Published quarterly 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.

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A Commonwealth of Massachusetts Agency

MarineFisheries Creates Integrated Habitat Project

MarineFisheries launched the Habitat Project in the winter of 2007 to consolidate and aid existing fisheries habitat research. Although *MarineFisheries* has been conducting fish habitat research since its inception, it became increasingly evident that a dedicated program was needed to better consolidate and guide existing habitat research within *MarineFisheries* and create new guidance documents and regional resource information (e.g. seafloor maps, time-of year windows) for the fisheries management and environmental permitting communities.

Led by Dr. Kathryn Ford, the Habitat Project is comprised of three interdependent components: *Habitat Research, Technical Review, and*

Technical Guidance. These sections respectively 1) build on our capacity to conduct fisheries habitat research, 2) provide science-based technical review of coastal and marine alteration projects and guidance on both the status of, and potential impacts to fisheries resources and habitats of the Commonwealth, and 3) create and disseminate marine fisheries guidance documents and regional resource information for Massachusetts. Additionally, the Habitat Project provides a conduit for information collected in the private sector and enables a forum for discussing critical coastal issues.

Habitat research, such as eelgrass surveying and seafloor mapping, employs a variety of high and low-tech tools to



conduct research. Some examples include resource assessment studies for shellfish and finfish, shellfish safety, mapping of anadromous fish spawning runs, eelgrass monitoring and restoration, artificial reef studies, seafloor mapping, and other research projects as needed.

MarineFisheries has recently been involved in several habitat related studies such as lobster monitoring, artificial reef creation, and eelgrass restoration. *MarineFisheries*' work on Hubline mitigation projects has paved the way for the Division's continued involvement in near-shore habitat research. For example, *MarineFisheries*' Hubline Eelgrass Mitigation Project is the largest eelgrass restoration project to date in the Commonwealth. Habitats such as eelgrass have been recognized as critical components of fisheries management for decades, but only recently have efforts been forwarded to include habitat and ecosystem management into research and management frameworks. Due to the encompassing nature of the studies of habitats and ecosystems, they require integration across many disciplines.

The *Technical Review & Guidance* sections are coordinated by Tay Evans and Mark Rousseau for the North Shore and Eileen Feeney and Frank Germano for the South Shore. *Technical Review* is responsible for analyzing coastal alteration projects and policy changes based on *MarineFisheries'* own data and expertise. The process provides scientific comment to towns and to regulatory agencies within the state regarding possible project impacts to fish populations and habitat.

Historically, *MarineFisheries*'s biologists reviewed projects and provided resource information upon request. More recently environmental review had been coordinated by tracking all coastal and marine projects, soliciting specific resource information from *MarineFisheries* biologists, writing letters and participating in interagency meetings. Although time consuming, this role has clearly been a critical one as other agencies now routinely look to *MarineFisheries* for site-specific expertise to aid in decision making relative to coastal development projects and other activities that may impact the marine environment. The Habitat Project has incorporated the previous stand-alone environmental impact assessment into its new *Technical Review*.

Technical Guidance develops guidance and policy documents, and highlights agency needs that require more research. Regional resource information helps municipalities, agencies, private and non-profit groups get the relevant information that they need concerning marine fisheries resources. Through coordination by the Habitat Project, MarineFisheries relevant technical expertise will continue to be brought to the forefront to ensure we are maximizing the agency's contribution to protect our fishery resources.

The Commonwealth is faced with challenges in managing the cumulative impacts of growth on marine habitat and fisheries resources. As coastal and ocean development pressures continue to rise, there is an increased call for Ecosystem Based Management, Ocean Management, and even Ocean Zoning. In addition to participating in a wide range of inter-agency meetings related to coastal alterations, the Habitat Project will represent *MarineFisheries* in Ocean Management activities. Such activities include support for implementation of the Commonwealth's new Ocean Act, participation with the Massachusetts Ocean Partnership Fund, and regional ecosystem based management initiatives (e.g. Gulf of Maine Council). Also, *MarineFisheries* participates in habitat partnerships such as the National Habitat Action Plan planning process, the NEFMC Habitat PDT and Committee, and the ASMFC Habitat Program (see related article).

The Habitat Project is dedicated to connecting the Division's wide range of resource expertise with a variety of state, regional, and national habitat initiatives. Check out further information on the project, including updates on performance and objectives, online at: www.mass.gov/ marinefisheries.

By Dr. Kathryn Ford, Enviornmental Analyst and Tay Evans, Aquatic Biologist

Fisheries Habitat Research

Seafloor mapping. The Habitat Research section is consolidating and examining acoustic and biological datasets with the goal of generating maps identifying biologically important resources. The first study area of this project is Buzzards Bay, where a GIS and habitat classification are being assembled. This project also conducts multibeam surveys to map backscatter characteristics of the seafloor. This project works cooperatively with the CZM and USGS mapping partnership.

Artificial reefs. The creation of artificial reefs is gaining popularity on the East Coast as a means to enhance fish populations. In order to ensure proper siting, construction, and assessment of such projects, the Division has authored a draft Artificial Reef Policy. Additionally, *MarineFisheries* monitors an artificial reef site as part of the Hubline project. This experience has enabled the Division to provide robust technical assistance in the site development for additional restoration sites and for proposed reef projects.

MarineFisheries' Hubline Eelgrass Mitigation Project is the largest eelgrass restoration project to date in Massachusetts.

Eelgrass research. MarineFisheries monitors eelgrass in Salem Sound as part of the global SeagrassNet program (See SeagrassNet Article in this newsletter) and in Boston Harbor as part of the Hubline eelgrass restoration.

The Division also contributed to the Annisquam River eelgrass habitat restoration project and is spearheading the formation of a Massachusetts multi-agency eelgrass technical working group.

Other projects. Many of the research projects overseen by *MarineFisheries* are directly relevant and critical to our success in examining the impacts of various permitting actions. These projects include shellfish habitat mapping, mapping of anadromous fish spawning runs, the fisheries independent trawl survey, lobster habitat mapping, and a review of time-of-year windows.

Protecting Fisheries Habitat Along the Atlantic Coast -

Partnerships and Direction

To the outside observer, MarineFisheries' participation with the Atlantic States Marine Fisheries Commission (ASMFC) is focused solely on fisheries management. However, for many years, MarineFisheries staff has also played an important role in helping to characterize fisheries habitat requirements for management plans, define habitat area of particular concern, and develop habitat guidance documents. Such efforts continue through participation on the ASMFC Habitat Committee and its initiative, the Atlantic Coastal Fish Habitat Partnership (ACFHP).

Following adoption of the National Fish Habitat Action Plan (NFHAP) by the Association of Fish and Wildlife Agencies and the Departments of the Interior and Commerce in 2006, ASMFC identified the need for an interstate partnership focused on diadromous and estuarine-dependent fish and their coastal habitats. In addition to natural factors such as climate change and sea level rise, these critical habitat areas continue to be degraded by anthropogenic impacts such as coastal development, poor water quality from run-off and discharges, physical barriers such as dams, water diversions and the introduction of invasive species. As a fisheries management organization made up of the 15 Atlantic coast states, ASMFC is uniquely qualified to identify coast-wide threats to fisheries habitat and to help coordinate restoration efforts. Accordingly, the Habitat Committee was directed to develop a coastal fish habitat partnership for inclusion under the auspices of the NFHAP.

In 2007, Jessie Thomas of ASMFC and members of the Habitat Committee held informational meetings along the Atlantic coast and sponsored a coast-wide workshop for potential partners. Eighty people representing a range of stakeholder groups such as State and Federal agencies, conservation and advocacy organizations, and regional restoration partnerships participated in the process. As there was general agreement that a partnership should be formed, an Interim Steering Committee (ISC) was formed to guide the process, along with Communications and Science and Data working groups. In keeping with past habitat-based efforts, *MarineFisheries* is an active member of the ISC and staff members are contributing to the data gathering activities of the Science and Data working groups.

The pilot ACFHP has since received recognition as a "candidate" partnership by the NFHAP Board. Status as a full partnership under the NFHAP will be considered upon completion of the ACFHP's infrastructure (guiding documents and agreements). The mission of the ACFHP is to "accelerate the conservation, protection, restoration, and enhancement of habitat for native Atlantic coastal, estuarine-dependent, and diadromous fishes; to build partnerships between federal, state, and private entities; to provide guidance, strategies, and priorities for advancing effectively; to see improvements in Atlantic coastal fish habitat (and/or effective coordination) well in progress by 2010; and to achieve our vision by 2030."

To achieve these ambitious goals, the ACFHP is working to integrate data sets, resource inventories, and conservation/ restoration plans from along the Atlantic coast into a unified habitat conservation strategy. In March 2008, members of the ACFHP ISC and Science and Data working groups participated in a workshop sponsored by the U.S. Geological Survey (USGS) in collaboration with the National Fish Habi-

tat Science and Data Committee to develop a 3-5 year science and research plan for the National Fish Habitat Board. The USGS and other Federal agencies will use these recom-



mendations to develop projects and proposals to support the research and monitoring needs of the NFHAP.

The ACFHP is also working to define regional sub-partnerships to better coordinate fisheries habitat conservation and enhancement efforts along the coast. Since August of 2007, the partnership has applied for and received \$188,000 in funding and in-kind services from the ASMFC, NOAA, and the Nature Conservancy. The Association of Fish and Wildlife Agencies Multistate Conservation Grant Program awarded a \$520,000 grant to begin development of the coastal fish habitat conservation strategy and partnership infrastructure.

More information about the ASMFC Habitat Committee and ACFHP can obtained from Vin Malkoski at (508) 910-6318 or at (www.asmfc.org). Information on the National Fish Habitat Action plan may be found at http://www.fishhabitat.org.

By Vin Malkoski, Aquatic Biologist

Seagrass Monitoring in Salem Sound Goes Global

On a crisp morning last October MarineFisheries habitat biologists loaded sampling gear onto the R/V Alosa for a reconnaissance trip out of Gloucester Harbor. Accompanied by Dr. Fred Short of the University of New Hampshire, the end goal would be a permanent transect in Salem Sound for monitoring changes in abundance and biomass; this time not of fish, but of their habitat: seagrass.



Seagrassnet team (1-r): Dr. Fred Short accompanied by DMF's Alison Leschen, Matt Ayer, Vin Malkoski, Tay Evans & Mark Rousseau.

Seagrass beds are important marine fisheries habitat, providing shelter and forage for many commercially and recreationally significant species. Growing along the coast, most often subtidally, in busy harbors and estuaries, seagrasses are subject to many anthropogenic and environmental stresses, including nutrient loading from storm-water run-off, pollution from oil spills, development related habitat loss, and climate change. As such, seagrasses are useful indicators of a system's health. In New England the predominant seagrass is *Zostera marina* L., known commonly as eelgrass.

MarineFisheries' Seagrass Monitoring Program is part of SeagrassNet, a global monitoring program originally developed in 2001 by Dr. Short, to document the changing status of seagrass systems world wide (www.seagrassnet.org). The program started with sites in the Western Pacific and New Hampshire. *SeagrassNet* now includes monitoring sites in 15 countries, and on all continents (except Antarctica). SeagrassNet teams are composed of scientists and managers around the globe who sample seagrasses according to the same comparable methods. There are currently 9 Seagrass-Net sites in the United States, including a location in New Hampshire, monitored by Dr. Short's lab at the University of New Hampshire, two sites in Rhode Island, led by Save the Bay, and two sites on Cape Cod, led by USGS. MarineFisheries site marks the 3rd SeagrassNet site in Massachusetts - the 45th worldwide.

The recently established monitoring program includes quarterly sampling of plant and habitat parameters to provide a baseline for the assessment of trends in seagrass habitat in Massachusetts and world wide. At our Salem Sound station we have defined three permanent transects at shallow, mid and deep water depths. Data collected include plant characteristics, such as percent cover, canopy height, biomass and distance to the bed edge; and environmental data, including light level, temperature, salinity and sediment grain size. Back at the lab, samples are processed and data entered into a web-based database.



Eelgrass beds are divided into quadrants enabling the DMF Seagrass Net to monitor the area.

Data collected from this effort will strengthen our understanding of the status and health of an important marine fisheries habitat, contributing to well-informed policy decisions and enabling effective responses to proposed coastal alteration projects impacting eelgrass.

In addition to our initial study site in Salem Sound, future sites may include locations in Nahant, Gloucester, Plymouth, Buzzards Bay or Martha's Vineyard. Future projects may also incorporate fish and invertebrate sampling at our eelgrass sites.

By Tay Evans, Aquatic Biologist

Fishway Passage Restored

Anadromous fish species such as alewife, blueback herring, rainbow smelt, American shad, and white perch are important members of the coastal and freshwater fish faunas of Massachusetts. Providing passage through numerous manmade blockages to allow for the spawning migration of these fish is essential to maintaining healthy populations. Toward that goal, MarineFisheries has undertaken a multi-prong effort to rebuild and better understand population dynamics, *MarineFisheries* biologists first assesses the entire inventory of fishways in the Commonwealth. This review, completed in 2004, allowed *MarineFisheries* to prioritize repair and improvement work on fish passageways. While restoration of passageways was underway, MarineFisheries took action in 2006 to ban the harvest, sale and possession of river herring (alewife and blueback herring). Now in 2008, MarineFisheries can report that over 200-acres and 9-miles of spawning habitat has been restored to the Acushnet River and Palmer River, respectively.

Acushnet River recovers 200+ acres

A dedication ceremony was held on October 11, 2007 to celebrate the completion of two fish ladders on the Acushnet River. These ladders represent the final stage of the Acushnet River Anadromous Fish Passage Restoration Project, which started in 2002 to restore river herring (alewife and blueback herring), American eel and rainbow smelt populations to the river. Prior to construction operations, only 250 to 400 river herring were reaching the New Bedford Reservoir each year. With uninhibited access to the reservoir and a 200+-acre spawning habitat available in the headwater, it is estimated that this system could support an annual spawning run of over 100,000 river herring.

Three dams on the 8.2-mile Acushnet river, although marginally passable formed obstructions to anadramous fish coming into fresh water to spawn. The first dam located at the Acushnet Sawmill (built in 1900), measures 118' wide and 5' feet high. Although it was equipped with a concrete weir-pool ladder, fish had difficulty finding the entrance due to heavy vegetation growth and diffused flows that attract fish to the passageway. The Hamlin Street dam (built in 1920) and an 11-foot dam built in 1867 at the New Bedford Reservoir had no fish passageways ensuring river herring could pass only under suitable flow conditions.

The restoration project kicked-off in 2002 at the river's headwaters by fitting that dam with a state-of-the-art three foot Denil fishway measuring 265' in length. The passage-way was designed by the U.S. Fish & Wildlife Service with



Construction of a denil fishway at the headwaters of the Acushnet River kicked off the restoration project.

assistance from *MarineFisheries* and funded by the New Bedford Harbor Cleanup Fund.

Following several design changes, restoration efforts continued in the fall of 2007 with replacement of the existing fish passageway at the Sawmill dam and installation of a new passageway at the Hamlin Street dam. Both dams were fitted with a constricted weir, rock step-pool fishway. These structures are a relatively new innovation that effectively eliminate the obstruction created by the dam without removing the dam itself. Only a few exist on the east coast and these were the first of their kind constructed in the Commonwealth. Passage efficiency should approach 100% allowing most migrating fish to pass up and down stream easily.

Fish passageway replacement at the Sawmill dam involved reducing the length of the dam and re-defining the stream channel. The top of the dam was notched and lowered about three feet. Large boulders (each weighing between 3,000 to 5,000 pounds) were placed side-by-side forming 11 weirs at different elevations allowing fish to navigate it at most water flow levels. A similar structure overcoming a smaller elevational differential was fabricated in the most easterly river channel below and under Hamlin Street.



The step-pool fishway at the Sawmill dam should assist return of over 100,000 river herring during spawning runs.

In anticipation of these projects, *MarineFisheries* initiated alewife stocking at the New Bedford Reservoir from 2000 through 2005 in order to accelerate the recovery of this population. A total of 22,000 running ripe alewife were released into the headwaters during this period. Monitoring of adults returning to the reservoir has been conducted since 2005 and will continue through 2012 to evaluate the status of the population and the success of these new fishways.

The \$1.2 million project on the Acushnet River was a cooperative effort of *MarineFisheries*, Massachusetts Executive Office of Energy and Environmental Affairs, National Oceanic and Atmospheric Administration, U.S. Fish and Wildlife Service and New Bedford Harbor Trustees Council.

9-miles restored to Palmer River

The Palmer River/ Shad Factory Pond of Rehoboth Massachusetts is a small coastal river system that supports one of the few small stream American shad fisheries in the Commonwealth and the only one south of Cape Cod. In addition, an increasingly important river herring fishery exists here as do rainbow smelt, white perch, tomcod, sea lamprey, brown trout and American eels. Although the fishway at Shad Factory Pond has been known to pass small numbers of shad as well as river herring, the 2004 survey of anadromous fish passageways concluded that the fishway's poor condition and collapsing walls would soon make it completely impassable. Three years later, *MarineFisheries* successfully has modified the dam resulting in greater attraction to the fishway entrance, removed an obstructing deposit of sediments near the fishway entrance and completed improvements to the weir-pool ladder.

The original weir pool fishway at the pond dam was constructed around 1912 and had fallen into severe disrepair over the last century. Wall collapses, leakage and stone debris within the fishway channel hindered and impeded access by any migrating fish to the upstream spawning areas. Deterioration of the structure had proceeded to the point of impassability for the past several spring seasons. Furthermore, the original fishway was constructed with only the passage of alewife and blueback herring in mind. However, with its replacement the opportunity arose to include design aspects, such as increased water depth in the pools, to encourage use of the facility by other natal and diadromous species especially the larger American shad.

The restoration project required several years of advance planning and effort by at least eighteen interested local, state, and federal government agencies, non-governmental organizations (NGOs) and area businesses who provided support and/or funding. The final design called for \$300,000 to construct a 300-foot long fishway in a series of 21 variable length concrete pools, each overcoming an elevation differential of approximately half a foot to eventually navigate around the approximately 8.5-foot high dam. These incremental pools allow migrating fish to move upstream without expending all their energy and becoming exhausted during their journey to the spawning grounds.

Construction to replace the fishway took place over a few months in the fall and winter of 2007. In the spring of 2008 migrating fish encountered their first unimpeded access to upstream and downstream aquatic habitats over the entire length of the river, from the Perryville Dam above Danforth Street to the river's confluence with the Barrington River at Route 114/103 in Barrington and Warren. That translates into almost 40-acres of spawning habitat in the Shad Factory Head Pond as well as nine additional miles of suitable riverine habitat above the dam that was not available prior to the reconstruction. For more information and a survey of all anadromous fish passages in coastal Massachusetts, visit www.mass.gov/dfwele/dmf/publications/technical.htm for the following technical reports, TR-15, 16, 17, and 18. By Phillips Brady & John Sheppard, Aquatic Biologists



A sign (left) displays the cooperative efforts of all involved in restoring the Shad Factory Pond Fishway (right).

Monitoring River Herring Remotely

Massachusetts residents, for hundreds of years, have watched river herring migrate annually into local coastal waterways to spawn. The arrival of herring is a welcome sign of spring and a signal of new life to come. Observing Massachusetts herring runs has been limited traditionally to riverside viewing, but is now moving into the electronic age with global accessibility.

Massachusetts residents and internet users will soon be able to watch live video feed from a number of local herring runs on the *MarineFisheries* website. Although this new technology will be a great benefit to people who enjoy monitoring local herring runs, the goal of the video technology project is to facilitate collection of better scientific data on river herring populations in the Commonwealth. Currently, river herring are in severe decline along the Atlantic coast. Consequently, as scientists and managers work to restore river herring populations, accurate monitoring of the number of herring returning to spawn in individual rivers is a critical component to understanding the decline.

In 2007, *MarineFisheries* funded the Massachusetts Cooperative Fish and Wildlife Research Unit at the University of Massachusetts, Amherst to develop an automated video monitoring system that will function under a variety of environmental conditions at herring runs in both urban and rural settings along the Massachusetts coast. Support for the project comes from mitigation funds awarded to *MarineFisheries* for the construction of the HubLine natural gas pipeline and from the federal Wallop-Breaux Sport Fish Restoration Program.



As of April 2008, UMass scientists, including Dr. Martha Mather, Dr. John Finn, and graduate student Matt Burak, have been working diligently to install and test video system prototypes in four fishways in the Boston Harbor and South Shore regions. Video setups are currently located in the Charles River in Watertown, the Back River in Weymouth, Town Brook in Plymouth, and the Monument River in Bourne. Because of the



A video monitor installed over the Back River (above) captures images of river herring as they pass through the fisheway (below).

unique structural challenges at each of the four fishways, UMass researchers have relied heavily on the construction ingenuity of Ed Clarke and Luis Carmo of the *MarineFisheries* Fishway Construction Crew. Clarke and Carmo helped design and complete the installation of the video systems at each of the four fishways.

The video monitoring prototypes are comprised of a high power camera connected to a computer data storage device that is either accessed through a direct cable link or wireless connections. Images of fish passing by the camera are captured and saved on the storage device and eventually transferred to large UMass computer servers. The internet is used to direct camera operation remotely, and in locations where WiFi is being used, the internet connection transmits fish images to the computer data storage device. Obtaining power for these video systems has been one of the biggest hurdles, but options range from a direct link or autonomous power such as solar panels.

In addition to the above water cameras used in the main prototype, underwater and night-time infrared cameras also will be tested. For a "remote sensing" project applied to a fisheries context, Drs. Mather and Finn have had to look in some unusual places for technology and advice. One such consultation even included specialists from the U.S. Department of Homeland Security.

Using these automated systems developed by UMass will allow *MarineFisheries* to record entire herring runs and use powerful statistical software to help answer critical questions about herring run size and composition, run timing, and fish behavior. Remote operation and monitoring of the cameras will allow *MarineFisheries* staff the ability to manage data collection in a number of systems simultaneously. Additionally, the hope is that by spring of 2009, visitors to the *MarineFisheries* website will be able to link to live video feed of river herring on their annual journey upriver. Stay tuned.

By Kristen Ferry, Aquatic Biologist

TUV Imaging of Haddock Trawl Net

Beginning in 2007, *MarineFisheries* has been conducting high-resolution multibeam imaging of the seafloor and novel video and acoustic imaging of trawl gear using a MacArtney Focus-2 towed underwater vehicle (TUV). The TUV was purchased by *MarineFisheries* to enable the Conservation Engineering program and Fisheries Habitat section to conduct cooperative high-resolution studies. *Via* automatic computer control or manual piloting, *MarineFisheries* researchers can fly the TUV at a constant depth in the water column, a constant altitude over the seafloor, or along undulating tows. Additionally, a horizontal correction can be input into the system to enable horizontal autopilot, which is particularly useful along survey tracklines or when following pipelines.

In 2007 the TUV was dedicated to conducting research with seafloor-imaging sonar arrays in Buzzards Bay. The work was a cooperative project with Applied Signal Technologies (Torrance, CA) to investigate the capabilities of the sonars to image fisheries habitat in shallow water. Since these state-of-the-art sonars are very susceptible to motion interference, the TUV was an ideal option for deployment.

In April 2008, Dr. Kathryn Ford - *MarineFisheries'* lead benthic ecologist – teamed with Mike Pol and Mark Syzmanski of *MarineFisheries'* Conservation Engineering Program to conduct the first deployment of the TUV to image experimental 5-Point Haddock trawl net (see DMF News 3rd &4th Quarters 2006). This net is a sweepless raised-footrope groundfish net intended to only make bottom contact with five 10-foot long "drop chains" along the footrope. It was designed to avoid Atlantic cod while harvesting haddock. Additionally, this net minimizes bottom contact through the lack of heavy ground gear common on more standard groundfish trawls. It was constructed by Reidar's Manufacturing, Inc. and initial funding came from the Massachusetts Marine Fisheries Institute (MFI).

To capture information on how the net functioned in the water, sensors known as net mensuration equipment were attached to the net and a video camera was affixed to the TUV. The net sensors gave *MarineFisheries* researchers measurements of the distance to the doors, the door spread, the headrope height off bottom, the vertical mouth opening, and the wingspread. This gave us a good idea of the net's dimensions and where it was along the bottom which enabled us to find the net with the TUV.

Once the trawl net was deployed the TUV was lowered into the water and *MarineFisheries* Technician Steve Voss



piloted the TUV to the net. Steve was able to position the TUV at a safe height above the net by referensing depth and altitude information provided by sensors onboard the TUV. However, low trawling speed (2-3 knots) and variable tidal currents made maneuvering the TUV within the mouth of the net extemely difficult depite Steve's masterful piloting. Video imagery

illustrated the cor-

rect dimensions of

the towed net, and its

stability. Although im-

ages were captured of

In the water, the TUV provides a stable platform for imaging experimental fishing gear.

the headrope and inside of the wings, poor visibility due to water quality prohibited imaging of the footrope. Visual inspection of the drop chains once the net was back onboard suggested that the net was flying an appropriate height off bottom. Many thanks to

Frank Mirarchi for donating boat time and helping maintain the integrity of our gear on several close calls.

By Dr. Kathryn Ford, Environmental Analyst; David Chosid & Mike Pol, Aquatic Biologists.



Video imagery captures arcing headrope as well as an edge of the TUV in lower right corner.

ASMFC Awards of Excellence

Dr. David Pierce & Dr. Gary Nelson were presented the Atlantic States Marine Fisheries Commission's Annual Awards of Excellence at its Spring Meeting in Alexandria, Virginia for their contributions to the success of fisheries management & policy and science, respectively. The Commission established the Annual Awards of Excellence in 1998 to recognize the important contributions of individuals to the success of the organization.



From left to right: DMF's Dr. Michael Armstrong, Dr. Gary Nelson. Dr. David Pierce, Director Paul Diodati, and Dan McKiernan.

Dr. David Pierce, a biologist and manager for more than thirty years with *MarineFisheries*, has played a prominent role in fisheries management at local, state, interstate, federal, and international levels. At the interstate and regional levels, he is renowned for his tireless devotion to effective management, with his contributions being a critical component in the success of the current management regimes for Atlantic herring, fluke, scup, black sea bass, dogfish, tautog, and others. He brings to the table a unique combination of skills, blending science, policy, and decades of fisheries management knowledge. Always insightful in his approach to resolving complex fisheries management problems, Dr. Pierce has never been afraid to think outside the box and provide novel approaches to difficult challenges. His ability to bridge the gap between stakeholders and the complex and often convoluted fishery management processes has made him an indispensable asset to his state and its fishing constituents.

Dr. Gary Nelson's unfailing and innovative work in stock assessment and fish biology has been a credit not only to his state and the Commission but also to the field of fisheries biology in general. As the lead for *MarineFisheries'* analysis and statistical modeling group, as well as the Commission's Striped Bass Technical Committee and Stock Assessment Subcommittee, Dr. Nelson has put forth an extraordinary effort to improve the ability to assess striped bass stocks coastwide. As Commission's Striped Bass Stock Assessment Chair, he oversaw the completion of the 2007 striped bass stock assessment. He has implemented several new approaches that seek to solve many of the known problems with the current striped bass assessment. Dr. Nelson also places great emphasis on sharing his knowledge and expertise with his colleagues along the coast and with up and coming fisheries scientists.

Excerpt of article by Tina Berger, ASMFC Press Contact

Regional Groundfish Management Delayed to Await Best Science

At its June meeting the New England Fishery Management Council acted to slightly its decisions on Amendment 16 to the Groundfish Management Plan. The Council opted not to bring the Amendment to June and July public hearings for many good reasons. Principally, a lack of new information on status of all the groundfish stocks that will not be available until September.

Bringing the Amendment to hearings without that critical information, including new and revised rebuilding targets, would have created an amendment with too broad a range of alternatives.

MarineFisheries, and now the Council, concluded the public must be able to comment on an amendment with clear rebuilding alternatives rather than on a hodgepodge of options that may become meaningless upon release of up-dated science. The Council must have science available to explain and defend what will be necessary to effectively control fishing mortality while acknowledging and responding to expected socioeconomic impacts.

The Council's new timeline calls for October 7-9 approval of measures for the Amendment's Draft Environmental Impact Statement. November 18-20 will be when the DEIS is approved for public hearings. After January hearings the Council will make final decisions on Amendment 16 in February. New rules will be in place sometime between September and December, 2009, not May as originally anticipated.

The question now becomes: what will happen on May 1 – the start of the next fishing year? At a minimum, it's likely Amendment 13 default measure will be implemented. Daysat-sea for targeting groundfish will be reduced by 18% (DAS Category A/B ratio = 45/55). Whether other measures will be adopted depends on stock assessment advice and how NOAA Fisheries will respond to the Council's decision to delay the Amendment by about 4-5 months to await updated science and provide a meaningful and defensible set of rebuilding alternatives.

Greatly complicating matters is the Council not having revised "guidelines" for National Standard 1 of the 2007 reauthorized Magnuson-Stevens Act (MSRA). We await after public comment and further federal review what NOAA Fisheries will conclude is the way to implement Congressional intent regarding that first National Standard: "Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry."

Unfortunately, proposed federal revisions to these guidelines give us every reason to believe socioeconomic impacts on the fishing industry will have little influence on NOAA Fisheries decisions as to whether National Standard 1 will be met by Amendment 16. NOAA Fisheries may require optimum yields from many healthy groundfish stocks to be sacrificed to accommodate rebuilding "needs" of one or a few stocks. *MarineFisheries* will offer another set of comments and recommendations on the proposed rule.

Recently released stock assessment information indicates the necessity of further mortality reductions fot the Gulf of Maine and Georges Bank areas. The coming days will shed light on management responses by NOAA Fisheries and the Council. All of this reminds us that the New England Council and NOAA Fisheries are part of a complicated fisheries management system with many parts and players. Successes and failure are shared.

By Dr. David E. Pierce, Deputy Director

Agency Prepares to Disburse Funds for Groundfish Fishermen

MarineFisheries has completed a review of the applications submitted for inclusion in the "Massachusetts Relief for Framework 42" subsidy program, and payments should be fully disbursed by the first week in September. While the Framework 42 subsidy can not fully compensate fishermen for their full economic loss, MarineFisheries developed a program to ensure that the allocation of limited monies available for direct subsidy assistance would result in disbursement of funds to a representative range of impacted fishermen. This includes a limitation on the total amount of direct subsidies available to a single owner and is consistent with the proposal submitted to the National Marine Fisheries Service in May of 2008. As such, a cap of 3.5% of available funds has been set as the maximum amount a single owner or entities with commonly held ownership may receive under this program.

MarineFisheries has scheduled \$11.3-million in payments to more than 500 Massachusetts fishermen to be sent on August 29, 2008. Applicants that signed up for Electronic Funds Transfer (EFT) will have funds automatically deposited into their account by the first week of September. For those applicants that did not select the EFT option, a paper check will be delivered through U.S. mail by September 13, 2008.

Applicants with federal groundfish permits are receiving relief checks based on the total number of qualified vessels and the number of days at sea that each vessel has been allocated. Approximately \$500 per day at sea will be awarded, with payments averaging \$23,500 per vessel. Those with state permits will receive a subsidy of just under \$10,000 each, based solely on the number of qualified applicants.

In addition to the direct subsidies to commercial fishing permit holders, the Commonwealth will provide \$750,000 to individual crew members by November, and contribute about \$650,00 toward health insurance benefits for fishermen and their families.

Recognizing that many recipients of this subsidy will have questions about tax liability, *MarineFisheries* has contacted the Massachusetts Department of Revenue (DOR) and federal Internal Revenue Service (IRS); the responses of these agencies and/or contact phone numbers will be posted on the *MarineFisheries* website as soon as the information is available. Please direct tax questions to the appropriate institution, updated information on this program can be found on the *MarineFisheries* website at www.mass.gov/marinefisheries.

4th Annual "Bucket Brigade" Excited Many to Move Herring

On May 23rd and 24th, the 4th Annual Herring Bucket Bridgade took place at the dam between the Lower and Upper Mystic Lakes in Medford. This collaborative event between *MarineFisheries* and the Medford Boat Club has gained strong interest in the surrounding communities over

the last few years.

The two-day volunteer effort to move river herrng over the dam brought out hundreds of kids and adults fully equipped with boots and buckets including Fish and Game Commissioner Mary Griffin.

Each year volunteers use dip-nets to capture river herring as they move from the Lower Mystic Lake into the spillway below the dam. Fish are then lifted in buckets up the face of



inaccessible habitat.

The "Bucket Brigade" is a fun family event at which young volunteers release herring into the Upper Mystic Lake (left), having collected them below the spillway (middle). Dr. Mike Armstrong and Commissioner Griffin (right) do their part to transport herring over the dam.

Response to Expected Spike in Demand for Horseshoe Crabs -Delaware Bay region cuts will increase demand for MA crabs

The Marine Fisheries Advisory Commission approved new rules to regulate the harvest of horseshoe crabs for bait, which is used in eel and conch pot fisheries. New regulations a) reduce the annual quota from 330,377 to 165,000 crabs, b) set the daily catch limit at 400 crabs, down from 1,000, c) put a moratorium on new permits, and d) institute a temporary closure of the fishery on July 7 to allow accounting of landings to determine if catch has met the annual quota

These regulations come in response to concern about potential for unprecedented pressure on Massachusetts fisheries resulting from shortages of crabs in other states where allowable harvest has been severely curtailed to protect the endangered red knot, a bird which relies on horseshoe crab eggs to fuel its northward migration.

States bordering Delaware Bay, where the bulk of horseshoe crabs have historically been harvested, now have delayed season openings, restricted harvest to males-only, reduced harvest, or implemented outright harvest moratoriums. Last year New York, which has an earlier season than Massachusetts and is closer to the Delaware Bay markets, absorbed much of the demand for crabs from Delaware Bay conch fishermen. In so doing, they exceeded their annual quota by 80%. This year, New York has lowered daily catch limits to 200 crabs, and its annual quota to 150,000 crabs.

While Massachusetts harvest levels have been about 50% or less of the ASMFC approved state-specific quota since 2001, *MarineFisheries* biologists believe the quota may be too high to sustain horseshoe crab populations in Massa-chusetts. The quota was based on reference period landings during 1998 and 1999 when landings for Massachusetts may have been inaccurate and inflated.

A further conundrum for *MarineFisheries* is that there is no precise stock assessment for horseshoe crab within Commonwealth waters or within certain Massachusetts embayments, and consequently confidence is undermined in the sustainability of the previous 330,337 quota.

the dam before being released down a gently sloped chute into the Upper Mystic Lake thus exposing them to otherwise

The event was a great success and will continue to be held

annually until the new ladder is in place.

By Matt Ayer, Aquatic Biologist

Many thanks go out to everyone who came out to help.

Aside from a lack of precise assessment, half of the 545,715 crabs reported in 1999 and used to set the quota came from areas that are now closed to bait crab harvest by state and federal management actions. Federal closures on Monomoy Island and National Seashore in Nauset as well as state closures to bait harvest in Pleasant Bay have prevented harvest from some of the most productive areas in the state.

As a result of the closures, harvest pressure has shifted to other areas. Because MA crabs do not appear to move much between estuaries, this intensified pressure in some places has the potential to cause localized depletion. For these reasons, it's doubtful that the remaining open areas can produce sufficient crabs on a sustained basis to fill the quota. The intent of new Massachusetts regulations is to maintain recent statewide harvest levels while minimizing changes of local depletion.

Additionally, *MarineFisheries* has been coordinating a volunteer-based spawning survey modeled on the one conducted in Delaware Bay since 1999. We hope to continue this survey on an annual basis in embayments which are of particular concern because of high harvest levels. Spawning surveys can provide population trends over time, but actual population levels cannot be assessed this way. Moreover, the effort and cost required to accomplish precise state-wide estimates and/or embayment specific estimates could exceed the ex-vessel value of the fishery. It is likely, given the lack of information, that we will need to continue to conservatively manage this species.

By Alison Leschen, Aquatic Biologist

DMF *Rules UPDATE*

Public Hearings • Regulations • Legislation

Notice of Public Hearings September 16, 17 & 18, 2008

Under the provisions of M.G.L. c. 30A and pursuant to the authority found in M.G.L. c. 130 ss. 17A, 38, 80 & 104, the Division of Marine Fisheries (DMF) and the Marine Fisheries Advisory Commission (MFC) have scheduled hearings to accept comments on:

- 1. DMF proposal to prohibit any person from harvesting cod from the Cod Conservation Zone during December and January (322 CMR 8.15). This proposal shortens the closed period by one month (February) that has been in place since 2005. The rule would continue the prohibition on gillnets, otter trawls, mid-water trawl, seines and all hook-and-line gears including longlines, rod-and-reel, and handlines in the Conservation Zone.
- 2. DMF proposal to extend the moratorium for an additional three years on river herring harvest, sale and possession through 2011 (322 CMR 6.17). DMF seeks comments on possible amendments to the tolereance allowed for incidental by-catch and possession in other fisheries such as the sea herring fishery where fish are not sorted at-sea. Current tolerane of 5% for any batch of fish by count may be amended to a percentage as low as 1% by weight.
- **3.** Public petition and DMF proposal to establish a 50-blue crab per person per day possession limit (322 CMR 6.19) for recreational and commercial fishermen.

Public hearings have been scheduled for:

Tuesday, September 16th (6PM) at the Radisson-Plymouth Harbor (180 Water St.); Wednesday, September 17th (6PM) at the Annisquam River Marine Fisheries Station (30 Emerson Ave., Gloucester); Thursday, Sepember 18th (5:30PM) at the Tisbury Town Hall (51 Spring St., Vineyard Haven).

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, September 19, 2008.

Contact DMF for regulations and further details or visit our website at www.mass.gov/marinefisheries.

Regulations Update

During the period January through July 2008, 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:

Commercial Black Sea Bass Fishery

The 2008 commercial black sea bass fishery operated under the *status quo* annual quota split with 50% of the quota allocated to the spring period (May – July) and 50% allocated to the fall period (August – December). The fishery operated under *status quo* gear-specific possession limits, however additional no-fishing days applied. Authorized commercial fishermen were able to fish for black sea bass during the spring period on Sunday, Monday and Wednesday only and during the fall period on Sunday, Monday, Wednesday and Thursday only.

Season	Gear Type	Possession limit	
May - Dec	Fish pot & weir	500-lbs.	
	Lobster traps	100-lbs.	
	All other authorized gear	200-lbs.	

With two additional days off in the spring fishery and one additional day off in the fall fishery, *MarineFisheries* hoped to mitigate the impacts of a shortened season and maintain product availability in the markets during traditional seasons.

Commercial Summer Flounder (Fluke) Fishery

The Commission approved as final a recent emergency action to open the 2008 commercial fluke fishery on February 1st under a 500-lb. daily possession limit as well as changes to fishery sub-periods.

In the past, there has been a winter fishery divided into two sub-periods allocated 15% of the quota each, the first starting January 1 and the second beginning November 1, and a summer fishery beginning on Apr 23 that was allocated the remaining 70% of the quota.

The goal was to constrain landings to prevent an inadvertent reduction in the summer sub-quota. However, due to the high catch rates and volume of landings in January 2007, over 10% of the quota was harvested during the first five days of the Winter I fishery. The February start date for the winter period should markedly reduce the rate of quota consumption and fluke landings to the Commonwealth.

New regulations revise the sub-periods. Instead of WinterI/II and Summer sub-periods, the February – April 22 sub-period is now referred to as Period I. The Period I fishery possession limit drops to 100-lbs. when 25% of the annual quota has been reached.

Period II opens on April 23rd and runs through December 31st or the quota is harvested, whichever comes first. The Period II possession limits remain the same as the traditional summer period limits:

Gear Type	4/23 – 6/9	6/10 – 12/31, or quota is harvested
Net	100-lbs.	300-lbs.
Longlines	100-lbs.	200-lbs.
Handlines or Rod&Reel Dossession prohibited		200-lbs.

Commercial Scup Fishery

The 2008 commercial scup quota set-aside for weir fishermen has been established at 121,500-lbs. This is com-

mensurate with a 46% cut in commercial harvest mandated by the ASMFC. Commercial pot fishermen and hook and line fishermen were allowed nominal amounts of scup during the spring sea bass fishery on "open" sea bass fishing days. Since *MarineFisheries* has decreased these "open" sea bass fishing days, commercial pot and hook & line fishermen were allowed to land and possess scup on Monday, Wednesday & Sunday during May – July, or until 50% of the quota has been harvested, and on Monday, Wednesday, Thursday & Sunday during August through December, or until 100% of the quota has been harvested. The fishery operated under *status quo* gear-specific possession limits, quota dependent.

Season	Gear Type	Possession limit	
Jan - Dec	Fish Weir	none	
Apr 23 – Jul	Trawlers	400 lb	
May – Jul	Fich not 8 book and line	200 lb	
Aug - Oct	FISH pot & hook-and-line	400 lb	
Nov - Dec	All authorized gear types	2,000 lb	

Recreational Scup Fishery

Recreational fishermen are subject to the following minimum sizes, open season and possession limits when recreationally fishing for scup:

Sector	Minimum Size	Open Season	Possession Limit
Private	10.5" (no change)	May 24 – Sep. 26 (new)	10 fish (new)
For-hire	11" (new)	May 15 – Jun 28: 45-days (new) Jun 29 – Sep 17: 81-days (new)	45 fish (new) 10 fish (new)

These regulations implement regional measures approved by states from (Massachusetts through New York) through an interstate agreement.

Commercial Monkfish Limits

Commercial fishermen authorized to fish for monkfish may land and possess no more than 470-lbs. of monkfish tails or 1,560-lbs. of whole weight monkfish. Previously, fishermen with only state permits were unconstrained by monkfish possession limits. This limit maintains a limited fishery that has been conducted in waters under the jurisdiction of the Commonwealth.

Hook Gear Control Date

As of March 6, 2008 persons issued a new commercial permit authorizing use of hook gear in a fishery, excluding striped bass, may be subject to future management restrictions. At this time, no management restrictions have been proposed; any future regulatory proposals would go to public hearing. Previously, a November 4, 2004 hook gear control date was in effect, but expired in 2006.

Horseshoe Crab

Effective March 31, 2008, Director Paul Diodati took emergency action to cap landings near current levels in anticipation of unprecedented pressure on Massachusetts fisheries, resulting from shortages of crabs in other states. The actions include: 1) a lowering of the daily catch limit from 1,000 to 400 crabs, 2) a moratorium on new permits, 3) a new overall quota limit of 165,000 crabs (down from 330,377 crabs) and 4) the temporary closure of the fishery to allow accounting of landings to determine catch levels. Final actions were approved in June.

Division of Marine Fisheries

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Wideo Monitoring of Anadromous Fish

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)

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626-1520, or write to:

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