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 • Volume 30 • 2009

MarineFisheries
A Commonwealth of Massachusetts Agency

New State Law to License Recreational Fishermen -

Register federally in 2010, but purchase state permit in 2011

New federal law requires most saltwater recreational fishermen to be documented in 2010. Massachusetts fishermen will be required to register with the National Marine Fisheries Service (NMFS). However, recently enacted state law, "*An Act Instituting Saltwater Fishing Licenses,*" enables *MarineFisheries* to build and implement a state permitting program for 2011 and beyond that will exempt the Commonwealth's saltwater recreational anglers from the federal registry. The new state law triggers a transition from the federal registry in 2010 to the state's marine recreational fishing permit program in 2011. Governor Patrick signed the permit act into law on November 23rd after it passed unanimously through the Legislature.

Support for the act was driven by a large group of recreational stakeholders seeking a state permitting program that would exempt anglers from a higher-cost federal license in 2011 and ensure license revenues went to local user benefits. Representatives of the recreational fishery advocated strongly for a state program including services to enhance public access for saltwater sportsmen and improving fisheries management.

Stakeholders insisted the new state law establish a dedicated saltwater recreational fishing fund and 1/3 of annual appropriated permit funds be devoted to public access projects. They determined that a proposed $10 individual permit fee for resident and non-resident anglers alike would be substantially lower than the fee proposed by the federal government for 2011 yet high enough to add benefits for the Commonwealth's recreational fisheries and fishermen.

MarineFisheries will work during the next year to develop the state's permitting program and will provide public updates via its website, ***www.mass.gov/marinefisheries***.

Meanwhile, *MarineFisheries* will be working with NMFS to assist anglers with federal registration during 2010. Massachusetts anglers who fish in federal waters, or target or catch anadromous species (saltwater fish that spawn in freshwater) like shad, striped bass or smelt in any tidal or salt waters must register beginning January 1, 2010.

Some anglers are exempt from registration in 2010: those under 16; patrons on permitted charter, party or guide boats; anglers who hold a Migratory Species Angling permit; anglers fishing commercially under a valid commercial permit; or are already registered in an exempted state. Federal registration is free in 2010 and starting January 1, 2010, you can register by calling 888.MRIP.411 (888.674.7411) or online at ***www.countmyfish.noaa.gov***.

We expect some confusion regarding the switch from the federal registry to the state permitting program, so remember: 2010 – Massachusetts saltwater anglers must register for free with the federal government; 2011 – Massachusetts saltwater anglers must buy a permit from *MarineFisheries*.

By Melanie Griffin, Fisheries Management Specialist.

New Age and Growth Lab Launched

MarineFisheries is proud to announce the opening of its new Age and Growth Lab located at the Annisquam River Marine Fisheries Station in Gloucester. Federal funding from the Sport Fish Restoration Act (Wallop-Breaux) has allowed us to combine and renovate two existing lab spaces to form a new age and growth center where a majority of the agency's fish ageing will take place. The new lab has been outfitted with state-of-the-art equipment for processing the varied structures used for ageing, including scales, otoliths, opercula, vertebrae and fin rays.

Photo by Scott Elzy, DMF

Katie L'Heureux ageing rainbow smelt scales in the new Age and Growth Lab.

Accurately determining the age of fish is a critical step in understanding their populations. Age data are used for stock assessments as well as to determine, growth rates, mortality and age structure of populations. These are all important factors taken into consideration when managing and assessing our fish stocks.

In its first year the lab will age rainbow smelt, tautog, river herring and American shad. We are working closely with the National Marine Fisheries Service Fisheries Biology Program to develop strict protocols for age determination, quality assurance and quality control. As the efficiency of our lab increases, we will take on other species and address other fish ageing-related projects.

MarineFisheries is very excited about this new addition. It will enable us to accurately process a higher quantity of age structures and therefore provide the best data possible for management of our fisheries.

By Scott Elzey, Marine Fisheries Biologist

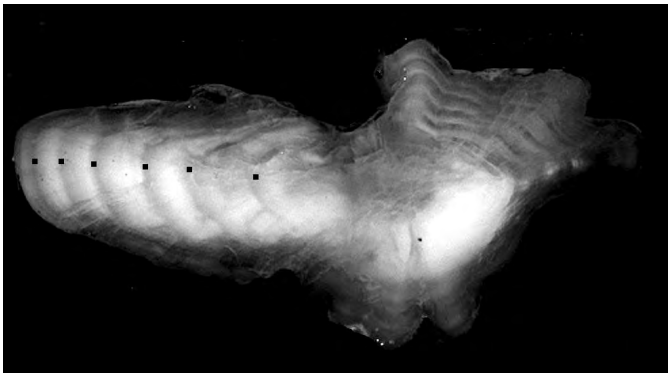


Photo by Katie L'Heureux, DMF

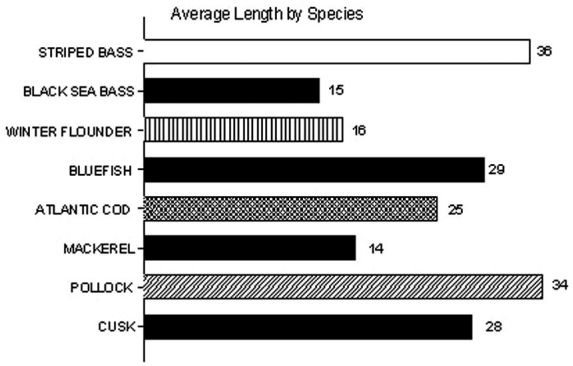
A cross section from a 58.5cm Atlantic wolfish otolith. This fish is 6+ years old as indicated by six growth rings denoted by black dots.

Recreational Fishing Electronic Logbook available for Anglers

MarineFisheries in conjunction with the Atlantic Coastal Cooperative Statistics Program (ACCSP) announced in June a new electronic angler logbook (eLogbook) for recreational anglers willing to provide data useful for management of marine fisheries in Massachusetts. The eLogbook is a web database designed for recreational anglers to enter daily trip information on general location, gear used, and sizes of fish species that are harvested or released. Participating anglers can access and summarize their fishing data in tabular or graphical forms at anytime which is useful for tracking fishing successes.

Initial feedback from anglers has been positive and encouraging. On-going improvements will be made based on their comments. To date, 133 anglers are enlisted and 1,696 trip entries have been made with 2,692 fish reported. (The top three species reported are striped bass (73%), bluefish (11%) and Atlantic cod (4%).)

Why is *MarineFisheries* interested in collecting this data? The Marine Recreational Information Program (MRIP), the primary federal program designed to collect information on recreational fisheries throughout the United States, doesn't measure some aspects of fisheries required for more effective management in Massachusetts waters. Currently we lack sufficient information on sizes of fishes that are harvested or released and information on important recreational fishing areas in state waters. These data are needed to improve stock assessments of marine species and to help protect important fishing grounds.



DMF file grpahic

eLogbook generates user-friendly information on fish catch such as size (in inches) of fish harvested.

Residents or non-residents who fish in Massachusetts and adjacent federal marine waters can participate in this program. To begin using the eLogbook, go to ***eLogbook Login*** located under the Quick Links on the left hand side of *MarineFisheries'* website (www.mass.gov/marinefisheries). First time users will have to register. A password and user name will be sent to the angler's email account. All data provided by participating anglers are considered confidential under M.G.L. c. 66A, the Fair Information Practices Act and only *MarineFisheries* personnel will have complete access.

The eLogbook is an easy way for you to keep track of your fishing season and aid in conservation efforts of important recreational fish species. Sign up and start today! Questions or comments: contact Jennifer Stritzel Thomson at 978-282-0308 x 130 or email at ***elogbookrec@state.ma.us***.

By Jennifer Stritzel Thomson, Marine Fisheries Biologist

Spring Cod Conservation Zone Research Underway

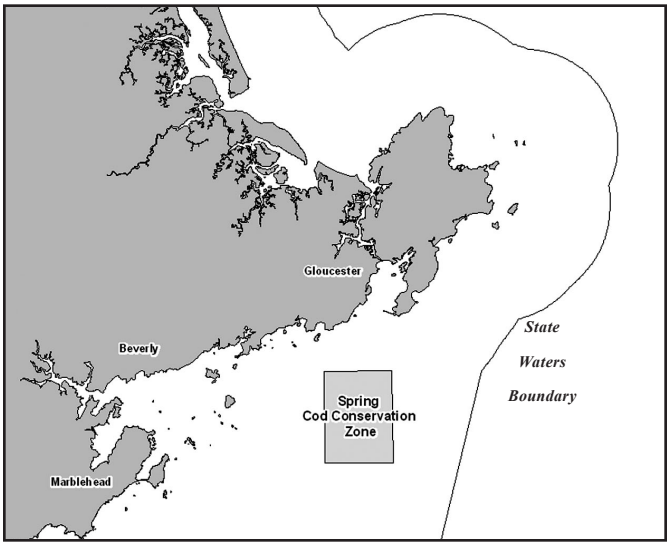
There is a growing body of evidence that the Gulf of Maine Atlantic cod stock is actually a metapopulation composed of many partially-isolated spawning subsets, known as subpopulations. Researchers have used historic and biological data to illustrate the existence of a multitude of spawning stocks along the inshore Gulf of Maine, most of which appear to have vanished, due to stock depletion and overfishing. The lack of inshore spawning subsets is consistent with the metapopulation theory, which predicts that fewer spawning areas will be occupied as a population declines, and close-to-shore areas are the first to be depleted.

Although some subpopulations of cod in the Gulf of Maine are starting to show signs of recovery, local exploitation has the potential to deplete these subsets to the point where they cannot support themselves. When subpopulations are depleted, recovery becomes impossible without recolonization from other areas. This comes with a consequent loss of genetic diversity and a slowing of the recovery of the metapopulation (in this case, the Gulf of Maine stock). It is clear that preservation of the remaining spawning groups is critical to recovery of the Gulf of Maine Atlantic cod stock.

Over the past several years, *MarineFisheries* has been monitoring a very localized active spawning subset aggregating every spring in state waters. This formerly lesser known aggregation was becoming well known to the local recreational fishing sector and, therefore, was beginning to suffer excessive fishing pressure.

As reported catch rates and the average size of fish harvested from the aggregation began to decrease, *MarineFisheries* took action in 2009 to protect this body of fish. It was our fear that if action was not taken, exploitation would continue to grow resulting in further disruption and depletion of this discrete spawning aggregation.

MarineFisheries delineated an 8.8 mi^2 area in northern Massachusetts Bay and prohibited harvest of cod by both the recreational and commercial sectors within its bounds. This closure, named the Spring Cod Conservation Zone (Spring CCZ), began on May 1st and extended through June 30th.



The Spring CCZ offer a unique opportunity to study the biological characteristics of a group of spawning Atlantic cod and their habitat. The area is easily accessible owing to its relative proximity to the Annisquam River Marine Fisheries Station, and the spawning aggregation is predictable in space and time each year.

MarineFisheries biologists are conducting research in the Spring CCZ to obtain further insight on the following questions:

- *Why do these cod appear to aggregate on this small "hump" and not others in the area that look similar on a gross scale? Can we answer this by looking at habitat differences alone?*
- *What is the residence time of these fish? Do fish come and go repeatedly or are new fish immigrating constantly? Do the sexes differ in their residence time?*
- *What is the biomass of this group of fish?*
- *What can we learn about cod spawning behaviors?*

Some of the techniques used to investigate this body of fish include the use of acoustic telemetry, DNA analysis, and hydroacoustic assessments.

Telemetry uses transmitters (tags) and listening devices (receivers) to monitor the movements of fish. This technique was piloted in spring 2009 when transmitters were surgically implanted into several spawning cod caught in the closure area. Fish movements were tracked using a simple array of receivers. Data were uploaded weeks after tagging and movements re-created. Preliminary results were examined to estimate residence time and emigration. Next spring (2010), a full-time graduate student from the University of Massachusetts Dartmouth will be assisting *MarineFisheries* in more extensive telemetry research. In addition, *MarineFisheries* will also be employing 3-dimensional tracking using a sophisticated acoustic array of receivers in the Spring CCZ.

During the pilot telemetry program, several DNA samples obtained from spawning cod located in the Spring CCZ were provided to Dr. David Berlinski at the University of New Hampshire to determine if the spawning aggregations were a unique genetic subpopulation of the Gulf of Maine Atlantic cod stock. To answer this type of question, at least 100 samples are required; therefore, many more samples will be collected and added to the data set during the 2010 season.

To better understand the abundance of cod (biomass) in the Spring CCZ, *MarineFisheries* conducted a hydroacoustic assessment using our BioSonics DT-X Digital Scientific Echosounder. An Echosounder is essentially the same technology as a "fish finder' commonly used by commercial and recreational fishermen; however, the unit used by *MarineFisheries* has the ability record the data collected for later review and analysis.

During the 2009 closure, the Spring CCZ was surveyed approximately once per week. The distribution of fish recorded was sorted to filter out the presence of other species and preliminary estimations of cod biomass were developed.

A fine scale map of the bottom topography in the Spring CCZ is being created by Dr. Kathryn Ford of the *MarineFisheries* Habitat Protection Program. This will allow her to evaluate physical characteristics of the site that could play a role in attracting spawning aggregations each year.

Data collected during the 2009 season will continue to be evaluated this winter, with further studies planned in 2010. For more information, contact Bill Hoffman at ***bill.hoffman@state.ma.us*** or 978-282-0308 ext. 106.

By Bill Hoffman, Marine Fisheries Biologist

MarineFisheries Tags White Sharks off Chatham

On Labor Day weekend, the presence of several white sharks (*Carcharodon carcharias*) off the coast of Cape Cod grabbed the attention of state and local officials, worldwide media, and *MarineFisheries* biologists. While the seasonal (summer, fall) presence of white sharks off the coast of Massachusetts is well documented, this large charismatic shark is relatively rare in the Atlantic and much of what is known about its distribution and movements is based solely on historical sightings data.

The advent of new satellite-based tagging technology has allowed researchers to examine the movements, habitat use, and behavior of white sharks in the Pacific and Indian Oceans, but its elusive nature in the Atlantic has been a roadblock to such studies in this region. The nearshore appearance of at least 10 white sharks off Monomoy Island provided an ideal opportunity for *MarineFisheries* biologists to deploy this technology for the first time in the North Atlantic.

The sharks were first spotted on Thursday, September 2nd when pilot George Breen saw two large sharks along the east coast of Monomoy Island while flying over the area. This information was immediately relayed to commercial fisherman Bill Chaprales, who contacted *MarineFisheries*. Both Bill and George have been tagging sharks with the *MarineFisheries* Shark Research Program for many years and, therefore, understood the significance of this sighting. Later that afternoon, senior *MarineFisheries* biologist Greg Skomal returned to the area with the spotter pilot and confirmed the presence of five sharks off the coast of Monomoy in close proximity to grey seals.

Over the next five days, *MarineFisheries* biologists worked with Bill and Nick Chaprales on the F/V Ezyduzit to tag the sharks. With the aerial assistance of George Breen, the harpoon vessel was directed to white sharks swimming in the area. Using a modified harpoon, Bill Chaprales was able to tag five white sharks, ranging from 8-13 feet long, from the pulpit of the boat. A commercial harpoon fisherman with decades of experience, Bill has been tagging sharks and tunas for scientists since 1994. Instead of using a standard harpoon, Bill uses one that has been modified to reduce the level of skin penetration and minimize tissue damage.

All five white sharks were tagged with Pop-up Satellite Archival Transmitting (PSAT) tags. In contrast to standard satellite tags, these tags do not transmit real-time positions, but instead act as dataloggers, which collect and store temperature, depth, and light level data. At a time programmed by the researcher, the tags will pop-off the sharks, ascend to the surface, and transmit archived data to satellites, which relay them back to the researchers. At that time, the three-dimensional movements, including migration paths, depths, and temperature preferences of the shark can be re-created based on those data.

These tags are ideal for studying the ecology of highly migratory species (see: ***www.mass.gov/dfwele/dmf/spotlight/basking_shark.htm***). Although this tag technology has been deployed on numerous fish species including sharks, tunas, and billfish, this was the first successful effort to tag white sharks in the North Atlantic. Real time satellite tags were not used because there is no guarantee that the sharks would remain at the surface, which is required for satellite link-up. The PSAT tags do not allow for real time monitoring, but they do collect more comprehensive information on the movements of the sharks; they are programmed to release in January, March, and May, 2010.

In 2004, a large female great white shark swam into a Naushon Island estuary and remained for 13 days until it was forced to exit the area in a concerted effort by *MarineFisheries* personnel. Although this shark was tagged with a PSAT tag, the release mechanism caused it to jettison prematurely because the shark was in shallow water for an extended period (see DMF NEWS Second Quarter - Third Quarter 2004). Since this event, the *MarineFisheries* Shark Research Program has broadened it efforts to compile white shark sightings data.

While the occurrence of great white sharks off Massachusetts is not unusual, the unusual abundance off Monomoy over Labor Day weekend begs the question: why? The

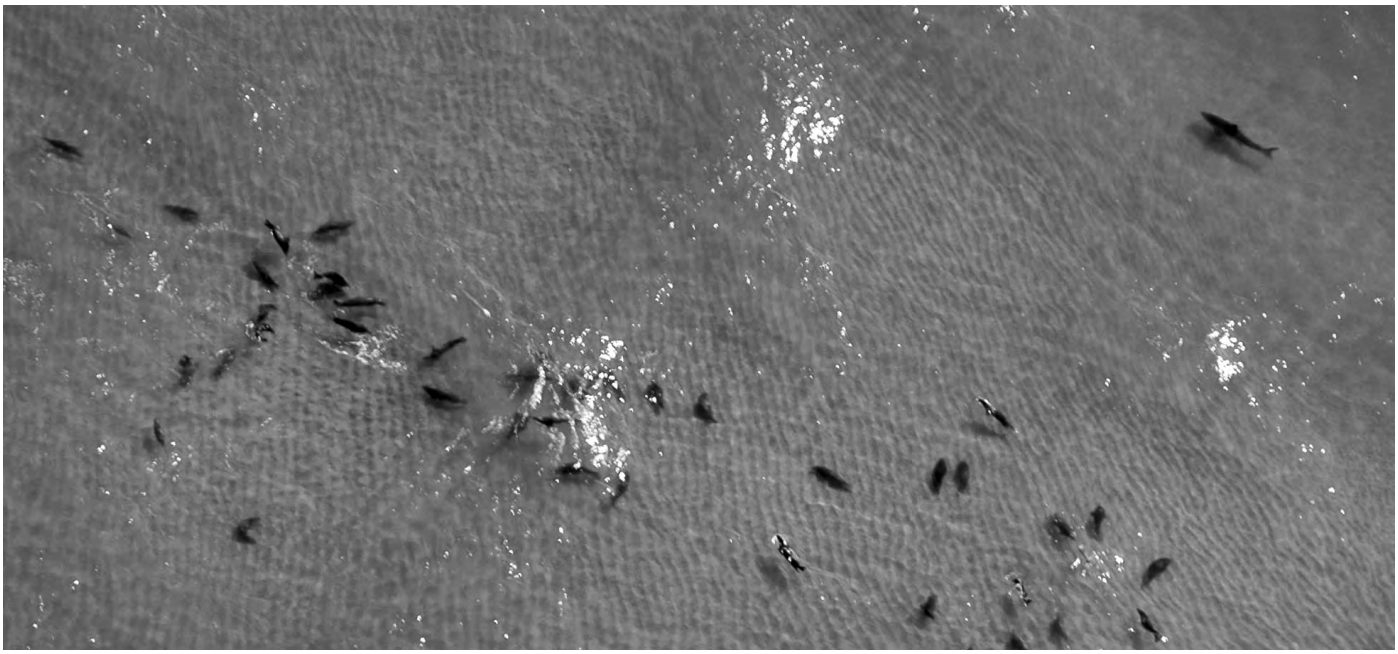


Photo by Dan McKiernan, DMF

A white shark (upper right corner) lurks near a group of grey seals.

Photo by Wayne Davis, OceanAerials.com

Captain Bill Chaprales assists MarineFisheries biologists in harpoon tagging a 13 foot white shark from the F/V Ezyduzit.

number of white shark sightings as well as the number of shark-bitten seals has been rising in recent years off the coast of Massachusetts. In most cases, these interactions have occurred adjacent to Monomoy Island, which hosts a sizeable growing population of grey seals.

The white shark is a documented predator and scavenger of marine mammals and has been the species most implicated in these interactions. Indeed, most white shark "hotspots" around the world are associated with large seal and sea lion colonies. While the perceived increase in shark predation on grey seals can be attributed to several factors, we speculate that white sharks, which were thought to generally feed offshore in the Atlantic, are exhibiting a dietary shift in response to changes in seal abundance. As a result, it is anticipated that the number of white shark sightings as well as seal interactions will continue to rise off the coast of Massachusetts and, in particular, Monomoy Island.

The white sharks tagged off Monomoy Island on Labor Day weekend will provide the first real insights into the ecology of this species in the North Atlantic. These tags will also allow us to examine site fidelity and residency in Cape Cod waters. In other parts of the world, these tags have shown that the white shark is not exclusively a coastal species and routinely exhibits broad offshore movements while diving to depths in excess of 2,000 feet. It should be fascinating to see what they do in the Atlantic.

Given the potential for more white sharks in Massachusetts waters, the *MarineFisheries* Shark Research Program will continue to compile shark sightings data. We encourage the public to report such sightings. In addition, we will continue to actively study these sharks to collect information that will enhance our ability to advise local authorities and to improve state and federal management. *MarineFisheries'* Shark Research Program and the white shark tagging activities are supported by Federal Aid in Sport Fish Restoration and a grant from the Massachusetts Environmental Trust. Additional information related to this project, including photos and video, can be found at: ***www.mass.gov/dfwele/dmf/spotlight/white_shark_2009.htm***.

By Dr. Gregory Skomal, Shark Project Leader and John Chisholm, Shark Biologist

Studying Sand Tiger Movements in Plymouth-Kingston-Duxbury Bay

The sand tiger (*Carcharias taurus*) is a coastal shark species that ranges from the Gulf of Mexico to the Gulf of Maine along the east coast of the United States. Historically, the species has been fished throughout its range, but recent implementation of the Interstate Shark Fishery Management Plan now prohibits harvest in both state and federal waters.

In the past few years, an increasing number of juvenile sand tigers have been caught by recreational fishermen in Plymouth-Kingston-Duxbury Bay, a 10,200 acre tidal estuary located on Massachusetts' south shore. Most of these fish are in the size range of 3-4 feet, which indicates that this bay provides important nursery habitat for newborn sand tigers that move north from southeastern US pupping grounds.

Working with UMass School of Marine Science and Technology doctoral student Jeff Kneebone, *MarineFisheries* has been tracking the behavior, movements, and habitat use of sand tigers in the Bay. Local fisherman Dave Lindamood has assisted Jeff and *MarineFisheries* biologist John Chisholm to tag and release more than 60 sand tigers in the bay during the last two summers. Over half were outfitted with acoustic transmitters that allow researchers to track real-time movements of the sharks within the bay.

Photo by Derek Perry, DMF

The large awl-shaped teeth of the sand tiger distinguish it from spiny and smooth dogfish.

Transmitters emit a high frequency sound pulse that can be detected and logged by any one of 25 receivers placed throughout the bay. By examining where and when sharks are detected after they are released, movement patterns may be defined as they relate to tide, temperature, depth, time of year, and location.

Ultimately, *MarineFisheries* hopes to identify and quantify the characteristics of essential sand tiger habitat within the bay. In addition, this technology allows us to investigate the impacts of capture stress on behavior and survivorship after release, which is particularly important because release is mandated throughout the range of this species.

Results to date show that sharks remain within the bay during all tides and show fidelity to specific sites during most of the summer. By early October, sand tigers exit the bay and begin their migration to wintering grounds off North Carolina. One tagged sand tiger was detected in a receiver array near the entrance to Pamlico Sound off Cape Hatteras, NC in January 2009. All of the sharks tracked to date survived the capture event, thereby demonstrating that catch and release could be a viable conservation tool.

This research is supported by Federal Aid in Sportfish Restoration as well as a grant from the NOAA Proactive Species Conservation Grant Program. Jeff Kneebone is supported by Massachusetts Marine Fisheries Institute funds. Much of this work would not be possible without the logistical and hands-on support of the Jones River Landing Environmental Heritage Center, the office of the Duxbury Harbormaster, and numerous local fishermen.

By Dr. Gregory Skomal, Shark Project Leader

Decades Later – 750 Acres of Shellfishing Reopened in Swansea

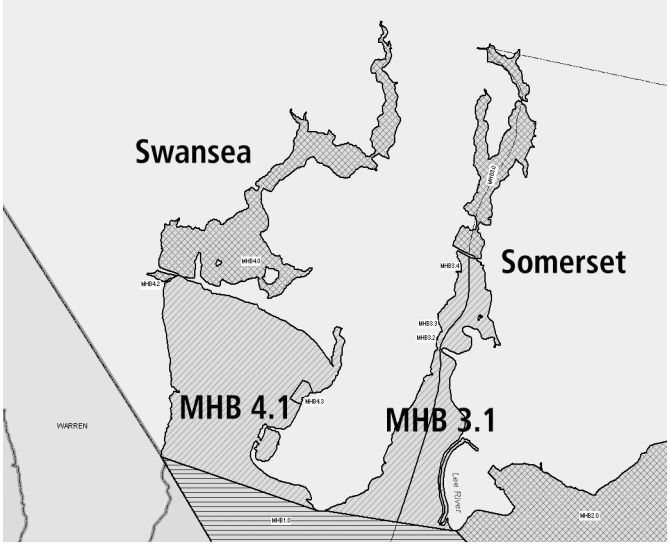
After a 25-year shellfishing prohibition in Swansea's Coles River and a 40+ year closure of the lower Lee River, *MarineFisheries* reclassified 746 acres of closed shellfish beds in the Towns of Swansea and Somerset. The shellfish resource consists of soft shell clams in the intertidal areas and quahogs in the subtidal waters of both rivers with oysters also found in parts of the Coles River.

Each area will be open annually beginning May 1 and close on December 1 provided no more than 0.3 inches of rainfall falls in any 24 hour period. However, Somerset waters in the reclassified portion of the Lee River will remain closed to harvest due to local budgetary constraints.

During the last 25 years interest in shellfishing and hope that it would one day return to Swansea never seemed to wane. The reopening has been met with enthusiasm by local residents; to date the Town of Swansea has sold over 550 commercial and recreational shellfish licenses.

In order to track and meet the rainfall restriction, Swansea officials agreed to maintain a rain gauge at the Gardner's Neck Fire Station, collect daily rain data, maintain data logs and notify *MarineFisheries* immediately when 0.3 inches or more of rainfall occurs within a 24-hour period. If the amount of rain recorded is between 0.3 and 1.99 inches, areas are immediately closed and shellfishing may automatically commence six days following cessation of a rain event that triggers a closure. If 2"+ of rainfall occur in a 24 hour period the area remains closed until *MarineFisheries* confirms through testing that bacterial levels meet National Shellfish Sanitation Program (NSSP) criteria for harvesting.

The Town of Swansea is also responsible for notifying the public of the status of areas by raising red flags during closures and green flags when areas are open, by posting openings and closures on the Police Department website and by providing information to the local media. Flag poles are located at three major access points, one on the Coles River and two on the Lee River that can be seen throughout the affected area in each river.



DMF file graphic

MarineFisheries reclassified the Coles River (MHB 4.1) and lower Lee River (MHB 3.1) as Conditionally Approved on July 1, 2009.

Photo by Dan Lowney, Swansea Shellfish Constable

Swansea family permit holders harvesting soft shell clam along the western shore of Coles River

MarineFisheries agreed to re-evaluate the closures in Swansea waters after a 2007 request by the town's Board of Selectman following septic system upgrades made under Title V - Septic Systems of the State Environmental Code (310 CMR 15.00). The Swansea Board of Health has vigorously applied the code to system failures and at the time of real estate transfers. Recent water sampling by *MarineFisheries* had shown seasonal water quality improvements.

Assessment work began in the Coles and Lee Rivers in February 2008 after *MarineFisheries* Shellfish Program personnel met with the Swansea Board of Selectmen and other local officials to explain the process. This included NSSP sampling and water quality requirements, town responsibilities such as supervision, enforcement and monitoring rainfall, and the role of *MarineFisheries.*

An analysis of existing *MarineFisheries* data collected through 2007 seemed to indicate the potential for a conditionally approved classification linked to limited rainfall. Consequently, water samples were collected throughout periods of dry weather and during and immediately after light rain events of less than 0.5 inches. Additionally, a sanitary survey was conducted in the Coles River and Lee River – the nearshore portion involved walking the entire length of the shoreline and identifying and evaluating all potential and actual sources of pollution. During this process *MarineFisheries* biologists found home owners were very interested in the process and helpful in finding old pipes or other potential pollution sources.

The sanitary survey process involved continuous contact with and cooperation by town department heads. The Fire Department collected and made available daily rainfall data. The harbormaster provided information on mooring areas, marinas, and the number of boats with sanitation devices and boat occupancy. The former shellfish constable furnished information on the location of shellfish resources. The Board of Health Agent provided information on individual sewage disposal systems (septic systems) and the Department of Public Works supplied maps of storm drains throughout the town.

Storm drains were sampled first while flowing during wet weather along with water samples from the two rivers.

It was quickly evident that rain in excess of 0.3 inches in 24 hours had an adverse impact on water quality in the shellfish areas. Other pipes and dry weather flows were also tested and found to have little impact on shellfish water quality.

The major source of fecal contamination was found to be storm water runoff from 64 sources; 58 storm water pipes (39 in the Coles and 19 in the Lee) and 6 major road runoff sites (4 in the Coles and 2 in the Lee). Other potential sources were waterfowl that do not appear to affect significantly water quality during the periods open to shellfishing and boats at one marina and four mooring areas in the Coles River and one mooring area in the Lee River. The Town of Swansea does not allow overnight occupancy and does provide boat pump-out service. Boats presence was found not to be a significant source of contamination.

Throughout a 16-month period, approximately 150 shellfish growing water samples and 120 pollution source samples were collected and analyzed for fecal coliform bacteria in order to classify the two areas and assess potential sources of contamination. Additionally, over 250 water samples collected prior to the sanitary survey were used to help determine both seasonal and climatic impacts on water quality that in turn affect shellfish safety. In all, over 800 water samples were used to reclassify the shellfish beds.

Shellfish were also sampled in the Lee River and tested for arsenic, cadmium, chromium, total mercury and polychlorinated biphenyls (PCBs). Soft-shelled clam and quahog samples from multiple locations were analyzed and all found to be below US Food & Drug Administration tolerances for mercury and PCBs in seafood and guidelines for arsenic, cadmium and chromium in shellfish. Testing for these contaminants in shellfish was conducted due to concern about industrial contamination from a long defunct manufacturing plant that discharged into the upper portion of the Lee River.

As of November 6, 2009, the Swansea shellfish beds have been open a total of 53 days since July 1, 2009. This year has seen above normal rainfall; it is expected that under more normal climatic conditions there will be more open days. Preliminary data provided by the shellfish constable indicates that landings for this period have been significant. It is estimated that approximately 60 bushels of soft shell clams and 175 bushels of mixed size quahogs have been landed by recreational harvesters and at least 500 bushels of large or chowder quahogs and 250 bushels of mixed littleneck and cherrystone quahogs have been commercially harvested.

The reopening of shellfish beds in Swansea was a true cooperative effort by the town and *MarineFisheries*. Town department heads with the support and encouragement of the Board of Selectmen and the coordination of Town Administrator James Kern provided information and assistance as needed. Efforts by the Board of Health to upgrade septic systems should be lauded because failing septic systems were a major factor in the closures 25 years ago.

MarineFisheries will continue to monitor the shellfish beds as required by the NSSP and work to determine if additional areas may be opened or if the seasonal open period can be expanded.

By J. Michael Hickey, Shellfish Program Chief and Gregory Sawyer, Shellfish Biologist

Rainbow Smelt Restoration and Monitoring in the Crane River

In the spring of 2004, *MarineFisheries* began an enhancement project to increase the rainbow smelt population in Danvers' Crane River. Historically this river supported a strong population of smelt; however, after years of industrial pollution and poor overall water quality the smelt population had plummeted. Improvements to spawning habitat and water quality of the river, due to increased environmental regulations and removal of industrial point source pollution, suggested that a rainbow smelt population might once again be sustained in the Crane River.

MarineFisheries began stocking oxytetracycline (OTC) marked rainbow smelt larvae into the Crane River in the spring of 2005. OTC marking enables researchers to track individual fish by causing the otoliths (ear bones) of injected fish to glow under ultraviolet light. At first *MarineFisheries* staff injected larvae with OTC as developing embryos before hatching. After examining the process of marking more thoroughly, embryonic marking was discontinued in the spring of 2007 and replaced with larval marking. Larval marking provides a much more robust mark on the extracted otoliths of older fish in laboratory experiments.

Beginning in the spring of 2008, adult rainbow smelt (1-year old) were retained from fyke nets set in the Crane and North Rivers. The otoliths were removed and examined for the presence of an OTC mark under ultraviolet light. Sixteen

DMF File Photo

Adult rainbow smelt captured by MarineFisheries staff for examination of OTC mark

percent of smelt re-captured from the Crane River (12 out of 74 fish) had an OTC mark, indicating that they were from the *MarineFisheries* stocking effort in 2007. *MarineFisheries* also examined the neighboring North River, where a collection net was already installed, for any stray smelt - 10% of those fish (two out of 20 captured) were marked.

These early results indicate that *MarineFisheries*' stocking efforts have benefited rainbow smelt populations in both the Crane and North Rivers. Work is ongoing in the agency's new Age and Growth Laboratory at the Annisquam River Marine Fisheries Station in Gloucester (see related article) to examine smelt sampled from the Crane and North Rivers during the spring of 2009 for OTC marks. *MarineFisheries* will continue its restoration efforts in the Crane River in hopes that rainbow smelt populations continue to rise.

By Matt Ayer, Sportfish Biologist

Diadromous Fish Restoration Work Expanded

Massachusetts has long been a leader when it comes to helping diadromous fish migrations. Diadromous species are those that spend various stages of their life history in both fresh and salt water; anadromous species such as salmon migrate to freshwater to spawn while catadromous species (e.g., eels) migrate to the ocean to spawn.

This leadership tradition originated with the industrial revolution when dams were built on many coastal rivers to support hydropower mills. Dams interfered with spawning migrations of salmon and river herring, American shad, and other species that were valuable natural resources for food and commerce. This conflict fueled decades of innovations to keep fish runs viable.

Earlier in the 20th century, regulations evolved to encourage local control of diadromous fish runs with oversight by *MarineFisheries* in coastal rivers and *MassWildlife* for anadromous salmonids (sea run trout and salmon). Current state laws and regulations direct *MarineFisheries* to manage diadromous fish resources in coastal waters and protect fish passage, while working with towns and cities through approved management plans. This process required *MarineFisheries* to staff a fishway construction crew since 1934.

Once again anadromous fish restoration is in a dynamic period. Landward runs for most of these species have declined sharply during the last 20 years. Reasons behind the decline are not fully understood but watershed alterations, harvest mortality, and passage impediments all have been negative influences on fish runs. Public interest has increased in response to the declining numbers of fish observed along with increased attention from federal agencies and federal/private partnerships that fund restoration projects. All this has coincided with a growing national trend to seek natural solutions for river restoration and, dam removal is a favorite approach.

MarineFisheries efforts are expanding along with this increased support. As we endeavor to stay true to existing statutes and time-tested partnerships with local authorities, we are working on a wider range of passage and habitat improvement projects than the traditional fish ladders that were our target for successful population restoration for decades. Our focus remains providing technical assistance for fishway projects and repairs, but we are also becoming more active as technical partners for dam removal projects, spawning habitat improvements, and emerging technologies such as American eel passage ramps.

Restoration activities in 2009 reflect the changing landscape of diadromous fish habitat restoration. Our fishway construction crew of Ed Clark and Luis Carmo repaired 20 coastal fishways during spring spawning runs. The crew also designed and constructed custom fish traps for monitoring three fish runs and a customized eel ramp for Cold Brook in Harwich that passed over 20,000 eels in 2009. A large-scale, gravity-fed eel ramp also was installed in the Wankinco River in a partnership with A.D. Makepeace cranberry growers and the Town of Wareham. The eel ramp passed over 6,000 eels in its first year of operation.

Other ongoing projects include the design for a new fish ladder in Herring Brook in Pembroke; design and permitting for rainbow smelt spawning habitat restoration below the Foundry Pond Dam in the Weir River, Hingham; and funding of engineering plans for a fishway outlet to Pilgrim Lake in Orleans. Earlier in 2009, a large feasibility study was completed on restoring a river herring run to Great Pond Reservoir in the Fore River system, Braintree. Technical assistance was provided by the program on a variety of larger jobs.

To keep up with the wider range of biological monitoring and restoration staff has been reassigned to the Recreational and Diadromous Fish Program. Leading diadromous fish restoration at our New Bedford station is Brad Chase who will work closely with the Program's biologist, Phillips Brady, and local, state and federal partners to advance restoration projects. Matt Ayer on the North Shore will take over several tasks including American shad and rainbow smelt stocking, and management coordination for sturgeon species.

The one thing that hasn't changed is that these fish need as much help now as anytime before. *MarineFisheries* is striving to improve our capabilities and efficiency working on the restoration of diadromous fish populations and habitat.

By Brad Chase, Anadromous Restoration Specialist

DMF File Photo

MarineFisheries' Luis Carmo installing an eel ramp at Cold Brook in Harwich.

MarineFisheries to Work with Local River Herring Officials on Sustainable Management of Massachusetts River Herring

River herring, alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*), are the most abundant species of anadromous fish in Massachusetts. Going back to colonial times both species have played an important role in the sport and commercial fisheries of the Commonwealth.

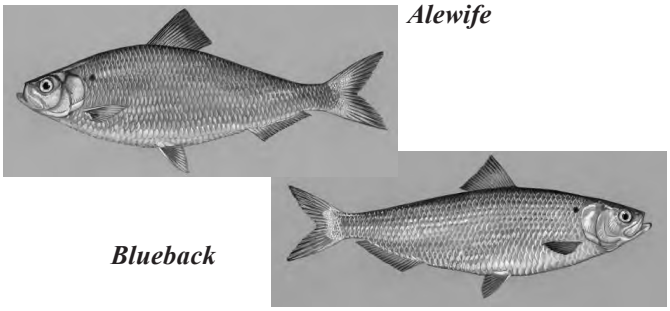
Coastwide declines in the populations of river herring prompted *MarineFisheries* to implement a moratorium on the collection, possession, or sale of these species in 2005 that will remain in place at least through 2011. Since 2006 both species have been listed by the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service as "Species of Concern". NMFS defines this designation as "species about which (there is) some concern regarding status and threats, but for which insufficient information is available to indicate a need to list the species under the Endangered Species Act". Currently five states: Massachusetts, Rhode Island, Connecticut, North Carolina and parts of Virginia have instituted moratoria on the taking and possession of river herring.

Since Massachusetts implemented the river herring fishery moratorium in December 2005, estimates of returning river herring populations to several of our coastal streams have ceased their precipitous declines and seemed to have stabilized. Counts over the past three years have improved slightly in some runs from the lows of earlier this decade, but still remain well below the longer term averages.

While current indications are encouraging, data from just three years of spawning runs is insufficient to determine a true upward trend in our coastal river herring populations. Should population numbers continue to improve *MarineFisheries* will have to develop future river herring management strategies when the current moratorium is lifted.

In response to the coast wide landings decline, the Atlantic States Marine Fisheries Commission (ASMFC) has implemented Amendment 2 to the Interstate Fishery Management Plan for Shad and River Herring. Amendment 2 facilitates adaptive management and restoration efforts along the entire east coast. Under this plan, both commercial and recreational harvest will be prohibited in state waters beginning January 1, 2012, unless a member state or jurisdiction submits for approval a sustainable management plan.

ASMFC defines a sustainable fishery as "a commercial and/or recreational fishery that will not diminish the potential future stock reproduction and recruitment". As many of our coastal river herring runs are also managed under M.G.L Chapter 130, Section 94, "local control", cities and towns will need to provide their local input and ideas in developing any meaningful management framework.

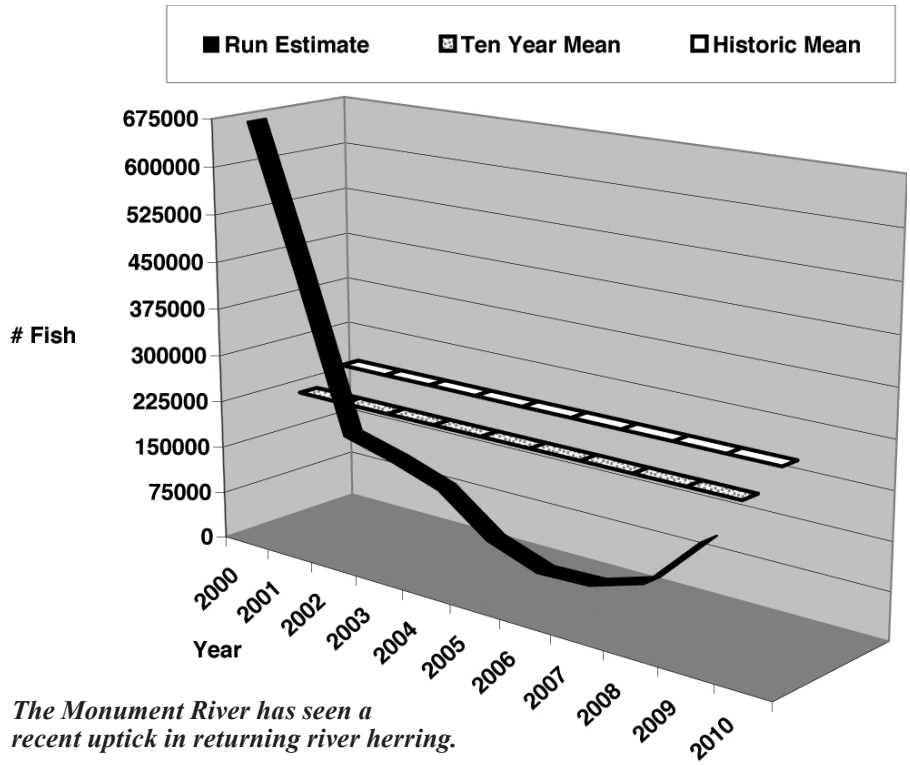


Images Courtesy of USFWS

To that end *MarineFisheries* will sponsor a river herring stakeholders' meeting with representatives of our coastal cities and towns, local herring wardens, herring commissions, NGO's and concerned citizens early in 2010. The intent of this meeting will be to disseminate and gather information as well as discuss possible management measures for local fish runs. This meeting will commence the process of developing specific management plans for individual runs which may be instituted when the current state wide River Herring Moratorium expires on January 1, 2012.

Crafting regulations for harvesting river herring from our local runs in future years in compliance with the sustainability requirements of the ASMFC plan is a daunting task. But *MarineFisheries* regards this as a high priority, and we look forward to working closely with towns and other concerned groups to move forward on this important undertaking.

By Phillips D. Brady, Senior Anadromous Fishery Biologist



The Monument River has seen a recent uptick in returning river herring.

Dick Quinn Receives Belding Award for Fish Passage Work

On September 3rd the Marine Fisheries Advisory Commission (MFC) awarded a longtime civil engineer from the U.S. Fish & Wildlife Service with the Dr. David L. Belding Award. Richard (Dick) Quinn was cited for his work on the conceptualization, design, and implementation of hundreds of fish passage structures that have lead to the survival of millions of anadromous fish, restoration of many extirpated runs, and the sustainability of runs in dammed rivers.

Created in 1989, the Belding Award is given annually to the individual who, in the opinion of the MFC, has done the most to promote conservation and sustainable use of the Commonwealth's marine resources. The award's namesake, Dr. Belding, was well known both to medical students and shellfish wardens in the first half of the 20th century, as he conducted two distinguished careers simultaneously in medicine and marine biology. Dr. Belding, who passed away in 1972, left a prodigious life's work. His research in marine biology, especially local shellfish populations, is continually referred to, even today, and became one of the cornerstones of today's *MarineFisheries*. The award was funded in perpetuity by Dr. Belding's family.

The MFC was joined in congratulating Mr. Quinn by Dr. David L. Belding Eldridge (a grandson of Dr. Belding), Commissioner Griffin, Director Diodati and numerous of Dr. Quinn's colleagues from the U.S. Fish & Wildlife Service. At the ceremony, the head of the *MarineFisheries* Diadromous Fish Program, Dr. Mike Armstrong, spoke on the long, rewarding relationship that he and his staff has had with Mr. Quinn and how he has been a vital partner in building and improving fishways throughout the Commonwealth. Dozens of fishways in Massachusetts have been built or improved over the last couple decades and

Mr. Quinn's designs and valuable input were used on most of these. Mr. Quinn's efforts have been instrumental in providing for the long term sustainability and resilience of anadromous fish runs in Massachusetts. Dr. Armstrong highlighted the fact that it was especially appropriate for Dick to receive the Belding Award since Dr. Belding himself wrote in 1920 the first treatise on anadromous fish passage in Massachusetts.

By Dr. Michael Armstrong, Fisheries Biology Section Chief

Photo by Dan McKiernan, DMF

(L-R): Dr. Michael Armstrong, Dr. David Eldridge, Dick Quinn, DFG Commissioner Mary Griffin, MFC Chairman Mark Amorello, and DMF Director Paul Diodati.

Horseshoe Crab Conservation Strategies Re-examined

MarineFisheries and MFC to consider alternative management to prevent local depletion

At an upcoming January 19 public hearing (see notice in this DMF News), *MarineFisheries* and the Marine Fisheries Advisory Commission will consider new strategies for horseshoe crab conservation. Preventing local depletion is the focus. A decade since the state's horseshoe crab rules were adopted, it is appropriate to review current strategies and decide whether to stay the course or consider alternative strategies.

The fishery is managed under limited entry and is comprised of three distinct segments: hand-harvest along spawning beaches in spring, dragger harvest in deeper waters during summer and fall, and a limited catch and release (after bleeding) harvest for biomedical industries. Most spawning - and harvest - occurs during peak tides linked to lunar cycles. The new and full moons in spring result in extreme flood tides, and spawning horseshoe crabs capitalize on these tides to deposit eggs in the sand at or just below the water's edge.

Though heavily regulated, there are concerns that management and harvesting strategies are conducive to local over-fishing, especially that portion of the fishery that harvests crabs from spawning beaches. The commercial fishery is managed by a yearly quota, daily catch limits, no-fishing days, and limited entry for permits.

MarineFisheries recently halved the quota in 2008 in response to cuts in other states and concern that there would be increased pressure to harvest in Massachusetts to meet regional demands. Despite these protective measures, *MarineFisheries* believes it is likely excessive removals from discrete locations will have long-lasting effects.

Though governed by an interstate plan quota, this species is not particularly migratory, and there are likely discrete sub-populations within the Commonwealth. Most other quota-managed species (e.g. striped bass, sea bass, scup, fluke, bluefish) depart state waters and migrate great distances where other state's fisheries may exploit them. But not so for horseshoe crabs. Horseshoe crabs are more sedentary and comprise localized populations that can be vulnerable to local harvest.

There are several lines of evidence - tagging and genetic studies - that suggest horseshoe crabs remain within a localized area, at least within a season and often from year-to-year. Furthermore, horseshoe crabs do not have a planktonic larval stage like other invertebrate species, and as such can not rely on larval subsidies from adjacent areas via dispersal to replenish depleted stocks. Therefore if crabs are depleted from an area, they are not likely to "fill in" from somewhere else.

Moreover, nearly all the state's harvest comes from areas along Cape Cod and the South Coast including the islands of Martha's Vineyard and Nantucket. The faunal break of Cape Cod further isolates the populations. For example there's likely no exchange between Cape Cod Bay areas with those south and west of the Cape.

There are several sources of data which indicate there is cause for concern about horseshoe crab populations in Massachusetts. The thirty-year *MarineFisheries* trawl survey data set shows a declining trend for horseshoe crabs in both spring and fall surveys. The newly created annual spawning

beach surveys initiated in 2008 show extremely low densities of crabs. Though we lack a historic time series, densities are quite low when compared to densities observed in other states and are supported by anecdotal reports from both horseshoe crab fishermen and others that numbers of spawning crabs observed on beaches has greatly declined.

In addition, sex ratios in some areas are skewed either highly male (9:1 in Pleasant Bay) or close to 1:1 in other areas. While 1:1 ratios may not be a problem in locations with very high crab densities, spawning potential may be compromised at locations where population densities are low because of the inability of the female crabs to find a male prior to spawning on the beach.

Since all fertilization is external, the presence of a male is necessary to ensure viable clutches of eggs. Eggs deposited by non-paired females will not develop. Single spawning females were observed this year at several beaches in the Commonwealth. This is a cause for concern and a phenomenon that is virtually unprecedented in other areas where horseshoe crabs occur.

DMF file photo

Former MarineFisheries Horseshoe Crab Biologist, Alison Leschen, conducts a spawning beach survey on Swifts Beach in Wareham, MA.

MarineFisheries' goal is to keep harvest at a sustainable level while maintaining economic viability for all sectors for the fishery. Horseshoe crabs are a critical bait source for the state's $3 million whelk pot fishery, and the biomedical industry producing Limulus amebocyte lysate (LAL) in the state employs over 100 people. LAL is used by biomedical firms in the U.S. and worldwide and considered essential for public health as a testing agent for contaminants in injectable drugs, intravenous solutions, and many medical devices.

MarineFisheries' management challenge is to achieve the fine line of conservation and ensuring adequate spawning while meeting the harvest needs of the industries. The current daily catch limit is 400 crabs and 1,000 for biomedical harvesters, and no harvest is allowed on weekends. Are these rules adequate to ensure escapement and successful spawning?

Since there are typically not that many crabs on any one spawning beach, fishermen may visit many different beaches in an evening, until they reach their daily limit or run out of time. Weekend closures were enacted to minimize waterfront conflicts with property owners and other members of the public. In some years, these closures coincide with peak lunar tides resulting in some protection of spawning crabs, but in other years they don't provide much protection.

Because much of the harvest occurs at night, enforcement is challenging. This fishery has not been a high priority for the Office of Environmental Law Enforcement and this situation may worsen with recent cuts to the enforcement budget.

MarineFisheries has crafted two new strategies for the public to consider: size limits and a lunar closure. *MarineFisheries'* preferred size limits would create a minimum size for males 7.1 inches (180 mm) and a "slot" limit for females where only crabs that fall between a minimum size and maximum size of 8.7 – 10.25 inches (220-260 mm) could be harvested.

This proposal brings challenges of compliance and enforcement because non-conforming crabs from out-of state would have to be addressed. Moreover there would be enforcement challenges with crabs that are broken into small pieces for bait use. As a conservation strategy *MarineFisheries* urged fishermen to use small pieces of crabs in bait containers – instead of whole crabs.

MarineFisheries' preferred lunar closure is three days before and three days after the date of the second peak lunar tide in May attributed to either a new or full moon. This proposal could result in a 30% reduction in available harvest (in numbers of crabs) of the bait fishery based on 2008 catch statistics, but some landings would be re-gained if crabs reappear on spawning beaches again at a later date when the fishery would be open.

Both of these proposals are substantial deviations from previous strategies and may make it appropriate to consider relaxing some other measures including: 1) weekend closures, 2) the 400 crab daily harvest limit for bait harvesters, and 3) the catch limit for mobile gear fishermen fishing after the May-June spawning period. *MarineFisheries* looks forward to working with all stakeholders to find practical and effective management strategies to ensure horseshoe crab fisheries are sustainable in all parts of the Commonwealth.

By Dan McKiernan, Deputy Director

DMF file photo

Horseshoe crabs spawning on Swifts Beach in Wareham.

Notice of Public Hearing
January 19, 2010

Under the provisions of M.G.L. Ch 30A and pursuant to the authority found in M.G.L. Ch. 130 ss. 17A & 80 Division of Marine Fisheries (DMF) and the Marine Fisheries Advisory Commission (MFC) have scheduled a hearing to accept comments on DMF proposals to improve management of horseshoe crab fisheries (322 CMR 6.00) to prevent local depletion and enhance spawning by adoption of one or more measures among the following:

Size limits based on prosomal width. Comments will be accepted on a minimum size for males and a slot limit for females. DMF's preferred option for males is a preferred minimum size of 7.1" (180 mm); for females, the preferred option is a minimum size of 8.7" (220 mm) and a maximum size of 10.25" (260 mm); only female crabs that measure between 8.7" and 10.25" would be lawful to harvest. These limits may also apply to both harvesters and dealers and would apply to crabs imported into Massachusetts from other states, unless properly tagged with state of origin.

Spawning closure. Comments will be accepted on a seven day, lunar cycle-based closure in late May to ensure some spawning opportunity for crabs. DMF's preferred lunar closure is three days before and three days after the date of the second peak lunar tide in May attributed to either a new or full moon. If adopted, consideration would be given to lifting the current prohibition on weekend harvest.

Possession limits. Comments will be accepted on whether to amend the current daily possession limits of 400 crabs per day for bait harvesters and 1,000 crabs per day for biomedical harvesters. Comments also are sought on whether the 400-crab limit applied to bait harvesters is warranted after the May-June spawning season.

A public hearing has been scheduled for 6PM on January 19, 2010 at the Cape Cod Natural History Museum (869 Main St./Rte 6A, Brewster, MA 02631)

Comments received by e-mail (marine.fish@state.ma.us), fax (617.626.1509), or mail (251 Causeway St., Suite 400; Boston, MA 02114) will be accepted until 5PM on Friday, January 22, 2010.

Copies of proposed regulations may be obtained by contacting Melanie Griffin by email (Melanie.Griffin@state.ma.us), phone (617.626.1528), or at the above fax and mailing address.

Applications Sought for New England Fishery Management Council

The Commonwealth of Massachusetts is seeking interested individuals for nomination to open seats on the New England Fishery Management Council (NEFMC). Candidates "by reason of their occupation or other experience, scientific expertise or training must be knowledgeable and experienced in ways related to fishery resources of New England." Two at-large seats will be open to nominations:

• an at-large seat currently held by Rip Cunningham of Massachusetts; and

• an at-large seat currently held by Frank Blount of Rhode Island.

The NEFMC is one of eight regional councils that manage our nation's marine fisheries seaward of state territorial waters. Responsibilities include development of fishery management plans that are submitted to the National Marine Fisheries Service and the Secretary of Commerce for approval and implementation.

Qualified individuals interested in being considered for nomination to the Council should contact Shannon Davis at (617) 626-1621 or e-mail shannon.davis@state.ma.us by January 31, 2010. Nominees must complete a comprehensive application that will be provided by *MarineFisheries* and includes a philosophy statement and financial disclosure statement. For further information on the Council and the Council process, please visit www.nefmc.org.

Regulatory Year in Review

During the period January through November 2009, the following regulatory changes were enacted by DMF after public hearings and Marine Fishery Advisory Commission (MFC) approval. Emergency regulations that have subsequently expired are not included. Annual specifications in effect as of November 2009 are also listed.

Atlantic Bluefin Tuna

The Director, through conditions on permits, banned purse seining for Atlantic bluefin tuna in Cape Cod Bay.

Bay Scallops

DMF finalized a clarification (322 CMR 6.11) on which bay scallops are legal for harvest based on presence and location of an annual growth ring as well as size in some cases. The harvest and possession of seed scallops, defined as scallops without a well-defined raised annual growth line at least 10 millimeters (mm) from the hinge of the shell, is prohibited. An exception to this prohibition was established for those scallops that have a well-defined raised annual growth line located less than 10 mm from the hinge of the shell if the shell height is at least 63.5 mm (2.5").

Black Sea Bass

The recreational black sea bass minimum size increased from 12" to 12.5" (322 CMR 8.06) to comply with the Atlantic States Marine Fisheries Commission (ASMFC) mandated reduction (10%) in harvest.

Established 2009 commercial seasons and trip limits (322 CMR 6.28).

Blue Crabs (322 CMR 6.19)

Recreational and commercial harvesters are limited to 25-blue crab possession limit (322 CMR 6.19)

Legal minimum size for blue crabs increased to 5".

Coastal Sharks

Regulatory amendments (322 CMR 6.37) to remain in compliance with the Interstate Fishery Management Plan for Atlantic Coastal Sharks, including:

a. establishing recreational and commercial minimum size limits, possession limits, and gear restrictions;
b. prohibiting possession of some species, filleting of sharks at sea, and finning of sharks; and
c. establishing additional standards for disposition of commercial and recreational catch.

Fixed Gear (related to protected species measures)

Regulatory amendments were enacted to remain current with changes to the federal Atlantic Large Whale and Harbor Porpoise Take Reduction Plans (322 CMR 4.13 & 12.00). Specifically revised regulations:

a. require marking of fixed gear (gillnet and pots traps) buoy lines with gear-specific 4-inch colored mark midway on the buoy line (see Table 2 for gear specific colors). Note, recreational fishermen will be required to mark their buoy lines beginning in 2010;

Table 2. Colored marking rules for buoy lines on fixed gear.

Gear	Color
Gillnets	Green
Pots/Traps	Red for all inshore lobster fishing (LCMA 1, 2 and Outer Cape)
	Black for offshore fishery (LCMA 3 only)
Exception, if color of rope is same as color code, a white mark may be substituted for the mandated color.	

b. allow bottom gillnetters to re-gain access to a portion of waters in the northern Gulf of Maine that is no longer closed under the Harbor Porpoise Take Reduction Plan;
c. prohibit use of bottom gillnets during March South of Cape Cod in waters under the jurisdiction of the Commonwealth west of the 70° 30' W longitude line and south of a line drawn westerly from the intersection of the 70° 30' W longitude line with the Mashpee shoreline;
d. mandate use of pingers on bottom gillnets fished in Upper Massachusetts Bay and Ipswich Bay during specific times (see Table 3);

Table 3. Gillnet pinger requirements.

Area	Period during which bottom gillnets must have pingers
Upper MA Bay/ Ipswich Bay from Marblehead to the NH Border	September 15 – May 31
MA Bay Area	Dec – Feb and Apr – May

For further details on area boundaries see 322 CMR 12.04(3).

e. require gillnets be rigged with anchoring system with the holding power of at least 22-pound Danforth anchor (eliminates previous anchoring system options); and
f. require 600-lb weak link for pot gear year-round, except during January 1 – May 15 in the Right Whale Critical Habitat when a 500-lb. weak link is required.

Groundfish (322 CMR 6.03 & 8.15)

Haddock minimum size was decreased to 18" for commercial and recreational harvest.

Commercial trip limit of 1,000 lbs. was implemented for witch flounder.

Spring Cod Conservation Zone established preventing possession on board of cod taken from waters under the jurisdiction of the Commonwealth north of latitude 42 30', south of latitude 42 33', east of 70 43' and west of 70 40' during May and June with an allowance for vessels transiting the area to possess cod provided they were caught outside of the area and fishing gear is stowed. Measures will remain in place through 2011.

Revised possession limits for commercial harvest of winter flounder by State Waters Groundfish Endorsement (GE) permit holders: 250-lbs in Gulf of Maine and 50-lbs. in Southern New England.

Recreational closed season for winter flounder in Gulf of Maine during September and October.

Reduction of recreational possession limit for winter flounder to two-fish per day in Southern New England.

Inshore Net Regulations for Pelagic Fisheries

Regulations were enacted that implement net specifications and performance standards in the Commonwealth's nearshore pelagic fisheries (322 CMR 4.02, 4.14, 4.15, 6.07, 7.00 & 12.00). Approved measures:

a. specify that a Coastal Access Permit (CAP) for mobile gear is required to use purse seines, but that moratorium on new CAPs does not apply to those being issued specifically for the use of purse seines;

b. specify that the 72-foot maximum vessel length limit for CAP holders does apply to purse seine vessels but certain permit holders who have fished purse seines with vessels longer than 72-feet in waters under the jurisdiction of the Commonwealth since 1995 may be exempt from the vessel size limit;

c. establish a distinct commercial surface gillnet endorsement, separate from a sink gillnet endorsement;

d. increase the maximum gillnet size from 200 to 250 square feet that could be used and still be exempt from surface gillnet permit requirement;

e. clarify requirement that any person using a surface gillnet for purposes of obtaining and selling bait to a person who is not a licensed dealer must obtain both a commercial fishermen's permit and a bait dealer's permit;

f. clarify that the prohibition on use of gillnets south and west of Cape Cod during April 1 through November 15 does not apply to persons using surface gillnets less than 250-square feet to take bait for personal use in the Inshore Restricted Waters (exempt from permit requirements) or fishing surface gillnets with a permit (in accordance with 322 CMR 4.14) and fishing in the Inshore Restricted Waters as defined in 322 CMR 4.02;

g. clarify that vessels using or possessing surface gillnets shall not be precluded from possessing striped bass under a longstanding regulation that prohibits striped bass possession for vessels "rigged for netting;"

h. require all fishermen fishing surface gillnets to remain within 200 feet of the net at all times. This recommendation increases the maximum distance from 100 feet proposed at public hearing;

i. approve a maximum net length of 300 linear feet fishing at any one time. Permit holders seeking to fish longer nets or setting overnight without tending may be permitted through experimental fishery permits;

j. require that for each 50 linear feet of gillnet, at least one headrope float must be marked with the letters "SGN" as well as the DMF 6-digit permit number, and a buoy marking scheme that includes reflective tape and the 6-digit number;

k. prohibit use of more than one net in the water at a time; additional nets must be stowed aboard the vessel;

l. approve maximum mesh opening of 3 ¾" and a minimum mesh opening of 1 7/8." This recommendation liberalizes the minimum mesh size from 2 ½" down to 1 7/8";

m. enact a seasonal river herring protection closure that prohibits the use of surface gillnets in south coastal waters prior to May 16 and in waters east and north of Cape Cod prior to June 1;

n. prohibit year-round use of surface gillnets in excess of 250 square feet in Buzzards Bay;

o. allow any person to use a cast net for purposes of catching bait species for personal use without a permit;

p. require any person using a cast net for purposes of obtaining bait for sale to a bait dealer to obtain a commercial fishing permit; and

q. require any person using a cast net for purposes of obtaining bait for sale to someone who is not a dealer to obtain both a commercial fishermen's permit and a bait dealer's permit.

Northern shrimp

Commercial season of 180-days beginning December 1, 2009 and ending May 29, 2010. Various gear restrictions (322 CMR 5.00) remain in effect, including a minimum mesh size of 1 ¾", required use of a Nordmore Grate System, as well as a prohibition on mechanical devices used to cull, grade, separate, or shake shrimp.

Rainbow smelt

Uniform 50-fish daily limit for rainbow smelt harvested by recreational and commercial fishermen from coastal waters of the Commonwealth (322 CMR 6.09).

Scup (322 CMR 6.28)

Established seasons, trip limits and no-fishing days for the 2009 commercial fishery.

Spiny dogfish

MFC approved a November 6, 2008 control date for the spiny dogfish fishery (322 CMR 7.04). No management measures have been proposed at this time in association with this date.

Striped bass

For-hire captains conducting charters are allowed to dispose of striped bass racks at-sea (322 CMR 6.07).

Summer Flounder (Fluke)

For 2009, recreational fishermen were subject to a 5-fluke possession limit at an 18.5" minimum size during July 1 – August 13 (322 CMR 8.06). This action increased the minimum size by ½" and shortened the season by 23 days to July 1 – August 13.

Trap Tags

Commercial lobstermen authorized to fish traps in the Outer Cape Cod (OCC) Lobster Conservation Management Area are required to affix current trap tags by March 16th (322 CMR 6.31).

Staff Comings & Goings

Kristen Ferry recently left *MarineFisheries* to take a job with the NOAA Restoration Center where she'll be working on projects to improve fisheries habitat in New England. Kristen joined *MarineFisheries* in 2001 shortly after completing her Masters work on striped bass ecology at UMass-Amherst. While with *MarineFisheries* she initiated the Sportfish Angler Data Collection Program which continues to provide valuable striped bass catch data to *MarineFisheries* scientists. She led a number of anadromous fish habitat restoration projects including the Charles River Shad Restoration Program and represented *MarineFisheries* on the Merrimack River Technical Committee and the Sturgeon Technical Committee. We wish Kristen all the best in her new position and look forward to continued work with her and the NOAA Restoration Center.

Frank Germano retired from *MarineFisheries* in September after 32 years of service. Frank spent much of his career on *MarineFisheries*' shellfish program where he served as the south shore bureau supervisor for 12 years. In 2000, he became *MarineFisheries'* specialist on horseshoe crab and whelk fisheries. In the final years of his career he served on *MarineFisheries* Habitat Program conducting reviews of coastal alteration projects. Frank will be missed for his local knowledge of south shore and south coast marine resources, and we wish him a long and healthy retirement.

Alison Leschen departed *MarineFisheries* in October to take on her current role as manager of the Waquoit Bay Estuarine Research Reserve on Cape Cod for the Department of Conservation & Recreation. Alison began work with *MarineFisheries* in August of 2004 as a biologist on the HubLine Eelgrass Restoration Project. She spent three years on that project conducting field work associated with the restoration of over five acres of eelgrass in Boston Harbor as partial mitigation for assumed environmental damage from the construction of a natural gas pipeline in Massachusetts Bay. Alison subsequently assumed responsibility for *MarineFisheries* horseshoe crab research and management efforts instituting spawning surveys for that species. *MarineFisheries* wishes Alison all the best in her new position.

Dave Whittaker retired in December after 23 years with *MarineFisheries*. Dave started in 1968 as an Assistant Marine Fisheries Biologist on the Shellfish Technical Assistance Program advising municipal shellfish managers. In 1970 he transferred to the Estuarine Program and was involved in the marine resources studies in Wellfleet Harbor, Bass River and the Taunton River-Mount Hope Bay.

In late 1971, Dave left *MarineFisheries* to become the Assistant Director of Public Health in New Bedford and in 1976 moved to Texas where he was a hospital administrator and eventually Chief Information Officer. In 1988, he returned to Massachusetts and *MarineFisheries* working for a short time in the Boston Office. From November 1989 through 1991 he was the field biologist for the Massachusetts Health Research Institute (MHRI) involved in a cooperative study with the Department of Public Health and *MarineFisheries* to quantify the temporal and spatial distribution of marine biotoxins in molluscan shellfish harvested from coastal Massachusetts, Nantucket Shoals and Georges Bank.

At the conclusion of the field work, he returned to *MarineFisheries* as a biologist in the South Shore Section of the Shellfish Sanitation and Management Program in Sandwich. Eventually Dave assumed the role of Senior Biologist and Section Supervisor. Dave was a mentor to *MarineFisheries* staff and anyone involved in shellfisheries. His main interests among many were biotoxins in shellfish and management of the surf clam, ocean quahog and quahog dredge boat fisheries.

Dave is now enjoying more time with his grandchildren, carving, making intricate wampum style jewelry, fishing, and kayaking. He also plans to do some traveling. His sense of humor, dedication and expertise will be missed. We wish him well.

Staff Publications

MarineFisheries Technical Reports

TR-35 Barber, J. S., K. A. Whitmore, M. Rousseau, D. M. Chosid, and R. P. Glenn. 2009. Boston Harbor artificial reef site selection and monitoring program. http://www.mass.gov/dfwele/dmf/publications/tr35_artificial_reef.pdf

TR-36 Nelson, G. A. 2009. Massachusetts striped bass monitoring report for 2008. http://www.mass.gov/dfwele/dmf/publications/tr36_stb_monitoring_2008.pdf.

Contributions

Barber, J. S., D. M. Chosid, R. P. Glenn, and K. A. Whitmore. 2009. A systematic model for artificial reef site selection. New Zealand J. Mar. Freshw. Res. 43:283-297.

Chase, B.C. 2009. The spawning habitat of anadromous rainbow smelt: trouble at the tidal interface. Challenges for Diadromous Fishes in a Dynamic Global Environment, pages 859-862.

Chase, B.C., M.H Ayer, and S.P. Elzey. 2009. Rainbow Smelt Population Monitoring and Restoration on the Gulf of Maine Coast of Massachusetts. Challenges for Diadromous Fishes in a Dynamic Global Environment, pages 899-902.

Mandelman, J. and G. Skomal. 2009. Differential sensitivity to capture stress assessed by blood acid-base status in five carcharhinid sharks. J. Comp. Physiol. B. 79 (3): 267–277. DMF Contribution No. 23.

Skomal, G.B., S.I. Zeeman, J.H. Chisholm, E.L. Summers, H. J. Walsh, K.W. McMahon, and S. R. Thorrold. 2009. Transequatorial migrations by basking sharks in the western Atlantic Ocean. Current Biology 19:1-4. DMF Contribution No. 24.

Skomal, G., H. Marshall, J. Chisholm, L. Natanson, and D. Bernal. 2009. Habitat utilization and movement patterns of porbeagle sharks (Lamna nasus) in the western North Atlantic. Col.Vol.Sci.Pap. ICCAT SCRS/2009/094.

Division of Marine Fisheries
251 Causeway Street, Suite 400
Boston, Massachusetts 02114

PRESORTED
FIRST-CLASS MAIL
U.S. POSTAGE
PAID
BOSTON MA
PERMIT NO. 56299

Printed on recycled paper.

INSIDE...

Surfers • Surfers • Surfers

This Newsletter and Other Information is available at our Web Site!

http://www.mass.gov/marinefisheries

DMF NEWS

EDITORS: **Dan McKiernan**
David Pierce
Melanie Griffin
GRAPHICS: **David Gabriel**

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.

Deval L. Patrick, Governor
Timothy P. Murray, Lt. Governor
Ian A. Bowles, Secretary, EOEEA
Mary B. Griffin, Commissioner, DFG
Paul J. Diodati, Director, *MarineFisheries*

Comments and suggestions for the newsletter are welcome. Please contact the Editors at (617) 626-1520, or write to:
Division of Marine Fisheries
251 Causeway Street, Suite 400
Boston, MA 02114

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

EXECUTIVE OFFICE of ENERGY & ENVIRONMENTAL AFFAIRS