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

2010 • 1st — 4th Quarters • Volume 31

MarineFisheries
A Commonwealth of Massachusetts Agency

State's first recreational saltwater permit in 2011

Recreational saltwater fishermen are reminded they will need to be permitted before going fishing in 2011. In December of 2009, *MarineFisheries* reported on the newly enacted state and federal laws that changed the permitting requirements for recreational saltwater fishermen (see DMF NEWS 2009 volume 30). Beginning January 2011, Massachusetts recreational fishermen will no longer register with the National Marine Fisheries Service (NMFS), but with the Commonwealth of Massachusetts, as the new permit issued by the Division of Marine Fisheries will be fully implemented.

To improve the quality of data used to estimate the effects of recreational fishing on ocean resources and the nation's economy, the US Congress included a provision in the 2006 reauthorization of the Magnuson-Stevens Fisheries Conservation and Management Act requiring all recreational saltwater anglers become registered permit holders. The basic idea behind the requirement is that the improved data will aid in developing recreational fishing regulations that are fair, effective, and based on sound science.

In 2010, to comply with the permitting requirement, the National Marine Fisheries Service established a universal registry of all saltwater anglers whereby all saltwater fishermen were required to register with NMFS or obtain a permit from an "exempted" state. NMFS debuted the federal registry program in 2010 at no cost to registrants, but estimated the cost to be set as high as $25 annually beginning in 2011. Proceeds from the sale of a federal permit would go directly into the US Treasury. However, if a state were to develop its own recreational saltwater permitting programs prior to 2011, and it met the permitting and reporting criteria established by the federal government, anglers participating in the state program would be exempt from having to purchase the federal permit.

In response to the NMFS registry, Governor Deval Patrick signed into law "*An Act Instituting Saltwater Fishing Licenses*" (Saltwater Act) on November 23, 2009. This bill enabled *MarineFisheries* to build and implement a state permitting program for 2011, exempting the Commonwealth's saltwater recreational anglers from the

Photo courtesy of Dan McKiernan

All recreational fishermen will be required to obtain a recreational saltwater fishing permit in 2011.

more expensive federal registry – the Commonwealth has proposed a $10 permit for both residents and non-residents alike. Based on stakeholder feedback, the law established a dedicated saltwater recreational fishing fund, ensuring a 'user-pay/user-benefits' program; all fees collected from the sale of a recreational saltwater fishing permit can only be used on approved marine recreational fishing programs, and 1/3 of all annual appropriations must be dedicated to recreational saltwater fishing access projects in Massachusetts.

As directed by the Saltwater Act DFG Commissioner Mary Griffin appointed five founding members to the Marine Recreational Licensing Development Panel (Panel): Chuck Cassella of the Marine Fisheries Advisory Commission (MFC) serves as the Panel's Chairman, Mark Amorello (MFC Chairman); and three active members of the recreational fishing community, Elizabeth Stromeyer (former owner of Red Top Bait and Tackle), Patrick Paquette (Massachusetts Striped Bass Association) and Michael Moss (Massachusetts Sportsmen's Council). A preliminary meeting was held on May 13, 2010, and the Panel will meet twice a year to advise the Director on potential recreational fishing projects and permitting issues.

The basic provisions of the saltwater fishing license are included in the text of the bill, with more detailed programmatic information included in the regulations (see public hearing notice in this newsletter). Fishermen should be familiar with the rules and regulations governing the recreational saltwater fishing permit, but provided below we answer the most common questions, including: who needs a permit, how much will it cost, and where can I get one?

All fishermen 16 years and older will need to be permitted with the exception of: (1) permanently disabled individuals; (2) fishermen fishing exclusively on board a properly permitted for-hire vessel (charter or head boat); and (3) properly permitted residents of another state that has a reciprocity agreement with Massachusetts. At this time we anticipate reciprocity with our neighboring coastal states, RI and NH. If we enter into reciprocity agreements with other states, we will post an updated list of those states on the *MarineFisheries* website.

The proposed cost of the Massachusetts recreational saltwater fishing permit is $10 for fishermen between the ages of 16 and 59. The cost will be the same for both residents and non-residents. Fishermen aged 60 years and older must obtain a permit, but the permit will be free. Fishermen under 16 do not need a permit.

We anticipate that many individuals who will obtain the recreational saltwater fishing permit are the same sportsmen purchasing freshwater fishing permits from our sister agency, *MassWildlife*. As such, we have been working closely with our Department of Fish and Game (DFG) and *MassWildlife* in developing a common on-line recreational permitting system called *MassFishHunt*. *MassFishHunt* will take the place of our existing system that has been operating under the name of *MassOutdoors* for the past 10 years. In January 2010, DFG entered into an agreement with a private contractor, Active Outdoors, to build the permit application for *MassFishHunt*. Active Outdoors is the premiere outdoor permitting vendor in the nation; they are responsible for running the Reserve America program (National and State Parks and Forests campgrounds), many town recreational sporting programs, and a number of hunting and fishing permitting programs across the United States.

MarineFisheries will issue the new recreational saltwater fishing permit, along with our existing non-commercial lobster permit and the for-hire permits through *MassFishHunt* for the 2011 permit year. In addition, users will also be able to obtain *MassWildlife* hunting and freshwater fishing licenses through this same application. For *MarineFisheries* constituents the permit system will initially roll out for internet users at www.mass.gov/massfishhunt and at *MarineFisheries* permitting offices in Boston, Gloucester and New Bedford. Shortly thereafter, we expect to include a phone option, and a full deployment at those bait & tackle shops that opt to be *MarineFisheries* permitting agents. Applicants should be aware that agents are allowed to charge a small processing fee up to $1.50, and Active Outdoors will also charge a convenience fee of approximately $1.50 to $2.00. There will not be any additional charges for anyone that obtains their permit from a *MarineFisheries* permitting office.

We expect there to be some confusion regarding the transition from the federal registry to the state permit program. *MarineFisheries* will be prepared, with staff ready, to focus on making this a smooth transition. Information will be updated continuously on our website at www.mass.gov/marinefisheries and *MarineFisheries* staff is available at 617-626-1520 to answer questions regarding the permit.

By Kevin Creighton, Chief Financial Officer

New report cites economic shift in the Massachusetts Multispecies Groundfishery

MFI prescribes quota increases to soften impact of new management system.

A recent Massachusetts Marine Fisheries Institute (MFI) report demonstrates that the transition to catch shares (sector management), under Amendment 16 to the Northeast Multispecies Fishery Management Plan, caused major unforseen shifts in the distribution of quota and income; this has resulted in a direct economic loss of $21 million and forgone yield of $19 million for the Massachusetts groundfish fishery.

The report identifies scientifically valid alternative reference points which can trigger scientifically justified increases in annual catch limits (ACLs) without sacrificing conservation. These increases are particularly helpful with regard to raising limits for "choke species" – those whose quota limits are so low they must be avoided to prevent a shutdown of the mixed species fisheries. Increases would total 32 million lbs. for the Northeast Multispecies fishery.

Marine Fisheries Institute report justifies 32 million pound increase for the Northeast Multispecies Fishery.

NOAA Fisheries' own review of landings and revenue data available for the first five months (May-September) of the 2010 fishing year shows that landings (and revenues) are comparable (or in some cases greater) to levels observed for this same period last year. While these data indicate potential economic health in the groundfishery as a whole, aggregate data masks significant unforeseen economic impacts that are happening at more local levels, partly through consolidation. The report finds that of the 385 Massachusetts groundfish boats that have joined cooperatives known as "sectors", 56% have not yet been active in the fishery this year. This represents a 22% increase in vessel inactivity compared to this time last year.

Photo courtesy of Dan McKiernan

Groundfish vessels would benefit from suggested increases in quota according to the Marine Fisheries Institute Report.

The transition to catch shares has advantaged some fishing businesses, but low quota allocations represent an economic emergency for a significant portion of the fishing community. For example, a comparison of 2010 Annual Catch Entitlements (ACE) to actual landings in recent years shows as much as two thirds of fishing permits were allocated 50%-60% less than their 2007-2009 average annual harvest. This reduction in allocation represents lost revenue of $21 million for this portion of permit holders.

This information coupled with reports from sector managers concerning the drop in active fishing vessels in the 2010 fishery compared to last year, demonstrates that a significant shift in the distribution of income has occurred. The total revenue for vessels that landed more than $300,000 during May-September (2010) almost doubled from $14 million to $26 million, while the number of vessels in sectors that did not fish increased about 11%. In other words, 10% of the Massachusetts sector vessels landed about 64% of total revenue from May through September of 2010. The impacts of lost revenue are compounded by the increased operating costs that go along with sector management – fees are assessed against sector landings to cover monitoring and administrative costs that can undermine the profitability of a trip.

The cumulative economic impacts – which include high costs to operate within a sector, past debt incurred to survive the former Days-at-Sea (DAS) program, lost harvest opportunities because of low quota allocations, and added investment needed to continue in sector programs – all contribute to decreased profitability for a significant portion of the industry, rapid consolidation of fishing businesses, rise in unemployment, and reduced infrastructure.

The MFI report concludes that there are alternatives within the best available science for calculating and setting higher than current ACLs for 2011. Of the three components that capture uncertainty in determining ACLs, all three used conservative methodology, sometimes "double counting" uncertainty. Specifically, use of direct estimates of overfishing ($F_{90\%msy}$) instead of lower proxy values ($F_{40\%\ msp}$) for some stocks underestimates overfishing limits and lowers ACLs. Alternative assessments would allow increases in groundfish ACLs such as for Georges Bank yellowtail flounder. Smaller uncertainty buffers would accomplish the same increases. For some stocks, rebuilding objectives can be revised, thereby allowing increases in ACLs. In the context of the new management system, adding an uncertainty buffer to an overfishing limit that is based on an underestimate of Fmsy or stock size is doubly precautious.

Combined adjustments provide ACL increases for all groundfish stocks with substantial increases for choke species such as Georges Bank cod and yellowtail flounder, Gulf of Maine cod and winter flounder, and southern New England winter flounder. Increased ACLs for choke stocks will allow the groundfish fleet to reach far more of their allocations of other stocks thereby substantially increasing mixed-stock yield within the multispecies fishery. This analysis, in which ACLs would be raised to the maximum amount that would be scientifically justified while still maintaining conservation goals reveals that increased ACLs will allow an additional 14,500 mt (about 32 million pounds) of potential catch.

Massachusetts Governor Deval Patrick recently sent the MFI report to US Secretary of Commerce Gary Locke with his requests for immediate actions to issue emergency regulations to revise catch limits to higher levels. High limits will be consistent with conservation requirements and will provide $21 million in direct economic relief to the Commonwealth for impacts caused by the transition to catch shares.

The full MFI report and the Governor's letter to Secretary Locke can be found at http://www.mass.gov/dfwele/dmf/marinefisheriesnotices/advisories.htm

By Paul Diodati, Director

Protection of Spawning Cod

Massachusetts a leader

MarineFisheries has embarked on a new conservation strategy for Atlantic cod (*Gadus morhua*): surgical temporal and spatial closures now protect remnant Gulf of Maine cod spawning aggregations. Research conducted on these protected aggregations shows this approach has tremendous promise.

Atlantic cod is a mainstay of the Gulf of Maine (GOM) groundfish fishery. It is highly sought after and has supported large-scale commercial and recreational fisheries for generations. Due to high demand, over-harvesting led to past collapses of cod stocks throughout the species' range in Europe, Canada, and the US.

Protecting spawning aggregations is a critical component of meeting the challenges to rebuild and restore the historic size and distribution of GOM cod and ensure its long-term commercial and biological sustainability. Through scientific studies and interviews with commercial fishermen, it has been reported there are two components of the GOM stock: one found near-shore (between 20-30 nautical miles off the coast) and another on offshore banks and sills of deep basins (both components typically aggregate inshore to spawn). However, the GOM cod stock complex is a mosaic of distinct or semi-distinct spawning groups (subpopulations), many of which are migratory.

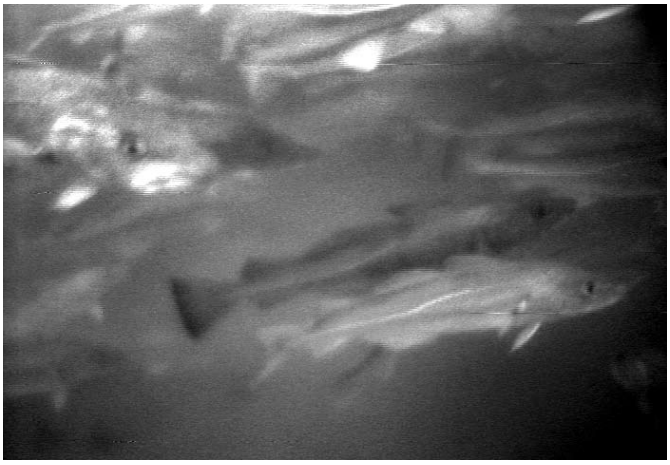
Through tagging and acoustic telemetry studies, it has been shown that mature cod show a high level of spawning site fidelity, and some aggregations over-winter in close proximity to their spawning grounds.

Newly published work has demonstrated that spawning groups are genetically unique, indicating they function independently of one another. Conservation and rebuilding of inshore stocks will help protect genetic diversity and increase resiliency enabling cod to better adapt to change and disruptions. The more subpopulations that exist in the GOM system, the more likely larvae will find suitable settlement habitat, resulting in improved recruitment.

Research also suggests protecting the remaining inshore stocks could act as a source for recolonizing unoccupied spawning grounds in Massachusetts, New Hampshire and Maine, resulting in the resurrection of historic spawning areas. The restoration of inshore stocks would strengthen smallboat commercial fisheries and private/charter recreational fisheries thereby increasing their financial contributions to local economies.

DMF Staff Photo

DMF Researchers tagging cod.



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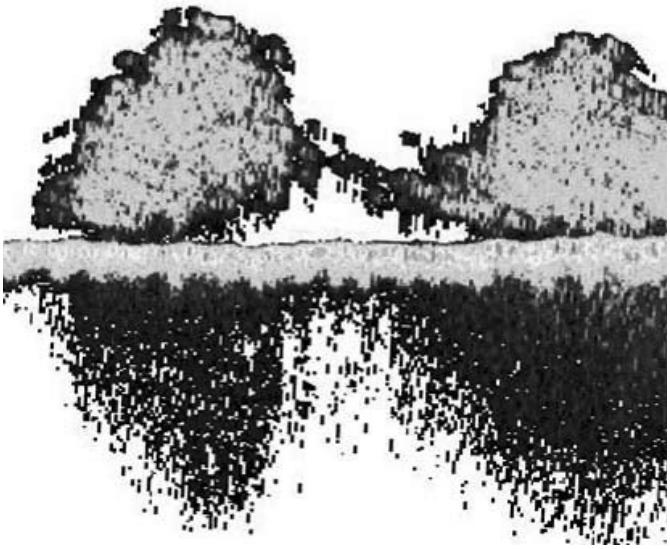


DMF file graphic

Spawning cod aggregate densely in 'haystacks.' The cod pictured are found in the dense plots on the sonar image.

For the past several decades, cod have been managed according to large geographical units (e.g. Gulf of Maine, Georges Banks, etc), as managers have preferred to set targets for large areas rather than micro-manage individual sub-populations. Although some success has been achieved with this method, restoring the historical redistribution, and thereby ensuring long-term sustainability, has proven difficult. A major challenge has been the demise of many of the spawning aggregations that once existed on Nantucket shoals, Massachusetts Bay, Ipswich Bay and downeast Maine.

MarineFisheries has created winter and spring Cod Conservation Zones (CCZ) in state waters. By protecting Massachusetts Bay and Ipswich Bay spawners, which have already been found to be genetically isolated, researchers and managers are working together to understand the fine-scale population structure of cod and prevent depletion of these subpopulations through localized overexploitation.

Working through the Massachusetts Marine Fisheries Institute (MFI), a partnership between *MarineFisheries* and the University of Massachusetts/School for Science and Marine Technology (SMAST), studies using acoustic telemetry, data storage tags, traditional tags, and underwater video have improved understanding of the fine-scale popula-

tion structure of inshore cod, as well as their behavior and movement patterns. Results of these efforts support protection of spawning aggregations that represent the few known remnants of once numerous and diverse historical spawning groups in the Gulf of Maine.

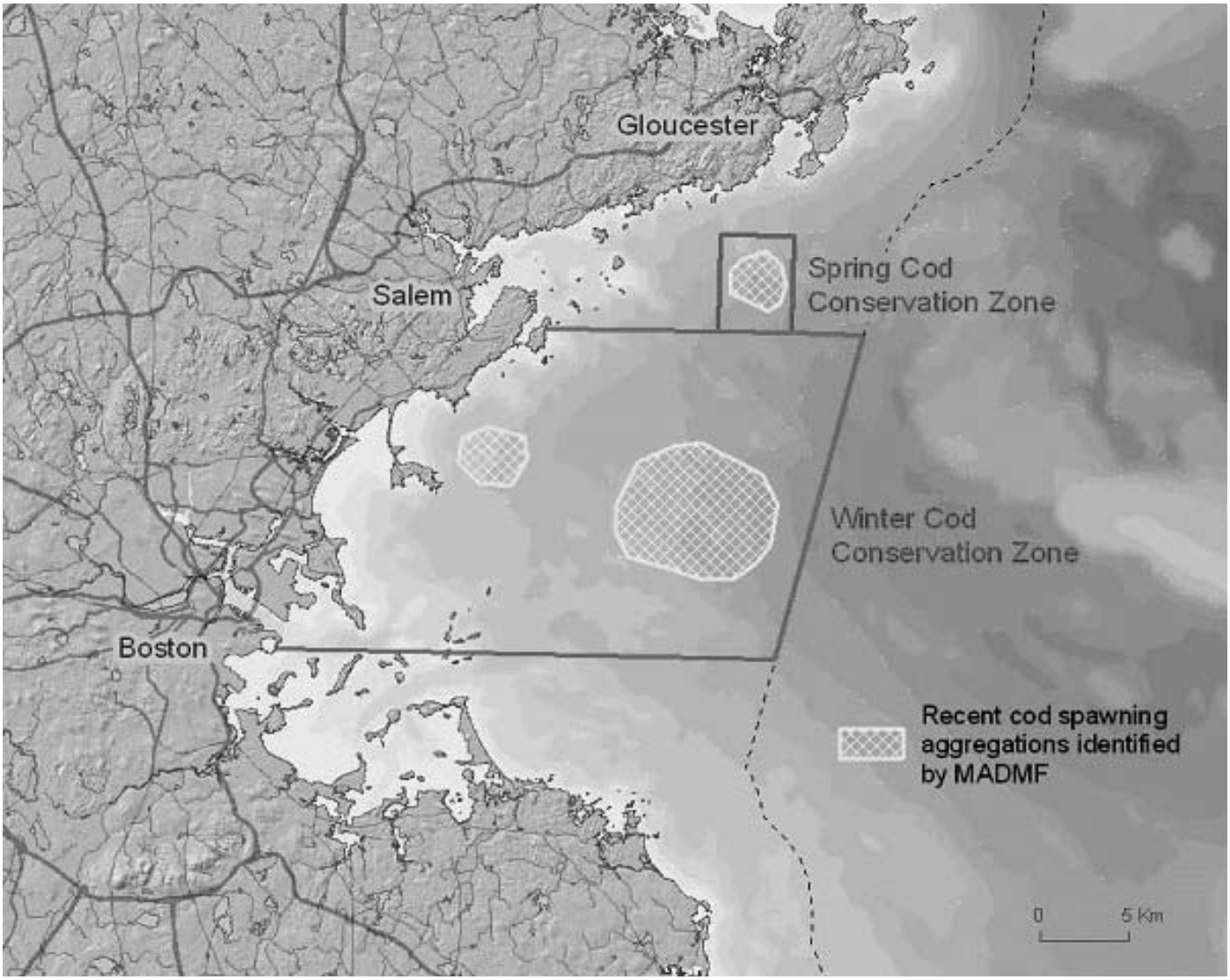
Spawning cod protection promotes reproduction, increases genetic diversity and stock resiliency and may result in the recolonization of unoccupied historic spawning grounds; providing improved recruitment and a more productive resource.

Current research projects are occurring not a moment too soon. The New England Fishery Management Council's new system of groundfish management (sector management) has direct consequences for inshore GOM cod. Rather than using time-area closures (rolling closures) and trip limits to control fishing effort, sector management apportions total allowable catch into catch shares. As a result, areas that were once closed to control fishing effort under the old management scheme are now open for harvest. Unfortunately, some of these areas include critical cod spawning grounds.

One such area known as "Whaleback" is located in northern Ipswich Bay, adjacent to New Hampshire state waters. Not only is this unique aggregation now vulnerable to commercial fishing, the recreational fishing fleet has also become aware of its existence and is currently exerting significant pressure. If left unprotected, it is likely that Whaleback will be unable to withstand this level of exploitation, and the aggregation may disappear like so many others along the inshore GOM.

Current management of the GOM cod complex has been effective to a point; however, until the protection of inshore spawning aggregations is secured, complete rebuilding may not be possible. Through continued research efforts such as the ongoing *MarineFisheries* CCZ projects, we will be able to enhance our understanding of GOM cod behavior and population structure. We are hopeful that this information will prove instrumental in formulating creative management solutions that will allow GOM cod to continue to rebuild, ultimately resulting in a more sustainable fishery for the future. The CCZ closures are set to expire in February 2011, MarineFisheries will be looking to renew this conservation measure in the coming months.

By William Hoffman, Project Leader for Fisheries Dependent Investigations and Special Projects



DMF file graphic

Fine Scale seasonal closures in Massachusetts Bay have protected three unique spawning cod aggregations.

Management changes expected in Southern New England Lobster Fishery

ASMFC Lobster Management Board tasked with recovering a declining stock

Since summer, when the Atlantic States Marine Fisheries Commission (ASMFC) Lobster Technical Committee (TC) proposed a potential moratorium on the fishery, the media has focused attention on the Southern New England (SNE) lobster fishery. The TC suggested a moratorium because the stock had not responded to management measures adopted in the last decade. Despite changes in the minimum size and maximum sizes in portions of the stock unit and various trap limit programs, the stock remains depressed.

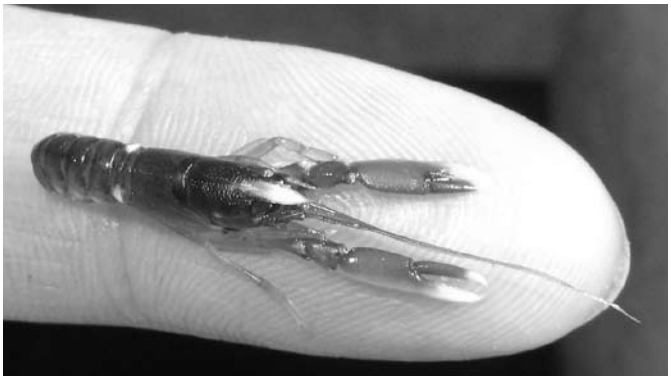
The Technical Committee's recommendation jolted industry and fishery managers, but it was delivered based on dire scientific findings, including a "recruitment failure" in this region. Based on surveys of juvenile lobsters, young lobsters appear to be in widespread decline. The Committee hypothesized rising ocean temperatures, that have been observed in near-shore areas over the last 25 years, to be the decline's root cause. Lobsters exposed to water temperatures above 68° F for prolonged periods of time are subject to increased physiological stress and higher incidence of disease. In response, adult lobsters will typically migrate out of habitats that are sub-optimal. Recent trends in the distribution of commercial effort and catch locations along Massachusetts' south coast support these trends.

The Committee concluded the change in distribution of adult lobsters to deeper offshore waters is having a negative consequence on juvenile lobster survival. Lobster life history studies have shown shallow waters with cobble substrates are a critical nursery habitat for juvenile lobsters. Recent research using oceanographic models and GPS-rigged drifters suggest most lobster larvae hatched in the offshore deeper water habitats off southern Massachusetts and in RI Sound are probably swept offshore, and away from the optimal inshore habitats.

In the opinion of the Committee, the dots have been connected: warmer water temperatures have increased the risk of disease and forced adults to migrate away from shore. The absence of larval release within the inshore waters of Buzzards Bay and Vineyard Sound prevent larvae from being transported to prime inshore rocky and cobble habitat. The result has been weak year-classes and inevitable stock decline and reduced landings. Some historic inshore lobster producing habitats such as Long Island Sound (NY & CT) and Buzzards Bay (MA) have seen landings decline by more than 80% over the past decade.

What's left of landings in southern New England comes from deeper, offshore waters. *MarineFisheries'* sea sampling program has observed this fishery for the past three decades. Over the last 10 years there has been a marked decline in near-shore trips compared to the 80s and 90s. Instead, the fishery's focus has been in federal waters (beyond three miles from shore). Many former inshore fishermen now opt to travel almost 3 hours from port to lobster fishing grounds in federal waters.

The SNE ecosystem appears to be less productive for lobsters. While industry members have argued about other causes, such as predation by recovered fish populations



DMF Staff Photo

Young of the year juvenile lobsters.

(striped bass, scup, smooth dogfish) and even chemical contaminants including pesticides, the conundrum remains: can the stock be rebuilt to recent historic highs (or even half as much)?

Managers are challenged to prevent further declines in the stock through aggressive conservation; however, it is difficult to effectively and fairly manage a single stock that spans five Lobster Conservation Management Zones, each with its own industry-driven management plans which are politically distinct and do not share compatible conservation regulations. Moreover most of the landings come from five different states (NJ, NY, CT, RI, & MA) originating from both state and federal waters; coordination among the jurisdictions is critical.

At the summer Lobster Management Board meetings, debate began on what steps to take to protect and possibly rebuild this declining stock. What came out of the meeting was a request for some "second opinions." Three federally funded independent experts reviewed stock status and the Technical Committee's scientific findings and agreed that the stock decline is dire and they concurred with the prescription of either a complete moratorium or a drastic (50-75%) cut in removals from the stock.

At the recent November 10 Annual ASMFC Meeting the Lobster Plan Development Team was tasked with devising a plan to accomplish the necessary cuts. That plan will be completed by March 2011 and approved by next summer.

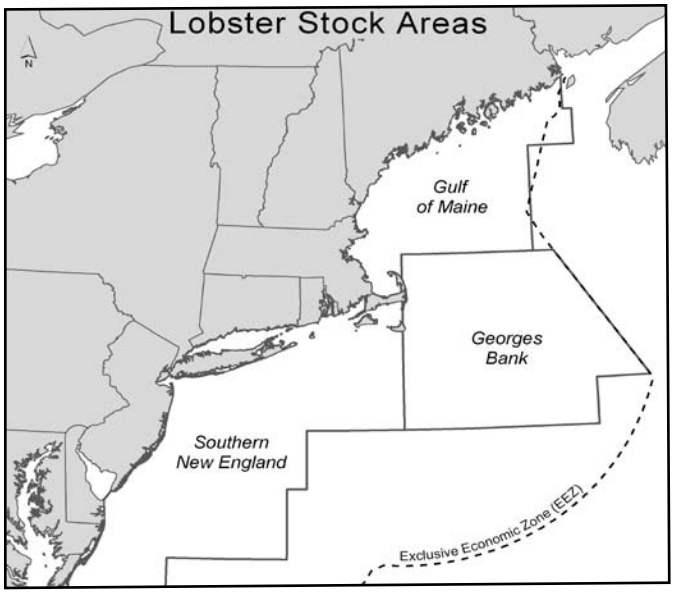
Thumbnail Sketch of SNE Lobster Fishery

The U.S. lobster fishery is conducted in each of the three stock units: the Gulf of Maine; Georges Bank; and Southern New England. The Gulf of Maine supports the largest fishery, constituting an average of 76% of the U.S landings between 1981 and 2007, and it has accounted for at least 87% of the total U.S. landings since 2002.

Southern New England has historically had the second largest fishery averaging betweem 18% - 20% of the U.S. landings from 1981 and 2002. However, since the dramatic decline in the stock, beginning in 2002, this fishery has been responsible for less than 9% of the U.S. landings and reached time series lows of 6% of the U. S. fishery in 2005 and 2006.

Georges Bank constitutes the smallest portion of the U.S. fishery, averaging 5% of the landings from 1981 to 2007. During this time period the relative contribution of the Georges Bank fishery to the total U.S. fishery has remained fairly stable.

The Southern New England fishery is conducted by lobstermen from the states of Connecticut, Massachusetts, New York, and Rhode Island, with smaller contributions from the



DMF Staff Image

SNE Lobster Fishery was once responsible for 20% of the overall catch, now lands only 9%.

states of New Jersey, Delaware, and Maryland. This fleet is comprised mainly of small vessels (22' - 42') that make day trips in near-shore waters (less than 12 miles), there is also a considerable offshore fishery, comprised of larger boats (55' - 75'), that make multi-day trips to the canyons along the continental shelf.

In 2009 the Massachusetts portion of Southern New England landed only 850,000 lbs. of lobster, of which roughly 190,000 lbs. came from state waters and 660,000 lbs. came from adjacent federal waters. This is dramatically lower than the record high observed in 1997 of 2.6 million lbs (900,000 lbs. in state and 1.7 million lbs. in federal waters).

Even with dramatic cuts in the southern New England fishery, the overall commerce and supply of lobsters will not be substantially affected in Massachusetts or the Southern New England region. The Commonwealth will still maintain over 90% of its state landings from other sources: Gulf of Maine and George's Bank. Moreover, lobsters imported from Canada and also those that are shipped down from Maine comprise a large portion of lobsters sold by local retailers and restaurants.

In the end, the lobster fishery represents an important component of the coastal economy of southern New England and critical part of many commercial fishermen's annual business plans. The Commonwealth is committed to ensuring the continuation of the fishery at whatever scale is considered sustainable.

By Daniel McKiernan, Deputy Director and Robert Glenn, Invertebrate Fisheries Project Leader

News from ASMFC's Annual Meeting

Commercial quotas increased for Spiny Dogfish but kept status quo for Striped Bass

The Atlantic States Marine Fisheries Commission (ASMFC) met for its annual meeting in November in Charleston, South Carolina. ASMFC made decisions on quotas for two species important to Massachusetts: dogfish and striped bass. *MarineFisheries* supported the outcome for striped bass, but objected to the size of the quota increase for dogfish. Although pleased the quota was raised by 5 million pounds, we argued an even higher increase was justified.

ASMFC's Spiny Dogfish and Coastal Shark Management Board approved a 20 million pound quota for the 2011/2012 commercial spiny dogfish fishing season – a 5 million pound increase from the 2010/2011 quota. As specified in the interstate management plan, the Commonwealth shares 58% of the quota with Maine, New Hampshire, Rhode Island, and Connecticut. Of the remaining quota 26 % is allocated to the "southern states" (New York through Virginia), while North Carolina has its own 16% set-aside.

"This quota increase will help extend the summer/fall fishery," stated David Pierce, *MarineFisheries* Deputy Director. "This past summer the regional quota of roughly 8.7 million pounds was taken in mid-August. The Commonwealth's fishery is expected to stay open into the fall with the May 1, 2011 – April 30, 2012 quota of 11.6 million pounds for the northern region."

Prior to setting the quota, the Management Board approved new biological reference points for spiny dogfish, which indicated the resource was not overfished or experiencing overfishing. Dogfish is rebuilt. The 20 million-pound quota was set to achieve a fishing mortality rate of 75% the target, considered by *MarineFisheries* as too precautionary, but consistent with both the advice of the Spiny Dogfish Technical Committee and the level recommended by the Mid-Atlantic Fishery Management Council at its October business meeting.

ASMFC's Atlantic Striped Bass Management Board decided against a proposal to increase the coastal commercial quotas in the interstate management plan. The coastal commercial quotas were last increased in 2003 and are equivalent to each state's average commercial landings during 1972 – 1979. At 1,159,750 pounds, the Commonwealth has the largest state-specific quota. Two motions to increase the quotas, first by 30% and second by 10% for one-year only, failed to pass. The proposal to increase the coastal commercial quotas was intended to bring more parity between the commercial and recreational fishery sectors.

The Management Board opted to maintain the existing coastal commercial quotas for good reasons including a 66% decline in coastwide recreational catch; a 25% decline in estimated striped bass abundance from 2004 to 2008; and several years of below-average production of young-of-the-year fish from the Chesapeake Bay. Although still above the target level, the biomass of mature females in the population has also declined from a peak in 2003.

"Chesapeake Bay is the primary spawning area for the population and where the majority of fish caught in Massachusetts' waters originate," explained Paul Diodati, *MarineFisheries* Director. "Several years of poor recruitment in the Bay have decreased the availability of striped bass in the Commonwealth's waters. Our delegation to the ASMFC could not support an increase in the quota at this time due to this and other disturbing trends from the fishery. We are willing to reconsider this issue when warranted by stock status."

The Management Board also requested an assessment in 2011, two years earlier than previously scheduled, to more closely track changes in the resource. The assessment will help indicate whether these trends are short- or long-term, and if corrective action is necessary to maintain the health of the resource.

By Nichola Meserve, Fisheries Policy Analyst

Industry and Researchers Collaborate to Develop a River Herring Bycatch Avoidance System

The National Fish and Wildlife Foundation awarded a $500,000 grant to *MarineFisheries*, UMASS Dartmouth's School for Marine Science and Technology (SMAST) and the Sustainable Fisheries Coalition (SFC) to develop a bycatch avoidance incentive system to minimize the incidental take of river herring in the directed Atlantic sea herring and mackerel fisheries (SFC members account for a majority of these target species commercial landings). Dr. Kevin Stokesbury (SMAST), his colleague Dr. Daniel Georgiana (SMAST) and Drs. Michael Armstrong and David Pierce (*MarineFisheries*) are collaborating to create a real-time intra-fleet bycatch avoidance communication system by developing a predictive model of where river herring are likely to occur in space and time.

Fisheries observer data, historic tagging data, independent fisheries information, and a coastal ocean circulation model will be used to identify specific water masses associated with these three species. From there at-sea distributions can be constructed and "hot spots" of river herring predicted and avoided.

Avoidance will be accomplished through on-board observer coverage sampling of each tow and reporting of river herring bycatch and tow information to SMAST, for the efficient circulation of species distribution maps to captains planning their next trip. SMAST's experience with real-time monitoring and fleet communication will be invaluable. They currently boast a very successful yellowtail flounder bycatch avoidance approach for the sea scallop fishery.

Part of this project involves expansion of *MarineFisheries* port sampling program to estimate bycatch of river herring and other species such as haddock. Sampling efforts will focus on gear types and locations expected to have higher bycatch (midwater, paired-midwater, and bottom trawl small-mesh vessels targeting sea herring).

Work has already begun; *MarineFisheries* scientists are training vessel captains and crews using Northeast Fisheries Observer Program sampling protocols. The interactive program will continue through April 2012.

DMF Staff Photo

MarineFisheries biologist Brad Schondelmeir samples herring catch.

This program has the support of SFC and is an excellent example of the fishing industry taking the initiative to address fisheries managers' and the public's concerns about river herring bycatch. SFC is committed to making this bycatch minimization program successful. *MarineFisheries* is equally committed and believes this effort will support the New England Fishery Management Council's plan to increase monitoring effectiveness of the New England sea herring fishery.

By Dr. David Pierce, Deputy Director

DMF Staff Photo

Sea herring vessels tie up at Gloucester dock, vessels like these will partake in the real time river herring bycatch avoidance system.

Comprehensive Trip-Level Reporting, New in 2010

A new commercial catch reporting program was instituted at the beginning of 2010, significantly changing the way *MarineFisheries* collects fisheries-dependent catch and effort information from commercial fishermen. Doing away with annual fishery-specific reports (e.g. striped bass, lobster, shellfish, horseshoe crab, etc.), all commercial permit holders are now required to submit monthly trip-level reports (for all trips conducted under the authority of their commercial permit) to either the Northeast Regional Office of NOAA Fisheries or *MarineFisheries*.

This new program was adopted for several reasons, most importantly to meet the standards established by the Atlantic Coastal Cooperative Statistics Program (ACCSP). ACCSP standards require all Atlantic states and the federal government to "design, implement, and conduct marine fisheries statistics data collection programs and to integrate those data into a single data management system that will meet the needs of fishery managers, scientists and fishermen."

Comprehensive trip-level reporting meets this standard and eliminates the suite of fishery-specific catch reports used in the past. It also eliminates duplicative reporting, where some federally-permitted vessels were providing the same information to both the state and federal governments. Furthermore, it ensures the data among all jurisdictions are collected in comparable methods, critically important to allow managers to oversee stocks that span multiple jurisdictions. Lastly, it adds the catch and effort piece to the landings data reported by dealers, a program instituted in Massachusetts in 2005. This two-ticket scenario matches the one established by NOAA Fisheries through the Fishing Vessel Trip Report (FVTR) program in 2004.

As of November 16, 2010 7,868 Massachusetts commercial fishing permits had been issued for 2010. Permit holders who do not report all of their fishing activity to NOAA Fisheries were given the option of reporting electronically or on paper. In the planning stages prior to 2010 it was estimated that only 5% of permit holders would choose to report electronically; it turns out that 25% of permit holders have chosen to report this way.

Fishermen reporting electronically use a secure web-based application called eTrips, which is managed by ACCSP staff. This greatly reduces paper use and the burden on data entry staff. *MarineFisheries* will continue to encourage more fishermen to report this way. *MarineFisheries'* staff also enters catch statistics submitted by paper using the eTrips program.

Massachusetts is the first state partner in ACCSP to submit all commercial trips to the program in this fashion (outside of those submitted to NOAA Fisheries). Other states, including Rhode Island, New Jersey and Maryland, have already started or have plans to do so in the coming years. Of the remaining permit holders in Massachusetts, 58% are reporting via paper submission, and 16% are reporting their commercial fishing activities to NOAA Fisheries (and *MarineFisheries* receives this data from NOAA).

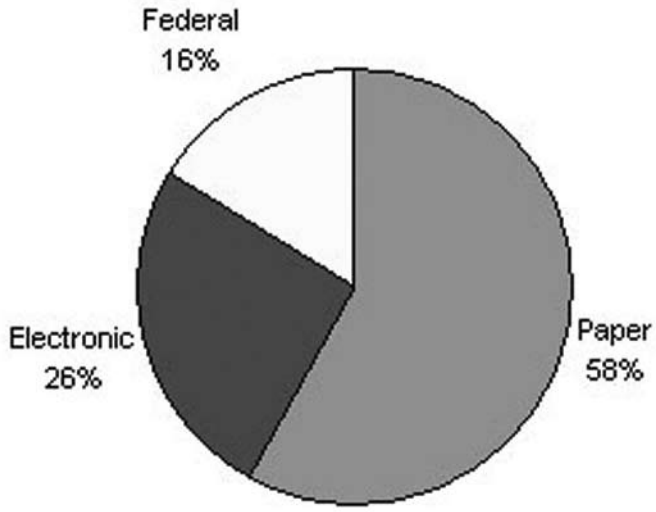
Future tasks for *MarineFisheries* Statistics Project staff include compliance monitoring, data auditing, particularly for those data entered by permit holders, and technical support to fishermen, especially those using the eTrips application.

In order to renew their permit for 2011 commercial permit holders are reminded that they must submit reports for all months of 2010, regardless of when their permit was issued or whether they fished commercially during a month or not. All species harvested under the authority of a commercial permit must be reported. More information about the trip-level reporting program can be found at: http://www.mass.gov/dfwele/dmf/commercialfishing/trip_level.htm.

If you have any questions, please call the Statistics Project at (978) 282-0308 ext. 101 or email dmf.stats@state.ma.us. For more information about ACCSP, visit www.accsp.org.

By Tom Hoopes, MIS and Fisheries Statistics Project Leader and Story Reed, Fisheries Data Coordinator

Reporting Method Breakdown



DMF file graphic

Figure 1. Percentage of 2010 commercial permit holders using each reporting method.

DMF Staff Photo

Provincetown Harbor.

Hake Symposium: A Successful Collaborative Effort

Despite a value of more than $6 million per annum in Massachusetts, there is a relative shortage of research on hakes (a common name given to a number of species in the Gadidae and Merluccidae families). However, the International Symposium on the Biology, Havesting, Management and Conservation of Hakes, held in Portland, ME on May 11 and 12, set out to change that attitude.

The symposium was designed to encourage the sharing of hake research and conservation strategies through the synthesis of specialized knowledge on biology, ecology and population dynamics. Participants sought to review and critique current bycatch reduction measures and other conservation strategies to develop recommendations on policy, fishing effort, research and stock assessment practices. Not only ambitious, it was successful; the symposium was identified as a collaborative model worthy of repeating for other species.

MarineFisheries biologists played a major role at the Symposium. Michael Pol, served as a co-convenor and panel chair, and was instrumental in organizing and managing the Symposium. David Chosid and Mark Szymansky, who with Pol comprise the Conservation Engineering program, were presenters and panelists at the event.

Mark Szymansky presented his research on the abundance trends of four commercially important species: silver hake (whiting), white hake, red hake and spotted hake. His findings included a south-to-north shift in the spring distribution of spotted hake, perhaps indicating a change in environmental conditions. Szymansky collaborated with staff biologists Matthew Camisa and Steven Correia to analyze the rich lode of *MarineFisheries'* semi-annual trawl data for this project.

David Chosid shared the success of the Conservation Engineering program's "DOGGRATE" project. Funded by the Northeast Consortium, and partnered with Frank and Andrew Mirachi of the F/V Barbara L. Peters (Scituate, MA) *MarineFisheries* tested a dogfish-excluder grid in a whiting trawl. Chosid used a combination of underwater video and catch analysis to demonstrate the grid's ability to reduce dogfish bycatch. Reducing dogfish bycatch is instrumental in increasing the fishery's access to whiting; local whiting fisheries are usually conducted after dogfish quotas are filled and large catches of dogfish can physically damage whiting, reducing their value. The Mirarchi's, who presented *MarineFisheries* with this cooperative opportunity, currently deploy a grid while fishing for whiting and are pleased with the results.

In addition to chairing and organizational duties, Pol set the stage for the Fisheries Management, Bycatch and Conservation talk. He discussed *MarineFisheries'* 20+ year partnership with the whiting trawl fishery and how this groundbreaking collaborative research partnership offered continuous examples of gear research, development and deployment.

The Symposium was sponsored by the Northeast Consortium, National Marine Fisheries Service, F/V Ellen Diane (Hampton, NH), *MarineFisheries*, Gulf of Maine Research Institute, UNH Sea Grant, and UMass-Dartmouth. While contributors were internationally diverse, Massachusetts attendees played a predominant role. The Testaverde and Mirarchi families and Russell Sherman gave a voice to the Commonwealth's fishermen and Dr. Steve Cadrin of SMAST provided his valuable expertise.

In response to the success of the Hake Symposium, a Redfish Symposium was held in November 2010 in Danvers, MA. A goal is to establish a directed, sustainable redfish fishery in New England. Pol co-convened the Redfish Symposium as well. Follow this website for more details: ***http://extension.unh.edu/Marine/ne-rarfs/index.htm***.

By Michael Pol, Conservation Engineering Project Leader

DMF Staff Photo

Andrew Mirachi uses the dogfish excluding grate on board F/V Barbara L. Peters.

State Biologist Nominated to International Working Group

This past June Michael Pol, head of the *MarineFisheries* Conservation Engineering program, was unanimously nominated to be chair of the International Council for Exploration of the Seas and the Food and Agriculture Organization of the United Nation's Working Group on Fishing Technology and Fish Behavior (ICES-FAO WGFTFB). Created in 1983, the Working Group is comprised of fishing gear experts and fish behavior specialists challenged to initiate and review gear studies towards bycatch and discard reduction and reduced impact on bottom habitats and other non-target ecosystem components.

DMF Staff Photo

Mike Pol adjusting bouyancy of experimental floating cod pots.

In the 1980s, former *MarineFisheries* biologist H. Arnold Carr pioneered the Commonwealth's participation in this highly respected group. Following Carr's legacy, Pol has been a member since 2001, serving as co-chair and rapporteur for numerous sub-groups. During this tenure he worked on projects regarding alternative fishing gears (e.g. fish pots), gear impact mitigation, and modified trawl gear to separate fish species.

State Biologist, Michael Pol to be Chair of International Working Group on fishing technology and fish behavior.

For Pol, the yearly working group meetings have become a ripe opportunity to develop global contacts, share state-of-the-art solutions and obtain knowledge to improve and develop fishing gear to benefit the Commonwealth's fishing fleet. As Chairman, Pol's expertise will be extremely valuable to groundfish fishermen and cooperatives of vessel owners (sectors), helping groundfish fisheries capitalize on abundant species and avoiding bycatch with low quotas.

On his nomination Pol said, "Taking on this challenge would not be possible without the support of *MarineFisheries* Director Paul Diodati, DFG Commissioner Griffin and the Executive Office of Energy and Environmental Affairs." Beginning his tenure as Chair in January 2011, Pol intends to continue the group's legacy as a nexus for emerging technologies. Additionally, he wants to broaden the group's scientific and industry expertise through encouraging even greater global participation. During his Chairmanship Pol hopes to bring the 2012 Working Group annual meeting to New Bedford, Massachusetts.

By Michael Pol, Conservation Engineering Project Leader

Comings and Goings

Nichola Meserve joined DMF in November to serve as a fisheries policy analyst for Director Diodati. She will be focusing on state and interstate mangement issues. She joins DMF from ASMFC, where she coordinated the management plans for several species including striped bass and weakfish. Nichola received her Masters in Environmental Management from Duke University.

Natalie Berthiaume came to DMF in February as a lab technician and bacteriologist for DMF's shellfish program. Natalie most recently worked as a lab technician for Jackson Labs in Bar Harbor, ME and received her bachelor's degree from Queen's University in Kingston, Ontario.

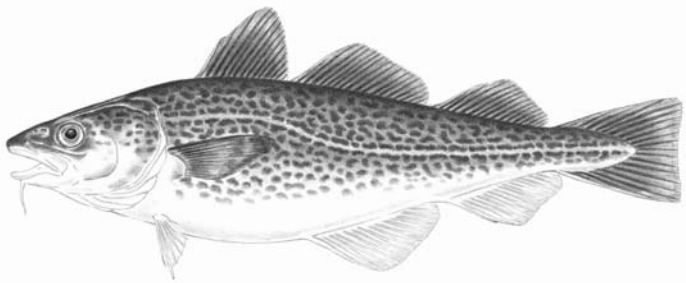
Kim Trull also came to DMF in February and has been working in the Age and Growth Lab analyzing growth structures. Kim has worked for both the New England Aquarium and also for New Hampshire's Department of Fish and Game.

Also joining DMF's Age and Growth lab is Katie L'Heureux. Katie previously worked as a shorebird specialist and seasonal natural resource officer for the Town of Barnstable. She has worked for DMF as a seasonal employee and obtained her degree from UMASS Amherst in Biology/Wildlife and Fisheries Conservation.

In April, fishery technician Chris Wood came aboard DMF's Rainbow Smelt/Species of Concern Project. Chris received his Masters in Environmental Studies from Antioch University New England and worked for Trustees of the Reservations and Antioch University.

Another April addition was John Logan. John received his Ph.D. from UNH conducting diet and movement tracking of large pelagic fishes using carbon and nitrogen stable isotopes. As a biologist for the environmental review program, he has been busy reviewing coastal alteration projects affecting marine resources.

Al Campbell retired in June from *MarineFisheries* after 22 years of service. Al started his career with the Division as a laborer on the fish way crew and eventually became the south shore maintenance foreman. Al is now enjoying more time fishing, hunting and pursuing his interest in historical event reenactments. We wish him well.



Commonwealth Awarded Leatherback Sea Turtle Conservation Grant

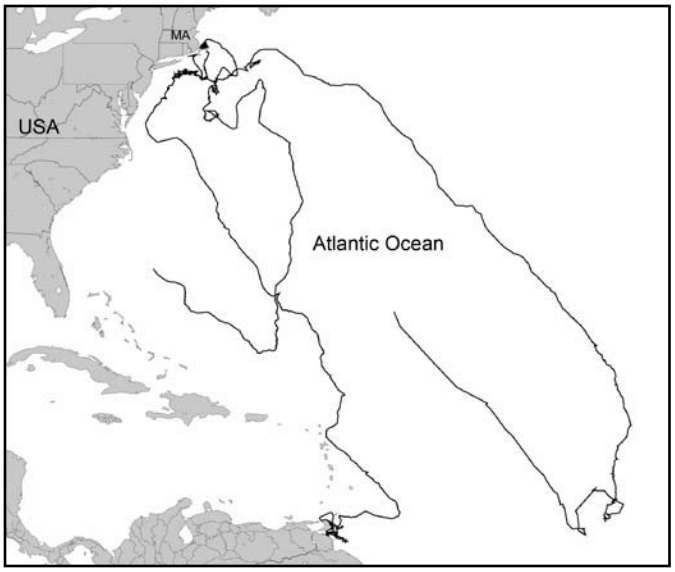
Joint Research Project Aims to Mitigate Fishery Related Entanglements

In May 2010, *MarineFisheries* was awarded a three-year NMFS grant to conduct research on the endangered leatherback sea turtle and provide a disentanglement program in Massachusetts' waters. *MarineFisheries* has operated the Massachusetts Sea Turtle Disentanglement Program with the Provincetown Center for Coastal Studies since 2005. In recent years, Dr. Molly Lutcavage, of the University of Massachusetts, has been attaching satellite tags to leatherback turtles in the state's coastal waters. This grant has created the opportunity to join forces and increase our knowledge of turtle behavior and habitat use in Massachusetts, with a goal of preventing vessel strikes and reducing fishery-related entanglements.

Leatherback sea turtles are seasonal visitors to our waters where they feed on abundant jellyfish, particularly in Cape Cod Bay, Nantucket Sound, and Buzzards Bay. Though they spend much of their lives in the open ocean, leatherbacks often come inshore when a food source is abundant; it is while inshore that they are at risk of vessel collisions and line entanglement. Entangling lines are typically buoy lines from the inshore pot and trap fisheries, but even mooring lines have been known to ensnare these turtles.

Among our challenges is the need to educate recreational and commercial fishermen and private boaters to respond appropriately to entangled or stranded turtles. Too often disentanglements by untrained persons create greater risks for these animals. Moreover, the turtles are endangered species and it is illegal to handle them without a permit. Safety is also a concern, as these are extremely large animals, often weighing in excess of 600 lbs.

We will combine a variety of methods to accomplish our goals. Aerial surveys will locate animals for tagging, with both long-term satellite tags monitoring migrations and short-term suction cup tags revealing swimming behavior in the water column. We hope the fine-scale data can help us understand *how* leatherbacks are using the water column and why they become entangled in buoylines.



Map courtesy of Kara Dodge/LPRC

Migrations of leatherback turtles tagged by Dr. Lutcavage off the coast of Massachusetts.

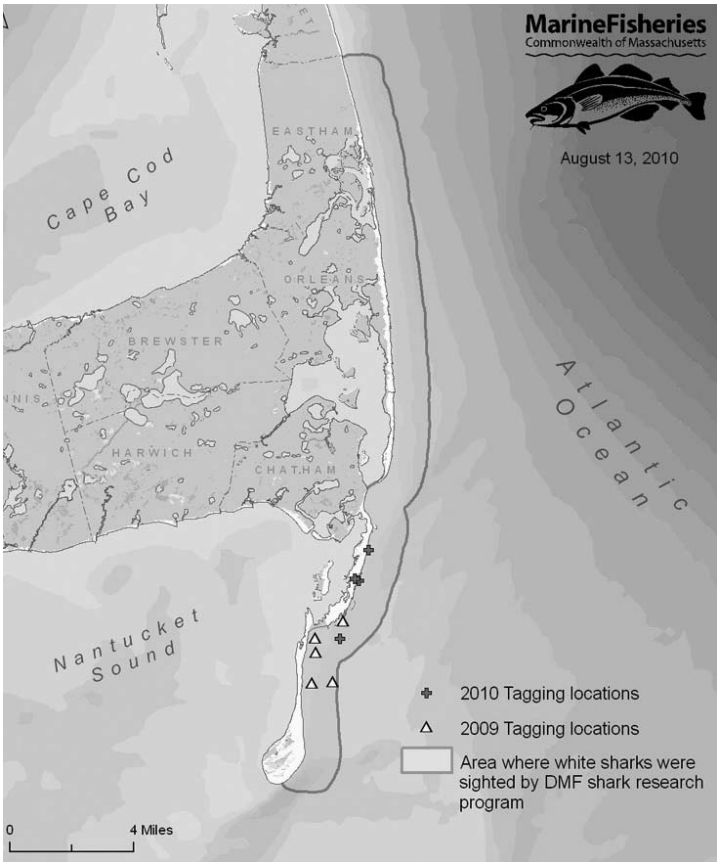
In addition, we will collect all entangled lines for analysis of the configuration of the gear, entanglement location within the gear, line diameter, and scope of the line relative to water depth. This information is critical to developing potential gear modifications to reduce the likelihood and severity of these events. This research also will allow us to determine turtle entanglement geographical hot spots. In most years eastern Nantucket Sound sees many turtles and entanglements, incidents have been increasing in Cape Cod Bay and Buzzards Bay as well.

In early 2011, *MarineFisheries* will host a workshop for pot and trap fishermen to discuss the issue of entanglement and brainstorm potential solutions. For more information contact Erin Burke at ***erin.burke@state.ma.us***.

By Erin Burke, DMF's Protected Species Specialist

Photo courtesy of Kara Dodge/LPRC

UMass Researcher, Molly Lutcavage, tracks the migrations of leatherback turtles using satellite tags, like the one on this turtle.



DMF Staff Graphic

MarineFisheries' Shark Team tagged and observed White Sharks from Monomoy Island north toward Wellfleet during the summers of 2009 and 2010.

Return of White Sharks prompts continued study

There is no doubt that *Carcharodon carcharias*, the white shark, prompts tremendous civic and media attention. This summer proved no exception; beach closings and shark sightings dominated local and national headlines throughout July and August.

Despite such increased awareness, these sharks are not new to our waters. Indeed their seasonal presence along coastal Massachusetts has been well documented throughout history. However, data compiled by *MarineFisheries* clearly demonstrate recent increases in the number of white shark sightings, as well as attacked seals.

The epicenter of this activity has been the eastern shore of Monomoy Island, south of the Chatham mainland. This wildlife preserve hosts a sizeable and growing population of federally protected grey seals and anecdotal data suggest white sharks are exhibiting a dietary shift in response to these changes in seal abundance. This has resulted in a more identifiable white shark presence along the Massachusetts coast.

Building on last summer's work, *MarineFisheries'* Shark Research Project, in conjunction with spotter pilot George Breen and commercial fishermen Bill Chaprales, applied Pop-up Satellite Archival (PSAT) tags to five white sharks this season. In addition the Shark Research Project began utilizing acoustic transmitters and a fixed receiver array to track local white shark movements. This technology allows *MarineFisheries* scientists to track the fine-scale movements of these fish to better determine fidelity to the region, as well as seasonal residency.

PSAT tags act as data loggers, collecting and storing depth and temperature information as the shark moves through the water column. At a pre-programmed time, the tag releases from the shark, floats to the surface, and broadcasts the archived data to a satellite. These data allows scientists to re-create three dimensional movements of the sharks and examine migratory patterns, movement rates, habitat associations, site fidelity, residency, and temperature and depth preferences.

While PSAT technology has been widely used in the Pacific and Indian Oceans, last summer's tagging of five white sharks off Chatham represented the first successful use of this technology on white sharks in the North Atlantic. Moreover, these tags revealed previously unknown seasonal migration patterns of white sharks in the northwest Atlantic; the tagged individuals migrated south when waters cooled, wintering off the southern US, as far south as Florida.

For over two decades now, the *MarineFisheries* Shark Research Project has been successful in researching regional abundance, age structure, feeding ecology, movements and reproduction of local shark species. This past year, high-tech tags have been used to study the fine- and broad-scale movements and habitat use of a number of other shark species in the inshore and offshore waters of Massachusetts, including: Georges Banks' porbeagle sharks; sand tigers in the Plymouth, Kingston, Duxbury estuaries; basking sharks off Cape Cod Bay; and shortfin mako sharks on the Grand Banks.

In 2010, the Project also fostered cooperative research partnerships, participated in state, regional, and federal management, and provided public education and technical information on the biology, utilization, and management of sharks.

More information can be found on DMF's White Shark webpage: http://www.mass.gov/dfwele/dmf/spotlight/white_shark_2010.htm

By Dr. Gregory Skomal, Senior Biologist

DMF Staff Photo

Monomoy Island is home to a sizeable and growing population of grey seals, a favorite prey of the white shark.

Notice of Public Hearing
Recreational Saltwater Fishing Permit

December 8TH and 15TH, 2010

On November 5, 2010, the Division of Marine Fisheries (DMF) promulgated recreational saltwater permit program at 322 CMR 7.01 and 7.10 on an emergency basis in order for these regulations to be in effect prior to January 1, 2011, thereby complying with the state exemption requirements under the federal Magnuson-Stevens Act and the provisions of Chapter 168, Acts of 2009, the state law that authorized the establishment of DMF's permit program. On the same date, the Executive Office of Administration and Finance (ANF) amended its fee regulations at 801 CMR 4.00 on an emergency basis to establish the fees associated with the DMF permit program.

DMF is simultaneously commencing the process for promulgating these regulations on a permanent basis, and pursuant to M.G.L. Ch. 130 § 17A, 17C and 80 gives notice of the dates of two public hearings to accept comments on the DMF permit regulations. At the same public hearings, public comment will be accepted on the fees applicable to the DMF permits. The DMF permit regulations identify persons required to obtain a permit, persons exempt from a permit, permit and related requirements applicable to for-hire vessels, allow the sale of permits by agents authorized by DMF, and establish penalties for violations. The ANF fee regulations establish fees for individuals and for-hire vessels.

Two Public Hearings Have Been Scheduled:

• December 8, 2010 at Gloucester Public High School Auditorium.
32 Leslie O Johnson Road, Gloucester, MA 01930. From 6:00 PM – 9:00 PM.

• December 15, 2010 at Plymouth South High School Auditorium.
490 Long Pond Road, Plymouth, MA 02360. From 6:00 PM – 9:00 PM.

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, December 17, 2010.

The permit and fee regulations are available at:
http://www.mass.gov/dfwele/dmf/marinefisheriesnotices/pubhearings/draft_regs_rec_license.pdf

A hard copy of the regulations may also be obtained by contacting:
Jared Silva by e-mail (jared.silva@state.ma.us), phone (617.626.1534), or at the above fax and mailing address.

Regulatory Year in Review

During the period of January through August 2010, the following regulatory changes were enacted by DMF after public hearings and Marine Fishery Advisory Commission (MFC) approval. Annual specifications and emergency regulations promulgated in 2010 are also listed.

Black Sea Bass

Recreational black sea bass season was extended with only a 3-week closure in October consistent with ASMFC management changes.

Coastal Sharks

To remain in compliance with the Interstate Fishery Management Plan for Atlantic coastal sharks, 322 CMR 6.37 was amended to require all dealers purchasing regulated species from commercial fishermen hold a federal Commercial Shark Dealer Permit issued by the National Marine Fisheries Service.

Groundfish

DMF enacted complimentary measures to Amendment 16, the federal groundfish fishery management plan. These changes include amending the definition of multi-species groundfish to include wolffish and ocean pout, prohibit the commercial retention or landing of wolffish, ocean pout and window pane flounder and the recreational retention and landing of wolffish, increases the minimum size for halibut from 36-41", extends the recreational season whereby two cod can be retained from March 30 to April 15, requires all groundfish filets to maintain 2" square of skin with the sum of filets not exceeding two times the trip limit, and require the weight of filets retained by commercial vessels be multiplied by three to determine overall compliance with per vessel weight trip limits, and specified commercial trip limits apply to singularly to the permitted vessel in use regardless of how many commercial permit holders are aboard that vessel.

Horseshoe Crabs

Regulatory amendments were enacted to better conserve discrete, local populations of horseshoe crabs. To protect spawning crabs weekend closures were replaced by 5-day lunar closures in May and June. Friday and Saturday closures for mobile-gear harvest were implemented to correspond with current commercial summer flounder effort management restrictions. Trip limits for the mobile gear sector were increased from 400 to 600 lbs per 24 hour period to supplement harvest lost due to lunar closures without threatening the spawning population.

Northern Shrimp

Updated stock assessments and landing information prompted an early closure to this fishery. Therefore, 322 CMR 5.00 was amended, by an emergency action, to close the fishery on May 6, 2010. On December 1, 2010, a 136-day northern shrimp season will go into effect, closing on April 15, 2011. The target landings will be 4,000 mt (8.8 million lbs.) The ASMFC Shrimp Section will be convened in late February to review the fishery performance in-season to determine if the season might be extended longer or closed sooner.

Scup

Decreased the for-hire "bonus season" and bag limit by 10-days and 5-fish, and extended the 10-fish per angler for-hire season by 9-days. The 2010 weir quota was increased from 177,000 – 225,000 lbs; poundage not taken from this fishery rolled over into the general commercial quota. These adjustments were based on amendments to the Interstate Management Plan.

Spiny Dogfish

On April 8, 2010 the MFC approved a specification for a 3,000 lb trip limit for the 2010/2011 commercial spiny dogfish fishery making the Massachusetts trip limit consistent with the other New England states.

Spring Cod Conservation Zone

The spring cod conservation zone was extended by emergency action for three additional weeks (until July 21) to protect spawning cod aggregations present in the area.

Summer Flounder (Fluke)

Established the 2010 recreational fluke season, a 146% increase from 2009 increasing the recreational season by 23 days, closing on September 6 rather than August 13.

Weakfish

Amend 322 CMR 8.06 to remain in compliance with the Interstate Management Plan for weakfish, including

a) reduced the recreational bag-limit from 6 to 1 fish.
b) establish a 100-lbs commercial trip limit.

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

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

EXECUTIVE OFFICE of ENERGY & ENVIRONMENTAL AFFAIRS