basketball courts, and boat ramp. At Dogfish Bar, the parking lot and path to the beach will be re-aligned as over time they have shifted and encroached on private property. *MarineFisheries* and the Office and Fishing and Boating Access continue to work with a number of other towns to identify and initiate plans for building additional public access sites in the future.

By Ross Kessler, Public Access Coordinator

MarineFisheries forms new advisory panel to improve management of shellfish resources

Shellfish fisheries are some of the Commonwealth's most historic legacy industries and have been incredibly resilient. These fisheries are extremely valuable, worth more than $31 million (ex-vessel value, excluding sea scallops), to commercial fishermen and provide vast public benefit to recreational fisheries. However, their management can be extremely complex because of the multi-jurisdictional responsibilities among local, state, and federal governments. As a result, *MarineFisheries* identified a need to enhance its communication with members of the shellfish fishing community on matters of concern within the industry.

To this end, *MarineFisheries* held the inaugural meeting of a new Shellfish Advisory Panel this past April. Fourteen key members of the Massachusetts shellfish industry – including harvesters, dealers, processors, aquaculturists, researchers, and municipal shellfish officials – were invited to serve on the panel. With direct input from this Shellfish Advisory Panel, *MarineFisheries* aims to identify problem areas in its management of shellfish resources, as well as possible solutions, particularly as the Division commences efforts to prepare its next five-year strategic plan.

At the first meeting of the Panel, *MarineFisheries* presented an overview of its current research and management efforts for shellfish species within Massachusetts waters. This included information on the legal responsibilities of the Division pertaining to shellfish, and its many programs to achieve its two primary missions of public health protection and direct and indirect management of the Commonwealth's molluscan shellfish resources. Program areas included shellfish growing area classification, depuration, toxicity testing, illness risk reduction, and aquaculture.

The second half of the meeting opened the floor to the Panel members to raise their concerns related to shellfish resources, fisheries, and management. Several issues brought up included: improving communication between regulators and the industry, particularly with respect to illness outbreaks and research priorities; developing better shellfish resource survey information; increasing areas open to harvest and developing new markets for lesser-targeted species; and supporting the growth of the aquaculture fishery.

It is anticipated that the Shellfish Advisory Panel will meet again this year. All meetings are open to the public and can be found on the *MarineFisheries* calendar as they are scheduled (*http://www.mass.gov/dmf/calendar)*. The 2014 meetings will result in a document of strategies and goals that the Division will use to improve its existing Shellfish Program and address current and upcoming challenges.

DMF Staff Photo

The inaugural meeting of the Shellfish Advisory Panel was held in Duxbury, Massachusetts in April 2014.

DMF Staff Photo

2014 rule changes aim, in part, to disperse congregations of striped bass commercial fishermen that have occurred east of Chatham in recent years.

Effective 2014: New Rules to Improve the Commercial Striped Bass Fishery

This past winter, *MarineFisheries* and the Marine Fisheries Advisory Commission proposed a suite of regulatory revisions to the management of the Commonwealth's commercial striped bass fishery. Most of the proposals were developed to improve the performance and administration of the commercial fishery given recent resource distribution patterns. One item, a commercial tagging program, was in response to an interstate plan requirement of every Atlantic coast state with a commercial striped bass fishery. As anticipated, these proposals garnered a lot of public comment, some of which significantly shaped the final measures being implemented. The following regulation changes are in effect starting in the 2014 season.

The number of open fishing days has been reduced from four to two days to assist with market glut, ex-vessel value, and season length. Based on public input, Mondays and Thursdays were selected as the new open fishing days in order to accommodate supply to both out-of-state and local markets. Notably, Sunday was eliminated as an open commercial day to reduce user conflict, primarily between recreational and commercial harvesters. While the number of fishing days per week was reduced, the number of open days per season may stay the same or even increase given other rule changes, such as the lowering of the daily possession limits.

Like the number of weekly fishing days, the commercial bag limits were also reduced to improve market conditions and extend the season. In addition, two different daily limits were applied to harvesters based on the type of commercial fishing permit held. A 15-fish limit was set for fishermen issued a Commercial Lobster or Boat Permit endorsed for striped bass, whereas a 2-fish limit was set for fishermen issued a Commercial Individual or Rod & Reel Permit endorsed for striped bass. The reduction from prior years' 30-fish limit may discourage long-distance travel to the Chatham bass aggregation, alleviating vessel congestion and diffusing the repeated site-specific heavy fishing effort that has implications for the stock's health.

The lower limit for non-boat permits aims to accommodate the occasional catch with intent to sell that occurs from shore, while also discouraging the illegal practice of fishermen selling an overage of the possession limit by attributing the excess harvest to a second permit. To further combat this illegal activity, dealers are now prohibited from purchasing more than one daily limit from a commercial fisherman regardless of the number of commercial Striped Bass Permit Endorsements in the fisherman's possession. Both the 15 and 2-fish limits apply to the permit holder regardless of the number of Striped Bass Permit Endorsements held or trips taken in a day. The 15-fish limit also applies to the vessel regardless of the number of Striped Bass Permit Endorsement holders onboard or trips taken in a day.

The season start date was moved forward from July 12 to June 23 based on industry interest to provide fish to the busy 4th of July market, as well as increase access to the resource in more areas of the coast (that is, start the fishery before the Chatham aggregation forms). With reductions to both the number of open days per week and the daily limits, it is not expected that the earlier opening date will curtail the season's end date (recent closures have been in early August). Rather, it is hoped that this suite of options will extend the season later into the summer, benefiting both harvesters with better prices and consumers with better availability of local, fresh seafood.

A control date of September 8, 2013 was also implemented by which future access levels in the fishery may be determined. Any person issued a new Striped Bass Permit Endorsement after the control date may be restricted from participating in this fishery or may be subject to different eligibility criteria than those persons who did hold a Striped Bass Permit Endorsement on the control date. Several previous control dates applied to the commercial striped bass fishery in the early 2000s, but these were never used to condition participation in the fishery and have since expired. Another control date of March 6, 2008 applies to all other commercial hook and line fisheries. One more date to remember is the Striped Bass Permit Endorsement application and renewal date, which is now the last day of February beginning in 2015 (moved up from March 15 this year so as to align with other permit renewal deadlines).

The rules by which for-hire vessels may sell striped bass caught during for-hire trips have also been adjusted. A for-hire

vessel on a for-hire trip must now abide by all recreational rules for striped bass (i.e., no more than 2 fish per person, 28" minimum size), but could sell part of the striped bass catch if unwanted by the patrons at the end of the trip, provided the commercial rules are also met (the for-hire vessel is also properly permitted for commercial bass sales, 34" minimum size met, it's an open commercial day, no more than 15 fish sold per day, etc.). This differs from past years in which a for-hire vessel with a commercial permit endorsed for striped bass could take a for-hire trip and fish under the commercial rules for striped bass (30 fish in prior years at 34" minimum), patrons could leave with up to two fish each, and the for-hire captain could sell the remaining fish. This change will improve data collection on both recreational and commercial harvest. Fish kept by the patrons will be accounted for by MRIP, the recreational fishing survey, while the sold fish will be reported on commercial trip-level reporting forms. *MarineFisheries* will be considering whether to extend to other species this special allowance for the sale of striped bass caught during for-hire trips.

Lastly, a dealer (or point-of-sale) tagging program now requires all primary buyers of striped bass to affix a valid *MarineFisheries*-issued Striped Bass ID Tag to each striped bass at the place of primary purchase and prior to transit. The tags must remain affixed to whole striped bass until the fish are processed into fillets; thereafter, the tags must accompany the fillets while in possession for re-sale. Tags are to remain on the premises of retail seafood dealers or food establishments until all portions are sold, at which point the tags must be cut into two pieces and discarded. Primary buyers are subject to tag accountability measures following the close of the commercial striped bass season. It is unlawful for any individual to possess whole or portions of striped bass for the purpose of re-sale without the fish being tagged in accordance with these provisions. The objective of the coastwide tagging program is to increase accountability in the supply chain and give law enforcement a greater ability to detect poaching. *MarineFisheries* will be working closely with primary buyers of striped bass to achieve as smooth an implementation as possible of this new requirement.

By Nichola Meserve, Fisheries Policy Analyst

Photo courtesy of Atlantic Coast Seafood

A striped bass tagged by a dealer after purchase from a commercial fisherman.

Groundfish Economic Assistance Update

Stability continues to elude the New England groundfish fishery. The advent of catch share management was to have seen improved business planning and profitability for fishermen. Instead, the rebuilding trajectory plummeted and a federal fishery disaster was declared for the 2013 Fishing Year (May 1, 2013 – April 30, 2014). Our understanding of the forces behind the poor status of many groundfish stocks is emerging, but meanwhile the disaster's economic and social impacts on fishermen and fishing communities plainly have arisen. The Commonwealth, attempting to address these negative impacts, is engaging at the New England Fishery Management Council on measures like Amendment 18 which seeks to address fleet diversity. But perhaps the most effective responses, in the short-term, have been the development of programs to provide direct financial assistance to impacted groundfishermen. *MarineFisheries* is currently crafting strategies for disbursing $8.2-million in federal disaster assistance funds. The Commonwealth also continues to perfect its pilot Revolving Loan Fund program, which has expanded to additional communities in the Commonwealth.

Federal Disaster Aid – Spending strategies for state program under development

The Federal Disaster Aid Grant Program stems from a $32.8-million Congressional relief package to address impacts from the Fishing Year 2013 quota cuts that formed the basis for the disaster declaration. A consensus framework developed by the states from Maine to New York and NOAA Fisheries apportioned the larger pot of funds into three roughly equivalent spending bins: (1) direct aid to active federal groundfish permit holders, (2) individual state programs to address specific impacts to their groundfish fisheries, and (3) development of a buyout/buyback program. Excluding the $11-million set-aside for regional consideration of a future vessel buyout/buyback, the Commonwealth of Massachusetts will receive $14.5-million: $6.3-million in direct subsidies to pre-identified active commercial groundfishermen and $8.2-million for consideration of additional assistance strategies in a state program.

Prior to submitting a formal grant proposal to NOAA Fisheries for the $8.2-million, the Division solicited input from fishermen and community interests on potential uses of these funds. Initial spending options for the state program, developed with the assistance of an Industry-based Working Group, include: (1) direct aid to commercial groundfishermen excluded from initial federal aid and for-hire fishermen; (2) crew direct aid & training; (3) cooperative research; (4) local seafood marketing; and (5) shoreside industry direct aid and grants/loans.

Lending Sources - Revolving Loan Fund expands to rest of Commonwealth and deadline approaches for SBA loans

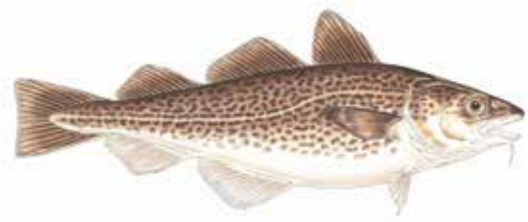
During first, the transition to catch shares and now, the rebuilding of key groundfish stocks fishermen have grown increasingly wary of acquiring additional debt. A joint *MarineFisheries*/NOAA Fisheries analysis showed fewer vessels breaking even during the transitional year to sectors (FY2010). Leasing in quota has become a heavy cost for most fishermen. The Massachusetts Commercial Fishery Revolving Loan Fund (RLF) is meant to provide a relief valve for some fishermen. To date, no loans have been taken out to purchase quota but low interest loans for vessel repairs and gear purchases along with debt refinancing have drawn interest. The pilot program, begun on the Cape & Islands under the Community Development Partnership, has

recently expanded operations to the North Shore under operation of the Cape Ann Commercial Fishermen's Loan Fund and on the South Shore and Metro Boston Area through the Tremont Credit Union. Further information on how to apply is available on the *MarineFisheries* website at ***http://www.mass.gov/eea/agencies/dfg/dmf/programs-and-projects/commercial-fisheries-revolving-loan-fund.html.***

An additional opportunity for working capital loans through the Small Business Administration (SBA) will soon expire. These Economic Injury Disaster Loans were made available to small Businesses in November 2013 when the SBA approved Governor Patrick's request for an economic injury disaster declaration. That declaration made available subsidized loans to Massachusetts fishermen and fishing-related businesses during the disaster period. Eligible applicants can still qualify for loans up to $2 million, but the filing deadline is August 1, 2014. Further information on this program is available on our website at: ***http://www.mass.gov/eea/agencies/dfg/dmf/marine-fisheries-notices/sba-loans-for-fishermen.html***.

Moving forward, the Division is engaged on several other fronts aimed at providing stability to fishermen in general and the groundfish fishery in particular. Magnuson-Stevens Act (MSA) Reauthorization efforts, implementation of Amendment 18, and buyout/buyback discussions should give greater consideration and weight to socioeconomic impacts. Stability, so desired by managers, scientists and fishermen alike, should ensue – but not without some insightful and dedicated effort by all.

By Melanie Griffin, Fishery Policy Analyst and RLF Program Manager



$1.5M in federal funds awarded for fishery research and development projects in Massachusetts

Earlier this year, NOAA Fisheries announced that five proposals for cooperative research projects in Massachusetts were expected to be awarded over $1.5 million through a competitive grants program. One of these five projects will study Atlantic cod spawning behavior off the South Shore of Massachusetts using fish tagging technologies. The co-investigators of this project, The Nature Conservancy and *MarineFisheries*, in cooperation with commercial fishermen, aim to decode the timing, location, scale, and nature of cod reproductive activity within an area that local fishermen have identified as an important spawning habitat possibly in need of further protection. This work follows up on past tagging studies by *MarineFisheries* to identify discrete cod spawning areas in inshore waters north of the current research area.

The $1.5 million for research in Massachusetts is part of over $10 million awarded nationally for 40 studies, 14 of which are centered in New England with over $4 million in support. Funding for these projects comes from NOAA Fisheries' Saltonstall-Kennedy Grant Program, which provides financial assistance for research and development projects that benefit the U.S. fishing industry. The sum of federal funds available through this competitive grants program for FY13 was a welcome increase from recent years; in some years the program was cancelled altogether due to insufficient funding.

This decay of funding disappointed those familiar with the history of the Saltonstall-Kennedy Act – sponsored 60 years ago by Massachusetts senators John F. Kennedy and Leverett Saltonstall. When President Eisenhower signed this Act into law in 1954, he established a fund – known as the S-K Fund – meant to provide consistent monetary support for fisheries research and development. With funds derived from a permanent 30% appropriation of fishery import duties, no less than 60% of S-K dollars were to be used to make direct industry assistance grants for developing U.S. fisheries and expanding domestic and foreign markets for U.S. fishery products. However, a 2004 report by the Congressional Research Service (a legislative branch agency within the Library of Congress) identified a gradual, multi-decadal shift in the use of S-K Funds from funding the cooperative grants to subsidizing NOAA Fisheries' operational costs.

Former Senators John Kerry (MA) and Olympia Snow (ME) introduced a bill in 2012 to restore the use of S-K Funds to fishermen for fisheries research and development. Amidst a general economic downturn for groundfish, direct industry assistance grants would be a major boost, particularly if a number of reintroduced grants succeeded in developing new fishery jobs and expanding markets for U.S. fishery products.

While this bill did not become law, we hope this year's rededication of S-K Funds is a harbinger of additional increases in funds for cooperative fisheries research in Massachusetts and the nation through the Saltonstall-Kennedy Grant Program. Our fishermen, many of whom face growing challenges to remain in their industry, stand to gain both in the short-term (receiving compensation for providing the research platform or other assistance in studies) and the long-term (as project results improve management, stock health, and/or markets).

By Paul Diodati, Director

DMF Staff Photo

Biologist Bill Hoffman (left) and Assistant Director Dr. Mike Armstrong releasing a tagged cod.

DMF Staff Photo

Despite being in the area since the early 1800s, green crabs are an invasive species.

Increase in numbers of the invasive green crabs

Over the past two years, the invasive green crab (*Carcinus maenas*) has increased dramatically along the coast of Maine. This has garnered much attention from shellfish fishermen, marine biologists, coastal resource managers, and the public who are concerned about the ecological repercussions of this destructive non-native species on valuable shellfish resources and sensitive marsh habitats. Along the Maine coast, green crabs have been implicated in eelgrass die offs, salt marsh destabilization, and decreased softshell clam (*Mya arenaria*) and blue mussel (*Mytilus edulis*) landings. Some sources suggest green crab numbers are beginning to rise in Massachusetts coastal waters as well, posing a potential threat to our coastal fishery resources.

Despite their presence here now, green crabs are actually native to Europe and northern Africa. Transport by human activities – primarily through ballast water in ships – and the crab's tolerance for highly variable estuarine conditions has allowed this species to become a global invader. Adults are able to survive in water temperatures from 32°F to greater than 95°F and a wide range of salinities – from four to 52 parts per thousand. They can also tolerate very low oxygen conditions and remain out of the water for several days at a time.

In New England, green crabs were first found in 1817 in Woods Hole, Massachusetts. Since then, this once exotic species has become a familiar sight in the coastal landscape, particularly during periods of rapid proliferation. Like other decapod crustaceans, such as lobster, warm temperatures permit larvae to develop and settle earlier and for juveniles to reach sexual maturity faster. Periods of warmer water temperatures in the 1930s, 1950s, and 1970s were associated with an increased presence of green crabs, resulting in impacts to shellfish and eelgrass. In between these years, long cold winters tended to keep the population at bay. Recent warming ocean temperatures have provided ideal conditions for green crab populations to increase once again. In fact, in 2012, coastal water temperatures were on par with those observed in the 1950s, supporting the observed rebound.

Recent genetic work has indicated that the outbreak of green crabs in Maine may be due, in part, to another factor. Some green crabs in eastern Maine show the genotype of the original strain first found in Massachusetts, while others bear the signature of a strain later introduced in eastern Canada. The native ranges of these genotypes vary, with the earlier arrival from the mild climates in southern Europe and the later arrival from colder Scandinavia. While there has been much speculation of the Canadian genotype being more cold tolerant – as well as aggressive and destructive – it seems there is little research to support these claims. Absent are studies comparing larval survival, juvenile and/or adult competitive ability, or thermal tolerances of the genotypes.

At this time, the northern strain is reported to be found as far south as Mount Desert Island, Maine. If genetic differences prove influential, impacts in Massachusetts could be realized as green crab larvae travel. Larvae are released on out-going tides after an incubation period of several months on a female's abdomen. They follow coastal currents for up to two to three months before settling in shallow habitat. The combination of this long pelagic stage and the southward-flowing Gulf of Maine coastal current may distribute this newer genotype further south.

Regardless of whether genetics present an additional factor of concern, green crabs appear to have become more prevalent in Maine as result of recent increases in ocean temperature. Unfortunately, the population in New England has not been monitored since the 1970s, so how the current status relates to historic levels is unclear. Trapping work by Salem State University in 2013 indicates that the population density in Massachusetts (Salem Sound) is lower than in Maine and New Hampshire by at least an order of magnitude. Consistent with this, it appears that the effects in Massachusetts have not been as extensive or as damaging as those witnessed in Maine.

Observed changes in Massachusetts have included a rise in green crab landings, coincident with a drop in commercial shellfish landings. Dealer records indicate that softshell clam landings declined statewide by 33% from 2006 to 2013. While there was a slight rebound in many areas of the state in 2012, landings from the North Shore, where more than half of the state's softshell clam harvest occurs, remained depressed. Although the cause of the loss may be due to multiple factors (such as over-harvest, disease, or natural shifts in juvenile recruitment), depredation by green crabs is also implicated. Juvenile softshell clams and blue mussels are preferred food items for green crabs. The exclusion of crabs typically results in greater survival and larger sets of these shellfish. With Massachusetts softshell clam and mussel fisheries valued at roughly $4.6 million and $1.4 million respectively, the threat of green crabs on shellfish resources is recognized.

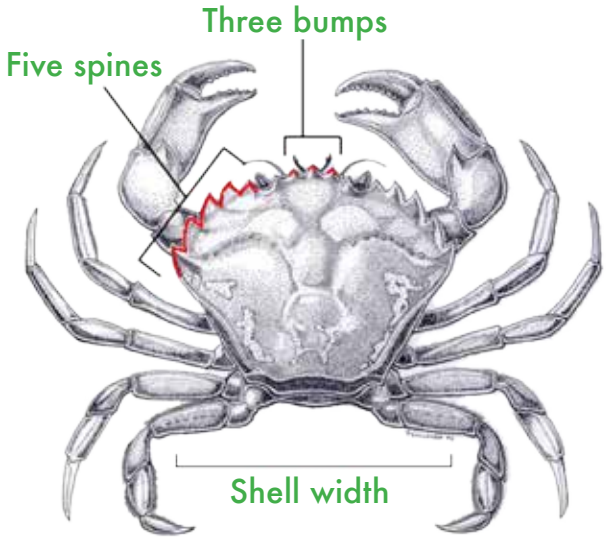


Image: T. Sullivan, "Look out for invasive European green crab"

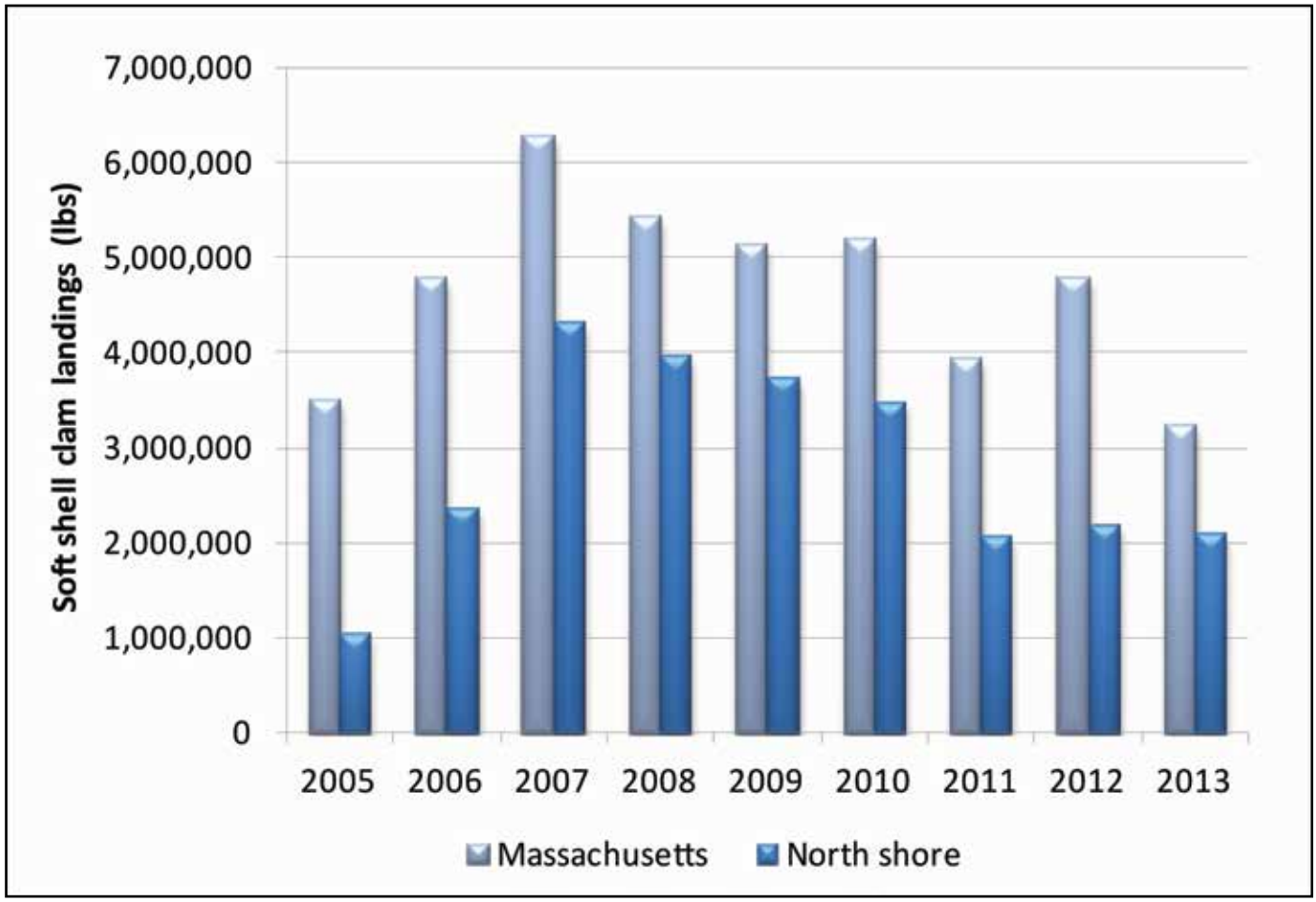
Green crabs are best identified by the five lateral spines along the front end of the carapace (shell) on either side of the eyes. They have three bumps between the eyes and the carapace width is usually no larger than 3.5 inches.

Green crabs have been observed during scientific eelgrass and lobster dive surveys, where their presence has been noted qualitatively over the years. Green crabs have routinely been a nuisance during eelgrass restoration efforts, as they damage transplants by cutting off the shoots. Anecdotally, observations of green crab "swarms" in Plum Island Sound are thought to have contributed to an unsuccessful restoration by the MassBays program in 2013. In Salem Sound, *MarineFisheries* transplanted eelgrass in 2010 which grew from 2011-2012, and then disappeared in 2013. At this time, salt marsh slumping was noted in the area along with increased presence of green crabs. As a result, there is emerging interest in defining the density at which green crabs are detrimental to the nearshore environment, particularly with emphasis on improving the success of restoration efforts.

To prevent and mitigate impacts on fragile eelgrass beds, salt marsh habitats, and shellfish stocks, *MarineFisheries* supports individual and community-based efforts to reduce the green crab population. Trapping has been shown to be an effective and rapid means of removal, capable of reducing high densities of green crabs to levels which allow native clams and eelgrass to rebound. Trapping also decreases the mean size of crabs, causing them to become prey rather than predator in the estuarine system. For this type of effort to be successful, it needs to be both intense (high density of traps over large area) and recurring (over multiple years) which can be difficult to sustain.

Local interest in trapping green crabs is on the rise. While some of this activity occurs to promote more successful commercial shellfish sets and promote eelgrass and salt marsh restoration and growth, harvest occurs more commonly to sell or use the crabs as bait. The number of harvesters authorized to trap green crabs in Massachusetts more than tripled from 2011 to 2013. In 2013, Massachusetts dealers reported that 186,646 pounds of green crab were landed with a value of $66,648. Most of the catch was sold as bait to commercial pot fishermen who harvest channeled whelk (conch) and to baitshops who provide bait for hook and line anglers targeting tautog. Demand for green crabs is reportedly increasing, in part, due to limited availability and high cost of other baits including horseshoe crab.

In anticipation of a greater number of traps being deployed in Massachusetts nearshore waters to catch green crabs, *MarineFisheries* has clarified the rules under which this activity can be conducted. As in the past, a Letter of Authorization (LOA) must first be requested and received from the Director of *MarineFisheries*. Following receipt of the LOA, green crab trappers may set gear from April 1 to November 15 in waters less than 30 feet deep at mean low water (where most green crabs are typically found). Commercial harvesters are allowed to set up to 60 traps and recreational harvesters are allowed up to 15 traps. There are no limits on size or numbers of green crabs that may be landed. Those intending to sell green crabs must have a commercial permit, sell to a permitted Massachusetts seafood dealer, and report all green crab transactions on a monthly trip-level report. If intending to sell the crabs to other fishermen, individuals must hold a Massachusetts Bait Dealer Permit and comply with all reporting requirements. Those who are not commercially-permitted and catch crabs for personal use must submit an effort/catch report in order to renew the LOA annually.



DMF Staff Graphic

Massachusetts dealer-reported landings of soft shell clams from 2005-2013, statewide (light) and for the north shore region of Massachusetts (dark).

DMF Staff Photo

Recreational anglers use green crab as bait for targeting species such as tautog.

MarineFisheries will continue to engage with community officials, scientists, and harvesters to assess the green crab threat and to preempt potential ecological impacts. We will work to evaluate the effectiveness of green crab trapping efforts, as well as promote the use of locally-sourced green crabs in bait markets and as a potential human food product. Citizens observing dense aggregations of green crabs, slumping or crumbling of salt marsh banks associated with green crab burrows, or other significant changes to estuarine or marine habitats are encouraged to contact *MarineFisheries*.

By Kelly Whitmore, Derek Perry, and Bob Glenn, Aquatic Biologists

Commission on Seafood Marketing Report Leads to Bill for Permanent Marketing Program

A special commission founded and tasked by the Legislature to investigate the merits of developing a marketing program for seafood caught in the Commonwealth finalized its recommendations last year. With examples of successful seafood marketing program in other states, it's no surprise that this commission, representing a wide-variety of commercial fishing industry interests, recommended the establishment of a permanent state seafood marketing program.

Specifically, the special commission recommended the development of a marketing program for wild-caught seafood landed in Massachusetts, supported by a directed fund, led by an industry steering committee, and hosted and staffed within the Massachusetts Executive Office of Energy and Environmental Affairs. Strategic planning and selection of programmatic elements, including a branding logo, would be left to the decision of the program's steering committee.

In response, late last year, State Senator Bruce Tarr introduced Senate Bill 1979, "An Act establishing a Massachusetts Seafood Marketing Program." This bill continues to work its way through the legislative process. If the state seafood marketing program comes to be, DMF News will cover it.

by Nichola Meserve, Fisheries Policy Analyst

Ocean Planning: State, Regional, and National

Five-year Update of the Massachusetts Ocean Plan

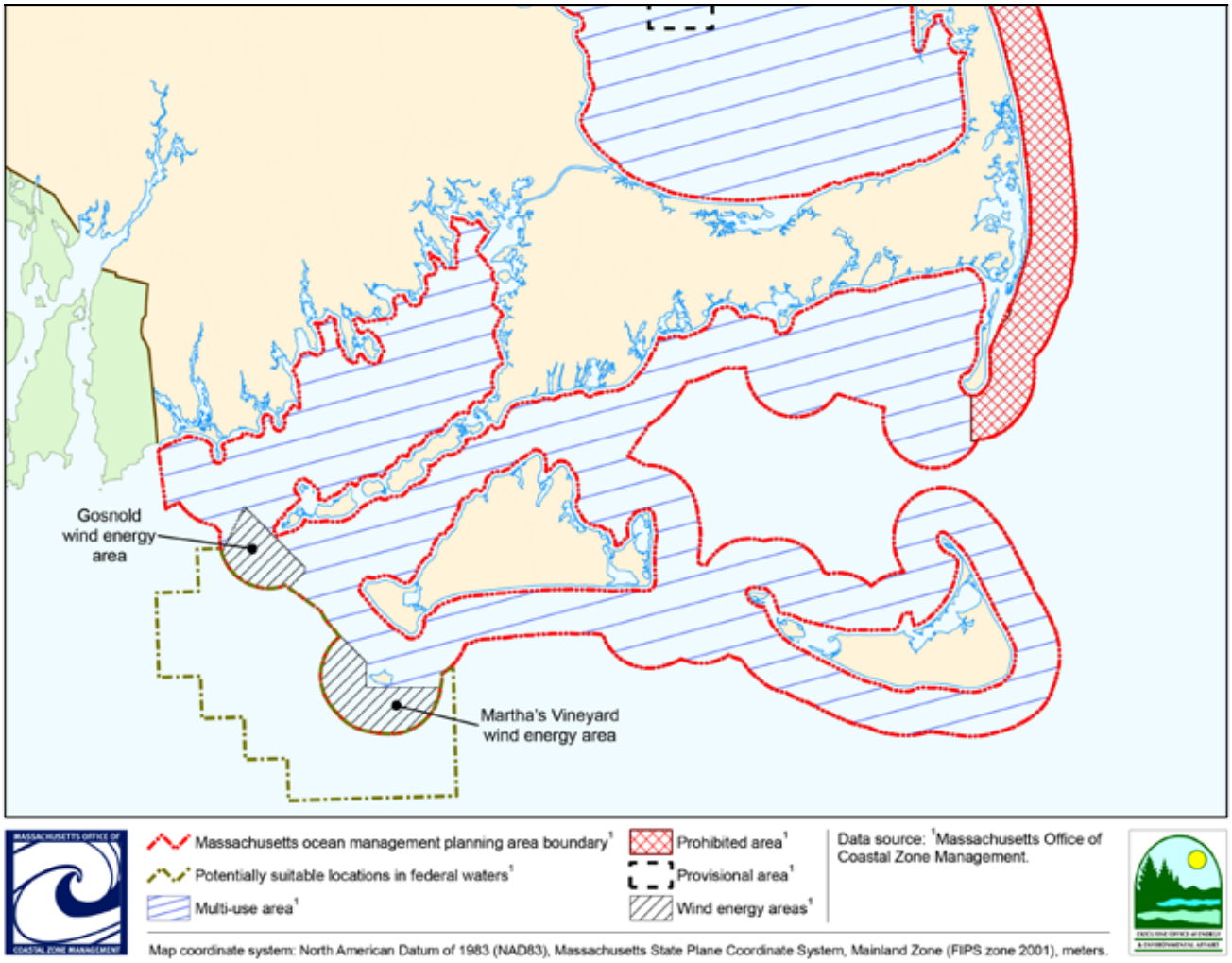
Massachusetts has a well-established fishing tradition, and fishermen know better than most that there is increased competition for ocean space with other societal needs including municipal sewer outfalls, offshore sand mining, electric cables, natural gas pipelines, disposal of dredge material, and wind farms. The first offshore wind farm proposal in the country, Cape Wind, was put forth for waters within view of the Massachusetts coast in 2001. The proposed project highlighted the need for Massachusetts to define priorities with respect to using and protecting ocean resources.

This was precisely the goal of the Massachusetts Ocean Act, enacted in 2008. The Act required that the state develop an Ocean Plan, an Ocean Planning Commission (OPC), and a Science Advisory Council (SAC). *MarineFisheries* is a member of both the OPC and the SAC. The planning area is in state waters, with a landward limit defined by a line 0.3 nautical miles seaward of mean high water. The Act identified principles that the Ocean Plan must address. Importantly, it delineated that all commercial and recreational fishing activities would continue to be managed by *MarineFisheries*. Six working groups were assembled to develop maps for 11 special, sensitive, and unique (SSU) estuarine and marine habitats and four existing uses (commercial and recreational fishing and concentrated commercial and recreational fishing traffic). These maps, along with other mapped uses such as navigation channels, were used to identify sites for commercial scale wind energy. Performance criteria for sand extraction, cables, and pipelines were also established. For example, cables are prohibited from hard/complex seafloor. The Act required a review of the plan every five years. Therefore, the Ocean Plan that was promulgated in 2009 is being reviewed this year.

The six workgroups have since reassembled to update the maps. Several public meetings have been held to review the results and discuss plan modifications. The state is interested in determining potential sand mining sites in the future. Another update will be the siting of transmission corridor(s) from the Wind Energy Areas designated by the Bureau of Ocean Energy Management in federal waters. A siting assessment has been drafted and is currently under review. Another change being discussed is creating performance criteria for new aquaculture sites in the planning area; this was proposed by the fisheries workgroup. All of the workgroup reports are available at: ***www.mass.gov/eea/waste-mgnt-recycling/coasts-and-oceans/mass-ocean-plan/.*** All of the maps in the Ocean Plan are available through an online viewer at: ***maps.massgis.state.ma.us/map_ol/mass_ocean_plan.php***. Email ***kathryn.ford@state.ma.us*** for more information. The draft update will be available for public review. To receive ocean plan related updates and news, contact SeaPlan or New England Ocean Action Network.

Regional and National Ocean Planning Activities

Despite many efforts at improvement over the past 40 years, the water quality and aquatic resources of the nation's 200,000 square miles of ocean are degraded. The Interagency Ocean Policy Task Force, formed by President Obama in 2009, has reviewed the current status of national ocean policy and provided recommendations for improving management of aquatic resources. Recommendations from the Task Force resulted in Executive Order 13547 in 2010, which lays out the National Ocean Policy and supports the development of regional coastal



Wind energy areas are located southwest of Buzzards Bay and Martha's Vineyard.

and marine spatial plans to protect ocean health and preserve sustainable uses of the ocean. The Order also created the National Ocean Council (NOC) with officials from 27 federal agencies, which is charged with implementing the National Ocean Policy.

The NOC drafted an Implementation Plan to identify the many ways federal agencies can further the principles of the National Ocean Policy. Both the Executive Order and the Implementation Plan support the development of non-regulatory, voluntary Regional Planning Bodies (RPBs).The RPBs include representatives of states, fishery management councils, federal agencies, and tribes within the region. The primary purpose of each RPB is to create a regional ocean plan that identifies the priority science, information, and ocean management issues of the region to ensure that federal actions support and advance regional objectives in addition to national.

The Northeast Regional Planning Body (NERPB) was the first in the nation to organize. The Director of *MarineFisheries* is among its Massachusetts representatives. Thus far, the NERPB has held five meetings in which a charter was created and goals were defined. The next meeting is planned for November 2014. The draft Mass Ocean Plan update will be coming out in the next couple of months. The ***http://www.northeastoceandata.org/*** website has many great resources for maps of fish distributions and fishing activities. Many studies are currently underway to further refine these maps; there are currently several opportunities to participate in the interpretation of the data. Related to ocean planning are activities connected with the wind farms. For more information, please see our next newsletter.

Within the New England region are several coordinating bodies with various mandates. The Northeast Regional Ocean Council (NROC) was established in 2005 and is more oriented toward the regulatory community; it creates and interprets data relevant to marine spatial planning. The Gulf of Maine Council on the Marine Environment (GOMC) is a bi-national council, established in 1989, with the mission to maintain and enhance marine environmental quality in the Gulf of Maine and to allow for sustainable resource use. Unlike NROC, the GOMC's interests encompass Canadian waters, including the Bay of Fundy. The Northeast Regional Association of Coastal and Ocean Observing Systems was established in 2008 and assists in coordinating the collection and dissemination of data with regional oceanographic significance. There are also academic coordinating bodies such as Seagrant Northeast, the Regional Association for Research on the Gulf of Maine, and the Northeast Academic Consortium that support ocean research and outreach activities throughout the region. The New England Ocean Action Network communicates with its members regarding NERPB activities. SeaPlan is a non-profit organization that provides financial support, conducts research relevant to, and helps communicate ocean planning activities. Many of these organizations collaborate on shared interests defined by memoranda of understanding.

By Dr. Kathryn Ford, Habitat Program Manager

2014 Update on Spring Fish Runs: Some herring runs clearly on the rebound

With nearly 100 fish runs in the Commonwealth, most coastal communities have at least one river herring run of their own. This spring's runs were certainly not early, as in some recent years, given the cold weather pattern of late winter. After a delay of a week or more, most runs were active by late April. The emerging trend of rising run counts which began in moderation in 2010-2011, and more sharply in 2012, continued in 2014 at many rivers.

This pattern, which followed a decade of historic lows, is encouraging to the many local authorities and volunteer groups that continued conservation efforts when the counts were low. The decline was likely driven by a combination of environmental factors (such as low precipitation and habitat degradation) and mortality (coastal harvest for bait, ocean bycatch, and increasing natural predation). We have seen the benefits from the now nine-year harvest ban, cooperative efforts to reduce ocean bycatch mortality, and dedicated local efforts to maintain these ancient migrants that connect the ocean to our ponds.

The improvements seen during 2012-2014 have not affected all herring runs. In fact, many small runs have shown limited responses. And relatively few have been strong during each of these three years. Presented here are just a few of the many regional examples of the rivers that are giving hope for sustainable herring runs in the future:

Currently, the Nemasket River in Middleboro and Lakeville hosts the largest river herring run in the Commonwealth. This tributary to the Taunton River has shown encouraging improvements in recent years. A volunteer visual count, organized by the Middleboro-Lakeville Herring Commission since 1996, had a series low of about 250,000 herring in both 2004 and 2005.The counts have gone up most years since then, exceeding 500,000 in 2012 and reaching almost 900,000 in 2013. *MarineFisheries* installed a video monitoring station in the Nemasket River in 2013 to augment the count. The video count data have not been processed to date, but monitoring observations point to a third consecutive strong run in the Nemasket River.

Stony Brook in Brewster has one of the Commonwealth's best known runs, due to a scenic and historic setting that attracts many viewers each spring. The Stony Brook run is a good example of a fish run that previously was at very low levels relative to historic accounts, but has shown sharp improvements since 2012. A volunteer visual count, organized by the Association for the Preservation of Cape Cod since 2007, had low counts in the range of 20,000 to 70,000 herring, until 2013 when over 150,000 herring were estimated. This year's count is not final, but it is well ahead of 2013, for a second year of strong improvements.

The Mattapoisett River in Mattapoisett and Rochester had its largest run in over 10 years with about 55,000 herring this spring. This run plummeted to less than 10,000 herring in 2004 and stayed around this low level for eight years. After modest improvements in 2012 and 2013, the number of fish doubled this year, providing much encouragement for this historically large and important run. This count is provided by an electronic

DMF Staff Photo

River herring and other anadromous species run up river for spawning every spring.

Herring Run Monitoring *MarineFisheries* has been ramping up its efforts to monitor river herring runs in recent years. We now maintain nine river stations for counting river herring, seven stations for biological sampling, and provide technical assistance to several other run counts led by local groups. We began an initiative in 2013 to use video technology and switch from single-tube electronic counters to more accurate multi-tube counters. This spring, new video stations were established at the Parker River in Newbury and Herring River in Harwich, and a new electronic counter station was started in the Essex River, Essex. These stations provide population data in the form of abundance indices and metrics on age structure, mortality, and survival. This information is essential to manage these unique fish runs and will become the basis of the sustainable fishery plans needed to reopen run harvest under the interstate management plan for river herring.

Passage and Habitat Restoration Spring is typically a period of intensive run monitoring and fish passage maintenance for *MarineFisheries*' diadromous fish team. Fishway construction is usually done during the lower flows of the summer. However, this spring proved busier than most with the fabrication and installation of two new eel ramps and three replacement fish ladders. Eel ramps were added to the Morey's Street Dam in Taunton's Mill River, and Silver Spring at the MA Audubon Sanctuary in Wellfleet. Both sites found eels in the collection tanks soon after the pumps were activated, a response that thrills our local partners and presumably the many freshwater fish that feed on the newcomers from the ocean. Custom wood fish ladders replaced degraded or failing ladders at Tom Matthews Pond in Yarmouth, Mill Pond in West Tisbury, and Herring Brook in Pembroke. In each case, the projects were conducted in close cooperation with the towns and were completed in time to meet all or most of the spring migration.

counter station maintained by the volunteer group, Alewives Anonymous.

Lastly, the Back River in Weymouth has one of the largest herring runs in Massachusetts Bay. The setting is an urban watershed where several large fishways are needed to carry herring over historic dams and flood control structures to the spawning and nursery habitat of Whitman's Pond. This traditionally large alewife run, managed and monitored by the Town of Weymouth herring wardens, dipped below 200,000 fish during much of the 2000s, but has risen steadily during 2012 to 2014. At 455,000 fish, this year's run is the strongest in over a decade.

MarineFisheries conducts an annual fyke net project that monitors the spawning runs of rainbow smelt as they ascend coastal rivers soon after ice-out. Smelt are popular for their fine taste and as a fall and winter sportfish that can be caught when most other fisheries have ended with the cold weather. The fyke nets provide population data on smelt and have documented the presence of 10 species of diadromous fish in our coastal rivers. There is growing concern for smelt as their populations have disappeared from southern New England locations and declined sharply in Massachusetts in recent decades. Unfortunately, the results of the 2014 fyke net monitoring are going in the opposite direction from river herring. After a poor year for catches at the six fyke net stations in 2013, the catches for this year were the lowest for the 10 year time series for four of the six stations. Only the Fore River in Braintree had near average catches with some representation from older year classes.

MarineFisheries monitors recruitment of glass eels, also referred to as young-of-the-year or elvers, at two eel trap locations which contribute to the coastwide stock assessment of eels. In addition, counts are taken at several eel passageway locations in cooperation with local partners. In its 15th year of operation, the Jones River in Kingston has the longest running eel monitoring station. This eel trap is one of only three stations in New England accepted as a glass eel index of abundance by the Atlantic States Marine Fisheries Commission. The glass eel catches at the Jones River have trended low in recent years and the 2014 catch was again below average. This pattern was repeated at the other eel traps and passage count stations, with only the Wankinco River in Wareham having a catch near the time series' high.

The spring migration of glass eels unfortunately goes hand-in-hand with a high level of illegal harvest as these fish enter Massachusetts coastal rivers. Like all East Coast States, with the exception of Maine and South Carolina, Massachusetts has a ban on the harvest of glass eels. But a sharp increase in prices paid for glass eels, peaking at over $2,000 per pound in 2012, has led to a surge in poaching. (See DMF News, 2013 3rd & 4th Quarter Edition for more information). Despite prices declining to under $1,000 per pound in 2014, observations by *MarineFisheries* staff and enforcement activities of MA Environmental Police indicate that poaching was again occuring in Massachusetts this spring. The Atlantic States Marine Fisheries Commission is currently considering a suite of management options for glass eels, ranging from a moratorium on glass eel fisheries to opportunities to open glass eel fisheries in states where they are currently prohibited. Public hearings occurred coastwide in June and early July, with the Commission expected to vote on final measures in August.

The monitoring of river herring, smelt, and eel is a core mission of our diadromous fish projects and will continue next year when these fish make their dramatic and obligatory runs up our coastal rivers.

By Brad Chase, Aquatic Biologist

Protecting endangered whales: federal rules enacted to reduce vertical line entanglements

Humpback, North Atlantic right, fin, and minke whales seasonally venture into and through Massachusetts waters. While an attraction for sightseers and nature enthusiasts, these large whales represent a burden to commercial fixed-gear fishermen due to the implementation of federal restrictions to reduce the whales' susceptibility to entanglements with their fishing gear. Commercial pot/trap fishermen have been particularly impacted, and now face additional plans to reduce whale entanglements with this gear group.

These restrictions are established by way of the Large Whale Take Reduction Plan. First created by NOAA Fisheries in 1996, the Plan has undergone many changes as the Large Whale Take Reduction Team (convened by NOAA) responds to continued serious injuries and mortalities of large whales caused by fishing gear entanglements. The most substantial rule change accomplished until now was the prohibition on floating groundline in 2007. By mandating the use of sinking groundline, arcs created by buoyant ropes connecting traps were replaced by ropes that rest on the ocean floor, preventing entanglements with whales swimming in the water column.

This past June, additional federal rules were announced that will affect all commercial trap fishing in the Commonwealth and adjacent federal waters. The three most notable rules affecting Massachusetts commercial fishermen will be: enhanced buoy line marking, restrictions on setting single traps, and an area/season closure in waters around Cape Cod. (Please note that these NOAA Fisheries rules do not affect recreational lobster fishing.)

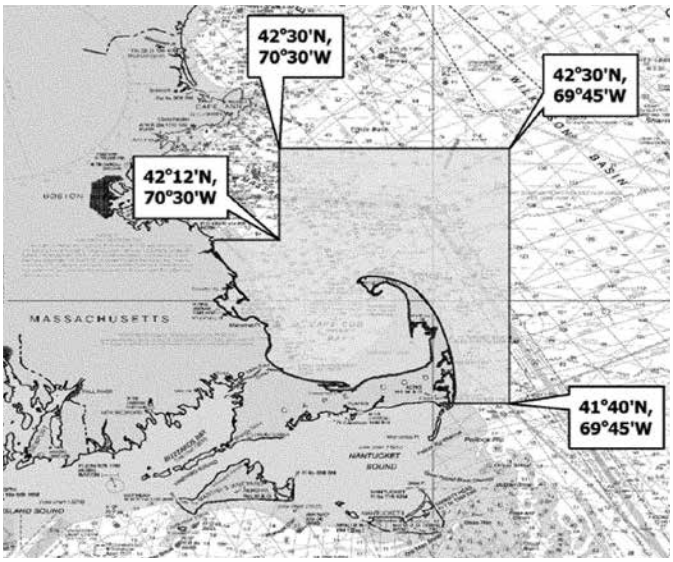
Buoy Line Marking (effective June 1, 2015). Although entanglements have continued to occur since the onset of the plan, much of the gear cannot be identified because it is too often rope or net fragments carried for months or years by the whales. To allow gear experts to better identify the origin of entangling rope on a whale, fishermen will be required to mark each buoy line with a 12 inch long colored marker on the top, midpoint, and bottom of the buoy line. Previous rules required inshore lobstermen use a single 4 inch red mark on the line.

Single Trap Restriction (effective June 1, 2015). To reduce the number of buoy lines in the water column in New England waters, the rules will restrict the use of single trap and single buoy line configurations, thereby requiring lobster traps and other pots be fished in trawls – multiple traps strung together. The number of traps required per trawl is based on area fished and distance from shore. This part of the plan attempts to restrict vertical lines in times and places that endangered whales (especially right whales) and fishing gears co-occur due to the lack of definitive information on the origin of past entangling gears.

Season/Area Closure (effective January 1, 2015). All trap and pot gear will be prohibited in an area of Cape Cod during a 4-month seasonal closure from January through April (see map). Winter months, especially February through April, are times that northern right whale are common around Cape Cod.

MarineFisheries, along with the Massachusetts Lobstermen's Association, expressed concerns about the impacts of the various options during the development of the rule. Now that the final rule has been announced, the impacts are clear and the Division will be requesting NOAA Fisheries and the Take Reduction Team consider minor adjustments to the rule to accommodate fishermen's safety without significantly increasing the risk to endangered whales. The amendments will include:

- Create exemptions to the prohibition on single traps in two areas: 1) all inshore (state) waters south of Cape Cod and in Buzzards Bay; and 2) within a mile of shore in all other northern state waters. In the southern areas, trap and pot fisheries for lobster, whelk, and fish are managed with very conservative trap limits and feature small vessels that are unsuited to fish trawls safely. In the northern waters, a 1-mile exemption from shore is sought to improve safety for student lobstermen and other small-scale commercial fishermen whose vessels are unsuited to the safe setting and hauling of trawls. Moreover, the occurrence of whales in all our southern state waters and within a mile of shore is rare.
- Eliminate January from the 4-month Cape Cod Area closure to allow lobstermen to safely bring gear home during January in advance of the high whale season (February-April).



NOAA Fisheries Graphic

The Massachusetts Restricted Area is scheduled to be closed to pot/trap gear from January through April.

Other exemptions or changes to the rules may be crafted with input from industry at meetings this summer. Massachusetts will be in a strong position to document the benefits and effects of these amendments thanks to a comprehensive data collection system that MarineFisheries has in place for all commercial lobstermen that includes buoy line counts.

By Dan McKiernan, Deputy Director

MarineFisheries headlines local conferences

MACC

This past March, *MarineFisheries* was present at the Massachusetts Association of Conservation Commissions' (MACC) annual environmental conference held in Worcester, Massachusetts. MACC was established through the Conservation Commission Act in 1957. This group works to protect the natural resources of Massachusetts by supporting the Conservation Commissions through education and advocacy. Tay Evans and Brad Chase, both biologists for the Division, presented on research preformed. Tay Evans spoke on the Division's eelgrass and moorings monitoring and restoration programs. Brad Chase presented on smelt spawning habitat restoration in urban environments. The conference was well attended by town conservation commissioners, state officials, and other interested parties.

NEERS

In early May, *MarineFisheries* hosted the Spring 2014 Meeting of the New England Estuarine Research Society (NEERS) in Salem, Massachusetts. NEERS is a society of scientists and managers working on the coasts and estuaries of New England. The meeting convened over 130 attendees from universities, state and federal agencies, and non-profits, as well as local, private citizens and school groups. Several talks by Division biologists were presented including: "A comparison of calcium carbonate sediment buffers to increase the larval settlement and juvenile recruitment of *Mya arenaria"*, "Shading impacts of small docks and piers on salt marsh vegetation", "Responses of diadromous fishes to passage restoration in the Mill River, Massachusetts", "Looking back at 10 years of eelgrass restoration in Massachusetts Bay", "Case studies using 'conservation moorings' as a component of eelgrass (*Zostera marina*) restoration and rehabilitation in two Massachusetts harbors", and "The Acushnet River restoration project: restoring diadromous fish populations to a superfund site in southeastern Massachusetts". The meeting began with a symposium on salt marsh restoration past and future. A new format this year included two sessions of quickly paced "ignite style" talks followed by a panel discussion on the topic. These sessions brought a lot of energy and focus to many hot topics in estuarine science.

ICES

The long fishing history and the recent revitalization of New Bedford were on display in early May when 140 fisheries scientists from over 20 countries attended meetings of the ICES (International Council for Exploration of the Seas) Working Groups on Fishing Technology and Fish Behaviour and Fisheries Acoustics, Science and Technology. These groups meet annually to address critical issues related to fishing gear, fish behavior, fishing impacts, and the use of sonar technology to quantify fish populations and to map the sea floor by bringing together the world's top scientists in these fields.

Each day of the conference was filled with interesting talks covering a range of topics. The idea of non-selective fishing in ecosystem-based fisheries was heavily discussed. The use of artificial lights was also a popular topic covered. Emerging acoustic and optical technologies for studying fishing gear, fish behavior, and abundance estimates were the prime themes covered during this year's conference.

As add-on activities, attendees visited the Cape Cod Canal, where river herring were returning in abundance to the Monument River. Anadromous Fisheries Biologist, John Sheppard, spoke and answered a flood of questions about the run. Stops were also made at Hydroid, Inc., manufacturer of a range of AUVs (autonomous underwater vehicles) in Pocasset; Woods Hole Oceanographic Institute's Quissett Campus to learn about HabCam, an underwater vehicle for mapping the sea floor, and the institute's dockside facility where attendees viewed James Cameron's DeepSea Challenger and other underwater technology. Visitors also attended an evening reception at Reidar's Trawl Gear and Marine Supply, where a model flume tank was on display at their new facility.

Generous funding and staff support from *MarineFisheries,* National Marine Fisheries Service (NMFS), and the School for Marine Science and Technology (SMAST) at UMass-Dartmouth were critical to making the meeting a success. In particular, Mike Pol, *MarineFisheries*' Conservation Engineering Program Leader, Dr. J. Michael Jech of NMFS's Woods Hole Laboratory, and Dr. Pingguo He of SMAST assembled five-days of informative meetings. Many attendees were impressed by the organization, accommodations and good discussion generated – by all accounts, the meeting was a tremendous success!

MarineFisheries biologists engage future scientists at different events throughout the Commonwealth

The past six months have seen *MarineFisheries* busy at outreach events around the state and New England. Here is a sampling of how our biologists connect with younger generations and get them excited about the marine sciences.

WISE Career Day

Many colleges and universities throughout the Nation have a WISE (Women In Science and Engineering) program geared to encourage women of all ages (from middle school through college) to take part in STEM (Science, Technology, Engineering, and Math) classes and to pursue science and engineering careers. Since 1999, female biologists from *MarineFisheries* have taken part in Salem State University's annual WISE Career Day. Presentations at Career Day include scientists explaining how and why they are in their respective fields and typically include a fun hands-on activity for the participants.

North Shore High School Marine Science Symposium

MarineFisheries held a workshop at the second annual North Shore High School Marine Science Symposium this spring at Endicott College. Two hundred high school students gathered to learn about careers and current research being done in the marine sciences. Biologists from the Division's Age and Growth lab in Gloucester showed students how to properly dissect, sex, and age fish. They also discussed with students the importance of such studies in fisheries conservation and management. The single day high school symposium mirrors the South Shore symposium, held on the same day at UMass Dartmouth.

DMF Staff Photo

Scott Elzey showing students how to extract otoliths at the North Shore High School Marine Science Symposium.

Sea Rovers

MarineFisheries biologist, Vin Malkoski, co-coordinated the Boston Sea Rovers Career Opportunities in Marine Science event this past spring. Three hundred students gathered at the Boston Public Library to take part in discussions about marine science careers with biologists, divers, and naturalists throughout the Commonwealth. At the event, the annual Sea Rovers Summer Internship was also presented. *MarineFisheries* has been a host for the internship since its inception in 2004.

Softshell Clam Planting

For the past few years, *MarineFisheries* shellfish biologist, Chris Schillaci, has ventured to Thompson Island in Boston Harbor to teach the Green Ambassadors the importance of shellfish not only for consumption, but also for habitat health. Participants learned about coastal marine life, invasive species, ecological impacts, and literally planted thousands of softshell clams in designated areas on the island. The Green Ambassador Program provides youth from the Greater Boston area with professional experience in local green initiatives. The program is a joint venture between the Thompson Island Outward Bound Educational Center and the National Park Service.

DMF Staff Photo

Green Ambassadors prep the area for planting shellfish on Thompson Island.

Eelgrass Volunteer Days

The *MarineFisheries* eelgrass team hosts annual outreach events to educate and involve the public in eelgrass restoration and protection. In summer 2013, the Division worked with the New England Aquarium's Live Blue Ambassadors (LBA) high-school program to prepare over 4,000 shoots of eelgrass to be planted in a quarter acre site off of Governors Island Flats in Boston Harbor. After a presentation about the project and a quick training, the LBAs worked hard to weave live eelgrass shoots into burlap discs that divers immediately planted underwater.

DMF Staff Photo

Participants of the Live Blue Ambassador program weave live eelgrass shoots into burlap discs for planting.

MarineFisheries biologists publish findings

Here, we highlight five articles our biologists have recently published in peer-reviewed journals. To see all of our publications, please visit our homepage (***www.mass.gov/marinefisheries***) and click on "Publications" in the left hand column.

Dr. Steven Correia co-authored a paper published in *Fisheries Research* on river herring bycatch in the Atlantic herring (*Clupea harengus*) industry. The purpose of the study was to bring to light the issue of river herring species (alewife, *Alosa pseudoharengus*, and blueback herring, *Alosa aestivalis*) which are under consideration for listing under the US Endangered Species Act, caught as bycatch. The authors examined spatial and temporal patterns of fishing effort in the US fishery for Atlantic herring and how these relate to river herring bycatch in this fishery. Because Atlantic herring and river herring are similar in size, shape, and schooling behaviors, gear-based bycatch mitigation methods do not have great potential. Therefore, the authors suggest approaches such as regulatory management measures and improved fleet communication strategies may be more practical and effective in minimizing river herring bycatch in the Atlantic herring fishery.

The citation for this article is: Cournane, J.M., J.P. Kritzer, and S.J. Correia. 2013. Spatial and temporal patterns of anadromous alosine bycatch in the US Atlantic herring fishery. *Fisheries Research* 141: 88-94.

John Sheppard co-authored a paper published in the *Journal of Environmental Science and Engineering* regarding diadromous fish response to fish passage improvements. The purpose of the study was to see how river herring species (alewife, *Alosa pseudoharengus*, and blueback herring, *Alosa aestivalis*) and American eel (*Anguilla rostrata*) respond to both technical and nature-like fish ways. The authors measured the amount of fish passing through three areas before and after construction of fish ways on the Acushnet River in southern Massachusetts. The numbers of all species were very low prior to construction. Post-construction monitoring indicated that adult river herring returning to spawning grounds increased. Passage of juvenile eels also increased post-construction.

The citation for this article is: Sheppard, J. and S. Block. 2013. Monitoring response of diadromous populations to fish passage improvements on a Massachusetts coastal stream. *Journal of Environmental Science and Engineering A 2*: 71-79.

Dr. Michael Armstrong led an article published in *Fisheries Research* on protecting Atlantic cod spawning aggregations through small scale fisheries closures. Atlantic cod have shown site fidelity specific to spawning locations each season. This paper outlines the path followed to create three small-scale closure areas, including the complicated array of fisheries management involved. Analysis of each closure was uniquely based on: amount of prior protection from commercial and recreational exploitation, timing and duration of the closure, size of the closure area, management body authorizing the closure, historic monitoring, and amount of spatial or temporal modification that have occurred since the enactment.

The citation for this article is: Armstrong, M.A., M.J. Dean, W.S. Hoffman, D.R. Zemeckis, T.A. Nies, D.E. Pierce, P.J. Diodati, and D.J. McKiernan. 2013. The application of small scale fishery closures to protect Atlantic cod spawning aggregations in the inshore Gulf of Maine. *Fisheries Research* 141: 62-69.

DMF Staff Photo

Co-authors Micah Dean and Bill Hoffman with tagged cod ready for release.

Micah Dean, **Bill Hoffman**, and **Dr. Michael Armstrong** were co-authors of an article recently published in the *ICES Journal of Marine Science* on Atlantic cod behavior on spawning grounds. The authors used an acoustic telemetry positioning system to study the fine-scale movements of Atlantic cod as they returned to and moved within a spawning location in the Western Gulf of Maine for two consecutive years. The resulting data showed clear sex-based daily patterns in space use and aggregation behavior among the cod. During the day, females remained in one small location that varied little over time. Males also gathered during the day, but occupied a much larger area adjacent to the female aggregation. At night, individual males sought out separate small territories while females generally remained near their daytime aggregation site. These observations are in agreement with previous laboratory observations of Atlantic cod spawning at night and are the first observations of natural spawning behavior of Atlantic cod in the wild. This article was the Editor's Choice in May 2014.

The citation for this article is: Dean, M.J., W.S. Hoffman, D.R. Zemeckis, and M.P. Armstrong. 2014. Fine-scale diel and gender-based patterns in behaviour of Atlantic cod (*Gadus morhua*) on a spawning ground in the Western Gulf of Maine. *ICES Journal of Marine Science* doi: 10.1093 / icesjms /fsu040.

Dr. Greg Skomal and **John Chisholm** were co-authors of a paper in *Marine Biology* on juvenile sand tiger shark (*Carcharias taurus*) movements along the eastern coast of the United States. Between 2007 and 2013, the research team used passive acoustic telemetry, pop-up satellite archival transmitting tags, and conventional fishery-dependent tag/recapture data to create a comprehensive image of seasonal movements of juvenile sand tiger sharks. The data indicate that juvenile sand tigers undergo extensive seasonal coastal migrations moving between summer habitat (Maine to Delaware Bay) and winter habitat (Cape Hatteras to central Florida) during the spring and fall. Understanding these migration patterns is pertinent for effective management and recovery of the species, given the magnitude of the purported decline in sand tiger shark populations in the western North Atlantic.

The citation for this article is: Kneebone, J., J. Chisholm, G. Skomal. 2014. Movement patterns of juvenile sand tigers (*Carcharias taurus*) along the east coast of the USA. *Marine Biology* 161: 1149-1163.

ASMFC Photo

From left:* MarineFisheries *Assistant Director Dr. Michael Armstrong, Deputy Director Dan McKiernan, Director Paul Diodati, award recipient Paul Caruso, Representative Sarah Peake, Deputy Director Dr. David Pierce, and Governor's Appointee to ASMFC, Bill Adler.

Accolades

This past May, the Atlantic States Marine Fisheries Commission (ASMFC) presented its Annual Awards of Excellence for outstanding contributions to fisheries management, science, and law enforcement along the Atlantic coast. Among the recipients was **Paul Caruso**, *MarineFisheries* senior fisheries biologist, whose award was in the category of scientific, technical, and advisory contributions. Caruso has devoted nearly three decades to advancing the field of fisheries biology and stock assessments by guiding countless sampling projects, as well as through his participation and chairmanship of numerous ASMFC and Mid-Atlantic Fishery Management Council technical committees. Caruso was recognized for addressing a multitude of projects and species issues from overseeing the Commonwealth's Marine Recreational Information Program project, to conducting tagging programs for striped bass and summer flounder, to his extensive outreach efforts in the recreational fishing community. Regionally and coastwide, Paul's expertise and leadership have guided the development of numerous interstate management plan revisions. He has helped advance stock assessments and their data inputs through his work on cooperative tagging programs, fish ageing protocols and sampling efforts, and improved biological monitoring requirements. Throughout his career, Mr. Caruso has approached his work with enthusiasm and good humor, striving to supply managers with the information they need to properly manage fisheries. His accomplishments are many and his efforts have impacted many fisheries biologists and staff by sheer example.

The Division's Diadromous Fish Project received recognition through the Commonwealth's Performance Recognition Program (PRP). PRP celebrates the accomplishments of employees who have exemplified excellence in public service while making a significant contribution to the Commonwealth and residents. The program is renowned for its hands-on work building fish passage throughout the Commonwealth's rivers and streams, and devising new methods to assess the health of anadromous fish such as alewives, blueback herring, and shad, as well as American eel. Congratulations go to **Michael Bednarski**, **Brad Chase**, **Ed Clark**, **Ben Gahagan**, and **John Sheppard**.

The Acushnet River Restoration Project was awarded the 2014 Distinguished Project in Fisheries Engineering and Ecohydrology Award this past June at the International Conference on Engineering and Ecohydrology for Fish Passage at the University of Wisconsin. The multi-year collaborative effort brought together *MarineFisheries*, NOAA Restoration Center, USFWS, the New Bedford Harbor Trustees Council, and the Coalition to Save Buzzards Bay to improve fish passage on the Acushnet River. A technical Denil fishway, as well as two innovative nature-like fishways, were built to improve passage at three dams along the river. Monitoring before and after the project showed more than an 1800% increase of river herring being able to access the New Bedford Reservoir after construction was complete. Continued monitoring indicate that the river herring population in the Acushnet River is on an increasingly upward trajectory. Congratulations to Division biologist **John Sheppard** for this great achievement! Also awarded were Steven Block of NOAA, H. Lee Becker of EA Engineering, Science and Technology, Dick Quinn (formerly) of USFWS and DQ Engineering, and Tony Williams of the Coalition to Save Buzzards Bay.

Photo courtesy of Sean Lucey

NOAA's Sean Lucey presents the 2014 Award of Excellence to* MarineFisheries' *Dr. Greg Skomal.

Dr. Greg Skomal received the Award of Excellence from the American Fisheries Society Southern New England Chapter this past June. This award recognizes the society member who has made exceptional contributions in one or more of the following fields: fishery administration, education, management, or research. This award goes to Dr. Skomal for his work on white shark research, education, and research. His tagging studies on white sharks have increased scientific knowledge and public awareness of the species.

Comings and Goings

Anna Webb joined the *MarineFisheries* Fisheries Statistics Program via Rhode Island Division of Fish and Wildlife this past May. She is a alumna of Stony Brook University, both undergrad and graduate, and finished her Masters of Science at the School of Marine and Atmospheric Sciences. Anna worked with RI DFW as an ACCSP Fishery Specialist since 2012, and will be working in a similar capacity at the Annisquam River Marine Field Station.

After six years, **Katie Rogers** has moved on from *MarineFisheries* to pursue a career in wetlands management. Katie started at the Division as a seasonal diadromous technician working with smelt in 2008. For the next two years, she assisted both the shellfish and diadromous programs as a contracted technician. In 2010, Katie was hired full time as a technician in the Fish Ageing Project. She enjoyed working with the public, having an enthusiastic approach when teaching about local marine life and lending an ear to the anglers who needed to chat. Katie's hard work and kind disposition made her a pleasure to work with and she will be greatly missed.

Brant McAfee left *MarineFisheries* this spring to join NOAA Fisheries Greater Atlantic Regional Fisheries Office (GARFO) in Gloucester. He began with *MarineFisheries* in 2007 serving on the Fisheries Dependent Sampling Project, focused primarily on sea sampling as well as field coordination of the Industry Based Survey for Gulf of Maine Cod. In 2010, he transferred to the Management Information Systems & Fisheries Statistics Program as a data analyst, using commercial fisheries-dependent data collected from both dealers and harvesters to help answer requests from managers, Division staff, academia, and the general public. Brant was a key "go-to" guy for the Division, fulfilling many specialized data requests concerning catch and effort of our commercial fisheries. During this time, he also completed a graduate degree in Geo-Information Science. His thesis demonstrated geographic methods of examining Resource Assessment Program survey data. Brant was a constant contributor to Resource Assessment surveys and developed an improved method to aid in plotting planned trawl survey sites. We will miss Brant and his creative and tireless work ethic, and wish him well.

Luis Carmo left *MarineFisheries* after working with the Division's Fishway Crew for 9 years. Over the years, Luis assisted with the reconstruction of over 20 fish ladders and the maintenance of countless more. He was an integral part of the crew, aiding with river herring stocking efforts, stream clearing, and installation of eel passage ramps. Luis' new position is with the Department of Developmental Services in Wrentham public schools. We wish him the best of luck!

Albert "Chuck" Thistlewood retired from *MarineFisheries* this past May as a Building Maintenance Supervisor. Chuck worked for 30 years at the Newburyport Shellfish Purification Plant, starting in 1983 as a laborer. In this time, Chuck saw many racks of shellfish through the facility and he competently did all aspects of the job; from handling shellfish racks, to operating the crane, to completing billing. Chuck's dependability, sense of humor, and willingness to cover shifts as needed were instrumental to the operation of the facility and greatly appreciated. We wish Chuck a happy retirement!

Jennifer Stritzel Thomson started working at *MarineFisheries* in April 2005 in the Sportfish Program, taking over responsibility for the Sportfish Angler Data Collection Team, the volunteer program under which recreational anglers collect scales from striped bass, black sea bass, scup, and fluke for use in stock assessments. She also created the e-Logbook for recreational anglers to keep a fishing journal of all their recreational catch. Jenni assisted on various other projects such as a striped bass temperature monitoring study, MRIP, and a striped bass otolith/scale aging comparison study. Jenni was a delight to work with and will be missed as she takes on her new job, which will keep her busy as her two new co-workers are highly demanding, but cute — she's biased, she's their mom.

DMF *Rules UPDATE*

Public Hearings • Regulations • Legislation

Regulation Update

During the period of January 1, 2014 through June 30, 2014, the following regulatory changes were enacted by the Division of Marine Fisheries after public hearings and Marine Fisheries Advisory Commission approval. Annual specifications and emergency regulations promulgated during this period have also been listed.

American Eel

To comply with Addendum III to the Interstate Management Plan for American Eel, conservation measures were enacted to reduce fishing mortality at all life stages. The recreational and commercial minimum size was increased from 6 inches to 9 inches. The recreational bag limit was decreased from 50 eels per person or per vessel per day to 25 eels per person or per vessel per day; for-hire vessels were exempt from this bag limit reduction and remain authorized to take up to 50 eels per day. A minimum mesh size opening of ½ inch by ½ inch was established for eel pots to enhance escapement of sublegal eels. Lastly, the use of fyke nets in rivers to catch outward migrating eels was prohibited from September 1 through December 31.

Atlantic Sea Herring

For Trimester 2 (June 1 – September 30), the Atlantic States Marine Fisheries Commission sea herring section voted and *MarineFisheries* Director subsequently declared that the commercial Atlantic sea herring fishery in Management Area 1A would begin with two days out of the fishery on Saturdays and Sunday, resulting in open fishing days of Monday through Friday. On day outs, a commercial vessel may land up to 2,000 pounds of Atlantic sea herring. This days out schedule was revised effective July 7 to lift the days out, resulting in seven days per week open to fishing. The schedule may be further amended following another review of catch and effort by the Section to ensure that sea herring bait is available throughout the summer.

Additionally, *MarineFisheries* has filed emergency regulations that establish a procedure for the Director to set fishery limits for all Atlantic sea herring management areas, and to close specific management areas when 95% of the quota allocation for that management area is reached and the entire fishery when 92% of the overall quota is reached.

Black Sea Bass

MarineFisheries filed emergency regulations to establish the 2014 recreational fishing limits for black sea bass. This fishery is open from May 17 through September 15 and anglers may take up to 8 black sea bass per day provided each fish is at least 14 inches in total length. Compared to 2013, this rule constitutes a shortening of the season by 52 days, but a doubling of the bag limit. Additionally, *MarineFisheries* established an optional special access program for authorized for-hire operations, whereby their patrons may harvest 8 fish per day from May 17 through May 31 and 20 fish per day from September 1 through September 30, provided the vessel follow a June through August closed period in which their patrons may not retain any black sea bass.

Fish Pots and Fish Pot Permits

MarineFisheries amended its fish pot and fish pot permit rules to improve enforcement and compliance and to treat the state's black sea bass, scup and whelk pot fisheries more like the state's lobster fishery; the lobster fishery is the model for a sustainable, near-shore, small boat, fixed gear fishery.

Three actions were taken. First, all fish pot permits are now owner-operated, meaning the individual named on the commercial fisherman permit must be onboard the fishing vessel whenever fish pot or conch pot fishing is occurring. This requirement may be waived by a letter of authorization issued by the Director for immediate family or active military duty, or for up to two years (subject to annual renewal) in instances of disability or death to the permit holder if performance criteria are met. Second, *MarineFisheries* is prohibiting holders of multiple fish pot permit endorsements from fishing more than one species-specific fish pot limit on a single vessel without a letter of authorization issued by the Director. Lastly, *MarineFisheries* is revising the permit transferee fishing experience criteria to allow any individual who has one year of documented full-time or the equivalent documented part-time commercial fishing experience in a pot fishery or two years full-time or equivalent part-time commercial fishing experience in another commercial fishery to obtain a regulated fishery fish pot permit endorsement through transfer.

MarineFisheries promulgated two additional regulations to improve enforcement and compliance. First, all fish pots and conch pots must be tagged with a valid, current year trap tag before being set during any calendar year. Additionally, all scup and black sea bass pots must be hauled three days after the respective fishery closes and they must remain out of the water until three days before the respective fishery opens.

Hammerhead Sharks

In compliance with Addendum III to the Interstate Management Plan for Atlantic Coastal Sharks, the recreational minimum size for all hammerhead shark species has been increased from 54 to 78 inches. The most recent stock assessment for hammerhead sharks demonstrated that female scalloped hammerhead sharks did not reach sexual maturity until they were at least 78 inches in length. Because it is difficult to differentiate among the various hammerhead shark species once the fish has been eviscerated, the new 78 inch minimum size applies to all hammerhead shark species.

Horseshoe Crab

All mobile gear fishermen are now subject to a 300 crab per day limit throughout the year. Previously mobile gear fishermen were allowed to take up to 400 crabs through June 30 and up to 600 crabs thereafter. This reduced trip limit should improve horseshoe crab conservation and reduce the regulatory discard of finfish species such as fluke.

Additionally, *MarineFisheries* has prohibited the possession and sale of three species of Asian horseshoe crab (*Carcinoscorpius ratundicauda, Tachypleus gigas and Trachypleus tridentas*). There is substantial concern that these species, if used as bait, could have detrimental effects on marine and human health.

The Atlantic States Marine Fisheries Commission requested all Atlantic coastal states ban the possession and sale of these species through Resolution 13-1.

Recreational V-Notched Lobster Possession Standard

MarineFisheries has established a single state-wide standard for the recreational possession of v-notched lobsters. It is now illegal for recreational harvesters to possess any female lobster that bears a notch or indentation in the base of the flipper that is at least a sdeep as 1/8", with or without setal hairs. V-notch protection is an integral aspect of lobster conservation and management and this state-wide recreational v-notch standard should help improve enforcement, compliance, education, and outreach. Previously, there were three geographic area-specific recreational v-notched lobster possession standards.

Shellfish Handling and Vibrio Management

MarineFisheries has promulgated a new chapter of regulations that codify provisions of the 2014 Massachusetts Vibrio (Vp) Control Plan and the National Shellfish Sanitation Program's (NSSP) Model Ordinance.

Vp is a naturally occurring bacterium in oysters which rapidly multiples when exposed to high temperatures. At higher concentrations, Vp can cause severe gastro-intestinal illness in humans who consume oysters raw. Due to recent increases in seasonal water and air temperatures, the occurrence of Vp related food-borne illness in Massachusetts from the consumption of raw oysters harvested here has increased. To safeguard public health, *MarineFisheries*, the Massachusetts Department of Public Health, and the US Food and Drug Administration worked together to establish a Massachusetts Vp Control Plan for 2014. *MarineFisheries* recently filed emergency regulations to codify this control plan. The regulations establish a series of time-to-temperature requirements for icing and shading oysters, and logbook reporting requirements for all aquaculturists and wild commercial oyster harvesters. Additionally, it sets forth stringent guidelines for oyster aquaculturists regarding off-site culling, anti-fouling processes, wet storage, as well as establishes protocols for product recalls and permit sanctions for non-compliance findings.

With regards to the NSSP Model Ordinance, *MarineFisheries* promulgated emergency regulations to codify a number of long standing shellfish harvesting requirements. These include shellfish tagging and the requirement that commercial shellfish harvesters only take shellfish from areas open to commercial shellfish fishing.

Small Mesh Trawl Fishery for Squid

MarineFisheries has authorized trawl vessels to continue to fish for longfinned squid with small mesh in those state waters south of Martha's Vineyard and Nantucket, between 70° 46' to the west and 70° 00' to the east, from June 10 until December 31 or until the commercial fluke fishery is closed, whichever occurs first. This liberalization provides trawl fishermen with additional opportunities to fish for and harvest the federal longfinned squid quota.

Spiny Dogfish

The Director declared a 4,000 pound trip limit for the 2014/2015 commercial spiny dogfish fishery. This trip limit is in effect from May 1, 2014 through April 30, 2015, or until 100% of the northern state's (ME-CT) spiny dogfish quota allocation is taken, whichever occurs first. The 2014/2015 northern states' spiny dogfish quota allocation is over 28.6 million pounds.

Striped Bass

MarineFisheries promulgated new regulations for 2014 that affect the commercial striped bass fishery.

These regulations adjust the commercial fishery limits, affect commercial striped bass permitting, and implement a commercial tagging program. See page 4 for full details.

Whelk

To reduce fishing effort on whelks and the regulatory discarding of finfish species such as fluke, *MarineFisheries* has established a 1,000-lb mixed whelk (channeled and knobbed) trip limit for draggers. To improve spawning stock biomass, *MarineFisheries* also increased the knobbed whelk minimum size from 2 ¾ inches to 2 $^{7}/_{8}$ inches in 2014 and 3 inches in 2015, based on a new size-at-maturity study demonstrating that about 50% of female knobbed whelks do not reach sexual maturity until 3.5 inches in size. These size limit increases match those previously approved for channeled whelk.

Winter Flounder

MarineFisheries has promulgated two regulations affecting the harvest of winter flounder. The first regulation affects the commercial fishery. Previously, federal groundfish permit holders authorized to fish in state waters could fish under their federal limits and exceed the state's winter flounder trip limits. Due to concerns about the negative effects of increased fishing effort on near-shore localized populations, *MarineFisheries* now requires all commercial fishermen – both state and federally permitted – to adhere to the state's winter flounder trip limits while fishing in state waters. Federal groundfish permit holders may transit state waters in excess of the state's winter flounder trip limits provided all commercial fishing activity has ceased and all gear is stowed.

The second regulation expands the season when recreational fishermen may take winter flounder in the Southern New England Groundfish Management Area. Recreational fishermen fishing in this area are now allowed to take two winter flounder per angler per day from March 1 through December 31; this fishery is closed during January and February. The previous rule allowed only two months of fishing per year.

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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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Publication #17020-12-7000-01/2007-$4,200

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